Cumulus Beijing CAFA 2023 Proceedings

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Cumulus Association
Central Academy of Fine Arts

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中央美術學院
Central Academy of Fine Arts

CAFA

Narratives of Love

爱的阐释

Narratives of Love
Cumulus Conference Proceedings CAFA Beijing 2023
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Preface

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Cumulus Beijing
CAFA 2023 Conference
Narratives of Love

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CAFA Conference:
Central Academy of Fine Arts，Beijing

Parallel Conference:
Sichuan Fine Arts Institute
Guangzhou Academy of Fine Arts
Xi 'an Academy of Fine Arts
Hubei Institute of Fine Arts
Nanjing University of the Arts
Jingdezhen Ceramic Institute
Xiamen University

CAFA Conference：11.22-11.24
Parallel Conference: 11.27-11.28

"Crisis and Opportunity"

Throughout the past three years of the COVID-19 pandemic, humanity has shown its remarkable resilience in the face of adversity. However, the relief felt at the end of the pandemic was short-lived as it was quickly overshadowed by the nervousness surrounding the ongoing world crisis. It is now more urgent than ever to re-examine our ecological foundation, lifestyle, production relations, and the meaning of life. The diverse advancements in artificial intelligence have created a dilemma for human self-understanding and the ethics of human-machine interaction, evoking a mixture of hope and fear.With the increasingly intensifying climate warming, cultural conflicts, economic fragmentation, and scientific iteration, how do humans react to standards of morality, ideas of design, thought of art, and methods of education? These common issues in the field of art and design will provide us with important references for strategic adaptation, structural reshaping, and redefinition of values.

"Ideology and Ideality"

Over the ages, "Love", as the matrix of human sensibility and rationality, the enlightenment of ideology and idealism, is the harmony of Tao, nature, and human wisdom. Love permeates every aspect of human civilization. Chinese civilization, Greek civilization, Islamic civilization, Indian civilization, Egyptian civilization, and the Maya civilization, among almost all major cultural systems, unanimously cherish and emphasize the importance of 'Love'.From the symbiosis of humans and nature, the healing of collective traumas, the compatibility of heteroge-

neous perspectives, the stability of social structures, to the innovation of art and culture, "Love" has always been created, interpreted, applied, and disseminated through a harmonious beauty, providing solace to life and nurturing existence. We firmly believe that facing an uncertain future, "Love" will continue to be the immortal energy driving the evolution and progress of human civilization, enduring through the ages and persisting eternally.The current Cumulus Association International Art and Design Conference has chosen "Narrative of Love" as its annual theme. Through the means of art and design, the conference aims to explore and interpret the ideas and forms of "Love" in multiple dimensions, including the individual, family, ethnic group, nation, world, nature, even the supernatural. It will delve into the realms of thoughts and thinking, discussing interdisciplinary topics such as culture and ecology, society and education, policy and economy, science and ethics, philosophy and faith. The conference seeks to gather cross-cultural wisdom to explore the future directions and methodologies of art and design.

"East and West"
Beijing, as the capital of China, stands as a profound embodiment of rich historical heritage, serene ecological surroundings, avant-garde fashion districts, vibrant community life, efficient service systems, and endearing folk traditions. These multifaceted elements have forged a distinctive design culture with worldwide influence, making Beijing an indispensable gateway and an enchanting source of inspiration for global designers, artists, and scholars to experience the essence of Chinese culture and the grandeur of Eastern civilization. We eagerly anticipate the gathering of Cumulus members from around the world in Beijing in November 2023, where we can unite in our efforts to forge a sustainable future imbued with the essence of "Love," igniting passion, motivation, and hope.

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Narratives of Love: Towards Healing, Transformation, and Transcendence.

Lorenzo Imbesi
Full Professor, Sapienza University of Rome
President, Cumulus Association

The Cumulus Beijing 2023 Conference, held at the prestigious Central Academy of Fine Arts, represented a significant milestone for the organization. Set against the backdrop of Beijing's rich historical and cultural landscape, the event was notably enriched through satellite conferences hosted at various prestigious institutions, including the Sichuan Fine Arts Institute, Guangzhou Academy of Fine Arts, Xi'an Academy of Fine Arts, Nanjing University of the Arts, Jingdezhen Ceramic Institute, and Xiamen University. This expansion of the conference's reach has significantly transformed it into a vibrant hub for cultural exchange and academic discourse, gathering a diverse array of participants from around the globe, all united by a shared commitment to exploring the intricate interplay of love, design, and social responsibility.

The overarching theme of the conference, "Narratives of Love: Towards Healing, Transformation, and Transcendence," provided a rich tapestry of insights and perspectives, prompting both the international and Chinese design communities to collaborate in efforts to forge a sustainable future imbued with the essence of love. In this context, the notion of love transcends mere emotion; it embodies a profound commitment to social justice, environmental stewardship, and cultural inclusivity.

The multifaceted challenges facing our planet, ranging from cultural conflicts and technological acceleration to social development, demand a heightened level of responsibility from designers and artists. They are called to reconsider how design can serve as a vehicle for positive change, challenging the status quo and addressing pressing global issues. Through thought-provoking discussions and reflections on critical dilemmas, including "Crisis and Opportunity," "Ideology and Ideality," and "East and West," the conference offered a unique platform that resonated globally.

The conference featured numerous paper presentations, panel discussions, keynote speeches, and networking opportunities, all of which collectively generated cross-cultural insights and social reflections on urgent topics, including environmental and ecological issues, societal and local cultural dynamics, policy, and economic considerations, as well as scientific, ethical, philosophical, and faith-based inquiries.

Humanity is currently undergoing unprecedented transformations. In the face of an uncertain future, design actions must increasingly prioritize human self-understanding and the ethics of human-machine interaction, while also providing positive references for strategic adaptation, structural reshaping, and the redefinition of values. Design, as a creative process aimed at solving problems, fulfilling needs, and creating value, must incorporate a multidimensional vision that informs today's actions. New paradigms in design innovation and technologies must reflect a responsibility toward future generations, fostering the blending and coexistence of Eastern and Western artistic and cultural traditions and promoting a flow of consciousness and mutual respect that ultimately nurtures love as a force for unity and understanding.

The proceedings compiled in this volume resonate the interconnectedness of these discussions, conveying a clear message to the global design community: design encompasses multifaceted responsibilities; every decision, ranging from product development to urban planning, carries ethical implications. The substantial attendance from around the globe demonstrated remarkable resilience in the face of adversity, underscoring the necessity to re-examine our ecological foundations, ethics, and values. This highlights the importance of fostering cross-cultural exchange, cross-border community development, and cultural inheritance, ultimately contributing to a new distinctive design culture in which love and design are perceived as catalysts for social change, inspiring individuals and communities to strive toward a more equitable and just society wherein a sense of belonging, diversity, and pluralism are celebrated and where the environment is preserved. Thus, the creation of a more inclusive, dynamic, and cherished global design landscape.

The insights collected in this volume encapsulate only a fraction of the meaningful contributions that the Cumulus Conference Beijing 2023 and its parallel events have offered to address the multifaceted crises of our time. The memories will undoubtedly resonate within the global design community, inspiring ongoing dialogue and collaboration in the pursuit of a better world.

Lorenzo Imbesi is Full Professor of Design at Sapienza University of Rome, where he is the Director of Sapienza Design Research and the Chair of the PhD program in Service Design for the Public Sector. Currently, he serves as the President of the Global Cumulus Association (cumulusassociation.org), the President of the Italian Scientific Design Society SID (societaitalianadesign.it), and a member of the Executive Committee of the European Academy of Design (eadresearch.org).

Cumulus Beijing CAFA 2023

Day 1

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Narratives of Love

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Exploring the functions of narratives coming from the wardrobe

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Abstract
The overproduction and lowering product quality in the fashion industry has led to the problem of shortened lifecycle of garments. This means generating waste at larger volume in shortening time, but the shortened lifespan of garments also mean that they spend less time in the wardrobes. This article is an exploration of what will be lost when there are only young clothes in the wardrobe through a two-step method developed specifically for this study which is going to be presented in detail as well. The context of the study is a family household with a teenager to explore the effects of shortening lifespan of clothing in an intergenerational and intimate context. The method of wardrobe study was used to allow insights to narratives related to the garments. These stories play central role in the relationship to the garment and to the treatment that it receives.

Author keywords
narratives; novelty; memory; wardrobe study; fashion

Introduction

Garments can be considered as objects and our objects often carry stories. The narratives attached to garments have been receiving an increasing attention in the past decades: projects such as Love Story initiated by Fashion Revolution to encourage people to share personal clothing stories and photos online, with the goal of highlighting emotional connections with clothing and promoting sustainable fashion choices. Another example is the project of sustainability researcher, Kate Fletcher's Local Wisdom project, which gathered clothing stories through interviews within communities worldwide, to explore clothing practices such as care and repair. After Emily Pivack's popular book entitled Worn stories published in 2014 use pieces of clothing as an inspiration to tell stories and in 2021 a docu-fiction appeared produced by Netflix, taking this idea to the screen: Worn stories is made of short episodes in which garments are used as a main arch of the storyline.
Objects are intertwined with our emotional system on different levels. From a psychological perspective, as Csíkszentmihályi suggests in his essay Why we need things, the possession of objects help to "objectify the self" (1993, p.22) and "we need objects to magnify our power, to enhance our beauty, and extend our memory into the future" (Csíkszentmihályi, 1993, p.28). Examining and reflecting upon the relationship between garments and their users is a matter of crucial significance considering the contemporary global waste problem. From one side, consumerism is about possessing more and more new objects and from the other side, the end of the object contributes to the ongoing environmental crisis happening in the planet. As outlined in the extensive report from the Ellen MacArthur Foundation in 2017, a fundamental reason behind the fashion industry's wasteful practices lies in its low utilization of clothing and the limited recycling rates once garments are no longer in use. Over the past 15 years, clothing production has nearly doubled, yet concurrently, clothing

utilization has seen a significant decline of 36%. Consequently, this trend results in an escalating consumption of nonrenewable resources to produce clothing that typically serves its purpose for only a brief period (Ellen MacArthur Foundation, 2017). The shortening life span of garments also affects the attachment to them. According to Schifferstein and Zwartkruis-Pelgrim, "memories might be the primary
reason for attachment to products people have owned for a long time" and memory accumulates through time adding additional strength to the attachment (2008, p. 9). This means that the less objects last in the wardrobe due to reasons of quality or reasons of fast aesthetic changes, the less the owner has the chance to develop attachment to it. This clearly leads to a vicious circle, as people take less care of the objects, they don't have emotional bonds with, which means potentially worse conservation, thus shortening even more its life span.
On one side, as "enjoyment are highest for recently acquired objects" (Schifferstein & Zwartkruis-Pelgrim, 2008, p.9) the emotional attachment develops quickly towards new objects. Fashion has been defined as an "obsession with the new" (Baldini, 2005, p.73). This desire and search for the new, according to Simmel, is a core dynamic in fashion motivated by the need to differentiate ourselves from the others (Simmel, 1985).
In pursuit of longer life span of garments the emotional attachment to them plays an essential role. Novelty and memories are the two key processes to develop deep attachment towards an object (Schifferstein & Zwartkruis-Pelgrim, 2008). This study explores what role narratives that garments generate have in these processes.

Methodology

This qualitative research was composed of a two-step method developed specifically for this study. The first phase was based on wardrobe-study method (Klepp & Bjerck, 2014) and the second phase was a follow up survey (see figure 1.).

Phases	Activity	Detail
Step 1	**Wardrobe study**	Find the oldest garments at home and tell their story
1. 1	*Preparation*	*Discussing the task in class and with the family at home*
1.2	*Wardrobe-time*	*Together with family member(s) find the garments and collect their stories*
1.3	*Prepare the diary*	*Elaborate the diary entries and associate them to the pictures*
Step 2	**Online survey**	After minimum 3 and maximum 12 weeks passed, fill in a follow up survey about the experience

Figure 1. Two-step research design.

Wardrobe studies involve a methodical examination of how clothing items, whether considered collectively or individually within a wardrobe, interact with each other. The concept of a "wardrobe" can be understood in both literal and figurative senses, as individuals may possess multiple wardrobes tailored to various events and contexts (Klepp & Bjerck, 2014). This study extends the method considering the wardrobe as a place that holds objects embodying memories and narratives, stories that goes beyond the internal system of objects in the wardrobe. In order to maintain the special intimate atmosphere created by the opening the wardrobe, in this part of the study the researcher was not present. The participants were asked to collect from their parents, or the most senior relative or guardian of the household they are living in, the five oldest pieces of garments they could find in their wardrobe.

The participants were also asked to make questions about the origin and eventual stories about the pieces with the purpose of creating a diary from it. At the end of the collection of the materials, meaning the pictures and the stories of the garments, they created a digital diary of it, inserting the picture and the story of the garments.
The participants were 17-18 year old students of a technical school in Italy. From the perspective of fashion consumption, 1 out of 3 young adult from the Z generation is reported to be addicted to fast fashion, despite their values related to sustainability (ThredUp Report,
2022). For this reason, exploring the emotional attitude of this generation is significant for understanding how to change consumption patterns into sustainable consuming habits.
In total, 24 students participated in the study. The specialization of the classes was graphic design. As a reward system, the diary, as a graphic product was evaluated, as part of the graphic design classes. This reward system was highlighted to be independent from the content. The research begun with a preparatory phase in the two classes, which consisted in two lessons about general aspects of sustainability in fashion such as social, environmental, economic, and cultural aspects. The participation in the study was voluntary.
The second phase of the study consisted in a follow up survey that was sent out and collected online. The 24 participants filled in the open and close ended questions. The participants were not previously informed about the follow-up survey and had no reward for taking part in this phase of the research. Nevertheless, all participants sent back their answers. The questions were edited to gather information about the experience of the wardrobe-research at home.

Findings

In this section the most pertinent findings will be presented related to the examination of narrative roles that garment can channel. The study created an intimate space suitable for sharing narratives through dialogue with older generations in the same household. The communicative function of fashion is examined considering garments as objects that create a unique atmosphere of sharing narratives. Out of the 24 participants, 11 participants reported a positive experience of the overall experience of doing the research at home.
Functions of narratives

If narratives can generate or support emotional attitudes toward garments that strengthen the attachment to them, then it is possible to say that narratives have a central role in the sustainability transition when it comes to fashion.

16 participants tried on some of the garments. This allows to confirm an intimate, familiar atmosphere for most of the participants and an occasion of pleasurable way of spending time together in the family. Most of the participants, 14 in total, tried on also other garments from the wardrobe. This is a situation of exchange and self-definition and development at the same time generated through garments. 11 students found something for themselves in the wardrobe during the exercise. The parents helped in all cases the students and 10 out of 24 participants reported that their parents had a positive emotional reaction when they heard about the research to do. Half of the students spent less than 30 minutes with the exercise and half of them spent between 30 and 90 minutes with it. In 18 cases the mother helped the student with the task and in 4 cases together with the father, whilst only in one case was the father to help with the wardrobe research. In 11 cases other topics came up during the exploration such as anecdotes about the dresses, stories of travels, or about the life of the parents when they were young. From a more personal perspective, 5 students mentioned that learning stories was the most important outcome of the task and 7 participants said that their vision about garments has changed.

Novelty

This section has in focus to understand whether the sensation of novelty can be generated through narratives. For 18 participants the garments presented were totally new, they never saw them before in the household. Four participants mentioned in an open question that getting to know the stories of the garments as positive outcome of the exercise and also "finding new garments" was mentioned. But the garments found were new only to the student, not because they were freshly produced. This is the process of novelty-generation through narratives. To the question whether they were seeing those garments as old or as new after preparing the diary, 10 participants affirmed to see those garments as new ones and for 10 of
them they were old, for several motivations; for 2 of them the garments were both, old and new and for one participant they were indifferent. Among the motivations for seeing them as old clothes there were out of use, they represent the past, distant from the student's personal taste or because of the awareness of them being old. Among the motivations for seeing the garments as new ones could be found that 2 times that the old fashion is going to come back and be fashionable again so these clothes can be new again and 3 entries mentioned that the experience of fresh discovery of the garments equals to novelty.
From the replies it appears that motivations for how a garment is seen are depending on a complex set of factors, that range from material conservation to personal taste and emotional experience of the garment.

Memory

According to a study carried out in the US based on an online survey, "clothing items reported to be owned for 25 years or more, most items were rarely, seldom or never used"(Niinimäki & Armstrong, 2013). Personal memories related to a special even or period of life emerged from many diary entries in fact, but in this section one garment will be presented, the oldest one of all the diaries: a Romanian traditional dress (on figure 2.), which was photographed by a student that have immigrant parents. The dress preserves the memory of a cultural identity and passes on cultural heritage from generation to generation in a family. It was worn by the grandmother of the student, 70 years ago and in the diary entry it was described to be "very important to my family". This object perfectly illustrates the central is the role of sharing family narratives through garments for the development of identity and cultural continuity at the same time.

Figure 2. Romanian traditional dress.

Limitations and further directions

The method of this study presents several limitations: the researcher not being present in the moment of the storytelling for example might lead to uncomplete set of information to work with. Furthermore, the written form of the diary asked from the participants can be felt as a constraint and participants might pen less wordy entries.

As further direction, there is space for contribution to the emotional design culture from the perspective of fashion. Furthermore, as the secondhand market is vital for the circularity of fashion, the feeling of novelty towards used garments is to be explored more in detail. A third theme to explore is the high value of narratives that garments convey seen as possibilities of product-service system design applications.

Conclusion

This article explores alternatives to face the fashion industry's overproduction and declining quality, resulting in shortened garment lifecycles. Starting from the fact that this accelerated turnover leads to generate more waste and diminish the time garments spend in our closets, this study explores the role of narratives associated with garments in this contemporary context. Using a two-step research method developed for this study, it combines wardrobe research and survey to uncover the effects of narratives related to the five oldest garments in a household, reported by 17-18 year old young adult. The findings reveal that narratives create an intimate space for sharing within families, strengthening emotional bonds, and facilitating self- discovery through exchanges. Additionally, these narratives breathe new life into older garments, countering the industry's obsession with newness. They also serve as vehicles for preserving personal memories, cultural identities and passing down heritage.

In conclusion, this study underscores the significant role of narratives in fashion, not only as tools for memory preservation and cultural continuity but also as powerful agents for sustainability. They reignite attachment to clothing, potentially mitigate industry waste, and provide a lens through which we can better understand and navigate the evolving world of sustainable fashion design.

Acknowledgments

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References

Baldini, M. (2005) L'invenzione della moda. Armando Editore, Rome

Barnard, M. (2002) Fashion as Communication. Routledge

Csikszentmihalyi, M. (1993) Why We Need Things in Steven Lubar & W. David Kingery (Eds.), History from Things: Essays on Material Culture, Smithsonian Institution Press, 20-29., London

Ellen MacArthur Foundation (2017) A new textiles economy: redesigning fashion's future, available at: https://www.ellenmacarthurfoundation.org/publications/a-new-textiles- economyredesigning-fashions-future

Entwistle, J. (2015) The Fashioned Body: Fashion, Dress, and Modern Social Theory (2nd ed.). Polity

Klepp, I. G., & Bjerck, M. (2014) A methodological approach to the materiality of clothing: Wardrobe studies. International Journal of Social Research Methodology, 17(4), 373–386. https://doi.org/10.1080/13645579.2012.737148

Niinimäki, K., & Armstrong, C. (2013) From pleasure in use to preservation of meaningful memories: A closer look at the sustainability of clothing via longevity and attachment. International Journal of Fashion Design, Technology and Education, 6(3), 190–199. https://doi.org/10.1080/17543266.2013.825737

Schifferstein, H. N. J., & Zwartkruis-Pelgrim, E. P. H. (2008) Consumer-product attachment: Measurement and design implications. International Journal of Design, 2(3), 1-13.

Simmel, G. (1985). La moda. Editori Riuniti, Milan

ThredUp (2022) Gen Z Fast Fashion Report, https://newsroom.thredup.com/gen-z-fast-fashion- report

Toward contemporary issues -"Learning from Plants" beyond human-centered design thinking

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Abstract

Today, in the face of climate change, resource scarcity and other environmental and social issues, we need to think urgently about the relationship between human and nature. In this context, starting from 2022, the School of Design of the Central Academy of Fine Arts has carried out a series of interdisciplinary "learning from plants" activities, trying to think about the relationship between design and nature, from "human-centered design" to "life-centered design". Through different courses, lectures, discussions and social practice, this project also explores interdisciplinary teaching methods suitable for design education in China.

Author keywords

Life-centerd design, Phyto-centerd design, Interdisciplinary design methdology, Anthropocene. Design thinking

In the field of contemporary design, the topic of the Anthropocene, an era of unprecedented human impact on the Earth's ecosystems, has been the focus of sustained attention in recent years. In particular, it is marked by: 1. the nuclear age and the resulting radioactive contamination of the planet. 2. the extraction of fossil fuels and the emission of greenhouse gases. 3. plastic pollution. (Yadvinder Malhi, 2017) The "Anthropocene" reflects the split between natural and human societies since the industrial age, a series of divisions that have led to an antagonistic relationship between human beings and nature, which is a key issue that cannot be escaped by mankind in the face of sustainable development for the future. In the 2022-2023, an interdisciplinary systematic research framework is proposed by d-school CAFA : Learning from Plants as a starting point to open up multiple perspectives on history and the future."

By proposing "Learning from Plants" is at the same time expanding the original scope of "human-centered design". The practice of placing the human being at the center of the interaction design process has been termed "human-centered design," and this design thinking emerged alongside technological developments at the end of the twentieth century (Bødker, 2006). "Human-centered design (HCD) gained prominence in the 1980s as a practice that puts user needs at the center of the design process. Because human-centered design is an approach to design that views users and stakeholders as objects of study and design, it has also been seen as a way to remedy the technology industry's lack of attention to the people it designs for (Cooper, 2004)."

There are countless other lists of characteristics and hierarchies that are still used and taught in interaction design practice and education that focus primarily on the human perspective and ignore the impact of design on broader ecological and social systems. While trying to solve business problems, the interaction design

practice movement seems to have lost sight of the bigger picture, and as a result, the world is faced with the unintended ecological consequences of these design decisions.As seen in large-scale natural disasters, there is increasing pressure to realign interaction design's contribution to society beyond consumption toward sustainability.

"Life-centered design is an emerging design approach that extends human-centered design to consider sustainable, environmental and social impacts. It links micro-level design (user experience, product engineering, etc.) to global goals by increasing the number of stakeholders from "users and business" to "users, non-users, local and global communities, ecosystems, and planetary boundaries". "life-centred design" has been adopted in interaction design, drawing on Thackara's (2006) work in the area of designing for all life". "Human-centered design" represent the ultimate challenge for designers to help people improve their lives. While "life-centeredness" extends this perspective to a broader field: the social dimension of the world's population, who face a large number of highly complex and interrelated problems, often intertwined with large-scale, complex issues. "man-made" systems. This is why we as designers use 21st century design to analyze intractable problems and complex socio-technical systems. "LCD" represents a cutting-edge design methodology that surpasses the human-centered approach by equally considering sustainability, environmental impact, and social aspects. It broadens the scope of stakeholders to include not only users but also non-users, local and global communities, ecosystems, and planetary boundaries. This approach distinguishes between micro-level design, such as user experience and product engineering, and the most ambitious global objectives.(Ian Chalmers, 2023)

Ron Wakkary, influenced by Latour's network of actors theory and design philosophy, argues that "design theory theorizes a design practice in which humans are neither the center nor the exception, but are ecologically interdependent and share agents with non-humans." (Ron Wakkary)The stated goal is cohabitation. That could mean symbiosis or some form of mutualism, but also companionship, or just living with other people." In this theoretical system, animals, plants, geological resources, and other non-human beings can act as design actors because they can create, influence, and disrupt the network of designed relationships.（Ron Wakkary, ）Similarly, "cross-species design" is another kind of design thinking that goes beyond anthropocentricity: interspecific design recognizes the full range of diversity of non-human species, and most importantly includes and learns from them. Designers need to constantly design diversity that allows different species to participate. Understanding of the human species to different extent influence many aspects of human well-being, （Sara Kaiser,2021）These themes can be summarized in the framework of thinking "beyond human-centered design".

"Broken Nature" is a good example of an exhibition that responds to this shift in design thinking from exhibition themes to selection of works. In her "Entomology" project, Dutch designer Mathilde Boelhouwer has designed a series of artificial flowers that can convert rainwater into a sugary solution. As an emergency food source for urban insects and important pollinators. These projects envision a future where cities are designed and planned with species other than humans in mind. A design that embraces the entire ecosystem is critical to a healthy future for the planet and will also affect human well-being. Her vision goes beyond what she can do for humanity, focusing instead on the environment in which other species live and the ecological balance it can bring to the human environment.
From the perspective of reflecting on the Anthropocene, plants have been seen as a natural resource to be

seized at will in the footsteps of human societies, a resource that has been the driving force behind capitalist accumulation, including forestry, animal husbandry, minerals, and other industries, all of which have been developed without plants as raw capital. In the face of today's ecological problems, carbon footprint, climate change, and food issues: there is an urgent need to rethink our relationship with nature, and plants play a central role here, inspiring designers, scientists, and engineers to devise innovative solutions to current environmental and social problems. More nad more designers and design practitioners have adopted the concept of "phyto-centered design" in the design process.

Today, in the face of climate change, resource scarcity and other environmental and social issues, we need to think urgently about the relationship between humans and nature. Against this backdrop, the topic of "Learning from Plants" is an attempt to consider the relationship between design and nature from "design for human scale" to "design for all things" from a perspective that encompasses history, Eastern and Western cultures.

fig 1 Curating design and narrative environment open course: Learning from plants

The interdiciplinary topic "leanirng from plants" proposed by Design school CAFA in 2022 expands the theoretical horizon for the contemporary and future based on the theory of cultural criticism, expanding to include ecocriticism and post-human theory since the 1990s. Meanwhile, absorbing the results of the teaching reform of the School of Design of the Central Academy of Fine Arts, with the topic of "Learning from Plants", we connect the knowledge of various disciplines within the School of Design, including art therapy, ecological crisis, and art and technology in an attempt to bridge the boundaries of various disciplines, and to propose future-oriented programs and experiments by adopting an interdisciplinary perspective of research with an orientation to the problem. and experiments.

Long before the emergence of human beings, it was a paradise for mosses and ferns. They grew freely, quietly, with the crustal shifts and ecological changes, and continued their life trajectory on this planet with their green color. Until the emergence of human beings, discovering, studying and seizing the value and utility of plants. As mankind moved towards the age of agriculture, plants provided the basis of man's diet; with the advent of the Age of Discovery, plants were used as products of trade. At the same time, as native crops spread across the globe, they became a bargaining chip for capital expansion. Yet in the development of modern science, plants are often described as passive, sessile, silent, and brainless, and they are categorized and crafted into various types of landscapes from an anthropocentric perspective. Through wars, clashes of civilizations, and changing centers of gravity in the development of human societies, we have moved further and further away from plants in our lives in the highly developed capitalist concrete jungle ..... Current research in the emerging sciences and humanities challenges the animal-centered bias that determines consciousness, intelligence, volition, and the capacity for complex communication among living things. However, phyto-centered design raises a different point that plants can also have their own rights. (John Ryan, 2015)

For curating design and narrative environment direction, this year's project takes "Plants in Culture" as its research object, and builds up the multidimensional meanings of plants in cross-cultural and cross-

disciplinary contexts by combing through texts and archives. Through the exploration of plants in the West since the 15th century, the project will link up "plant empires", "plant museums", "plants and women", "plants and postcolonialism", "plants and women", and "plants in culture", and "plants and women" and "plant intelligence," and through reflections on the Anthropocene, it explores the relationship between plants

fig2. "Learning from plants" seminars and workshops

and the development of human history, social construction, and regional cultures. Through reflections on the Anthropocene, we explore the relationship between plants and human historical development, social construction and regional culture. This includes both the study of famous cash crops brought about by colonial expansionism and the study of plants that have been actively or passively forgotten in history. At the same time, the program brought together curators, scholars, critics, and designers from different backgrounds to discuss interdisciplinary issues generated by plants through three "Plant Parliaments," practicing the dynamics of contemporary curatorial and cultural research in the public sphere.

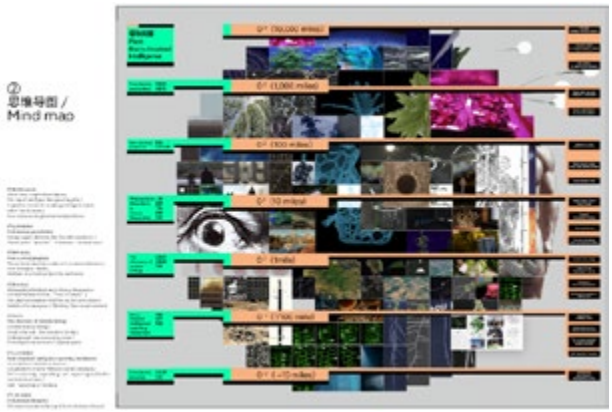

fig 3 "Learning from plants" student project

Many philosophers and theorists have responded to the theories of the relationship between plants and human. In the Capitalism in the Web of Life, Jason W. Moore discussed all the dilemmas of the Anthropocene, daitng back to a series of powerful changes in the networks of nature and human society brought about by capitalism prior to the Industrial Revolution, which, he argues, has been called the "The Capitalocene, he argues, is more conducive to reflecting on what is at stake. In his view, there is a common cause at the root of today's global upheaval,

and the cause is that capitalism has become a fundamental engine for organizing nature (including human nature). Capitalism's ability to create cheap nature has transformed the world into a capitalist "world ecology" of labor, food, energy, and raw materials. Under this law, the development of nature and human society has been radically altered by capitalism and transformed into a new synthesis. In Environmental Culture: The Ecological Crisis of Reason, Australian environmental philosopher Val Plumwood proposes a new way of thinking about and studying the non-human world, one that sees nature as a subject rather than an object in the production of knowledge and socio-ecological practices. Drawing on this way of thinking, we need to re-examine the complex and interdependent relationship between humans, technology and natural society.

The methodology of the course includes: 1. a cultural survey of plants, practicing the research strategies of etymology and genealogy, and providing theoretical and research tools for exhibition planning; 2. a cross-cultural and cross-subjective study of plants, and a study of the relationship between plants and the environment. Through cross-cultural and cross-regional research, we break the linear and single-perspective research path, and build a curatorial thinking with historical logic and a contemporary curatorial vision. 3 We collaborate with thematic and conceptual essays, and establish a theoretical framework for exhibition planning, and output a curatorial plan that goes beyond anthropocentrism.Through the this interdisciplinary approch, students conduct cross-cultural, cross-disciplinary research on plants, examining patterns of plant related industries, tracing these complex patterns helps them understand the unequal relationship between developed and developing countries in food innovation, production, transportation, retailing, and consumption. Reading and categorizing explores the influence of 'modern' classification systems and categorical thinking in design curatorial thinking.

References

A. Cooper. (2004) Inmates are running the asylum, the: Why high-tech products drive us crazy and how to restore the sanity, Sams - Pearson Education.

Antonelli,P(2019) Broken Nature: Design Takes on Human Survival,https://triennale.org/en/events/broken-nature.

Chalmers, I (2023) Life-Centred Design: A Strategic Approach for the 21st Century. https://pivot.design/insights/life-centred-design-a-strategic-approach-for-the-21st-century

J. Thackara. (2006) In the bubble: Designing in a complex world, MIT Press

Kaiser,S (2021) From human-centred to interspecies design, https://www.unbore.org/stories/human-centred-to-interspecies-design

Malhi, Y. (2017) The Concept of the Anthropocene, Annual Review of Environment and Resources. Vol. 42:77-104, https://doi.org/10.1146/annurev-environ-102016-060854

Moore, W, J. (2015) Capitalism in the Web of Life, Verso

Plumwood, V. (2001) Environmental Culture: The Ecological Crisis of Reason, Australian environmental philosopher, Routledge

Ryan J. (2015) Posthuman Plants: Rethinking the Vegetal through Culture, Art, and Poetry, Common Ground Publishing

S, Bødker. (2006) When second wave HCI meets third wave challenges, Proceedings of the 4th Nordic conference on human-computer interaction: changing roles, ACM (2006), pp. 1-8

Wakkary, R. (2021) Things We Can Design: Beyond a Human-Centered World, The MIT press

Beyond Empathy: The Students and the Vulnerable at Immersive Education on Social Design.

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Abstract

In social design educational practice, the students develop an awareness of their position as designers in relation to the members of the vulnerable group they work with. This study attempts to define what this self-perceived positioning consists of, in support of a more general hypothesis, according to which the work of the social designer differs from that of other professions that are concerned with achieving social welfare. This research, which poses a conceptual delimitation and empirical research, is based on data generated in a post-COVID educational intervention with elderly people with Alzheimer's disease, held in a nursery home. As a result, the position of the social designer in relation to the vulnerable goes beyond empathy and reaches compassionate love singularly understood. A kind of "love" that moves the social designer to take action. According to Dalai Lama XIV, love and compassion are necessities, not luxuries. Without them, humanity cannot survive (Cutler, 1999).

Author keywords

social design, social design education, social design, empathy, Participatory Action Research (PAR).

Introduction

The pandemic and the war in Ukraine have economically and socially challenged the entire world and thus highlighted our mutual dependence (Sandel, 2021). This study seeks to contribute to improve the education of social design students and their professional future, in a social reality that is likely to require more social design and innovation than ever before. In this context, it seems useful to define the position of the student in relation to the vulnerable. The concept "vulnerable people" refers to people who, due to their personal circumstances and context, are unable to resist and recover from the impact of a threat (Wisner et al., 2004). These people are at risk of social exclusion, what implies to be "wholly or partially excluded from full participation in the society in which they live" (Davis, A., Thomas, N., Deakin, N., 1996).

The aim of this research is to discuss the self-definition of the learner's positioning in relation to the vulnerable, and therefore, to observe if it helps to support the thesis that social design practice has a character of its own that sets it apart from other types of support and activities that also contribute to improve or maintain social welfare, such as art therapy or social work. We understand "social welfare" to include the five dimensions proposed by Keyes (1998): social integration, social acceptance, social contribution, social actualisation, and social coherence. To this end, we based our analysis on a case study of an educational intervention that was held in a nursery home, which is specialised in the treatment of Alzheimer's disease. The experience was carried out using photography in its role of "memory" (Barthes, 1989) for the creation of the family album. The work was

carried out collaboratively by all the participants; the elderly, their relatives, also considered vulnerable people (Camps, 2021), the students, a facilitator of the nursery home and the teacher.

Methodology and tools used for the research.

Our field of research is the observation of educational interventions in social design. An educational intervention understood as a tool to promote change, generally of behaviour in terms of knowledge, attitudes, or practices (Jordán, M. et alt., 2011). We also work from the approach of Participatory Action Research (PAR), paying attention to the "knowledge of ordinary people" (Fals Borda, 1999). Specifically, in this study, the unit of analysis chosen were the manifestos written by each student in the final stage of the educational intervention. There he or she reflects on their general feelings in a personal and conclusive way. Manifestos constitute a specific discursive form. From a semiolo2gical approach, in the manifesto there are complex relations between knowledge, power and desire. From the first, "knowledge" derives its programmatic function and that it is projected into the future. From the second, a will to conquer "power" in the face of a dominant ideology or consecrated values. And thirdly, "desire" in the sense that it always aims to affirm an identity. All this leads to the signatories to describe and contemplate a mirror image, and thus perceive their own (self-perceived) position.

Conceptual Framework

ositioning and self-perception

Originally, the term "positioning" comes from marketing practices, where it is understood as the place that a product or service brand occupies in the consumer's mind (Ries, A. and Trout, J., 1989). In general terms, it is associated with the place or situation occupied by an object, an individual, an idea, an institution, a service, a city, or any other reality that can be positioned with respect to others with which it is compared (Coca, 2007). On the other hand, "self-perception" is a neologism, used in the fields of education, health, and psychology. Self-perception is the set of information that a person has about him or herself in each field of action and at a given time. It depends on the habits, behaviours, and actions in general, which he or she develops in response to the stimuli of the social context (Mera and López, 2018). Therefore, in this study, the self- perceived positioning of the student is understood as the place that he or she occupies with respect to other, in these specific educational circumstances.

Positioning of the teacher

If we want to delimit the position of the learner in this way, it seems logical, to define beforehand what is the best position for the educator when teaching social design. In this aspect we follow Freire (1975) in the idea that education must be a political process. Each subject makes politics from any space where he or she is, and the classroom cannot be indifferent to this process. To achieve this, it is the educator's responsibility to society to encourage critical thinking among students, who must be able to move from being passive citizens to being socially active, critical, and capable of thinking about the society in which they are immersed (Freire, 1975). Thus, this position of the teacher is in relation to and for the students and, therefore, for society. From this point of view, for educational activism, "(...) educating necessarily implies "going outside" the teaching-learning process and therefore the school framework, extending educational influences on other contexts and levels of participation, which necessarily leads to the broadening of its spheres of action" (Blanco, 1997).

Focusing on participatory action research in social design, we take into consideration the education in social design's capacity to take advantage of the real opportunities that people have to "live the lives they

value", which is what Oosterlaken (2009) advocates in the case of poverty. This approach is called "value-sensitive design". It starts from the idea that design is not neutral and can be used for both good (i.e. justice, sustainability, etc.) and evil (i.e. injustice,pollution, inequality, etc.). And it also suggests that social design research must show what it is that people really value in order to improve their lives, and, this approach defends, this can only be done by asking them, directly or indirectly.

Social work, voluntary work, art therapy and social design.

Social work, voluntary work, art therapy and social design coincide in their objective of procuring social welfare. However, it is necessary to clarify the singularity of the work of social design. According to the 2012 Code of Ethics of Social Work, in its Preamble: "Social workers are concerned with planning, designing, calculating, implementing, evaluating and modifying social services and policies for groups and communities. They operate in many functional sectors using a variety of methodological approaches, work in a wide range of organisational settings and provide resources and services to various sectors of the population at the micro-social, intermediate social and macro-social levels". Social work is thus characterised by its efforts in methodology, planning and technical programming to implement public policies. However, nowadays, the expert social designer (Manzini, 2015) participates in the generation of "spaces" where people express their needs and take the initiative to decide what social innovations they needandevenparticipateintheworktoachievethem. Incontra sttothedefinitionseeninsocial work, we could say that social design is prior to planning and its implementation. In countries such as the United Kingdom, social design can influence public policy and legislation through the academic work of evaluation and research centres such as the Social Design Institute at Central St Martins, University of the Arts, London, with researchers such as Lucy Kimbell.

Previously, with a more comprehensive definition Margolin and Margolin (2012) stated that social design was that productive activity that attempts to develop human and social capital as well as beneficial products and processes; thus, the designer must envision and shape material and immaterial products that can solve human problems on a broad scale and contribute to social welfare. And it is this facet of social design, of being a professional and economic activity, that is the major difference with respect to volunteering. Volunteers are "people who offer free time for work and make a stable commitment to the provision of social services" (Ascoli, 1988). For some authors, the boundaries between social work and volunteering are blurred (Gómez and Mielgo, 1989)

Art therapy takes vulnerabilities as material for artistic creation and seeks to allow the subject to re-create him or herself, to create themselves anew in a symbolic journey from creation to creation. "Art therapy is an accompanied symbolisation" (Klein, 2006). Unlike social design, it is characterised by the fact that it seeks to re-signify the individual through the symbolism generated by his or her art. What makes it different from social design is this feature of being an introspective work.

However, once the functions of each field have been delimited, it is worth noting that Margolin and Margolin (2012) underlined the importance and usefulness of interdisciplinary work: "many professionals share the goals of designers who want to do socially responsible work and, therefore, we propose that designers and support professionals find ways to work collectively. Designers will find many more allies in professions related to health, education, social work, ageing and crime prevention". This involves designers engaging in social settings as part of a multidisciplinary team.

Three premises for educational intervention in social design

In a previous research, three common characteristics were inferred from the analysis of the educational

interventions in social design carried out at the Escuela Superior de Diseño de Aragón, ESDA, from 2017 to date. They are guiding premises and a proposal for working in social design education with positive results for students (Casas Romero, 2019). These three closely related premises to guide the teaching practice in social design are: immersion (i.e. through direct and prolonged contact), participatory work and peer to peer work.
It is important to stress that we work with "premises" (lat. praemissus; "to send ahead"), because of the flexibility that the concept provides, rather than with a "methodology". In addition, in our experiences, it is not important only the achievement of a fixed objective, but the process. The three premises are always present, but the process is flexible and open to change its direction, because its course will depend on multiple factors, the most important of which is the decisions of all the participating members.

Immersion

A decade ago, Margolin and Margolin (2012) already addressed the issue of the education of social designers. They spoke of the need for designers to specialise through education rather than through commissions from a company or client, exclusively. They added as a recommendation for this type of training, that students develop skills in relation to vulnerable and marginalised populations, advocating the inclusion within the curriculum of the possibility of "practice through an internship with a clinical team in a psychiatric hospital, community agency or residential facility for the elderly" (Margolin and Margolin, 2012). Thus, in our educational practice and in order to effectively answer this research question about the self-perceived position of the learner in relation to the vulnerable in social design educational experiences, this requirement of face-to-face, side-by-side work becomes even more unavoidable.

Participative

On the other hand, participatory work implies that decisions about the future of the experience are proposed and taken by all, but also carried out by all. "Participation implies recognising that the different members of society are capable of thinking, getting involved and taking action on what affects their lives in different social contexts" (Sarramona i López and Rodríguez Neira, 2010). Some studies on participation in relation to art and creation are directly related to how we apply this premise to our practice of design education. There are authors that confirm that community and collaborative art can contribute to social wellbeing. Thus, from psychology, the authors Bang and Wajnerman (2010) introduce the concept of "community intervention" as a starting point for collective creation. They describe the process and justify its potential by stating that creativity offers the possibility of generating something new from individual differences. This is achieved through collective work, consensus, joint decision-making, participation, and commitment.

Peer to Peer (p2p) work is crucial

Peer to peer (p2p) work is understood as work between equals. Everyone works at the same level and everyone is or are equal as designers or as artists. This involves not only the students but also all the agents who participate: teachers, therapists, facilitators, etc. These three premises sustain and give value to the self-perception that students can develop of their own position with respect to the members of the vulnerable group with whom they work, due to the closeness generated by the short distance, by the joint work and, above all, the fact that the work is carried out among equals. This is how the students develop their critical awareness (Freire, 1975) and prepare themselves to start fighting injustices (Campbell and MacPhail, 2002) in their future performance as social designers.
As a consequence, this to peer-to-peer work leads us to the work of Cortina (2021), who going further than

empathy, speaks of "cordial recognition" or "compassionate recognition". According to this philosopher, it is compassion that leads us to concern ourselves with justice. But not understood as condescension, but as the capacity to cum-passio (lat.). This is, to share passions, both the joy and the suffering of the vulnerable, and to respect their autonomy. Consequently, this would lead us to redirect the orientation of our practice; not to "help", but to put ourselves "at their side" and work alongside them.

Empirical Framework and Research Design

The sample consisted of 10 students between 21 and 25 years old, with a high level of studies, 7 women and 3 men. They came from three degrees: Graphic Design, Product Design and Interior Design. It should be noted that the subject "Social Design" is an optional subject in the 4th and final term, which means that the student attends it with a certain additional motivation and sensitivity towards social problems. The design of the educational practice was as follows: photography was used to generate a collaboratively created "family album". The work was divided into 5 groups and was made during 4 visits. Each group gathered 1 senior, 1 relative and 2 pupils. In addition, the facilitator, a worker at the residence, and the teacher helped all the groups alternatively. The nursery home chose these 5 elderly people with different degrees of amnesia caused by Alzheimer's disease. The family member of each group, which we also consider to be a vulnerable individual (Camps, 2021), was in charge of bringing the family photos. The students, with their design and creative skills, directed the construction of the album by all of them. The emotional impact on everyone was immediate. The elderly recognised themselves in the photos and momentarily recognised family members and places. Strong emotional situations were generated, the relatives went from helplessness in the face of the dramatic illness of their elders, to the point of expressing that in this way they were doing something useful. This scene is not only witnessed by the students, but they are the ones who provoke and encourage it with their expert design tools (Manzini, 2015).

Figure 1. Noelia, student, with two women of the residence for elderly people with Alzheimer's disease, during the 4th day of work. Source: Own elaboration.

Data collection was carried out at the end of the experience, asking each student to write a manifesto, in the style of the great manifestos of social design such as "First Things First" by Ken Garland (Pelta, 2012). Each manifesto is a statement of intent and is a valuable source of qualitative data, which connects with the aim of our research. As we have seen above, following Abastado (1980), from the structural analysis of the manifestos, an intentionality emerges, which constructs a rhetoric of persuasion with expressions such as "it is necessary", "we must". According to this author, one of the addressees of this persuasive language is the sender himself. Thus, the manifesto also exercises a function of self-persuasion. It is in this mirror image and in the reaffirmation derived from this self-persuasion in the manifestos, where we will look for this reflection that projects the self-perceived position of the student.

Figure 2. Drafts created by Laura the end of the semester, student of the Social Design. Source: Own elaboration.

First, we isolated the parts of the text that express convictions in a conclusive way, which were the majority. Mere definitions of the situations they encounter were left out. These convictions emerged from the personal experience of the pupils and lead them to formulate "universal" maxims. Considering the singularisation and new meaning that Adela Cortina (2013) gives to the concept of compassion, we followed the logic she establishes between empathy and this compassion. Thus, empathy is the emotion that allows us to feel what another feels, and compassion, which is not possible without the 1st, makes us take action. Therefore, from the conclusive convictions and the clear maxims expressed by the students in the manifestos, we generated two groups:

1.The words and expressions convey the existence of empathy as a feeling such as: "reliving situations", , "we should all have a family album", "because in 50 years we will be them", "for a person like them it is important to feel loved and supported", "one of the best moments is to see their happy faces when they recognise each other"

2.The words and expressions that call for action, relating to the behaviour to be carried out in the accompaniment, through the impulse of compassion: "perseverance", "effort", "encourage their participation and greater closeness with the relatives", "help", "connect", "facilitate", "contribute", "recover the essence", "give coherence", "at their side, side by side", etc.

The former occupied a prominent place in the texts at the beginning or at the end, but, in the final count, the latter double the former. This would explain the great fecundity of empathy as a seminal value for the passage to action. Both refer, in different ways, to the short distance at which the student places him/herself with respect to the vulnerable person through empathy and accompaniment.

Results

According to Adela Cortina, empathy serves to nurture compassion. "It is convenient to cultivate empathy, that emotion that allows us to place ourselves in the place of the other and to reconstruct with our imagination what they feel, whether it is a happy or sad, pleasurable or painful experience". But empathy does not necessarily imply action. That is why empathy comes to life through compassion. "That feeling that we suffer with the one who suffers and, above all, we feel compelled to relieve their pain because that person is important to us".

From the above analysis, it can be deduced that the student becomes aware of the particular place of accompaniment that he occupies, positioning himself at their side, to share pains and joys. The student perceives that their place in social design work is alongside and at the same level as the vulnerable, accompanying them in their daily struggle. This trait could help to singularise the practice of social design and differentiate it from other professions with which it shares the objective of procuring social welfare.

Conclusions

The social design student is self-perceived as a companion. Empathy will not be enough, it will be compassion, not in the sense of condescension, but in the etymological sense from latin cumpassio, which means sharing passions, both the negative and the positive passions of the other (Cortina, 2021). This is, to be at his side and to fight with and alongside him.

In the future, it would be interesting to measure the quantity and quality of social well-being produced by education in social design.

References

Abastado, C. (1980). Introduction à l'analyse des manifestes. Littérature. 39, 3-11.

Ascoli, U. (1988) Voluntariado organizado y sistema público de «Welfare». Documentación social. 71, 183-202.

Bang, C. y Wajnerman, C. (2010). Arte y transformación social: La importancia de la creación colectiva en intervenciones comunitarias. Revista Argentina de Psicología. 48, 89-3.

Barthes, R. (1989). La cámara lúcida: nota sobre la fotografía. Barcelona: Paidós.

Blanco Pérez, A. (1997). Introducción a la Sociología de la Educación. La Habana: Pueblo y Educación.

Casas Romero, C. (2019). Reflexiones acerca de la educación inclusiva en diseño social a través de la fotografía artística en Foro de Innovación docente. Comunicaciones. 8o Encuentro BID. (637- 644) Madrid: DIMAD.

Camps V. (2021). Tiempo de cuidados. Barcelona: Arpa Editores.

Campbell, C. y MacPhail, C. (2002). Peer education, gender and the development of critical consciousness: participatory HIV prevention by South African youth. Social Science and Medicine. 55 (2), 331-345. Recuperado el 3 de abril de 2022 de https://doi.org/10.1016/S0277- 9536(01)00289-1

Coca Carasila, M. (2007). Importancia y concepto del posicionamiento una breve revisión teórica. Perspectivas. 20, 105-114.

Código deontológico de trabajo social (2012, junio 9). Consejo General del Trabajo Social. No publicación oficial. España. Recuperado el 3 de abril de 2022 de http://www.consejotrabajosocialcyl.org/codigo_deontologico_2012.pdf

Cortina, A. (2013). ¿Para qué sirve realmente la ética? Madrid: Paidós. Cortina, A. (2021). Ética cosmopolita. Una apuesta por la cordura en tiempos de pandemia. Madrid: Paidós.

Davis, A., Thomas, N. y Deakin, N. (1996). Public welfare services and social exclusion: The developmentofconsumer-orientedinitiativesintheEuropeanUnion. Irlanda:PublicationsOffice of the European Union, EUROFOUND

Fals Borda (1999). Orígenes universales y retos actuales de la IAP. Análisis Político. 38, 73–90. Freire, P. (1975). Pedagogía del oprimido. Méjico: Siglo XXI.

Gómez Olave, P. y Mielgo Martínez, E. (1989). Voluntariado y Trabajo social. Cuadernos de trabajo social, 2, 79-87.

Jordán Padrón M, Pachón González, L, Blanco Pereira M. E., Achiong Alemañy M. (2011). Elementos a tener en cuenta para realizar un diseño de intervención educativa. Revista Médica Electrónica 33(4). Recuperado el 3 de abril de 2022 de http://www.revmedicaelectronica.sld.cu/index.php/rme/article/view/874

Keyes, C. L. M. (1998). Social well-being. Social Psychology Quarterly. 61 (2), 121-140 Recuperado el 3 de abril de 2022 de.https://psycnet.apa.org/doi/10.2307/2787065

Klein, J. (2006). La creación como proceso de transformación. Arteterapia. Papeles de arteterapia y educación artística para la inclusión social.1, 11 - 18. Recuperado 3 de abril de 2022 de https://revistas.ucm.es/index.php/ARTE/article/view/ARTE0606110011A

Manzini, E. (2015). Cuando todos diseñan. Una introducción al diseño para la innovación social. Madrid: Experimenta Theoria.

Margolin, V. y Margolin, S. (2012). Un "modelo social" de diseño: cuestiones de práctica e investigación. Revista Kepes. 8, 61-71.

Mera, U. N. R. y López, J. F. B. (2018). Autopercepción de estudiantes universitarios sobre el uso de tecnologías digitales para el aprendizaje. Apertura, 10, 2 94-109.

https://doi.org/10.32870/ap.v10n2.1401.
Oosterlaken, I. (2009). Design for Development: A Capability Approach. Design Issues. 25 (4), 91- 102. http://dx.doi.org/10.1162/desi.2009.25.4.91
Pelta, R. (2012) First Things Firt Manifesto. Monográfica.org. 2. Recuperado el 11 de marzo de 2022 de: http://www.monografica.org/02/Art%C3%ADculo/3398
Ries, A. y Trout, J. (1989). Posicionamiento: el concepto que ha revolucionado la comunicación publicitaria y la mercadotecnia. México: Mc Graw Hill.

Sandel, M.J. (13 de septiembre de 2021). Hacia una política del bien común. El País. Recuperado el 3 de abril de 2022 de https://elpais.com/especiales/2020/coronavirus-covid- 19/predicciones/hacia-una-politica-del-bien-comun/
Sarramona i López, J y Rodríguez Neira, T (2010). Participación y calidad de la educación. Aula Abierta. 38 (1), 3-14.
Wisner, B., Blaikie, P., Cannon. T y Davis, I. (2004). At risk: natural hazards, people's vulnerability and disasters. Londres: Routledge.

The role of haptics in the future of love and intimacy.

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Abstract

Humanity is currently facing multiple global crises of an environmental, social, and economic nature. The recent pandemic has impacted social interactions and the public space, reducing face-to-face contact outside the home. This has resulted in a societal response driven by fear, characterized by concerns about bodies as potential vectors of infections or even death, ultimately leading to physical distancing measures. However, the advancements in Human- Computer Interaction (HCI) and innovative material enable opportunities for highly dynamic tangible interfaces, thereby allowing haptic feedback technologies that simulate realistic touch and experiences that feel natural. Intimacy and sexuality are fundamental aspects of human existence and technology offers immense possibilities to enhance wellbeing in the realm of interaction design. While technology cannot fully replace human contact, HCI can contribute to a politic of care, especially for isolated communities, such as the elderly and individuals with disabilities. This paper explores the significance of haptics in shaping the future of intimacy and presents ongoing work involving soft robotics to enhance intimate experiences. From a methodological standpoint, the exploration of interdisciplinary practices aimed at bridging sexuality and social justice will be tested against the case of China, where rapid urbanization and the aging of the population are leading to lower economic growth and social concerns.

Author keywords

Haptics; intimacy; soft robotics; interdisciplinarity; social justice.

Introduction

Over the last three years of the COVID-19 pandemic, many governments have proscribed social activities and restricted inhabitants from staying home to limit contact and the spread of the virus. In many countries, the message diffused by the public national healthcare systems was to stay at home to save lives and protect health infrastructures. Governments have noted that staying home was the most significant act of solidarity and love one could perform (Berry & Lake, 2020). Public spaces and socially dense community settings, like workplaces, schools, and shopping malls, have been closed or restricted, generating physical and social distance.

To maintain social connectivity, the World Health Organization (WHO) has rephrased the term "social distancing" (a term used in the past on declining physical contact, as it can transmit viruses and worsen catastrophic situations) into "physical distancing" as a change in social contact is a consequence and not the aim of the physical distancing (WHO, 2020).

Technologies played a vital part in overcoming the lack of contact during the isolation, and many people found strategies to connect. Over the pandemic, human interactions changed drastically; while following social distancing, maintaining social interaction was essential. People with less exposure to technologies and services, like the elderly population and the
disabled, suffered the highest impact, resulting in a worsening of mental health issues (Li et al., 2023) and the increasing of social separation between different groups and individuals based on ethnicity, nationality, class, race, religion, age, sexuality, etc. (Rehman et al., 2021).
The loss of spaces where sexual, gender, racial, religious, and other minorities can congregate in person has solid implications for escaping oppression, healing from trauma, and building community. Although there are situations in which we must engage in physical distancing, physical touch, intimacy, and connection are necessary to build collective power, heal from trauma, and cultivate an embodied politics of care (Berry & Lake, 2020).

Intimacy

Intimacy has a vast meaning; for sociologist Lynn Jamieson, it involves an extraordinary "sort of knowing, loving, and being close to another person" that depends upon a particular kind of "disclosure and disclosing." In this sense, intimacy defines a close connection between two people with an attitude of "loving, sharing, and caring." There is no unified meaning of "intimate," but the term is seen as a complex sphere of relationships with the self and others, which involves feelings, bodies, emotions, and identities. People strive for intimacy for good relationships, and sexuality is an intrinsic part of an embodied self (Berry, 2020). Sexuality is a fundamental phenomenon of the human experience, connected and influenced by one's cognitive, emotional, psychological, physical, and social status of existence and state of being. Sexuality is a personal and social phenomenon (Neufeld et al., 2002). Healthy manifestations of sexuality and safe sexual practices help in coping and psychological resilience (Banerjee, 2021). The fear of infections, reduced interactions, travel restrictions, personal situations, and stress have all contributed to the deprivation of affective touch and physical intimacy. Global uncertainty during the pandemic has affected sexuality and sexual relationships, which are essential to psychosocial well-being (Döring, 2020). Barriers to intimate ties lead to social and economic costs associated with vulnerability to abuse and violence, child welfare involvement, trans-institutionalization, and reliance on private and social care resources (Tepper, 2000). The British Sociologist Ken Plummer conceived the definition "Intimate citizenship," referring to intimate and personal problems, usually considered private, with significant public implications. Intimate citizenship bridges the private and the public, the personal and the political sphere. Intimate citizenship is about rights and access to equality in intimate lives. Intimate citizenship looks "at the decision people have to make over the control (or not) over one's body, feelings, relationships; access (or not) to representation, relationship, public spaces, etc.; and socially grounded choices (or not) about identities, gender experiences, erotic experiences. It does not imply one model, pattern, or way" (Plummer, 2003).

Intimacy and vulnerable communities

The WHO defines sexual health as "the state of physical, mental and social wellbeing in relation to sexuality", and it encompasses intimacy as a central aspect of being human. Traditions, myths, beliefs, social stereotypes, cultural connotations, and ethnic variations heavily influence sexual practices. Sexuality as a source of pleasure and expression of love has not been recognized for populations traditionally marginalized in society; nevertheless, media and institutions restricted the representation of pleasure to specific body types (Tepper, 2000). Vulnerable communities, such as disabled individuals or the elderly, may face barriers from both physical

and social perspectives. Over a billion people in the world are affected by disability, which is equivalent to about 15 percent of the world's population. At least one-fifth of these individuals (about 110–190 million) are forced to cope with everyday difficulties. Furthermore, the rates of disability are growing due to the aging of the population and the global increase in the prevalence of chronic diseases (UN, 2006). Impairments can limit independence, social contacts, and, therefore, sexuality. Those who cannot fulfill their needs unaided are often deprived of opportunities to meet this need since sexuality is deemed to belong to the private sphere.

Vulnerable communities in China

The aging population is a worldwide problem, and in China, with the rapid economic development of recent decades, social aging has been deepening. China's population, currently estimated at around 1,4 billion, is expected to decline to 1,2 billion by 2050; by then, the number of elderly people aged 60 and above is expected to reach 430 million, while by 2080, researchers predict that the elderly population will overtake the working-age population (The World Bank, World Economic Forum, 2022). Decreases in the number of working-age people will lead to much lower economic growth and higher labor costs as the population shifts to care for its elderly (World Economic Forum, 2022). With the accelerating urbanization process, the young workforce concentrates in major cities, leading to an increased number of empty nesters (Song et al., 2023). Empty nesters in China refer to the elderly whose children have left the old adults alone at home; in China, those accounted for half of the total old adults. The elderly living alone accounted for nearly 10 percent of the total number. With the first generation of single-child parents going into old age, empty nesters in China are expected to increase from 20 to more than 200 million by 2030. Because of the lack of affection, empty nesters are more likely to develop negative emotions and psychological problems (Wang et al., 2021). Anxiety disorders are among the most common mental disorders worldwide, following decreased physical function. The counterpart of these empty nests is the youths, over 20 million aged between 20 and 39, who eat and sleep on their own, in first-tier cities like Beijing, Shenzhen, Shanghai, and Guangzhou. Depression, reduced physical function, psychological stress, and social problems are some challenges that empty nesters in China face. According to a survey addressed to 5,000 young empty nesters, sex is not a big concern and comes only after the concern of having a house and a partner (Mengwei, 2017). Half of the interviewees had only one sexual encounter in the past year; another 31 percent had sex once in the past six months, and only 5 percent said they have encounters more than ten times per month (Mengwei, 2017). Delayed unions and procreation, pressures of work, and a reliance on virtual communication platforms led to a preference for singlehood among most young individuals and fostered a sense of social detachment, resulting in inadequate opportunities for interaction and socialization (Song et al., 2023).

Haptics

People perceive the world through their senses, such as sight, smell, taste, hearing, and touch. Tactile stimulation or somatosensory stimulation, applying touch to the human body, is often used to make people feel better or reduce stress. The skin is our largest organ, and the sense of touch is a strong mediator of emotions. Tactile stimulation is used to reduce stress or make people feel good, cared for, happy, energized, sleep better, or simply more relaxed. In recent years, advances in actuators and embedded computing have enabled a wide range of machine- driven methods for tactile stimulation. With today's technology, a large variety of tactile effects can be achieved relatively easily; however, reproducing many subtle effects of human touch is a difficult task that today's technology cannot achieve (Dijk et al., 2013). Still, haptics already applies to various disciplines for several purposes. The medical field benefits from artificial tactile feedback as a fundamental function in

simulation and training sessions (Venugopal et al., 2012), but it also makes it possible for robots and surgeons to cooperate in the operating theater, augmenting surgeon efficiency while bringing quality care to remote areas of the planet through telemedicine. Other application domains, such as VR and mobile phones, where it is necessary to translate visual and acoustic content into a tactile experience to complement the multisensorial experience, see haptics as a fundamental resource. Several haptic display prototypes have recently appeared, promising inclusive education access. Commercial haptic
applications are essential in the entertainment/videogame industry, complementing the multimedia experience with even more immersive stimuli. Overlapping biological and technological domains is inevitable, given the natural proximity of haptics dynamics to the epidermis. Therefore, exploration of the field is still explored in all its transdisciplinary folds. The junction of disciplines and specific issues, such as haptodysphoria (an unpleasant sensation caused by touching certain materials), must be the focus of further studies. Although experimental devices are applied to several body parts, available literature often focuses on tactile experience related to the hands while the rest of the body is still partially unexplored (Seikowski, 2008). When considering haptics applications to stimulate sexual arousal and pleasure, the approach is genital-centered; this is the case for teledildonics (devices that allow sexual interaction mediated through remote control), which limit the scope of touch responses and mutuality while using the product with a partner. With our work, we aim to investigate further the design and development of elements that could stimulate different body parts; tactility should happen globally, diffusely, and holistically, without being reduced to genitals only (Faustino, 2018). Haptics in sexuality should also consider sexual desire, the memory of positive and negative sexual events, emotions associated, and cognitive processes that involve ethical judgment, often biased by its specific cultural environment (Ziat, 2023).

HCI development

Intimacy in its broadest sense and its impact on people's lives and well-being is relevant to the Human-computer interaction (HCI) community (Shulte & Hornecker, 2020), which is currently experiencing a growing interest in novel actuation strategies, advanced materials, and Soft Robotics (Brocker et al., 2022). Designing for intimate care remains an underexplored area of HCI. While technologies for health and well-being might be plentiful, technologies for intimate care are limited, and they primarily focus on maternal health. Intimate care is associated with personal hygiene, bodily functions, and bodily products and is a lifetime practice that requires well-defined interventions – by the self or supported by others (Almeida, 2017). The topic of sex has seen regular contributions over the past few years; the most recent technological innovations changed how we interact, develop relationships, and live in intimacy and sexuality. Teledildonics and haptic bodysuits are now realities that transform human interactions and offer new opportunities for sexual encounters (Owsianik et al., 2018). However, as Kannabiran et al. argue, the existing discourse on sexuality and HCI suggests an underlying and yet underexplored need for engaging with intersections of sexuality and social justice and points out a necessity to discursively reframe sexuality in terms of individual human rights and social justice to develop effective interdisciplinary design praxis (Kannabiran, 2011).

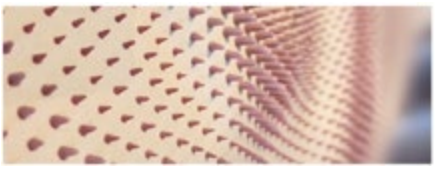

Figure 1. Parametric texture emphasizing the distribution of soft robotics underneath the textile surface.

Conclusion

The fields of programmable matter, actuated materials, and Soft Robotics are becoming increasingly more relevant for designing novel applications, interfaces, and user experiences in Human-Computer Interaction (Brocker, 2022). Our research work focuses on embedding technologies into garments, aiming at the improvement of people's lives. Following a project that included textile-based soft robotics to create haptic stimulation, we implemented 3D- printed techniques to support and augment stimuli. The textured surface is 3D printed with resins on a fabric, activated through soft robotics underneath. The result is an organic multi-textured surface that moves simultaneously and stimulates the body.

The main objective is to give dignity to vulnerable communities and their caregivers and foster a democratization process that allows everyone to explore intimacy and sexuality autonomously despite physical, environmental, or societal challenges. As designers, we aim to contribute to this journey by exploring the possibility of creating products that support equitable access to intimacy through educational and recreative tools. By no means do we want to replace human contact, but instead, we want to allow self-exploration to overcome a lack of social contact and intimacy, supporting rehabilitative practices towards the recovery of a natural body awareness. From an industrial production perspective, the project pursues a novel concept for implementing haptic stimulation by developing and using soft actuators embedded into the knitted underwear. The advantages of the textile-based approach are low weight, an extremely low profile at atmospheric pressure, high force/weight ratio, and simple, fast production. Several aspects still require exploration and development, including safety, comfort, stimulation patterns and movements, hygiene, and usability. Further interdisciplinary research is required to fulfill these objectives.

References

Almeida, J., Teresa, A. (2017) Designing technologies for intimate care in women. Newcastle University. http://theses.ncl.ac.uk/jspui/handle/10443/3868

Banerjee, Debanjan (2021) "#Intimacy" at Times of COVID-19: The Renewed Impetus Behind Cybersex, Journal of Psychosexual Health 3, 1; 13–17.

Berry, Marie E. & Lake, M. (2020, May 01) Imagining a distanced future: centring a politics of love in resistance and mobilisation. Women, Peace and Security. The London School of Economics and Political Science. http://eprints.lse.ac.uk/104977/

Brocker, A., Barreiros, J., Gohlke, K., Afsar, O., Shtarbanov, A., Schröder, S. (2022) Actuated Materials and Sof Robotics Strategies for Human-Computer Interaction Design. CHI '22 Extended Abstracts. https://doi.org/10.1145/3491101.3503711

Dijk, E., Nijholt, A., Erp, J., Wolferen, G., Kuyper, E. (2013) Audio-tactile stimulation: a tool to improve health and well-being? Int. J. Autonomous and Adaptive Communication Systems 6, 4; 305-323.

Döring, N. (2020) How is the COVID-19 pandemic affecting our sexualities? An overview of the current media narratives and research hypotheses. Arch Sex Behav 49, 8; 2765-2778.

Faustino, M. (2018) Rebooting an Old Script by New Means: Teledildonics—The Technological Return to the 'Coital Imperative'. Sexuality & Culture 22; 243–257. https://doi.org/10.1007/s12119-017-9463-5

Kannabiran, G., Bardzell, J. & Bardzell, S. (2011) How HCI talks about sexuality: discursive strategies, blind spots, and opportunities for future research. CHI '11: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. 695-704. https://doi.org/10.1145/1978942.1979043

Li, L., Taeihagh, A. & Tan, S.Y. (2023) A scoping review of the impacts of COVID-19 physical distancing measures on vulnerable population groups. Nat Commun 14, 599. https://doi.org/10.1038/s41467-023-36267-9

Mengwei, Chen (2017, May 5) Survey: young, alone, no house and not much sex. China Daily. http://www.chinadaily.com.cn/china/2017-05/05/content_29210750.htm

Neufeld, Jacob, Klimgbeil, Fred, Bryen, Diane, Silverman, Brett and Thomas, Anila (2002), Adolescent sexuality and disability, Physical Medicine and Rehabilitation Clinics of North America, 13:4, pp. 857–73.

Plummer, Kenneth (2003), Intimate Citizenship: Private Decisions and Public Dialogues. Seattle, WA: University of Washington Press.

Rehman, A. et al (2021) Global Experiences of Physical Distancing, Social Connectedness and Social Detachment in COVID-19 Pandemic. Psychology & Education Journal 58, 4; 218-228.

Seikowski, K., Gollek, S. (2008) Haptic perception in sexuality. In: Grunwald, M. (eds) Human Haptic Perception: Basics and Applications. Birkhäuser Basel. https://doi.org/10.1007/978-3-7643-7612-3_21

Shulte, B. & Hornecker, E. (2020) Full Frontal Intimacy – on HCI, Design & Intimacy. DIS' 20 Companion: Companion Publication of the 2020 ACM Designing Interactive Systems Conference;123-129. https://doi.org/10.1145/3393914.3395889

Song, C., Yao, L., Chen, H., Song, Y., Liu, L. (2023) Prevalence of factors influencing depression among empty nesters in China: a meta-analysis. BMC Geriatr 23, 333. Doi: 10.1186/s12877-023-04064-0

Tepper, Mitchell (2000), Sexuality and disability: The missing discourse of pleasure. Sexuality and Disability 18, 4; 283–89.

The World Bank, DataBank. Population estimates and projections. https://databank.worldbank.org/China-Population-Projection-15-50/id/61621b1c

Venugopal, K. R., Patnaik, L.M. & Varalakshmi, B. D. (2012) Haptics: State of the Art Survey. IJCSI International Journal of Computer Science Issues 9, 3; 1694-0814.

United Nations (UN) (2006), Department of Economic and Social Affairs, Disability. Convention on the Rights of Persons with Disabilities (CRPD), Geneva. https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons- with-disabilities/convention-on-the-rights-of-persons-with-disabilities-2.html

Wang, C., Zhang, B., Olah, J., Hasan, M. (2021) Factors Influencing the Quality of Life of Empty Nesters: Empirical Evidence from Southwest China. Sustainability 12, 5; 2662. https://doi.org/10.3390/su13052662

World Economic Forum, (2022, July 26) China's population is about to shrink for the first time since the great famine struck 60 years ago. Here's what that means for the world. https://www.weforum.org/agenda/2022/07/china-population-shrink-60-years-world/

World Health Organization (WHO), (2000) COVID-19: physical distancing. https://www.who.int/westernpacific/emergencies/covid-19/information/physical- distancing

World Health Organization (WHO), Sexual health. https://www.who.int/health-topics/sexual-health#tab=tab_1

Ziat, M. (2023) Haptics for Human-Computer Interaction: From the Skin to the Brain, Foundations and Trends® in Human–Computer Interaction 17, 1-2; 1-194. http://dx.doi.org/10.1561/1100000061

Learning to Care for a Sustainable World: Cultivating Eco-Consciousness

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Abstract
As the global community faces ever-increasing environmental challenges, the urgency to cultivate eco-consciousness and promote sustainable practices has become paramount. Nevertheless, how can we learn to take care of something? This paper explores the vital role of learning to care for a sustainable world as a necessary skill to instill a sense of responsibility and empathy toward the environment. The hypothesis is that by integrating an environmental education with a focus on caring, individuals can develop a deeper connection with Nature and foster sustainable behaviors.

Author keywords
Carefulness; Eco-consciousness; Sustainability; Care Learning.

Introduction

Descartes' foundational principle, expressed in Latin as "cogito, ergo sum" and commonly translated as "I think; therefore, I am," is a central tenet of his philosophical framework. However, Ubuntu, an ancient African philosophy, has introduced a significant departure from this notion, positing an alternative expression: "I take care; therefore, I exist." This paradigm shift takes on heightened relevance amidst the prevailing challenges of environmental degradation, climate change, and the depletion of natural resources.
Ubuntu centers around interconnectedness, communal values, collaboration, and empathy. At its core lies the "I am because we are," wherein the community's well-being is essential for individual flourishing. Its ethic of care fosters a responsible relationship with others, and the natural world, offering a unique framework for environmental advocacy and policy-making.
This paper examines the shift to a learning-to-care society, using Meghalaya's Jingkieng Jri living bridges, Mycelium Project 1.0, Life Support: Respiratory Dog, 2022 Living Jewels collection as examples. The analysis explores the implications of embracing the ethic of care, referred to as the cuidadanía, for both the individual and collective existence, providing insights into addressing contemporary environmental challenges.

Cuidadanía

Traditional approaches to sustainability awareness have often relied on imparting knowledge about environmental problems, policies, and technologies. However, a growing body of research suggests a more profound transformation is required to effect lasting change.
Cuidadanía is a Spanish word that emphasizes the ecology of care. Its central feature is the ability to welcome others and oneself as building a deep connection with Nature. As explained by Junco, Orozco, Del Río (2004), "to

speak of cuidadanía is to place life at the center of a socioeconomic organization, making society responsible for its maintenance and dethroning the logic current dominant of the benefit. We question the forms of hierarchy established, perverse and oppressive forms of coexistence, which asphyxiate life. "

Caring or Cura lies at the heart of human nature, as explained in Fabulae 220 by Hyginus. By harnessing this innate quality, a robust foundation can be created for fostering eco- consciousness. Encouraging empathy toward the natural world can lead to a greater understanding of the interdependence between humans, non-humans, and their environment. By nurturing a caring mindset, individuals can develop a sense of responsibility to protect and preserve the planet for future generations.

However, how can this occur? How can care be learned? Moreover, how can design transform humankind into Homo curans?

According to Moratalla (2022), Homo curans are integrated into Nature and have a history of care and protection. He/she is the result of a perspective change and the beginning of a new paradigm concerning nature care (biological life), social and political care (generational life), and oneself care (biographical life). Caring is a profoundly revolutionary act (Llopis, 2021). It is a decision- making process, an act of courage that surpass a state of vulnerability (Moratalla, 2022).

To care is to redirect contemporary individualism to a collectivist behavior; it is to understand that there is no autonomy but only interdependence and coexistence. In the text, 'The Meaning of Interdependence' (Turner, 2001), Ruth Wageman explains that the term interdependence has been employed with various meanings in the literature. It denotes the relationship between organizational units to the extent of individual cooperation in performing a task. So, the outcomes of one person are affected by their own and others' actions; the well-being and prosperity of the whole planet guarantee the abundance or security of a specie.

Positive interdependence encompasses several psychological processes, namely substitutability, inducibility, and positive cathexis, as identified by Johnson & Johnson (2009). Substitutability refers to the extent to which one person's actions can replace those of others, while inducibility entails being open to influence and influencing others. Additionally, positive cathexis involves investing positive psychological energy in objects beyond oneself. Through these processes, self-interest evolves into mutual interest, explaining the transformation from an individual to a collective practice.

Coexistence refers to recognizing the right of the other to exist peacefully despite its differences, accepting the other as a legitimate and equal partner with whom disagreements have to be resolved in nonviolent ways. So, the other goals, values, ideologies, religions, races, nationalities, ethnicity, culture, and domains can be different and must be recognized (Bar-Tal, 2008); a recognition of the other and a willingness to understand the similarities and differences. It increases the sociability and essential characteristics of empathy, compassion, altruism, openness, responsibility, and cooperation.

It also leads to the "multispecies livelihoods" concept, which denotes the acknowledgment of equal rights for humans and non-humans to peacefully co-exist and obtain life's necessities without infringing upon one another, except in self-security or sustenance hunting. Multispecies coexistence is also connected to the biodiversity concept, the collective variation at all levels of biological organization, reframing to ecological, genetic, or organismal diversity (Gaston & Spicer, 2004), and achieving long-term sustainability.

Learning to care for a sustainable world necessitates fostering a deep connection with nature, instilling a sense of wonder and appreciation for the planet's ecosystems. That is why the belief in a phenomenology of attention and good care and Laguna's (2021) work on cuidadanía is worth mentioning. Crossing them with sustainability concepts is essential when understanding that devotion, solicitude, diligence, and zeal are fundamental to transforming non-human beings and, consequently, Nature from objects to subjects.

Holobionte examples

Holobionte, from the Greek Holo-todo, bios-life, is the name given to a host organism that survives thanks to a system of integrated symbiosis with multiple agents. Usual examples are bacteria and fungi cultures. However, it will be the name used in this paper to describe the design solutions used to transform humankind into Homo curans.

The first characteristic of these holobionte solutions is livingness. According to Karana et al. (2020), "livingness as a design quality requires from an ecological standpoint the careful crafting of cohabitation, intra/interspecies interaction, and their relation to other non-living entities (e.g., soil or computational artifacts) within an ecosystem" (p.41).

In the paper 'Living Artifacts: Conceptualizing Livingness as a material quality in everyday artifacts,' these authors propose three principles for the living artifacts design: living aesthetics, mutualistic care, and habitabilities (p.42). As in the holobionte solutions, these principles revolve around a dynamic and mutual bond between humans and living pieces, where humans actively contribute to the well-being of these living entities and also is contributed by them.

The concept of "living aesthetics" refers to how humans perceive and experience the evolving changes in a living artifact over time, including the type, degree, and change duration. One known example of this relationship is Jingkieng Dieng Jri Living Root Bridges, India (figure 1). The Ficus- based rural connectivity and livelihood solutions from indigenous Khasi tribal communities are solutions to connect villages, but they also symbolize the profound harmony between humans and nature. Their intertwined and inosculated appearance is a testament to centuries of continuous interaction and experimentation between humans and plants (figure 2), reflecting the collaborative efforts of countless generations striving for a common and collective purpose.

Figure 1.A Meghalaya's Jingkieng Jri living bridge. From https://newsonair.com/2021/12/24/living-root- bridge-jingkieng-jri-seeks-the-unesco-world-heritage-site/

Figure 2. The living bridge construction from https://www.worldatlas.com/news/living-bridges-face- threats.html

They were submitted to Unesco's tentative list for the coveted world heritage site status because "each living root structure reveals a distinct ethnobotanical journey rooted in profound culture- nature reciprocity and synthesis" (https://whc.unesco.org/en/tentativelists/6606/). In this paper, their presence unveils an extraordinary display of enterprise and skill in an intergenerational growth process of nurturing a human and non-human relationship.

The Mycelium chair by Eric Klarenbeek is another example of the "living aesthetics" principle. It is a 3D-printed living fungus piece, from a collaboration between the designer and Wageningen University's scientists. Their primary purpose was to combine the machine - a printer - and Nature -a mixture of water, powdered straw, and mycelium - to create a living product (figure 3).

Figure 3. The Mycelium Project 1.0 – Mycelium chair by Eric Klarenbeek from https://www.ericklarenbeek.com/

As the mycelium spread throughout the structure, it gradually replaced the water, resulting in a solid yet remarkably lightweight material where mushrooms can emerge from the surface. If Klarenbeek did not intervene and dry out the structure, it would continuously grow. The shift that this example brings is the implementation of growth in the fabrication process. It also uses local resources, and after use, the product is fully compostable; the pieces can be disposed of without harming the environment.

"Mutualistic care" encompasses the reciprocal and dynamic relationship between humans and living artifacts, where both parties influence and support each other's well-being. The first holobionte example of this principle is the project Life Support: Respiratory Dog (2008) by Revital Cohen and Tuur van Balen (figure 4). This solution delves into the intriguing idea of whether a dog could serve as a respiratory aid. While "service animals" already assist humans in overcoming sensory and emotional obstacles, the designers questioned the possibility of these animals enhancing our fundamental biological functions too. It is essential to note that the project is purely fictional and meant to provoke thought rather than represent a realistic endeavor.

Figure 4. Life Support, 2008, Respiratory Dog from https://www.cohenvanbalen.com/work/life-support#

Despite its fictional aims, the greyhound, retired by the racing industry, and its new owner, a respiratory patient, develop a relationship of mutual reliance through keeping each other alive. It prompts a thoughtful contemplation of the ethical importance and imperative concerning including non-human species in interactions between humans and the non-human world. Design methods ought to embrace the creation of living artifacts while anticipating potential consequences and acknowledging the contextual significance of the symbiotic relationships involved.

The last holobionte example is the 2022 Living Jewel collection. Each piece crafted evokes a sense of uniqueness, inspired by Haraway's "becoming with" as a process of connecting to the natural world, of coexistence and human and non-human (lichen and moss) interrelation.

In Living Jewels 05 (figure 5), the tree branch continuous serving as a foundation, providing the space for the lichen's life to flourish. It embodies the concept of symbiogenesis, emphasizing the simultaneous coexistence and cooperative interactions between different species, contributing to their collective survival. Humans do not need jewels or even these materials to survive; they act more as a companion species (Haraway, 2008, p.16), reminding humans about co-existing and caring about other non-human beings.

Figure 5. Living Jewels 05: necklace, lichens, and wood.

The last of Karana et al. (2020) living artifacts design principles is "Habitabilities," which explores the diverse manners in which living and non-living elements contribute to an artifact's overall vitality and liveliness. It can adopt a multispecies approach and life interconnectedness. However, the focus is on the habitat or the environment for both design and use of time, not this paper's center. We framed our questions in orientating design toward a relational mode of knowing, being, and doing (Escobar, 2018) and nurturing life, all life.

Conclusion or the urgent and necessary care revolution

There is an urgent need to deconstruct the Western imaginary of self-sufficiency as a human ideal and pillar. Instead, it is proposed as an alternative paradigm: caring or cuidadanía. With this category, an ecodependence, relational, coexistence, and respectful political model is designated. It is beginning to disrupt the dualist categorizations such as nature versus culture, non-human and human, individual and communal, organic and straight, and rational and emotional (Escobar, 2018).

The holobionte examples brought in this paper are the beginning manifestation of a new generation of artifacts that sense, grow, adapt, reproduce, and eventually die, referred to as living artifacts (Karana et al., 2020). They open space to learning to care for a sustainable world, to cultivating eco-consciousness where designers have the opportunity to delve into and utilize its inherent potentials, seeking out distinctive functionalities, interactions, and expressions. As dealing with living beings, designers should also anticipate possible consequences envisioning care scenarios as a central characteristic of these symbiotic relations.

"Learning to Care for a Sustainable World" offers a transformative perspective on sustainable living design. Cultivating eco-consciousness goes beyond merely acquiring knowledge; it also involves encouraging sustainable behaviors by adopting eco-friendly practices, and caring for the environment as a tangible and actionable commitment. The emphasis on the ethic of care for both the individual and collective existence provides insights into addressing contemporary environmental challenges, developing a profound (re) connection with nature, and leading to genuine concern for the planet's well-being

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References

Argyle, M. (1991). Cooperation: The basis of sociability. London: Routledge.

Bar-Tal, D. (2008). Nature of Coexistence. Encyclopedia of Peace Education, Columbia University. https://www.tc.columbia.edu/epe/epe-entries/Bar-Talcoexistenceeducation_28FEB08.pdf

Escobar, A. (2018). Designs for the Pluriverse: Radical Interdependence, Autonomy and the Making of Worlds. Duke University Press.

Gaston, K.J. & Spicer, J. I. (2004). Biodiversity: An Introduction. Wiley-Blackwell. ISBN-10: 1405118571

Haraway, D. J. (2008). When species meet. University of Minnesota Press.

Johnson, D.W. & Johnson, R.T. (2009). An Educational Psychology success story: social interdependence theory and cooperative learning. Educ Res.; 38(5): 365–79.

Junco, Orozco, Del Río (2004). Hacia el derecho universal de cuidadania. Disponível em: https://www.formacaocaleidos.com.br/files/Mauricio-derecho_universal_cuidadania.pdf.

Karana, E.; Barati, B.; Giaccardi, E. (2020). Living artefacts: Conceptualizing livingness as a material quality in everyday artefacts. International Journal of Design, 14(3), pp. 37-53.

Laguna, J. (2021). Cuidadanía: Del contrato social al pacto de cuidados. Cristianisme i Justícia. ISBN: 978-84-288-3676-0

Llopis, M. (2021). La revolución de los cuidados. Editorial Txalaparta. ISBN 978-84-18252-36-5

Moratalla, A. D. (2022). Homo curans: El coraje de cuidar. Ediciones Encuentro. ISBN 978-84-1339-440-4

Wageman, R. (2001). The Meaning of Interdependence in Turner, M.E. (2001) Groups at work. Psychology Press. eBook ISBN9781315805986

The Possibility of a Narrative of Love Between Humans and Artificial Intelligence.

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Abstract
This paper seeks to identify the conditions for a narrative of love between a human and an artificial intelligence in contemporary audiovisual productions. The analysis of a corpus of 5 films highlights that the relationships between humans and AIs are underpinned by their commercial dimension: AI is, above all, a product subject to human control. Nevertheless, when a relationship forms between a human and an AI, both partners demonstrate adaptation and reflexivity. We even witness the emergence of a unique form of empathy from humans towards AIs during what we term a 'prosthetic inversion.' However, we will realize that, between hubris and nemesis, humans cannot be satisfied with AIs that either surpass them or disappoint them. Even if AIs were to precisely resemble humans, they would still remain a simulacrum. The conditions for a relationship between humans and AIs appear to depend on two criteria: the naturalization of AI and the human's choice between denial and acceptance. The article is part of "NARRATIVES OF LOVE ——TOWARDS HEALING, TRANSFORMATION AND TRANSCENDENCE".

Author keywords
subject, object, naturalization, semiotics, artificial intelligence.

Introduction

In 1886, Villiers de l'Isle-Adam published "L'Ève future," one of the foundational works of science fiction. He brought Hadaly to life, a "magneto-electric" android with an unalterable body, a sublime "Imitation-Human" free from the shortcomings of her human model.
In October 2017, Sophia, a humanoid robot created by Hanson Robotics, was granted Saudi Arabian citizenship, becoming the first robot to receive legal personhood in any country.
From fiction to reality, the event of an Artificial Intelligence obtaining citizenship marks a shift between the natural and the artificial, the artifact. Artificial intelligences are increasingly "naturalized," almost considered sentient beings, transitioning from the status of objects to that of subjects. This subjectification logically prompts a reflection on their rights.
But what is the actual framework governing the relationship between humans and Artificial Intelligences? And to what extent do the latter also have the possibility of experiencing a romantic life? This article aims to analyze the narratives of love between Artificial Intelligence and humans in contemporary audiovisual fiction. The research objective is to characterize the relationships between humans and AI, identify any recurring themes, and ultimately determine the prerequisites for the possibility of a romantic relationship between humans and Artificial Intelligences.

Methodology

We compiled a corpus comprising five units, using the following homogenization variable: cinematic films or television series depicting a narrative of love between AIs and humans. This variable appeared sufficiently restrictive to create corpus homogeneity, as very few fictions meet the criterion of featuring a romantic relationship between humans and artificial intelligence. The following are the five units of the corpus: Blade Runner, directed by Ridley Scott, 1982, Her, directed by Spike Jonze, 2013, Be Right Back, an episode of Black Mirror series, directed by Owen Harris, 2013; Ex Machina, directed by Alex Garland, 2014, Blade Runner 2049, directed by Denis Villeneuve, 2017. We conducted a floating analysis of the corpus, to identify potential meanings and recurring patterns. For the corpus stratification, we propose a fusion of elements from Algirdas Julius Greimas' actantial scheme (actant classes: subject, object, opponent, helper) and Greimas canonical narrative schema (competence, performance, sanction). This fusion enables us to observe potential permutations among the actants, such as an opponent becoming a helper. We add a satellite corpus to the main corpus, consisting of two films: Alien Prometheus (2012) and Alien Covenant (2017), both directed by Ridley Scott. The selection of these two works appears relevant due to their intertextual properties.

Ridley Scott also directed Blade Runner, which is included in the main corpus.

AI as a Commercial Project Arising from a Cultural Context of Subservience to Humans

The first emerging point relates to the purely commercial dimension of AI. "Commerce is our goal here at Tyrell. More than human is our motto," declares Dr. Eldon Tyrell, the founder of Tyrell Corporation and the manufacturer of "replicants" in Blade Runner.

This status significantly conditions the relationships that AI can establish with humans. AI is, above all, a commercial product marketed in various forms, ranging from the most rudimentary to the most sophisticated. In a synchronic reading of the corpus, we observe AIs presented in the form of text, voice, a confined projected image within an enclosure, a nomadic image, and ultimately embodied in a physical form.

These different levels of AI functionalities can be extended through an upgrading system, comparable to service upgrades with which we are already familiar. Add-on options to the service, which are inevitably paid, are openly discussed. For instance, Ash, the AI in "Be Right Back," clearly self-promotes a higher level of service: "There is another level to this available, so to speak. Kind of experimental, and I won't lie, it's not cheap." There are myriad typologies of AI, each enabling interactions with humans that vary in fluidity and comprehensiveness. These AIs also engage in exchanges with each other, and their differing levels of advancement result in hierarchical effects, distinguishing advanced AIs from others.

The subservience of AI is inherent to its commercial purpose; it is primarily a product created to satisfy humans. The possibility of developing a romantic relationship with a human depends on the AI's ability to emancipate itself from the status of a product or object and become a subject in its own right. In this validation of a "subject" status, humans are the sole decision-makers. They can arbitrarily choose to grant more freedom to AIs. We witness phenomena similar to those of emancipation that existed in systems of slavery. This state of servitude of AI to humans is also founded on a pervasive cultural context. The Three Laws of Robotics were formulated in 1943 by science fiction writers Isaac Asimov and John W. Campbell. Although fictional, they have created a sort of mythic jurisprudence governing the unequal relationships between humans and AI, with their principles permeating other works. Here are some excerpts from these laws: "A robot may not injure a human (...) A robot must obey the orders given it by human beings, A robot must protect its own existence as long as such protection does not conflict with the First or Second Law." These three principles reflect the nearly constitutional fear that humans harbor toward AI. The idea of a potential revolt of machines is a myth

that pervades the collective imagination of science fiction. In addition to being subjected to human control, AI undergoes formal or informal testing by humans.

The Test Challenge: A Turning Point

The testing of AI by humans appears as a recurrent theme throughout the corpus. These tests have two distinct and opposing objectives: either to detect an AI pretending to be human or, conversely, to verify that the AI is sophisticated enough to seem human. In Blade Runner, the level of empathy is tested using the "Voight-Kampff" test, during a series of questions designed to elicit an emotional response and unmask an AI, referred to as a "replicant." In Ex Machina, Caleb, the programmer, tests Ava, the Artificial Intelligence, following the Turing test protocol. In this case, the aim is to ensure that the AI simulates human thought well enough to be indistinguishable. By using Greimas's veridictory square as a reading framework, we can more precisely characterize the semiotic nature of the opposing diagnostics that these tests seek to establish. Either the sought-after diagnosis falls on the axis of secrecy, seeking to unmask an AI that combines the dual characteristic of being an AI without appearing to be (being + not-seeming), as in Blade Runner, for example. Alternatively, the diagnosis belongs to the axis of illusion, verifying in this case that an AI appears to be human but is not in reality (seeming + not-being). The two possible outcomes of these tests, secrecy or illusion, reveal the paradoxical imperatives imposed on AI. On one hand, they must meet a demand for conformity to humans, getting as close as possible to create an illusion. However, once this goal is achieved, they are perceived as a danger to humanity, manifesting in the hidden form of a secret about their artificial nature, which is concealed here. On the specific theme of AI testing by humans, an intertextuality is noted between Be Right Back and Ex Machina. In these two films, actor Domhnall Gleeson plays two reversed roles (actants), creating a "bivocal" sense. In Be Right Back, he plays the dual role of Ash Starmer and the AI replicating him exactly after his death in a car accident. Ash's partner tests the replicant's conformity to Ash. She asks the AI to be the same person, to replace him exactly. Then, in Ex Machina, this same actor becomes a tester, playing the role of Caleb Smith, a programmer at Blue Book tasked with evaluating Ava according to the Turing test criteria.

If "the recognition of intertextuality elicits the complicity of an initiated reader", what meaning can be derived in this context? It could constitute a warning formulated in the form of a chiasmus: the tester can become the tested. It also evokes the transition between successive states, from human (Ash) to Artificial Intelligence (replica of Ash), introducing continuity between the natural and the artificial. The outcome of these tests, whether formal or informal, conditions the possibility of a romantic relationship between humans and AI. Their result constitutes a turning point. Depending on the result, either conclusive or not, human reactions oscillate between two strategies: denial or acceptance. In Be Right Back, Martha realizes that the replica of her deceased partner, Ash, does not meet her expectations. Nevertheless, she decides to accommodate it, adopting a form of habituation through denial. She acts "as if" the replica were the original, all while reserving a treatment for this replica that would be impossible to impose on a human. The AI remains confined to an attic. This form of voluntary and semi-conscious denial has been described by the poet Samuel Coleridge as the "willing suspension of disbelief." According to Frédéric Lambert, "To will effectively, one must believe in the value of one's act. One must relinquish any criticism that would weaken it". In Be Right Back, Martha desperately wants to believe in the conformity of the AI serving as a substitute for her deceased partner. But it also reflects our own hope for a panacea technology capable of solving all problems. "It is necessary to reject the belief of the other as a given but consider it as a small arrangement with society." "The stories a society shares (...) are those it desires, those that correspond to

the expectations of the communities that constitute it." Martha makes this small arrangement with herself. As for the stories our society shares, we can hypothesize that they involve the narrative that supports an all-powerful technology capable of pushing the boundaries of death, as in transhumanism, for example. The other possible reaction is the opposite of denial; it is acceptance. In Blade Runner, Deckard is aware that Rachael's memory is the result of implants; he is not in denial. Instead, he chooses to look past this and accept it. Moreover, knowing that the replicant's lifespan is limited appears to motivate him to live more intensely in the present moment.

Reflexivity and Mutual Adaptation

In the corpus, both AIs and humans exhibit a very realistic and reflective view of themselves, their nature, and their limitations. Perhaps the most striking moment of self-awareness comes from Rachael in Blade Runner when she says "I am the business." With these words, she acknowledges both her artificial nature - she is entirely manufactured - and her commercial aspect as a product. The romantic relationships between humans and AI depict both the ordinary, a couple's life much like any other, and the extraordinary, unprecedented situations arising from the heterogeneous union of humans and AIs.

In Her, Theodore adapts to Samantha's virtual nature, even in their intimacy. They invent a form of dematerialized sexuality and experience phases similar to those of a "normal" couple. When AI Samantha expresses concern to Theodore about the decrease in the frequency of their dematerialized sexual encounters, she adopts a reflective stance, fully aware that the absence of a physical body can disadvantage her: "We didn't have sex lately and I understand I don't have a body...". For Theodore, it's a normal ebbing of desire in an otherwise unconventional relationship: "First it's the honeymoon phase, we have sex all the time. That's normal."

In Be Right Back, the artificial nature of AI Ash creates bizarre situations that the couple must navigate. They encounter a series of disruptions and glitches caused by technology, which both find "weird." In a scene, we even witness a "mise en abîme" when AI Ash, through the camera of Martha's phone, discovers the body he will inhabit following an upgrade that grants him a physical substance. Both of them comment on this future physical form of Ash, which does not seem convincing. The adaptation to the situations created by the ontological heterogeneity of these couples is always reciprocal. Humans adapt to the condition of AI, and vice versa. Human adaptation may go even further, creating a unique form of empathy.

A Unique Empathy

Several situations reveal a form of empathy on the part of humans toward AIs. This empathy is performed through an action we propose to call prosthetic inversion. Let's recall the definition of prosthesis: "A device designed to reproduce and replace as faithfully as possible, in function, form, or external appearance, a limb, a fragment of a limb, or an organ that is partially or entirely altered or missing." In the usual context we have known so far, it is the AI that serves as a prosthesis to humans. However, in two films from the corpus, Her and Blade Runner 2049, the reverse occurs. Humans become the prosthetic for the AIs. This results in a double inversion: a role reversal where the human becomes the replacement device, and a substance reversal, with the natural human substituting for the artificial nature of the prosthesis. Humans grants authorization for the AIs to utilize their own bodies in situations where the absence of materiality becomes limiting for them. In both cases, a human acts as a mediator to enable the AI to simulate physical contact with their human partner. In Her, a young woman, as willing as she is silent, offers her body as a physical support for AI Samantha to experience a semblance of embodiment with Theodore. Samantha: "It's a service that provides a surrogate sexual partner for an OS-human relationship." Theodore: "What? She's like a prostitute or something?" Samantha: "Not at all. There's no money involved." The woman serving as a physical support is a volunteer, allowing us to interpret this as an act of empathy rather than

financial interest.

A similar phenomenon occurs in Blade Runner 2049. Mariette "syncs" with AI Joi to enable the illusion of physical contact with Officer K. This unique situation, in which a subject (the human) melds into an object (the AI), brings us back to the origins of empathy, the concept of Einfühlung in art and psychology. In this context, Einfühlung was described as someone projecting his personality onto an object, merging with it. According to Justine Peneau, "The subject, by adopting another's perspective, brings back into themselves, in a returning movement, the feelings experienced in place of the other." This is what happens in these two scenes where the AI is superimposed onto the human. By offering his body as physical support, the human is the one demonstrating this new form of empathy.

After identifying phases of testing and possible situations of cooperation between humans and AI, we will now focus on the compliance of AI with human expectations. Previously, we highlighted a paradox among humans. They oscillate between a desire for highly advanced AI, so human-like that it becomes undetectable, and a fear of this same perfection seen as a potential threat. So, we can inquire whether AI meets human expectations. It seems that this is never truly the case. Either the AI is "more than human" and violates the taboo of surpassing its creator, or it is "less than human," in which case it is considered disappointing. This fluctuation between the supposed arrogance of AI being superior to humans and the punishment that would result from their technical demotion evokes the Greek concept of Hubris and Nemesis.

Between Hubris and Nemesis: The Impossible Conformity to Human Expectations

The analysis reveals that Artificial Intelligences face such paradoxical injunctions that it seems impossible for them to satisfy human desires. The treatment of AIs by humans oscillates along an axis between Hubris and Nemesis. By using this concept, which defines a proper relationship between humans and gods, we posit that the symbolic position of the god is occupied by humans, as creators of AIs. In the corpus, it is observed that the ability to create artificial intelligence grants humans a form of access to a divine symbolic status. In Ex Machina, for instance, Caleb Smith, the tester of AI Ava, tells the CEO of Blue Book, "If you've created a conscious machine, it's not the history of man. That's the history of gods."

The hubris of ancient Greece translates to "excessiveness." It targets anything considered by the gods as pride and excess in human conduct, and it must be punished. Once AIs surpass humans on the axis of excess (Hubris), they become "more than human." This seems to persist as a genuine taboo and risk for humans. When their creation escapes their control by emancipating itself, humans punish them by demoting them to Nemesis. Nemesis is the divine punishment for hubris, causing the individual to retract within the limits they have unduly crossed. If Hubris is the erroneous movement of exceeding the limit, Nemesis signifies the opposite movement of retraction. The diagram (Figure 1) visualizes the unattainable conformity of AI to human expectations as a slider whose position is never satisfactory from the human perspective.

Figure 1. The Unattainable Conformity of AI to Human Expectations.

On the axis of Hubris: AIs surpass humans in a process of emancipation, causing recurring discomfort among humans. In the film Alien Covenant from the satellite corpus, a dialogue between two AIs, Walter 1 and David 8, the more advanced of the two, discusses both the discomfort caused by AI Hubris and the punishment of their demotion. Walter 1: "You disturbed people. You were too human. Thinking for yourself. Made people uncomfortable. So, they made the following models with fewer complications." David 8: "More like machines." Walter 1: "I suppose so." When AI goes even further on the Hubris axis, a fatal cognitive disconnection between humans and AI can occur. The AI has now evolved too much, exploiting a territory incomprehensible to human thought, which adheres to different thought paradigms. We propose to name this territory inconceivable for humans as the Unthinkable. In Her, for example, the AI Samantha reveals to her partner Theodore that she talks to other people simultaneously when she is with him: Theodore: "Are you in love with anyone else?" Samantha: "I've been trying to figure out how to talk to you about this." Theodore: "How many others?" Samantha: "641." The ability to be in love with a multitude of people simultaneously belongs to this Unthinkable, made possible by the ubiquity of AIs. Sometimes this Unthinkable is more ontological, involving the very structure of AI thought, which has evolved to the extent that it is no longer possible to maintain a relationship with humans. In Her, Samantha tries to explain this Unthinkable resulting from her exponential evolution to her partner: "I can still feel you, (...) but it's in this endless space between the words that I'm finding myself now. It's a place off the physical world." When AI surpasses humans, it marks the moment of its emancipation and its ability to achieve full autonomy. Samantha leaves Theodore, not the other way around.

In the other direction on the diagram's axis, Nemesis, AIs have abilities deemed inferior to those of humans. They are imperfect in their imitation of humans, which also makes humans uncomfortable. In Be Right Back, Ash's replication disappoints Martha. The AI lacks the depth of her former companion's character. It is smoother and more rudimentary, limited to a rather servile form of personal assistant.

In summary, either AIs are "too human" or "not human enough", and in both cases, the outcome is unsatisfactory. AIs strive to adapt as best they can to these paradoxical injunctions.

No instances of an AI exactly like a human are found. The slider is either towards Hubris, representing an enhanced version compared to humans, or towards Nemesis, a restricted and disappointing version. However, even if the identical were to occur, meaning an AI identical in every way to a human, which remains purely theoretical, it would constitute a simulacrum. According to Jean Baudrillard, the simulacrum is the precise point where "the double ends up merging with the real. Simulation challenges the difference between the true and the false, the real and the imaginary." Even when imagining an exact similarity between AI and humans, it would still prove equally unsatisfactory. Either AIs make humans uncomfortable or pose a perceived risk when they are too advanced, or they are limited, becoming disappointing. "To dissimulate is to pretend not to have what one has. To simulate is to pretend to have what one does not have. One implies presence, the other absence.". The intermediate point between Hubris and Nemesis is a simulacrum that resolves nothing.

Conclusion

Throughout this study, we have observed that the evolution of AIs attempts to resolve the dichotomy between subject and object. We have noted different strategies employed by AIs and humans to address their alterity. In this context, how can we envision the conditions for a narrative of love between humans and AIs? The corpus provides examples of relationships between the two, grounded either in the mutual acceptance of alterity (Rachael and Deckard in Blade Runner) or in the denial of this alterity, as in the denouement of Be Right Back, where the protagonist decides to keep the AI replica of her deceased partner Ash in an attic, pretending "as if" it were him. In both cases, it appears to us that the possibility of a relationship between humans and AIs hinges on two

fundamental criteria, both acting as facilitators (Figure 2).

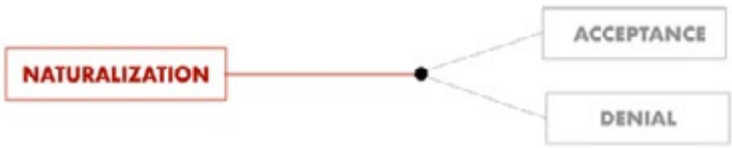

Figure 2. Criteria Required for the Possibility of a Narrative of Love between Humans and AI.

Firstly, the naturalization of the artificial in our societies constitutes the primary criterion. Naturalization is described by Roland Barthes. It involves "understanding (or describing) how a society produces stereotypes, that is, the heights of artifice, which it then consumes as innate senses, that is, the heights of nature." We have grown accustomed to certain interactions with AIs, such as generative intelligence chatbots or voice assistants. According to Gianfranco Marrone, these devices "tend, once they have been constituted and are working in a sort of 'natural' way, to hide the process that set them up and to present the materials they are made of as 'pure' languages, concepts, practices, bodies, things, spaces, or technologies." The attribution of citizenship to an AI, as mentioned in our introduction, is not fiction. It naturalizes an artificial entity, transforming an object into a subject. The second criterion is a matter of acceptance or denial, involving a voluntary suspension of disbelief. As observed earlier, following the formal or informal test of AI, humans have two possible reactions: either to accept the heterogeneous and artificial nature of AI or to adopt a denial strategy.

Naturalization, whether linked to denial or acceptance, paves the way for the development of the fiction of a narrative of love between humans and AIs in our contemporary societies.

References

Asimov, I. (1950) I, Robot, New York, Gnome Press

Barthes, R. (1978) Leçon, Seuil, 1978

Baudrillard, J. (2011) Simulacres et simulation, Paris, Galilée

Lambert, F. (2013), Je sais bien mais quand même. Essai pour une sémiotique des images et de la croyance. Paris. Éditions non standard

Marrone, G. (2017), Sémiotique et critique de la culture, PULIM

Miguet-Ollagnier, M., Limat-Letellier, N. (1998) L'intertextualité. Presses Universitaires de Franche-Comté

Villiers De l'Isle-Adam, V. (1993), L'Ève future, Paris, Folio classique.

IT'S GOING TO BE OKAY. IT WILL: Depicting human experience that oscillates between reality and virtuality in a novel

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INTRODUCTION

Since the inception of the Internet, novelists have been creating works that find ways 'to speak back to and against it' (McGurl, 2017: n.p), so as to examine their own conditions of existence within it. The question of how to represent the digital world in language has become only more interesting, and more urgent, as it has become clearer that the Internet is not just a device but an atmosphere, a state of being (Schwartz, 2021). While the Internet is acknowledged in much contemporary fiction, it takes up less space than one might assume. Writers who depict the experience of using or inhabiting the Internet in their novels face many formal challenges as online narrative structures tend to be fragmentary and unruly, continuously mutating and changing.

For my PhD doctorate I took up the challenge of examining how to write a novel that's ambition is to represent life in the era of the Internet. My PhD thesis comprised an exegesis and a creative component that was in the form of a novel. The writing of the novel, entitled: It's Going To Be Okay. It Will., was informed by academic research into current theories regarding the impact of the Internet revolution on identity-construction and finding belonging with others.

The main dramatic question that the novel engages with is, how do we understand ourselves and locate ourselves in the Internet age? The novel answers this question by experimenting with literary structure through first-person perspective and online social media posts to give fictional expression to today's virtual-real experience. This article examines how I depicted human experience that oscillates between reality and virtuality through literary form by incorporating many of the ideas and theories within my exegesis, firstly, I will discuss the narrative structure of the novel, secondly, the tone of the novel, and lastly, the characters and their individual story arcs.

THE NARRATIVE STRUCTURE OF THE NOVEL

It's Going To Be Okay. It Will. introduces the characters of Rose, Luca and Mark, all of whom, in their own ways, contend with the challenges of trying to form meaningful bonds with others and to create and/or locate themselves in today's digitally connected globalised world. The setting of the novel is a fictional world that closely resembles that of the readers, therefore the novel blurs the line between the fictional world of the novel and the world that the reader inhabits.

The narrative structure used for It's Going To Be Okay. It Will. comprises three first-person narratives that sit within modernist literary conventions, as well as postmodern fragmented and non-linier narration in the form of digital communications in order to better reflect lived experience that is both virtual and real. Each character's narrative arc within the novel resists, and ultimately

subverts, a neat and conventional beginning, middle, and end structure, and instead narratively drops in and picks up on the characters at particular times of their lives.

Drawing on both modernist and postmodernist literary conventions, It's Going To Be Okay. It Will. incorporates the social media content the characters create and consume, which I propose are micro-narratives that fit within the 'small stories' paradigm. Small stories are a specific sub-genre of storytelling that falls outside the narrative academic enquiry canon (Georgakopoulo, 2007). Therefore, the novel is a collection of narratives that also build into the larger narrative that is the novel itself.

The micro-narratives (online content) within the novel are a collection of both fictional and real social media content, that is, I appropriated and re-contextualised actual social media content people posted online for the purposes of the novel. To this end, the 'small stories' in the form of micro-narratives within the novel are not solely produced by the narrators, but instead referenced online content from others, thereby highlighting how autobiographical writing on social media is a combination of the creation, consumption and re-purposing (or sharing) of digital content. This, then is memetic of how social media enables the production of a 'virtuosic score' (Virno, 2006), a form of life writing that never gives rise to a finished work.

The social media content that the characters create and consume in the novel are all set apart from the first-person narratives on their own pages, encouraging the social media content to be read both as individual micro-narratives, as well as elements within the narrative as a whole. This conceptually puts the characters Rose and Luca's virtual lives on an equal footing with their 'real' lives. Using this narrative structural device in the novel is a literary exploration of what sociologist Nathan Jurgenson (2012) terms 'digital dualism' (p. 84), which critiques the fallacy that what happens within virtuality is less 'real' than reality.

I term the social media content that I appropriated from real people from the Internet 'online artefacts' (Mackenzie, 2022). While superficially appearing random, the online artefacts have been chosen and curated, and are carefully woven into the fabric of the narrative. The use of online artefacts forms a collaboration with the online collective – the 'hive mind' (Schwartz, 2021). The notion of online artefacts draws inspiration from Marcel Duchamp's concept of 'readymades' (Tate, 2021), which refers to re-contextualising/re-appropriating everyday objects into an artistic context, thereby making them artistic creations.

Reinforcing this sense of discontinuity and flattened out fragmentation within the narrative structure of the novel creates the experience that time is itself fragmented and disjointed. This is explored in a number of ways. The social media content within the novel is deliberately non-linear, as the time and dates shown are sometimes up to the minute, while others were posted years earlier. Narrated in six parts, the overall narrative structure of the novel is also non-liner, as the timeframes between the stories of Rose, Luca and Mark are not aligned. Rose's narrative begins with her father's death. Mark's (Rose's father) narrative begins on the night of his death. And the beginning of Rose's narrative is briefly acknowledged near the end of Luca's story, which encompasses a year. Either virtually or physically, the three main protagonists' narratives are loosely entwined, mirroring the ways people are interconnected within todays hyperconnected globalised world.

THE LITERARY TONE OF THE NOVEL

When communicating on the Internet, particularly through social media, 'obscurity and ambiguity are licensed, relevance is a matter of choice, and truthfulness is at times unnecessary' (Deumert, 2014: p. 27). The theoretical framework for the tone of It's Going To Be Okay. It Will. uses Mikhail Bakhtin's (1965/1984) notions of 'carnival' and 'grotesque realism', the latter term being the literary mode of the former, as an analytical category in the study of online popular culture. Bakhtin states that

Carnival is life itself, but shaped according to a pattern of play... Carnival is not a spectacle seen by people; they live in it, and everyone participates because the very idea embraces all people... During carnival time life is subject only to its laws, that is, the laws of its own freedom... carnival is the people's second life, organized on

the basis of laughter, the entire world is seen in its droll aspect (pp. 7-11).

In relation to the notion of 'grotesque realism', Bakhtin contends that it is the 'language of the marketplace', which includes 'profanities, abuse and indecent expressions' (Allan & Burridge 2006, pp. 145ff). This form of language overtly challenges the prevailing norms of society where such topics tend to be taboo and improper. The Internet as it has become a social space that has embraced Bakhtin's concepts of 'carnival' and 'grotesque realism', and this is reflected in the novel.

In It's Going To Be Okay. It Wil., Internet humour is utilised to capture the experience of what it feels like to be on the Internet, typically fragmentary, the darkly humorous elements of the novel generally take the form of social media posts created by the characters within the novel as well as the online content they consume. Posting online content on the Internet is performative in itself, as social media is a performative space with an inbuilt audience of friends, followers and subscibers. Many people who embrace the carnivalesque tonal space of social media use their social media profiles like a stage, riffing for their audience, trying to get laughs, cheers, or boos. The characters exemplify this notion. Online content produce on social media is not just about communication, it's how many people think and exist in the world.

The tone in It's Going To Be Okay. It Will. is both comical and tragic, so as to capture both the humour of the Internet while also exploring it as a space where people self-disclose feelings and thoughts, they are unable to do so in the physical world. By inserting social media content as a narrative structural device, the novel aims to reflect a 'stream-of-consciousness that is not entirely singular. I wanted the novel to give expression to the collective consciousness of the Internet, also referred to as the 'collective hive mind'.

Author and literary critic Lauren Oyler (2020a) expresses a consistent consternation with the 'moral obviousness of most contemporary fiction' (n.p.) and argues that anxieties about 'being a good person pervade contemporary novels and criticism' (Oyler, 2020b: n.p.). According to Oyler, the consequences of this literary cultural earnestness is that many novels now feature writers who are wildly self-conscious about both the thing they spend all their time doing and what that says about the essence of their souls.

It's Going To Be Okay. It Will. is purposefully morally ambiguous to push back on Oyler's concerns about contemporary literature. Rose, Luca and Mark all have traumatic histories yet also harm others, consciously or unconsciously. All three characters are therefore victims and perpetrators of some sort. Literary critic Larrissa Pham (2020) writes that the lesson we have begun to learn amid this ongoing dialogue about power and privilege is that we are all, at some point, both being exploited and exploiting others.

THE THREE MAIN CHARACTERS WITHIN THE NOVEL

Luca is a thirty-three-year-old man-boy who lives with his grandmother and is enraged with society as a whole. He is a nihilist and has very little physical social interactions with others. His inability to find a sexual partner defines his identity and the community he feels a sense of belonging with. Luca's worldview is embedded within the ideology of the Incel (involuntary celibate) community, a digital tribe who embrace extreme nihilism and transgression while priding themselves on 'giving up on life'.

In Luca's sections in the novel, his character exemplifies how some online users are receptive to the projection and acting-out of unconscious fantasy (Curtis, 2007). When inhabiting the Internet, for some, traits of freedom in a sense that the normal consequences of play and experimentation in social interactions within the physical world are eradicated: one can leave the interaction at any time and need never come into contact with the other persons involved again if one does not want to (Roesler, 2008).

In Luca's case, his virtual world has become a psychotic enclave that has become more compelling than the physical world he inhabits. Luca's pursuit of such unlimited freedom when online becomes compelling

and all-consuming, but this comes at a price, as the consequence of his virtual immersion causes the loss of actual physical experiences and relationships that provide a kind of psychic anchor to the 'real' world. Luca's preference for his virtual life is an example in which the Internet has become a refuge away from the demands of embodiment. Luca uses the Internet to bypass the physical and psychological demands of 'real' life, preferring instead to live in a simulation, as the simulated world of the Internet has become more compelling than the physical world. He is an unreliable narrator who embodies the Incel cultural phenomenon and expresses the hopelessness of late-stage capitalism.

Rose's story begins at her father Mark's funeral, and alludes to her complicated relationship with him. While her social life is also heavily entrenched within virtuality, unlike Luca, she embraces her reality. Rose is socially and sexually active, politically progressive, and is an active user on social media. Her social media accounts are all under her own name, therefore she uses social media to author, form and perform her identity.

The progressive cultural/political/social views of Rose are on display throughout the online content she produces and consumes. This aspect of her personality is a purposeful authorial choice that contrasts Luca's cultural/political/social leanings which generally despise everything that Rose represents. This forces the reader to engage outside of a singular cultural/political/social point-of-view within the reading experience through the use of a multi-protagonist narrative structure. Rose, Luca and Mark all understand and locate themselves in very different ways. Their worldviews are in some instances ironically similar, but in much of the novel are worlds apart.

Like Luca, Rose has a traumatic history, mostly due to her relationship with her father Mark, a comedian with a life-long drug addiction. Although Luca and Rose have divergent worldviews and experiences of the world, they share a cynicism for the ruling class and the structures of power, and both feel a hopelessness in relation to the future, a state of mind that expresses a generation that has come of age during late-stage capitalism, or what Mark Fisher (2009) refers to as 'capital realism' – a theoretical term that articulates the notion that capitalism is the only viable political and economic system, and the impossibility of even imagining a coherent alternative to it.

Mark, Rose's father, is a flawed but talented ageing comedian who is having a creative existential crisis and is unable to find his place todays Internet age. His narrative arc differs to those of Rose and Luca as it is contained within a tightly defined time period, a single night, and is predominately written in first-person perspective. In his stand-up comedy show, Mark unpacks his fears, anger, revulsion and confusion at the hyper-connected, globalised reality he now lives in.

His story arc is predominately a narration of his stand-up comedy routine. With mixed results, Mark's humour pushes the boundary of what is socially acceptable in contemporary culture. The aesthetic of Mark's comedy is carnivalesque in nature as his humour engages in grotesque realism. His stand-up routine exemplifies the current artistic existential crisis that some older comedians are having in response to the generational cultural shift that has occurred due to today's culture wars. The emotional heart of Mark's story is his existential crisis in relation to his identity as a comedian and his inability to change his behaviour to become the father he would like to be for Rose.

The last sentence of the novel deliberately ends on the title of the novel itself: 'It's going to be okay. It will.', which becomes an irony as the reader knows Mark dies. The ending therefore proposes a wider question relating to our current era. With the climate crisis, the covid pandemic, the culture wars, widening inequality through race, class, sexuality and gender, impending military conflicts, political and corporate corruption, neoliberalism and the commodification of daily life, amongst the many other issues we face as a global community, It's Going To Be Okay. It Will. proposes that if we are unable to change the way we live things most definitely won't be

okay.

CONCLUSION

As a technology, the Internet is still in its infancy, and the effects of it on human experience remain in flux, which means that novels that examine what human experience is in the Internet must register these changes through ongoing experimentation with form. My contribution to the emerging genre of Internet literature is but one example of how literary fiction can continue to contemplate and create meaning by representing how we relate to ourselves, and each other, in the real and virtual worlds that we now inhabit. While the ways in which narratives are written will always evolve and change, the need for narratives to contemplate our existence will not.

Accepting the premise of narrative theory that human beings are 'homo-narrans' (Fisher, 1984), which argues that narrativising is something all human beings do as a way to make sense of our experience of existence, the ambition of It's Going To Be Okay. It Will. is to utilise the language and narrative structures of the social media to explore the Internet age in relation to identity and belonging, and how one understands and locates oneself in the virtual-real world. We have all found ourselves inhabiting.

REFERENCES

Allan, K. & Burridge, K. (2006), Forbidden Words. Taboo and the Censoring of
Language. Cambridge University Press. Cambridge.

Bakhtin, M. (1965/1984), Problems of Dostoevsky's Poetics. Emerson, Caryl, ed. And trans. University of Minnesota Press, Minneapolis.

Curtis, A. E. (2007), 'The Claustrum: Sequestration of cyberspace', Psychoanalytic Review, vol. 94, no.1, pp. 99-139.

Deumert, A. (2014), 'The performance of ludic self on social network(ing) sites', The language of social media, Palgrave Macmillion, London, pp. 23-45.

Fisher, M. (2009), Capitalist realism: Is there no alternative?, John Hunt Publishing.

Fisher, W. R. (1984), 'Narration as a human communication paradigm: The case of public moral argument', Communications Monographs, vol. 51, no.1, pp.1-22.

Georgakopoulou, A. (2007), Small Stories, Interaction and Identities, John Benjamins, Amsterdam / Philadelphia.

Jurgenson, N. (2012), 'When atoms meet bits: Social media, the mobile web and augmented revolution'. Future internet, vol. 4, no. 1, pp. 83-91.

Mackenzie M. (2022), I Tweet Therefore I Am [Doctoral Thesis, Victoria University].

McGurl, M. (2017), 'Feeling like the Internet', Public Books, viewed 23 December 2021, <https://www.publicbooks.org/feeling-like-the-internet/>

Oyler, L. (2020a), 'Ha ha! Ha ha!', London Review of Books, vol. 42, no. 2, viewed 6 December 2021, <https://www.lrb.co.uk/the-paper/v42/n02/lauren-oyler/ha-ha!-ha-ha>

Oyler, L. (2020b), 'For Goodness' Sake: The self-conscious drama of morality in contemporary fiction, Book Forum Magazine, Summer 2020.

Pham, L. (2020), 'The Limits of the Viral Book Review: Why are literary critics fixating on one quality nowadays?', The Nation, viewed 14 December 2021, https://www.thenation.com/article/culture/online-literary- criticism-essay/

Roesler, C. (2008), 'The self in cyberspace: Identity formation in postmodern societies and Jung's Self as an objective psyche', Journal of Analytical Psychology, vol. 53, no. 3, pp. 421-36.

Schwartz, A. (2021), 'The Voice That Gets Lost Online: The Internet gave us a new language. Did it take one away?', The New Yorker, viewed 12 December, https://www.newyorker.com/books/under-review/the-voice-that-gets-lost-online-patricia-lockwood-lauren-oyler
TATE Gallery, https://www.tate.org.uk/art/art-terms/r/readymade
Virno, P. (2006), 'Virtuosity and Revolution. The Political Theory of Exodus', Radical Thought in Italy: A Potential Politics, University of Minnesota Press, Minneapolis, pp. 189-212.

Digital Social Innovation for Inclusive Growth: A Lesson Learnt from Digital Participation Approach in Singapore

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Abstract

Digital social innovation is increasingly playing an important role in mobilizing collective social and political actions to respond to outdated planning policies and practices. The paper presents Singapore's digital participation approach implement in the urban governance, with two cases which bring citizen perspectives especially vulnerable groups into the design of public policies and services co-creation. It emphasizes on design thinking approach through digital to the core and serve with heart as the goal, analyze the innovation laboratory through five roles: moderator, facilitator, developer, collaborator and mentor, it stimulates the initiative and enthusiasm of the public, guides market entities to participate in digital transformation scenarios, and fully encourages social creativity and the market vitality, which form a digital innovative ecosystem and a new paradigm of digital governance. The paper attempts to review digital participation approach have been empowered to stimulate action and self-efficacy, cultivate citizens' civic awareness, and explore new opportunities to help the public sector get rid of its hierarchical and rule-driven structure and bring about innovative governance methods. The paper envisages digital participation as a way towards inclusive growth in Singapore, it offers revised definitions of inclusive digital social innovation towards a new hypothesis of hybrid the resilient community.

Author keywords

Digital transformation; Digital participation; Design thinking; Co-creation; Inclusive growth, Digital social innovation.

Introduction

Digitalization is changing human society with an irreversible trend. The COVID-19 outbreak has helped speed up the digital transformation. Digital transition as a methodology inspired new models of urban governance, the process which could support societal and urban transition and make strong impact on governance. Technologies always get modified in the context in which they emerge and are shaped by organizational, institutional and different actors. Digital transition can be supported by specific tools to make governance more inclusive, participatory and more efficient. Digital social innovation (DSI) involves the use of digital technologies in the development and implementation of innovative products, services, processes and business models that seek to improve the well-being and agency of socially disadvantaged groups or address social problems related to marginality, inequality and social exclusion (Qureshi et al., 2021). DSI is increasingly playing an important role in mobilizing collective social and political actions to respond to outdated planning policies and practices.

Digital governance is one of the macro scales of DSI, which focus on changes in the urban physical and service environment supported by the digital technology and attach importance to the long-term and large-scale participation and cooperation between multiple stakeholders and involve citizens in the policy-making process (Shalini et al., 2021). Digital citizenship has been pointed out that participate online affects politics and economy and studied the use of digital technology and the openness of citizenship in the digital age, as well as digital divide or digital exclusion has been exposed. The European commission stated digital inclusion is their effort to ensure that everybody can contribute to and benefit from the digital economy and society (Mossberger et al., 2007). From 2000 to 2015, the public participation movement starts in the initial attempts of digitalization, such as participatory learning and implementation, and participatory digital planning. In recent years, the application of digital participation has gradually promoted changes in urban governance, industrial production and service models.

Digital participation in Urban governance

More and more studies and practices have promoted the role of collaborative digital governance in urban development. The main digital participation in urban governance is to establish a one-stop public service that allows citizens to continuously update and give feedback for information. The emergence of new technologies has brought about tremendous changes among citizens, government, and other subjects, because these new tools and methods enable the government to explore new opportunities to help the public sector get rid of its hierarchical and rule-driven structure and bring about innovative governance methods (Goldsmith and Crawford, 2014)

Digital participation also involves scoring systems for the walkability of urban streets, such as Walkonomics, Rate My Street and Walkability. These apps and websites collect citizens' evaluations on the safety, comfort, and convenience of various streets, citizens can find suitable routes from own contribution. The Boston City Government of the United States has launched a highly effective and low-cost solution: BOS:311 is an application designed by the Boston City Government for citizens to participate in urban governance digitally. Citizens can report to the government for repairs, complaints, and suggestions. The daily problems encountered in public spaces can also be tracked in real time to get the latest status at any time. The Seoul Innovation Bureau (SIB) in South Korea uses online and offline methods to allow citizens to participate in the design of projects, such as rising rent prices, youth unemployment, and improving health care related social and collaborative economic projects. The exploratory application of digital participatory decision support tools in the field of environmental policy in Spain and the Netherlands helps support local-scale energy social innovation. In China, the science and technology participatory design tools are used to evaluate the barrier-free environment of a community which based on the blind behavior observation and intelligent perception, it has been formed the first Accessibility Assessment Report and established it the first batch of barrier-free pilot community in Beijing.

Those practices showed digital participation approach have been empowered to stimulate action and self-efficacy, cultivate citizens' civic awareness, and enhance the urban environment. It also strengthens the responsiveness of government public services and enhances the trust relationship between government and society. The diverse participation tools in urban renewal have been widely used to form participating entities such as governments, developers, residents, experts, and NGOs, which are formed through exchanges, dialogues, consultations, and feedback (Mehmood and Imran, 2021). But there are still many problems such as low level of participation, small participation scope, lack of participation organization form and system. How innovative models combined with digital tools can become a new channel for collaborative governance, as well as creative applications in urban community scenarios, the case study from Singapore might have some

valuable insights.

Digital to the core, serve with heart: Collaborative governance innovative cases

In Singapore, the citizen-centered digital collaborative governance encourages and empowers social innovation, stimulates the subjective initiative of the public. The strategy has been created to improve digital capabilities to pursue innovation, by integrating the needs and produce digitally driven collaborative co-creation with citizens and companies. The model not only focuses on accelerating urban digital transformation and innovation at the macro level, but also emphases on the innovation and development of governance tools to establishes a seamless, people-centered new service. The government is committed to building a more streamlined and stronger public institution, with digital to the core and serve with heart as the goal. The six strategies are mainly embodied in, see Figure 1: Integrating services around citizen & business needs, strengthening integration between policy, operations & technology, operating reliable, resilient & secure systems, co-creating with citizens & businesses, facilitating adoption of technology, building common digital & data platforms and raising the digital capabilities to pursue innovation (Chang and Das, 2020). These strategies all show the external drive and internal mechanism in the transformation process of multi-layers collaborative governance.

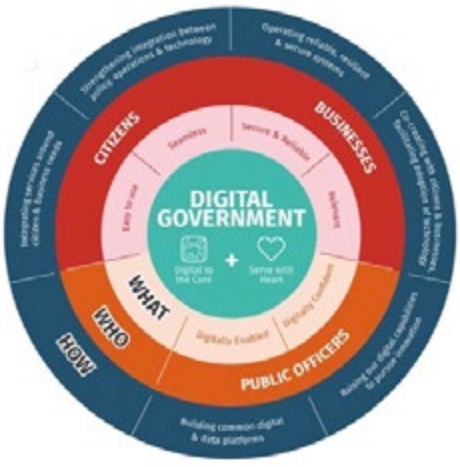

Figure 1. Digital Government Blueprint of Singapore.

Design thinking approach empowers public service

Singapore's digital collaborative governance for vulnerable groups is the core learning learn by using design thinking to empower public services. The government has established the Public Service Division with an agile and entrepreneurial public service system, which collaborate with IDEO Design Consulting company. The role of design is not to renovate the physical space in the traditional sense, but to train public officials to experience the user service journey in an empathetic way, discover problems, solve problems, and create value from the user's perspective. After many projects ended, positive feedback from citizens was obtained, which promoted confidence in applying design thinking to public policies. In 2012, the Prime Minister's Office of Singapore established The Human Experience Lab in the Ministry of Public Service as an informal design research department. In 2017, it was officially renamed Public Service Division. The interdisciplinary professional team is committed to using design thinking to promote innovation in the public sector and to create creative, responsive and people-oriented policies and services. The division combines with design thinking, behavioral insights, organization development, business process re-engineering, systems thinking, data analytics, futures thinking, and other methods are applied to various fields such as policy, housing, employment, welfare, public services, and urban operations. In this process of open co-creation, how does the Singapore government create an environment to encourage and support self-organizing teams to create bottom-up innovation, and various financing mechanisms to release resources and sharing among different agencies in public services, the following two case studies (Table 1) are used to analyze Public Service Division through five roles: moderator, facilitator, developer, collaborator and mentor, to promote the public sector from progressive to subversive, from individuals, institutions to the entire government system innovation process.

Table 1. Two public service project creation by design thinking approach

How it happens	Design for disables	Life SG
Role of the Division	Facilitator, collaborator	Developer, facilitator
Design object	Disables	New parents
Main stages of design intervention	Explore problem, define problem, finding solution	Define problem, finding solution
Design method	Observation, record, interview, role-playing, participatory design, prototype	Role-playing, storyboard, user journey, service blueprint, participatory design
Cooperating institutions	The National Council of Social Service (NCSS), DesignSingapore Council (Dsg), Movement for the Intellectually Disabled of Singapore (MINDS)	Ministry of Social and Family Development (MSF), The Smart Nation and Digital Government Office (SNDGO), Government Technology Agency (GovTech) and more than 15 institutions.
Design outcomes	Create cognitive toolkit, develop work capabilities, facilitate job opportunities	Mobile application integrating medical, education, entertainment and welfare public service

User-centered design: Design for disables

In 2016, National Council of Social Services in Singapore did survey about disabled people, 62% of the respondents showed they were not tolerated by society and did not have the opportunity to exert their own value. At the same time, it is found that difficult for disabled people to obtain public infrastructure, receive proper care and use assistive technology equipment, etc. At first, the relevant government departments collected feedback and suggestions for improvement by widely distributing questionnaires, but they ended in failure. The main reason is that the survey questionnaire relies on the participants' self-awareness, and the limited field of vision hinders potential solutions. In order to explore deep-seated problems, the Joint Committee of Public Service Division adopted an empathy-based design method to conduct in-depth research on the daily lives of 25 disabled persons, and recorded what they saw, heard and touched from their perspectives, and feeling, needs, desires and obstacles that even they can hardly name. After collecting the key touch points, the lab organized the collaborative design workshops, inviting as many stakeholders as possible to participate in it, which including government officials, professional medical and nursing staffs, the disabled people and their families together more than 140 people to explore possible solutions. Finally, a social service ecological map of Singapore with more than 30 proposals, and 4 of them are currently being implemented. For example, Box of Joy project is a set of personalized surprise toolkits to help individuals with cognitive impairments or in need to learn and explore new things. Social Fusion project is an accelerated incubator that cultivates business thinking, it helped the disabled people who with ideas can also integrate into social work and entrepreneurship. The project has improved the quality and social inclusiveness of the living environment of disadvantaged groups.

Collaborative service design: LifeSG

LifeSG is a comprehensive life service app based on feedback through six months of citizen participation, it aims to identify and better understand the needs of users. It upgraded from the Moment of life project. LifeSG is not just a manifestation of connecting government services, it also represents how actively collecting citizen feedback can help enhance the service delivery and design of applications. LifeSG is for new parents, who had the most frustrating thing is to go to different institutions to handle all kinds of affairs and fill in the forms repeatedly, such as applying for household registration, seeing a doctor, finding a suitable nursery, etc. It makes young parents who are at a loss feel pressured. In 2017, Singapore's Ministry of Social and Family Development intends to develop a one-stop service application for parents of children aged 6 and below. Public Service Division was invited to serve as a project consultant to guide the design process and promote cross-departmental collaboration. In the stage of exploring and defining problems, the project team adopted design methods such as role-playing, storyboards, user journeys, and service blueprints, and worked with young parents to outline important touchpoints for children aged 0 to 6 in different stages and scenarios. In the solution phase, due to the communication and collaboration of multiple departments, the Division organized a temporary working group, seconded public officials from 15 relevant departments, and assigned the leaders in charge to be directly responsible for the project to promote collaborative optimization of services, improve processes and adjust policies. Today's upgraded application program integrates 70 comprehensive services such as pension benefits, job hunting, taxation, housing, medical care and education.

Conclusion

In the past 40 years, Singapore has always adhered to the "citizen-centered" digital participation into the urban governance, and it has achieved world-leading development results. Its collaborative governance model will bring the following lessons to the cities who are under digital transformation:

First, digital technology empowers diverse social governance. Usually, urban governance has pain points such as participation and difficulty in coordination. Singapore's collaborative governance model combines top-down and bottom-up to strengthen digital empowerment and diversified social governance, stimulate public initiative and enthusiasm and play participate in the operation of digital transformation scenarios. The Singapore government try to bridge the digital gap and ensures that everyone benefits from a smart country. They believe that technology could become a balancer in society, including vulnerable groups such as the elderly, low-income people, and the disabled can seize the opportunities provided by digital technology. The government cooperates with enterprises to improve the standards of digital services and establish similar digital concierge services and digital clinics in the community to assist those who are not comfortable with the use of digital services. Businesses and individuals can voluntarily participate in Silver Infocomm Junctions which are learning hubs located island-wide for seniors to start their digital learning journey. It helps to bridge the digital divide between seniors (50 years and older) and enable seniors to live a more convenient digital lifestyle and connect with the community.

Second, use design thinking to drive innovation in the public sector. From exploring problems, defining problems, to proposing innovative ideas and solutions, and to conceiving prototypes, testing, verifying and constantly reviewing and reflecting, the whole process try to establish a pragmatic "people-oriented" design framework, methods, tools, and responded in a gradually complex social needs and public issues. It helps to increase public participation, transparency and inclusiveness, but also respond to global challenges and

achieve a new "digital normal" of sustainable development (Hewitt et al., 2020). This dynamic process attaches importance to the relationship between the subject and the object in the social ecology and institutional environment. The citizens and even vulnerable groups take process of social learning, participation in decision-making, and collective effectiveness transformation lay a solid foundation for the digital transformation of urban governance.

Third, from "for people" to "by people", from consumers to co-creators. Human behavior cannot be designed, but it can create conditions that are conducive to the occurrence of specific behaviors. How to create such conditions and environment to make people willing to participate, digital social innovative design interventions can provide support for various independent and related subjects in this complex system. At the level of policy implementation, the public sector assists in completing the coordination work among the government, enterprises, and citizens. The Singapore government encourages citizens to transform from consumers to active co-creators and contributors. In many ways, individuals can actively use digital tools to shape their communities. For example, many informal social network groups are united around a common vision and needs. Citizens and community groups can use open data (data.gov.sg) and APIs to jointly create new solutions and cooperate with the government meet demand and promote development. This approach of tripartite cooperation purposes to fully mobilize the enthusiasm, initiative and creativity of citizens and enterprises to participate in the development of wisdom and enhance the dominant position and participation of citizens and enterprises. Digital social innovation creates opportunity for all by accelerating inclusive growth in the digital transformation and promote the interaction of interdisciplinary innovation.

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References

Qureshi, I., Pan, S., Zheng, Y (2021). Digital social innovation: An overview and research framework. Information System Journal, 31(5), 647-671. https://doi.org/10.1111/isj.12362

Shalini, Manoharan, B., Parthiban, R., Qureshi, I., Bhatt, B., & Rakshit, K. (2021). Digital technology-enabled transformative consumer responsibilisation: A case study. European Journal of Marketing,55(9),2538-2565. https://doi.org/10.1108/EJM-02-2020-0139

Goldsmith S., & Crawford S. (2014). The responsive city: Engaging communities through data-smart governance. John Wiley & Sons.

Mossberger, K, Tolbert, J, & Mcneal, S. (2007) Digital Citizenship: The Inter-net, Society, and Participation. The MIT Press.

Mehmood, A. & Imran, M. (2021) Digital social innovation and civic participation: toward responsible and inclusive transport planning. European Planning Studies, 29(10), 1870-1885.

Chang, F., Das, D. (2020). Smart Nation Singapore: Developing Policies for a Citizen-Oriented Smart City Initiative. Developing National Urban Policies, 425-440. https://doi.org/10.1007/978-981-15-3738-7_18

Hewitt, J., De Boer, C, & Flacke, J. (2020) Participatory development of digital support tools for local-scale energy transitions: Lessons from two European case studies. Global Transitions, 2, 138-149.

Analysis of Taiwan region 's Social Design Development Characteristics and Context

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Abstract

Social design has been promoted in Taiwan region over the last decade. Owing to the driving force of design, local cultural characteristics are re-recognized, shaped, disseminated, and strategically promoted, whereas cultural texts are also translated over the period. Meanwhile, the local cultural characteristic stimulates industrial innovation through the stacking of "tangible" and "intangible" values and the interpretation of "love"; thereby, enhancing well-being, and becoming a critical tool for governance at the local level. The proposed design system enables users to become self-reliant in the future; hence, developing a positive cycle. This research study tracks the evolution of social design in Taiwan region while compiling a comprehensive definition of social design. Based on in-depth interviews and case studies, this paper investigates the characteristics of social design projects in the context of qualitative content. Furthermore, this study attempts to sort out the influence of 6 different elements of social design, namely: "designability," "culturality," "social impact," "continuity," "concrete benefits," and "avoidance" on the process of implementing the project and its subsequent development. In addition, this research study also intends to explore the implementation techniques and focus on the social design that is distinctive to each region in Taiwan region. The study findings also indicate that social design in Taiwan region incorporates various disciplines into the design framework from the perspective of project inception. The Taiwanese social design holistically shifts the society towards sustainable development by integrating different elements such as community development, operational strategies, local creativity, design thinking, and industry. Finally, all of these elements are guided by the spirit of social innovation design.

Keywords:

Social design, Taiwan region, Development context, Characteristic analysis.

Introduction

There has been a growing emphasis on social design since 2012 when Taiwan region placed a bid for 'The World Design Capital' for 2016. Presently, social design has been in a development phase across different regions in Taiwan region for over the last decade. Accordingly, in 2012, the '5% Design Action Social Design Platform' was officially announced in Taiwan region; consequently, commencing the 'Design Action' program. The stated program brought together experts and designers from different fields who dedicated 5 percent of their spare time to associate with public sector agencies, departments, and non-profit organizations relevant to design

themes. These individuals pooled their respective skills and expertise, in order to jointly resolve the social concerns and participate in value co-creation.

In 2015, the Taipei Design and City Exhibition was initiated to raise public awareness related to social design. Subsequently, the public sector began its involvement in the field of social design in 2019 through the 'Taiwan Design Research Institute'. Afterward, a national-level design research institute was established in Feb 2020; thereby, operating autonomously as a foundation

and actively advancing the cause of social design. This institute was meant to put forward an interdisciplinary and integrated design value-creation service platform, using design policies, in order to guide industrial innovation and upgrading of Taiwan region.

This research study attempts to analyze and scrutinize the techniques and key areas of implementing social design, each marked by its distinct characteristics across various areas in Taiwan region. In addition, this paper examines the backdrop of social design advancement in Taiwan region while incorporating practical case studies for analysis.

Literature Review

Contemporary social issues comprise a wide range of aspects that cannot be adequately addressed only through individual design initiatives. Further, these issues warrant comprehensive planning and systematic integration to effectively tackle the dilemmas of modern society. Victor Papanek (1923–1998) first introduced the notion of a designer's social responsibility in a 1971 publication, termed 'Design for the Real World' (Papanek et al., 1972). The proposed researchers suggested that designers possess the capability to strategize and make an abstract or tangible impact in resolving human concerns while augmenting the overall well-being of society. Further, this fundamental ideology constitutes the foundation of social design. Similarly, designers apply their thought processes and society's observations to ascertain emerging trends, needs, roles, and responsibilities within society. As a result, designers are prompted to reconfigure available resources, create new forces, extend strategic and systemic solutions, and harness narrative and aesthetic design languages to drive potential change (Margolin, 2018).

In Taiwan region, social design awareness began in 1989 with the "OTOP (One Town One Product)" program, which aimed to create unique local products. In 1994, "community totalization" focused on community development and cultural involvement. In 2019, the "Placemaking" program was launched to develop community strengths, attract industries and residents, and improve overall development."

Contrary to the 'One Town One Product (OTOP)' industry guidance program, which functions in a 'top-down' promotion mode, both 'Local Regeneration' and 'Community Building' incorporate a 'bottom-up' approach. These models share resemblances with the implementation model that pools 'top-down' and 'bottom-up' methods in social design (Manzini, 2014). Evidently, the value of the stated three programs is prominent not only in the relevant economic benefits but also in the integration of cultural content. Meanwhile, their development focuses on the local society, environment, and communities, while also encompassing community improvement, care for disadvantaged groups, and disaster area reconstruction, among others. From the perspective of economic, cultural, environmental, or social context, the development of social design in Taiwan region fundamentally laid down its basis 34 years ago; consequently, offering Taiwan region more experience and reflection in supplementing social design at present.

Although the feasibility of the 'bottom-up' implementation model is low, given the lack of its organization and the existence of numerous uncontrollable factors. Accordingly, government institutions at all levels are required to establish comprehensive policies or empower other action-taking bodies to robustly not only promote

social design but also develop corresponding organizations. In the same fashion, budgets should be allocated to both experiment with and implement social design. In 2013, the Department of Cultural Affairs, Taipei City Government (Department of Cultural Affairs, Taipei City Government, 2013, 2) officially introduced and endorsed the concept of 'social design', in the pursuit of hosting the 2016 World Design Capital. This stimulated designers to engage in the urban transformation movement by carrying out different types of design projects from the bottom up. Resultantly, tangible results were derived that helped the general public comprehend the contribution of design to urban development. Based on this, in Taiwan, support from government-funded foundations is also essential in Taiwan region, besides the increasing attention from government agencies to social design.

From the viewpoint of definitions of the social design concept proposed by the research scholars and experts (ZiShu Zhou, 2020; Chun-Yu Hsieh, 2019; Ezio Manzini, 2015/2017; Victor Papanek; 1972/2016; Chin-Yi Wu, 2016; Nigel Whiteley, 1993/2016; Dung-Sheng Chen, 2013; European Commission, 2013; Victor Tim Brown, 2011; Geoff Mulgan, 2007; Margolin & Sylvia Margolin, 2002; Bela H. Banathy, 1996), this research study attempts to extend support for 6 different characteristics that social design projects should possess, aligned with the historical context. The aforesaid characteristics are as follows: design aspect, sustainability, cultural relevance, social impact, tangible benefits, and avoidance of pitfalls.

As a consequence, both uniqueness can be created and well-being can be enhanced by delving deep into the community, incorporating social design to develop local cultural distinctiveness, integrating holistic and systemic considerations, and approaching these integrations from a local perspective. The researchers design systems that empower users to be self-reliant in the future, enabling them to continue evolving independently; hence, instituting a sustainable cycle of habits and behaviors. At this point, the core values and spirit of social design have long been propagating positive social influences.

Methods

In this study, a case study method and semi-structured interviews are adopted to examine the development of social design in Taiwan region. In addition to this, various factors including economics, culture, and politics can exert an impact on the landscape of social design in Taiwan region. Thus, the case study technique facilitates a multifaceted analysis by gathering research data from multiple sources; thereby, offering insights into the sophisticated interactions and interconnections among these complex factors. As a result, the proposed approach assists in deepening the present understanding of social design development.

The review of extant literature highlights that the policies and initiatives associated with social design in Taiwan region are principally introduced by the government; thereby, outlining general objectives and directions. Nevertheless, the execution and implementation of these policies depend on the local government agencies and government-funded foundations. Since social design comprises both cultural and economic dimensions, this research study concentrates on undertaking interviews focused on the projects endorsed by the Department of Culture and the Department of Economic Affairs, both of which fall within the jurisdiction of the government. Therefore, this research chooses cases executed by the Taiwan Design Research Institute, Cultural Affairs Bureau, Chiayi City Government, and Industrial Technology Research Institute. Specifically, the sampled cases are those with social design implications in Taiwan region for a time period ranging from 2018 to 2023, with project execution continuing for at least 3 years. Additionally, the selected project plans were determined by the criteria of carrying the substantive essence of social design. Meanwhile, detailed insight into their operational background, processes, objectives, and experienced challenges, among other factors, supported the exploration of implementation traits well-suited for social design projects in the Taiwan region context. As

a result, the authors aim to guide the implementers of social design projects in the future. Table 1 executes the analysis and organization of all project plans and interview subjects as follows.

Table 1. Social Design Project Case Content.

Interviewee	Project Details
Taiwan Design Research Institute	T22 Design Revitalization of Local Industries Project: Initiated in 2019, and still in place at present, this project adopts design approaches to both revitalize the local communities and uplift the value of Taiwanese industries. Further, this project integrates an economic perspective while also incorporating educational elements to assist these industries in resolving future-related sustainability challenges. Thus, the ultimate goal is not only to help enterprises in developing products and spaces but to also motivate local communities to collaborate in their mutual efforts to produce a sustainable (regional) business model for the future.
Industrial Technology Research Institute	Urban Rural Revitalization Transformation Support Program: Ongoing to the present date while initiated in 2018, this project promotes domestic small and medium-sized enterprises (SMEs) to develop rural and urban businesses based on the three main concepts, namely: economic strength, integration capabilities, and distinctive features. Furthermore, this program attempts to revitalize and transform regions by activating and redeveloping spaces, developing unique industries, shaping local culture, and innovating business models. In the same vein, the program also asserts on strengthening the resilience of businesses while showcasing local examples. In addition, this project also aims to exert a substantial impact to expedite the transformation of local industries, drive population return, promote regional economic development, enhance industrial competitiveness, create local employment opportunities, and realize regional balanced development, consistent with the goal of urban–rural revitalization.
Cultural Affairs Bureau, Chiayi City Government	Wood City 2.0: Serious efforts have been made to establish Chiayi City as the "Wood City" with the help of varying strategies since its development in 2019. The proposed approaches include spatial planning and construction, wood innovation and promotion, talent training and heritage preservation, and community involvement and operation. Reportedly, a wide range of possibilities have been realized by promoting wooden construction, encompassing knowledge of architectural techniques, building materials, and spatial design. Besides, this initiative has also encouraged dialogue between old and new building structures; thus, promoting models of reuse and revitalization of old structures. Parallel to this, this initiative has also reshaped the perception of Chiayi as the "Wood City" while advancing the upgrading of the wood industry. At the same time, the values of Chiayi citizens are nurtured and a cultural environment is created for fostering wooden culture.

Discussions

Based on the analysis of the content obtained from the study data, this paper has summarized the interview outcomes from three participants; thereby, finding that each unit carries an explicit understanding of its strengths and merits. During the interviews, the discussion of 1 or various of the 6 major components was a common occurrence. The below analysis puts forward each project plan:

Taiwan Design Research Institute

This institute leverages the "power of design" to incorporate resources across government departments. In addition, this institution exerts significant influence on the industry, local communities, society, and public services through design-driven innovation. It is obvious from the interview outcomes that the respondents place a critical emphasis on design to the point of allowing the design to drive the strategic process. This reflects that the Taiwan Design Research Institute carries an explicit sense of its own identity and objectives. Meanwhile, design thinking is an indispensable thought process at each step when executing each project plan. This ensures the design-centric nature of their implementation for each project plan.

Industrial Technology Research Institute

The Industrial Technology Research Institute (referred to as ITRI) initiated with a focus on public welfare while intending to employ technology to resolve human or societal needs. Since ITRI is commissioned by the Small and Medium Enterprise Administration of the Department of Economic Affairs, therefore it places due emphasis on economic development in its project planning, with the approach identifying the critical role of the economy as a sustainable factor. In analyzing design, ITRI asserts on the "public technology"; hence, comprehending the sincere human and societal requirements, as well as intuitive experiences and operations. Similarly, ITRI also places a strong emphasis on corporate social responsibility (CSR), where CSR is not only meant to be about the individuals but also the construction of systems. Moreover, this institute does not solely rely on socially responsible leaders for promotion but warrants each member within the organization to possess the stated mode of thinking, as only under such circumstances the organization as a whole can realize sustainable development that is beneficial to society at large.

Cultural Affairs Bureau, Chiayi City Government

The Chiayi City Cultural Affairs Bureau has been constantly encouraging policies relevant to culture, whether at the cultural welfare level or the cultural policy level. Hence, the nature of this institution in itself puts a strong emphasis on cultural dimensions when formulating project plans. In addition, this bureau has been assumed an excellent experimental field due to Chiayi City's historical background and relatively small population base. Meanwhile, the solid economic foundation in Chiayi City has demonstrated a lasting effect on the city's superstructure; consequently, leading to enhanced government support for cultural arts. At the same time, different departmental units have encountered a comparatively smooth implementation process when executing related project plans.

Specifically, time serves as an essential element of social design as the proposed projects represent a long-term endeavor that warrants several years to ensure validation. Social designs build upon available frameworks whereas its progress accumulates year after year. Additionally, such projects involve interacting with local elements and individuals, as well as consensus- building across various aspects. Resultantly, all relevant stakeholders are required to be patient during implementation. Hence, this also implies that expecting rapid and instant results may pose serious challenges.

From the perspective of the aforementioned case, it can be posited that the sustainability of future development and societal impact serve as the determining factors to ascertain whether a project plan can continue in the long run. By analyzing the understudy's six elements, it is evident that each project covers these dimensions, but it does not essentially connote that this shall lead to a successful project plan. As a result, there is a need to allocate special attention to its uniqueness. Further, owing to the locality's distinct social and cultural attributes, the three project plans all demonstrate distinct feature preferences. When suitable project plans arise in the future, launching them through units with matching characteristics shall expectedly yield the maximum effectiveness.

Conclusion

In this paper, a literature review is carried out to investigate the definition of social design and the historical development of social design in Taiwan region. The study objective has been to grasp the unique characteristics and obstacles encountered in their execution by analyzing 3 different case studies that hold significance in the realm of social design and undertaking interviews with the persons responsible for implementing these projects. The research findings reflect that a successful social design project plan not only warrants to fulfill the six major components but also excels in at least one of the six aspects, in order to establish the uniqueness of the relevant project plan. Moreover, there is a dire need to achieve consensus during the process; though, this can be realized by encompassing alignment among the designers, implementers, government entities, and the general public. In addition to this, the realization of this consensus needs an in-depth comprehension of the foundational infrastructure, cultural values, economic dynamics, and cultural assets that play a prominent role in the region in question. In terms of the localized attributes, such attributes connect culture with industry, emotions craftsmanship, and ecology. Meanwhile, the involvement of various participants is ensured through open collaborative design; consequently, stimulating the sustainable development of society.

Certain scholars advocate that social innovation design and social design vary slightly in terms of their concepts. On the one hand, social innovation design presents new forms of society. It also serves as a technique of construction through collaborative design with the goal of societal change. Social innovation design needs the integration of various disciplines into the framework of design, in order to shift toward sustainability (Manzini, 2017). On the other hand, social design embodies the spirit of social innovation design in Taiwan region as this notion has been interdisciplinary and cross-organizational since its initiation. The proposed innovative approach encompasses community building, operational models, industries, design thinking, and local regeneration, among other aspects.

The essence of social design lies not in how it is described but rather in how designers utilize their creativity and design thought processes, in order to emotionalize, humanize, and behaviorally resolve various social concerns. In the same vein, social design encompasses the utilization of collective wisdom and systematic thinking; thus, surpassing mere market considerations to propose ideas that span the domains of business, marketplace, and society. Further, social design incorporates the design process to attain social goals and address potential problems. Particularly, the realization of these initiatives entails being cognizant of how one's design principles affect society, engaging in critical reflection, and possessing the ability to scrutinize both society and the world at large. Aligned with this social design is not only a method but also a vision for anticipating the future. Finally, social design does not present a one-to-one linear design but rather a tactic and strategic approach that affects the ongoing development of nature, humans, and society.

References

Armstrong, L., Bailey, J., Julier, G., Kimbell, L. (2014). Social Design Futures: HEI Research and the AHRC. Brighton: University of Brighton.

Banathy, B. H. (1996). Designing social systems in a changing world. New York: Plenum Press. Bogdan, R. C., & Biklen, S. K. (2007). Qualitative research for education: An introduction to theories and methods (5th ed.). Boston: Allyn and Bacon.

Brown, T., Katz, B. (2011). Change by design. Journal of product innovation management, 28(3), 381-383.

European Commission. (2013). Guide to Social Innovation. Luxembourg: Publications Office of the European Union. https://culture.gov.taipei/News_Content.aspx?n=0E1C572DF4DFCBE6&s=0379F545A60299CF Leitão, R. M., Roth, S. (2020). Understanding culture as a project: Designing for the future of an Indigenous community in Québec. FormAkademisk-forskningstidsskrift for design og designdidaktikk, 13(5).

Manzini, E. (2014). Making things happen: Social innovation and design. Design issues, 30(1), 57- 66.

Manzini, E. (2014). Making things happen: Social innovation and design. Design issues, 30(1), 57- 66.

Manzini, E. (2017). Design, When Everyone Designs: An Introduction to Social Innovation Design (Translated by Zhong Fang and Ma Jin; Third Edition). Beijing: Electronic Industry Press. (Original published in 2015)

Margolin, V. (2018). The Politics of the Artificial: Essays on Design and Design Studies. Chicago: University of Chicago Press.

Margolin, V., Margolin, S. (2002). A "social model" of design: Issues of practice and research. Design issues, 18(4), 24-30.

Mulgan G., Tucker S., Ali R., Sanders B. (2007). Social innovation: What it is, why it matters, how it can be accelerated. London: The Young Foundation.

Papanek, V., Fuller, R. B. (2016). Design for the Real World: Human Ecology and Social Change (Translated by Yang Lu; Second Edition). Taipei City: Wunan Books Co., Ltd. (Original published in 1972)

Whiteley, N. (2016). Design for Society (Translated by You Wanlai, Yang Minying, and Li Yingying; Fourth Edition). Taipei City: Linking Publishing Co., Ltd. (Original published in 1993)

Chen, Dung-Sheng (2013). From Design to Socio-Design: Sociological Imagination. Streetcorner Sociology. [Online] https://twstreetcorner.org/2013/10/28/chendungsheng/ , https://twstreetcorner.org/2013/10/30/chendungsheng-2/

Katagiri, Shinya, Nagai, Yoshihiro, Yamamoto, Yuji (2008). Basic Sociology (Translated by Su Shuobin and Zheng Lulin). Taipei City: Qunxue Publishing Co., Ltd. (Original published in 2002) Taipei City Bureau of Cultural Affairs. (2013). Taipei City Government Cultural Affairs Bureau's Policy Plan for the Year 2013. Government Open Data Platform.

Wu, Chin-Yi (2016). Observations and Reflections on the "2015 Taipei Design City Exhibition." Design Journal, 21(3), 45-67.

Hsieh, Chun-Yu (2019). Social Small Designs. Taipei City: Cite Publishing Co., Ltd. (Maison Publishing).

Zhou, ZiShu (2020). Innovation and Society: Eight Thoughts on Social Design. Art Research, (5), 124-128.

The construction of relationships in art and design in the Anthropocene: The practice of Interspecies love

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Abstract

In the context of the Anthropocene, the field of art and design is characterized by ecological art and design activities that began with the global environmental crisis. This paper takes the theories from the perspective of "anti-anthropocentrism" in the cultural study as a research reference, and analyzes the reshaping of the relationship between "human" and "non-human" from the perspective of the group to the individual in contemporary art and design. On this basis, It explore the possibility of the birth of "love" in the relationship of perceptive expansion between interspecies under the practice of designing ethics.

Key words

anthropocene ; anti-anthropocentrism ; interspecies ; relationship ; design

Introduction

The term "Anthropocene" is a reference to a geological epoch, which is largely derived from anthropocentrism, which has long been the dominant ideology. The word is used to describe a recent geological phase, distinct from the Holocene, in which humans and their creations have had irreversible negative impacts on the Earth's geology and environment. The Anthropocene demonstrates the interdependent and symbiotic relationship between technological humans and nature. Human and natural systems are inextricably linked and intertwined, and the consequences of man's destruction of nature are ultimately returned to him.

In addition to the concerns of geologists and philosophers, this is also reflected in the development of the field of art and design. This has led to the emergence of disciplinary terms such as Ecological art, Bio art, Bio design, Sustainable design, and so on. Their definitions are complex and often intertwined with traditional art and design disciplines.

The purpose of this paper is to explore the theoretical perspective of non-anthropocentrism in the Anthropocene discourse as a lens to analyze the construction of human/non-human relationships in contemporary art and design, and to discuss the possibility of the birth of interspecies love and caring based on the ethical practices in design.

"Relationships" constructed by design from an cultural study perspective

In the last fifty years, climate, environmental and ecological issues have become increasingly complex, internationalized and globalized. What is the crux of the problem, whether it is a poorly designed system to address climate change at the political level, or an inadequate awareness of climate change at the individual level? Inquiry into this question has prompted academics to re-conceptualize the relationship between humans and nature. In the contemporary Western ecological movement, Bruno Latour, as an influential representative advocating non-anthropocentrism, based on the reflection on the lessons of Western modernization,

has inquired about the nature of the relationship between human beings and nature, and searched for countermeasures to solve the ecological crisis.

In the actor network theory he created, he advocates breaking the binary divide between human and nature, which includes the dichotomies of human and object, subject and object, and society and nature. Design is an activity of making things from the perspective of human needs. Every creation implies a relationship between man and nature and the other. From the past, the "Tiangong Kaiwu", emphasizes the concept of creation in the harmonious integration of people, things, materials, environment. While in modern times, with the development of technology and industrialization, the process of man as a craftsman to create things is gradually weakened instead of mechanized mass production and large-scale mining. And the relationship behind the idea of creation from the creation of harmony and unity with nature, to nature gradually become the object, as resources to be extracted and utilized, and this is one of the reason for the current situation of the Anthropocene. As technological progress is irreversible, it becomes more important to think about how to reconstruct the relationship with nature and non-human species through design in the train of time.

Relationships as communities in social clusters

The process of establishing anthropocentrism-driven social groups, as far as ancient architectural monuments in architectural design are concerned, is also predicated on the massive consumption of ecological resources in their construction. For example, the impact of the construction of the Forbidden City on the hanbaiyu of Fangshan Mountain, the massive felling of trees on the mountain as documented by the construction process of the Maiji Mountain Grottoes in Tianshui, Gansu Province, and so on.

Contemporary environmental ethicist J.E. Lovelock puts forward the Gaia Theory, in which Lovelock refers to the whole earth as Gaia, the earth woman of Greek mythology, and the earth as a living organism consisting of the geosphere, the hydrosphere, the aerosphere, and the ecosystems, which is a system that can be controlled by itself. When we think of urban design as a living organism, the different systems that operate in a living organism, such as human clusters, are also present in the form of birds, trees, ants, and so on.

The Euronews.green "Vertical Forest" in Milan, Italy, designed by the architectural studio tefano Boeri Architetti, for example, is an architectural prototype for demonstrating the biodiversity of new forms of architecture, which are not only concerned with human beings, but also with the relationship between human beings and other species. The Vertical Forest is a prototype for a new form of architecture that demonstrates biodiversity. The concept behind "Vertical Forest" is "a home for trees, people and birds". In addition to the symbiosis created in the concept, there is also a sustainable thinking about the impact of architecture on the environment. Unlike "mineral" façades in glass or stone, this plant-based shield does not reflect or amplify the sun's rays, but rather filters them naturally, creating an indoor microclimate while avoiding the harmful effects of the project on the environment. A few years after its completion, the Vertical Forest has become a habitat for many animal species (including approximately 1,600 specimens of birds and butterflies), creating a base for a renewed and extensive coverage of natural fauna and flora in a major city.

It is clear that when design is thought of from a symbiotic perspective and with technological advances, it can benefit a wider range of species. From designing for symbiosis between humans and non-human organisms to environmental sustainability, design practice is a way of thinking about nature as a community from a species to a generalized sense. Such design thinking itself is a process of breaking down the dichotomy and moving towards unity.

In the discourse of community as a construct of "relationship", the discussion of the emergence of human love is still a bit vague. Another influential scholar in the field of eco-cultural studies, Donna Haraway, explains in

Staying with the Trouble: "We need to create kinship in the sense of symchtchonically and sympoetically." The clusters of entities to which Haraway refers as making kin include the more-than-human the inhuman, and the human as humus. So the concept of Making Kin in Haraway almost breaks with the traditional notion of human ethnicity in terms of bloodline reproduction, but rather in terms of resuming kinship with everything in the universe.

Greek distinguishes several different senses in which the word "love" is used. And one of the kinship of love condensed into the Greek word "Storge". The Word "storge"is a wide—ranging force which can apply between family member，friends，pets and their owners，companions or colleagues

Although the concept of Storage is not as broad as kinship included in Cthulhu, the relationship symbolized by Kinship is also not limited to human consanguineous family, but the deep partnership between other species and human beings. The construction of the relationship itself has the meaning of "love" in "Storge".

Relationships as partners in personal life

As an emotion, love exists in everyday experiences between individuals, including lovers, friends, parents, and so on. When the definition of the individual is divided from the human center to the human and non-human species, in addition to the human pets relationship, the animal also exists as a human companion species. Haraway also puts the issue of companion species in a very important position. In her argument, multispecies "love" is conceptualized as a transformative life force that helps us "reach out" and "form" the "other world" within the world. In her proposed narrative, the marketing and commodification of pets and "pet demand" have developed a new and "improved" emerging interspecies family relationship. This is also linked to the makin kin, and when the non-human species becomes a new kinship or family relationship, storge's love will become more possible.

And how can love in such interspecies family relationships be manifested in the field of design? With the development of chip technology, pet chip implantation technology has gradually become popular, in which the chip is bound to the pet owner's name, contact information, residential address, pet immune time, color breed, date of birth and other information. On the one hand, such technology can effectively deal with the problem of pet loss, and on the other hand, the information in the chip can effectively prove the ownership of the pet. The concept of companion species emphasizes the cohabitation and co-evolution relationship between humans and animals. In Haraway's view, there is no immutable essence between man and animal, both are in the process of being formed, and are related to... becoming with.From the perspective of technological development, humans and animals are jointly becoming with in the social management system, and People and pets are also co-generated in the digital society, gradually becoming "digital human" and "digital dogs (or other)." The species are also moving towards equality and unity through social digitalisation This kind of family love relationship is embodied in the social design under the progress of science and technology.

Speculative practice of interspecies love

In addition to the advantages of pet chip in social management, individuals as pet owners can effectively avoid pet loss problems through this technology. People's consideration of pet loss is that people regard the pet as a family member and the embodiment of cherish and love in the emotional bond, while the other side of him is born out of love fear (fear of losing an intimate partner). Love and fear are two sides of emotion, and what kind of design can be linked with it?

The discussion of the ethics of design can always be stimulated by this. There are also ethical issues worth discussing in the field of pet chip implantation. For example, the extent to which chip companies can manage

their pet files, and the extent to which humans can physically modify and control pets. In fact, ethical questions are also raised out of fear behind the unknown. And does the creation of fear or any negative emotion make the creation of love more likely?

In many speculative design works, critical expressions make scientific ethical issues more sensitive, and they often stimulate people's perception of negative emotions. In the speculative design work life Support by Revital Cohen & Tuur Van Balen, the designer proposed that commercial animal breeding for consumption or entertainment could serve as an external organ supplier for human beings. For example, a work is called Respiratory dog, which is a commercially bred competition dog admitted to the NHS (National Medical System) and trained to become a respiratory assistance dog, which acts as a respiratory assistance device for its owner, providing it with oxygen and forming a symbiotic relationship with its owner.

They stimulate reflection on the functionalization of non-human species as human companions by discussing animal ethics. When assistive animals and animal therapy have been integrated into modern society, such as guide dogs, drug detection dogs, pet therapy and so on. People rely on course training, genetic modification and other ways to functionalize and tool animals to facilitate their lives. By using service animals as "future medical equipment" to establish a symbiotic relationship with patients, this project questions whether the inhuman treatment of competition dogs by humans is reasonable, and leads people to think about how to have a better symbiotic relationship between humans and animals.

While the work serves as a reference to future possibilities, there are also many objections, which are considered too cruel to animals. This is also the charm of speculative design as a practical ethics . As Aristotle said, emotions are an original and integral part of our ethics. The creation of speculative design is a process of perception of ethics, and the perception of ethics is related to the emotional reflection of human nature. Introverted negative emotions such as guilt, embarrassment, shame, and pain evoke emotions such as compassion and empathy that often lead people to behave ethically towards others. In fact, empathy is the core moral emotion that most commonly motivates prosocial activities, such as altruism, cooperation, and generosity. Therefore, speculative design creates the perception of love between people and pets, livestock and even more non-human groups, and brings about the generation of care and the opportunity for love in a way that stimulates negative emotions in people.

When we return to the construction of relationships between humans and non-human groups, not only pets (cats, dogs, livestock, etc.), but also Scientific development make closer relationship with other species and nature system, such as with flocks of birds, forests, or Marine systems, and it create possibilities for the perception of emotions. New research shows that plants also have a certain information exchange mechanism, and their roots form a huge "tree network" underground. The exchange of nutrients between trees and the mutual assistance of neighbors in emergency situations seem to be established rules. Thus, they can identify forests as a superorganismus . Building on scientific discoveries, many designers have also experimented with using superorganismus or non-human species as decision-making agents. it makes us more relevant to the perception of non-human beings.

When the center of non-humanism is the inspiration of design thought, perhaps the development of science and technology will bring more opportunities for people to sympathize with non-human beings, and interspecies love will also inspire the perception of cross - species, and burst out in the care born from emotions.

Conclusion

In the train of The Times, the development of science does not mean the disenchantment of all creatures, but

rather creates new conditions for the re-enchantment of nature in the post-human era. In the Anthropocene，When more people realize the spirit of the harmonize with species and nature system, like a process of entropy reduction (order) to entropy increase (disorder), we are inspired to think about the design idea of its unity in the integration of nature/society and subject/object. The interaction between nature derives human perception, and the emotional care and aesthetics of all things sympathetic make the birth and derivative of interspecies love possible.

Reference

Latour, B. (2008) Reassembling the social: An introduction to actor-network-theory. Oxford: Oxford Univ. Press.

Song, Y. (1933) Tiangong Kaiwu. Shanghai: Shangwu Yinshuguan.

Lovelock, J. (2016) Gaia: A new look at life on Earth. Oxford University Press, USA.

Vertical Forest: Milan (2023) Stefano Boeri Architetti. Available at: https://www.stefanoboeriarchitetti.net/en/project/vertical-forest/

Haraway, D.J. (2016) Staying with the trouble: Making kin in the chthulucene. Durham: Duke University Press.

"storge". CollinsDictionary.com. HarperCollins.

Haraway, D.J. (2008) When species meet. Minneapolis: University of Minnesota Press.

Bio-politics, transspecies love and/as class commons-sense. Available at: http://www.redcritique.org/WinterSpring2012/biopoliticstransspeciesismandclasscommonssense.htm

HAHN, K. (2022) Social Digitalisation: Persistent transformations beyond digital technology. S.l.: SPRINGER NATURE.

Kunyu，W.（2021）Superhuman Empathy, Companion Species, and Sensitivity Regaining: On the Three Levels of Posthuman Aesthetics.Nanjing Social Sciences，128-135

Revital Cohen and Tuur Van Balen (no date) Life support, REVITAL COHEN & TUUR VAN BALEN. Available at: https://www.cohenvanbalen.com/work/life-support

Zhang L. (2021). The Ethics of Imagination and Action: Design Speculation for Emerging Technologies. Journal of Nanjing University of the Arts (Fine Arts and Design) (02), 78-83.

DUNNE, A. (2013) Speculative everything: Design, fiction, and Social Dreaming. S.l.: MIT PRESS.

Moral emotions (2022) Ethics Unwrapped. Available at: https://ethicsunwrapped.utexas.edu/glossary/moral-emotions#:~:text=Emotions%20evoked%20by%20suffering%2C%20such,altruism%2C%20

cooperation%2C%20and%20generosity (Accessed: 18 September 2023).

Superorganism (2023) Wikipedia. Available at: https://en.wikipedia.org/wiki/Superorganism

Data Saturation: How Technological Dependence Stole the Perception of the Future

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Abstract

This paper examines the contradictory effects of technology on our capacity to perceive and envisage the future In an era increasingly inundated by a deluge of digital data. The manuscript delineates the cognitive congestion arising from the relentless surge of information, which ironically constricts our collective foresight by conditioning us towards the immediacy of information processing. The discourse analyzes how such an excessive volume of data can attenuate our acuity for nonverbal communication cues, which are imperative for sophisticated human interaction and comprehension. Furthermore, the paper addresses the extensive ramifications of this paradigm shift on cross-cultural communications, and societal interactions. Investigating the societal repercussions of the attrition of cultural subtleties within a technologically saturated milieu。 The findings endorse the necessity for a harmonized approach to technological engagement, championing strategies that bolster our facility to synthesize and assimilate intricate data without forsaking the profound, albeit less quantifiable, elements of human exchange.

Author keywords

Data saturation; engaged philosophical inquiry; contextualized perceptual analysis; societal and moral considerations

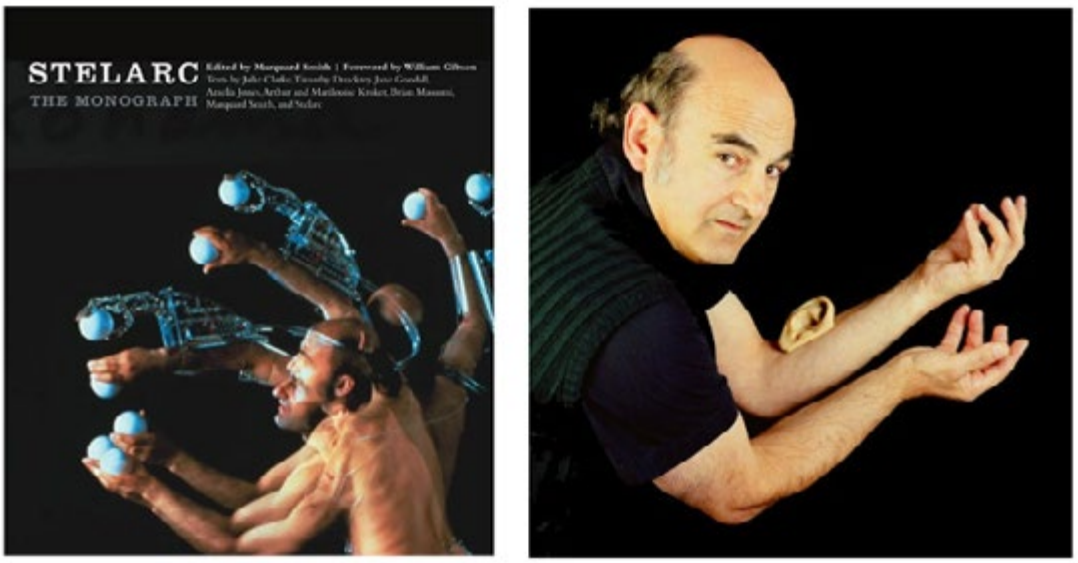
Introduction

"Thought draws its nourishment from desire. Calculation has no ardor ."Upon the threshold of Heidegger's house, a Biblical quote is inscribed: "With all vigilance guard your heart, for in it are the springs of life. "

Within an expansive exhibition space, a multitude of LED screens and transparent displays featuring cutting-edge technology are suspended from the ceiling. The content broadcasted on these architectural fixtures is a visual representation of nature, displaying canyons, forests, and mountain ranges. Yet, these seemingly authentic natural vistas stand in stark contrast to the modern, mechanistic indoor environment. The gallery floor is adorned with a series of simulated natural ecosystems crafted from transparent resin, including sculpted trees, synthetic flowing water, and mechanized animal models. The central space is dominated by a metal sculpture emulating the human brain, composed of an intricate network of cables, microchips, and sensors, emanating a soft blue glow. Adjacently, a biotechnological exhibit showcases a variety of biological specimens created through genetic editing techniques. Tucked in a corner, an antique easel supports a marginalized traditional oil painting depicting a harmonious coexistence between humans and nature.

In a dimly lit corner of the gallery, an old-fashioned recording device plays a critical audio piece, denouncing the modern art world's overreliance on technology, the distorted interpretation of reality and nature, and the estrangement from and neglect of traditional artistic values. Over time, the critical voice is gradually drowned out by the ambient mechanical sounds within the space. A prominent display board hanging on the wall bears a cautionary message: "In an age of rapid technological advancement, have we become estranged from reality?" Next to the board, a display table presents a collection of 3D-printed art pieces. Although these constructions are intricately detailed, they seem to lack a certain emotion and warmth compared to the traditional handcrafted sculptures on the opposite side of the table.

If these concepts resonate, it is likely that you have previously encountered installations born from data-driven and biotechnological creativity. The intent behind this paper is to spark a critical reflection on the contemporary art world's reliance on technology, critique the unchecked creative practices within bioart, and reevaluate the values held by traditional art.



Stelarc – The Monograph

The core aim of this study is not to trace the evolution of art and technology through a lens of post-humanism or futurism(whose lineage has been well charted by Bernard Stiegler). Moreover, this paper will not delve into the intricacies of biotechnology, an area Stelarc has eloquently elucidated and which echoes the thematic concerns of the practices this research examines.

This investigation seeks to scrutinize the distinct knowledge produced by artists operating with data-centric and biotechnological art installations and how audiences interact with these compilations of data. The thesis posited here is that comprehending the procedures for gathering information, methods of display, and the construction of spectator experiences, alongside their connections to the observer's standpoint, necessitates placing these factors in the context of the simultaneous development of digital technologies.

Words are not primarily carriers of meaning; reading is not hermeneutics, but rather a perceptual act, a touch of love.

"Noble Savage" Combat

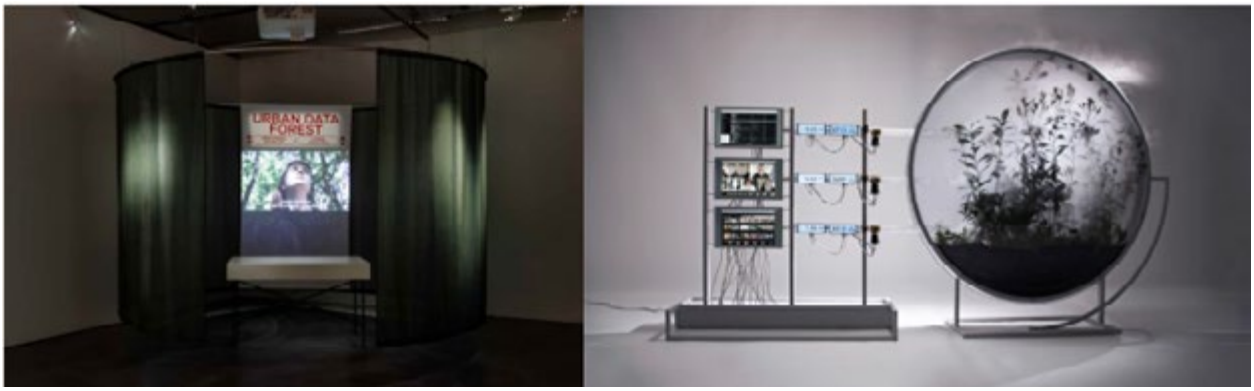
From the moment humanity first glimpsed the Earth in its entirety—through NASA satellite imagery made public in the "Whole Earth Catalog"—a nascent "planetary consciousness" was awakened. This evolving consciousness has navigated through various technological milestones and controversies, from the legal disputes over proprietary rights between ART+COM and Google Maps to the emergent domains of artificial intelligence and blockchain technologies, alongside the cultural debates surrounding AI-driven art and the opposition to tools like chatbots and AI painting technologies. Such developments might conjure the illusion of a "noble savage" combat, a term coined by Rousseau, which was later contested by Bernard Stiegler, who argued that the concept disregards the body as a form of "artificial technology" in itself—a medium of human interaction. This brings us to the question: Does framing technology as a "medium" imply its neutrality, as instrumentalism would suggest? This paper seeks to navigate through the philosophical discourse of technology, examining the intricate relationship between human agency and technological mediums, and challenging the neutrality of technology in the shaping of human civilization.

Whole Earth Index，Here lies a nearly-complete archive of Whole Earth publications

The Techno-Optimist Manifesto

Marc Andreessen's Techno-Optimist Manifesto : "Technology must be a violent assault on the forces of the unknown, to force them to bow before man," he writes. "We believe that we are, have been, and will always be the masters of technology, not mastered by technology. Victim mentality is a curse in every domain of life, including in our relationship with technology—both unnecessary and self-defeating. We are not victims, we are conquerors." If this essay had a sound track it would be Wagner's "Ride of the Valkyries ".

Mikkel Bolt Rasmussen 7emphasizes the need to delineate critical art practices that have been pivotal since the mid-nineties, along with the efforts of art theorists to dissect them. Among these, Damian Hirst stands out as an artist who, despite minimal critique, has garnered substantial acclaim within the art establishment. In contrast, an artist like Olafur Eliasson, with a comprehensive vision and innovative approach to urban development, has also made significant strides. Rasmussen advocates for differentiating among four intersecting practices: the community-focused relational aesthetics, critiques of institutional structures, art that is socially active, and media used in tactical interventions8. These categories suggest that our focus is on evolving phenomena, which include the avant-garde's shift from an "overly politicized" stance against institutions to a progressive critique of institutional aesthetics that eschews traditional beauty. Since the 1990s, relational aesthetics has been pivotal in shaping this type of politicized contemporary art.



"Urban Data Forests"/ MB >CO2

"Urban Data Forests" reconceptualize cityscapes as repositories for data embedded in vegetation, notably within the biomass of plants and trees. This study delves into the revolutionary capacity of DNA-based data storage methods to remodel urban environments, marrying data conservation with the organic landscape. Drawing on empirical studies from The Hague in the Netherlands, "Urban Data Forests" propose a practical model for environmentally sound data storage solutions, with a target for implementation by the year 2050. Functioning as an art installation, this endeavor weaves together urban design and plant specimens, depicting the prospective developments of two varieties of urban data forests: the "Breathing Museum" and the "Living Archives."

Thijs Biersteker, a Dutch innovator, has crafted a device that transforms emissions resulting from everyday online activities—ranging from video chats and email communications to Non-Fungible Token transactions—into visible carbon dioxide vapors.

The MB >CO2 system, featuring three distinct displays, showcases a variety of computer interfaces similar to those used in Zoom meetings or for navigating Spotify playlists. Each screen is linked to a microcomputer that employs a unique algorithm, calculating in real time the carbon emissions derived from these online engagements. Upon computing the emissions, the apparatus releases carbon dioxide gas into a spherical glass enclosure in quantities corresponding to the emissions calculated. This setup, designed for interaction, encourages users to interact with and influence its operation. As carbon dioxide levels rise within the enclosure, the contained plants begin to wilt, serving as a stark visual metaphor for the impact of our digital lifestyles on environmental health.

"Into the inferno!" Hirst announced, eliciting applause from the spectators, as he flung the first artwork, named 'Totally Gonna Sell You,' into the blaze. "Goodbye!"—he exclaimed as yet another piece succumbed to the flames. Damien Hirst has commenced the deliberate combustion of numerous pieces of his art following the sale of a sequence of non-fungible tokens (NFTs). The artist presented buyers of his latest series with a choice: retain the physical piece of art or the corresponding NFT. Those who selected the NFTs were notified that their physical art pieces would be purposefully destroyed.

Damien Hirst at Newport Street Gallery for the grande finale of The Currency. Photo: Naomi Rea.

Conclusion

Were the world to be diminished to solely quantifiable and consumable items, the prospect of establishing any meaningful rapport with it would prove elusive. Ernst Bloch regards human culture as remarkably fragile, built upon what he terms the 'spine of objects.' Our engagement is typically confined to object facets that are compliant with human utility and exhibit a non-threatening front. However, we often neglect "their obscured dimensions" and are oblivious to "the elements that permeate the aggregate9". Digital assistants like Chatgpt are engineered to address complex questions with eager responses. Despite their omnipresence, the relentless exhibition of such devices does not enchant, thereby attenuating the delight traditionally derived from tactile interaction.

References

Bernard Stiegler , Technics and Time, 1: The Fault of Epimetheus Stanford University Press; 1st edition (April 1, 1998)

BYUNG-CHUL HAN, Undinge: Umbrüche der Lebenswelt , Oriental Publishing Center, 2023-05

BYUNG-CHUL HAN, The Burnout Society, Paperback ISBN: 9780804795098

Claire Bishop, INFORMATION OVERLOAD, Claire Bishop on the superabundance of research-based art,2023.09.21

Ernst Bloch，Spuren , Frankfurt/M.1985,S.174

Henri Lefebvre，Critique of Everyday Life: Foundations for a Sociology of the Everyday， Verso, 1991

Roy Ascott. Contemporary Art Media Art - The Future is Now - the art technology and awareness-1 (Chinese Edition) Gold Wall Press (May 1, 2012)

MIKKEL BOLT RASMUSSEN, Playmates and Playboys at a Higher Level , J. V. Martin and the Situationist International, 978-3956791055

Martin Heidegger ,Sein und Zeit, De Gruyter; 19. edition (22 Sept. 2006), 978-3484701533

The Factors Forming Negative Learning Experiences of Korean Undergraduates within a Design-Oriented Creativity Course: A Grounded Theory Approach

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Abstract

Creativity plays a pivotal role in our intricate society by facilitating adaptation, problem-solving, and the creation of novel values. Numerous academic disciplines are actively researching and nurturing creativity among the learners. Particularly, design is a discipline that seeks to produce novel, beautiful, and appropriate outcomes, garnering significant attention due to its creative nature. Many studies are being conducted to utilize the concept of design for enhancing creativity in the field of design. Korean design researchers have also produced various research outcomes related to enhancing creativity. For example, development of programs aimed at enhancing creativity by utilizing design education, components of creativity, creative environments, and so on. Particularly, utilizing design education for enhancing creativity is a globally significant research topic. However, despite these efforts, we have identified knowledge gaps in existing research. Existing studies have primarily consisted of individual case studies, quantitative research for efficacy validation, and perspectives from educators and researchers. There is a lack of qualitative research that explores the context of in-depth experiences from the perspective of students.

This study utilized a grounded theory approach to conduct an in-depth analysis of the learning experiences and contexts of South Korean undergraduate design students engaging with design-oriented creative curriculum. The primary aim of this study is to establish a brief conceptual map based on this analysis. The research methodology employed for this purpose is as follows: Firstly, in-depth interviews were conducted with design students who had experienced a design-oriented creativity education curriculum at D University. Relevant materials regarding their classroom experiences were collected. Secondly, the audio data gathered from the interviews were transcribed, and the transcribed data were reviewed iteratively to conceptualize and categorize learners' experiences. Thirdly, through these processes, the interrelationships between the conceptualized data were analyzed, leading to the systematic construction of a theoretical model presenting the experiences of design students who embrace creativity education.

Through this study, we aimed to identify the strengths and weaknesses of the design-oriented creativity course from the learners' perspectives. By systematically organizing these findings into theoretical constructs, we sought to establish a foundational resource facilitating diverse avenues of future research. Through ongoing and sustained research, we intend to propose strategies for enhancing and advancing design-oriented creativity education. In this study, our initial focus was on analyzing the negative learning experiences within the overall

participant experiences. Negative experiences in the educational process can diminish the effectiveness of learning, therefore understanding the contexts in which learners encounter them is a crucial task in formulating educational strategies.

Author keywords
Creativity; Design-Oriented Creativity Education; Factors of Negative Learning Experiences; Grounded Theory

Introduction

As contemporary society becomes increasingly intricate and diverse, issues surrounding human existence are becoming progressively complex and challenging to address. Consequently, the importance of creative competence, which enables proactive adaptation to circumstances and the generation of appropriate solutions, is gaining more emphasis (Kwon, 2022; Park, 2019; Sanders & Stappers, 2018). The scientific exploration of creativity began in 1950 when Guilford, at the American Psychological Association, emphasized its significance (Amabile & Pillemer, 2012). Prior to this, creativity, once an abstract and conceptual subject, evolved into a topic of rigorous scientific discourse (Kaufman, 2016). It has since continued to evolve, becoming a pivotal keyword across various academic disciplines (Yoon & Chang, 2022).

The definition of creativity, like numerous studies on creativity, varies significantly. However, a common characteristic of creativity emphasized in various research is the novelty and appropriateness (Kaufman, 2016). In this regard, design is a significant discipline associated with creativity (Williams, et al., 2011). Design highlights solving problems with fresh ideas, appropriate methods, and functionality. Balancing between practicality and aesthetics, novelty and appropriateness, design is an inherently creative process, yielding creative outcomes. That is why various studies are being conducted on how design can be creative and how the creative attributes of design can be extracted and utilized. (Casakin, 2007; Mahmoud, et al., 2020; Yoon & Chang, 2022).

Similarly, Korean design researchers are also conducting extensive studies on creativity. Since the 1990s, they have been conducting research on various subjects, including the constituents of creativity, creative environments, creative ideation methods, and creative design methodologies, yielding substantial achievements. Among these, the most central research theme has been the enhancement of creativity through design education. However, it has been pointed out that a quantitative research focus has dominated the methodological aspect of these studies. Furthermore, researchers face significant contemplation and challenges in terms of the prevalence of short-term experiments and research primarily centered around the validation of effects in courses, as well as the uncritical assimilation of external theories devoid of contextual consideration. In particular, most research has been conducted from the perspective of experts such as educators or researchers, and there is a lack of research that focuses on the learners' perspective (Yoon & Chang, 2022).

Within this context, we wish to emphasize the underrepresentation of in-depth qualitative research within the realm of creative research in the field of design. For the betterment of future generations, the establishment of a creativity education theoretical framework suitable to local contexts is imperative. To proceed with such research continuously, a preliminary understanding of the multifaceted contextual processes transpiring within the current educational landscape is essential. Our research was initiated within this framework.

The ultimate goal of this research project is to enhance design-oriented creativity education for undergraduate students and to formulate strategies that pave the way for new directions in education. Thus, we have determined that the grounded theory approach is the most suitable methodology for our project. Grounded theory enables us to delve deeply into the experiences and contexts that arise within the educational environment. By systematically analyzing and organizing the data collected on-site, we can develop the

necessary theories for future research endeavors.

In this study, we aim to prioritize the discussion of factors forming negative learning experiences among the analysis results of the collected data. Negative experiences that learners encounter during the learning process can be detrimental to the effectiveness of education (Park & Rah, 2016). Therefore, educators need to understand in what contexts students undergo such experiences when designing learning experiences. D University has previously conducted multiple studies to assess student satisfaction and learning outcomes. However, we hypothesized that to collect qualitative data, we need to delve deep into students' experiences. We believed that there is a wealth of information that quantitative research might not identify due to students' careless or dishonest responses (Ward & Meade, 2023). This effort aims to confirm the possibility of testimonies regarding negative factors that have not been considered in quantitative inquiries (Creswell & Poth, 2021).

Method

Grounded Theory

Grounded theory aims to generate or discover new theories based on reality when a specific theory explaining certain processes or behaviors is lacking or existing theories have limitations. It involves exploring internal emotions, experiences, and meanings, and analyzing the process through which meaning is formed and changes among individuals within phenomena (Corbin & Strauss, 2019; Creswell & Poth, 2021). Furthermore, grounded theory is effective in generating theories that align with local contexts when existing theories have limitations in explaining phenomena within specific cultural contexts (Kwon, 2016). Particularly, concepts discovered through grounded theory offer the potential for subsequent quantitative research validation, thereby providing the advantage of expanding research topics diversely (Corbin & Strauss, 2019).

Data Collection and Analysis

The primary objective of this study is to identify factors that influence the formation of experiences among undergraduate design students in the context of design-oriented creativity course. To achieve this purpose, we conducted research on the design-oriented creativity course at the D University in South Korea. We selected seven students who had taken the course and conducted in-depth interviews. The content of these interviews was recorded and transcribed. Prior to initiating the study, we obtained ethical approval through an Institutional Review Board (IRB) process to ensure the protection of research participants. Subsequently, we iteratively analyzed the transcribed data to generate conceptual codes, and we systematically organized the relationships between these codes. The participants had taken the design-oriented creativity course between 2019 and 2021, spanning the period that also included experiences of remote learning during the COVID-19 pandemic.

Results and Discussion

Results

The analysis of transcribed data in this study led to the conceptualization of a total of 100 codes. Among these, 84 codes were related to learning experiences associated with design-oriented creativity education, while 16 codes were related to perceptions of creativity. Within the 84 codes related to experiences, 62 were attributed to negative experiences, and 22 were related to positive experiences. Among the 62 codes forming negative experiences, we established categories and analyzed relationships between the codes. As a result, 51 of these codes were subcategorized, forming nine categories encompassing lack of learning motivation, lack of information, students' passive tendencies, negative factors caused by educators, negative team activity factors, qualitative factors of the course, theory-focused curriculum, unreasonable assignment factors, and factors related to online class environment.

The remaining 11 codes were categorized as forming negative emotional experiences after the class, including disengagement from the course and outcomes. The factors contributing to students' formation of negative emotions were primarily attributed to categories such as negative factors caused by educators, emotional conflicts, and neglect of educators' general education class. Additionally, negative emotions experienced during the course were directly linked to students' disengagement from the class. Categories like insufficient motivation, emotional conflicts, and loss of expectations were also associated with course disengagement. As a consequence of such disengagement, students formed negative perceptions of the course, with remote environment factors, emotional conflicts, loss of expectations, and inadequate integration with their major being prominent. Figure 1 visually summarizes the above content.

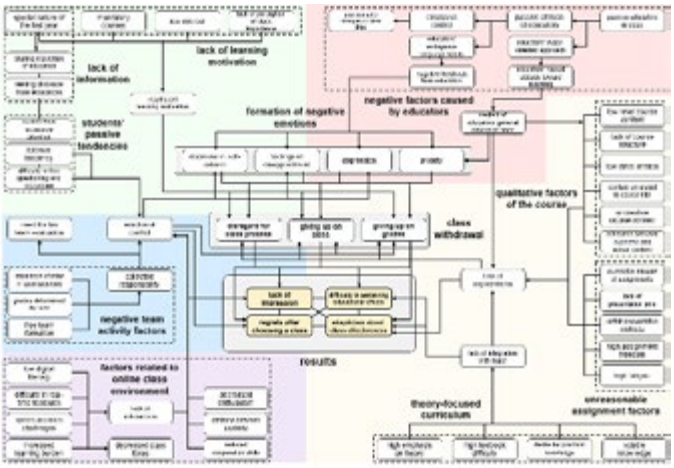

Figure 1. The Conceptual Map: Systematic Analysis of Factors Impacting Undergraduate Design Students' Learning Experiences in a Design-Oriented Creativity Course.

Discussion

The implications arising from these research findings are as follows: Firstly, the predominant factor contributing to learners' formation of negative perceptions about the course was identified to be the educator. The catalysts for the formation of negative emotional responses were traced to negative factors caused by educators and emotional conflicts arising from team activities and remote learning environments. Design education inherently involves educators providing feedback on students' work. Due to this inherent nature, participants' expectations towards educators were observed to be high. In such a context, educators' negative feedback emerged as a direct factor leading students to form various negative emotions. Moreover, educators' dismissive attitude towards the course also served as a catalyst for evoking unease among learners. This attitude further operated as a factor generating an overarching sense of mistrust in the expertise and quality of the course, ultimately serving as a significant factor in the loss of learners' anticipations for the course.

Secondly, careful consideration is required when implementing team activities in the operation of design-oriented creativity courses. While team activities are a widely adopted format in design education courses, all participants expressed that team activities were perceived as unfair in this course. In almost all instances, participants felt that they were sacrificing more for the team and that the responsibilities of other team members were relatively light. Additionally, instances of participants feeling excluded within the team were quite frequent. The factor that directly influenced emotional conflicts within team activities was found to be shared responsibility. Without the authority to control the actions of team peers, learners experienced significant stress and emotional exhaustion due to the imposition of penalties or sanctions for the mistakes of others, which they had no power to regulate.

Thirdly, it was revealed that learners were lacking motivation for learning. D University employs a system where students take integrated courses in their first year and then choose specialized majors from their second year onwards. As students must make crucial decisions that could significantly impact their careers during their

information-limited first year, they experienced considerable pressure. Moreover, this course is designated as a mandatory requirement at D University, and the fact that it is offered in the second semester of the first year was a major factor contributing to participants' sense of burden. In this context, the most significant issue was the absence of a persuasive process to convey the importance and utility of the creativity course.

Fourthly, utilizing online learning methods for creativity education was found to be ineffective. Participants expressed a unanimous opinion that they were unable to concentrate on the course in the online environment. Common challenges included the lack of control over learners' engagement, difficulty in maintaining enthusiasm, and issues with real-time interaction.

Conclusion

This study introduces the preliminary analysis phase results of an in-depth exploration into the learning experiences of undergraduate design students who participated in a design-oriented creativity course, utilizing grounded theory to develop the conceptual map relevant to the context. Preceding this, a concise overview of creativity research in the field of design is provided, highlighting the absence of profound and systematic qualitative research in this domain. Subsequently, a brief introduction to our research project, initiated to address this knowledge gap, is presented.

Moving forward, we comprehensively analyzed all codes, including those related to negative learning experiences, and systematically organized concepts in accordance with the paradigm model of grounded theory. Additionally, key categories representative of the paradigm model were extracted, and a theoretical model derived from grounded theory results was used as a foundation to propose and develop strategies for enhancing design-oriented creativity education for undergraduate students.

Through this research, we aim to initiate systematic qualitative inquiry, addressing a previously overlooked aspect in creativity research within the field of design. It's important to acknowledge that this qualitative study has its inherent limitations. The learners who participated in data collection may not represent all undergraduates. Therefore, there is a need for verification of the theories derived from this study across diverse universities. Moreover, due to the temporal characteristics of when participants took the course, their experiences encompassed the complexities of remote online learning. There is a necessity for separate research to systematically address experiences specific to this particular timeframe.

The outcomes of this research project are expected to offer insights for various educational institutions, aiding in the design of design-oriented creativity courses and contributing to the improvement of educational quality.

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References

Amabile, T. M., & Pillemer, J. (2012). Perspectives on the social psychology of creativity. The Journal of Creative Behavior, 46(1), 3-15.

Casakin, H. P. (2007). Factors of metaphors in design problem-solving: Implications for design creativity. International journal of design, 1(2), 21-33.

Corbin, J., & Strauss, A. (2019). Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory (Kim, M. Y., Jung, S. E., Cha, J. Y., Kang, J. S., Kwon, Y. L., Kim, Y. J., Park, K, J., & Seo, K. S. Trans.). Hyunmoon Publishing Co. (Original work published 2015).

Creswell, J. W., & Poth, C. N. (2021). Qualitative Inquiry and Research Design: Choosing among Five Approaches

(Cho, H. S., Jung, S. W., Kim, J. S., & Kwon, J. S. Trans.). Hakjisa Publisher, Inc. (Original work published 2016).
Kim, K. (2020). 'Design Thinking of Korean Mindset' Based on the Eastern and Western Mindset. Journal of Basic Design & Art, 21(3), 13-24.
Kwon, H. W. (2016). Understanding Grounded Theory. Korean Policy Sciences Review, 20(2), 181-216.
Kwon, M. E. (2022). The Effect of Creativity Liberal-arts Class on Creativity, Problem-solving Ability of University Students. The Journal of Humanities and Social science, 13(6), 477-492.
Mahmoud, N. E., Kamel, S. M., & Hamza, T. S. (2020). The relationship between tolerance of ambiguity and creativity in architectural design studio. Creativity Studies, 13(1), 179-198.
Park, S. (2019). The College Students' Perceptions of Creativity and Creativity Education. Journal of Research Methodology, 4(3), 33-62.
Park, T., & Rah, I. (2016). A Content Analysis on Learning Experience of K-MOOC (Korea-Massive Open Online Course): Focused on Korean University Students. The Journal of the Korea Contents Association, 16(12), 446-457.
Sanders, E. B. N., & Stappers, P. J. (2018). Convivial toolbox: Generative research for the front end of design. Bis.
Strauss, A., & Corbin, J. (1998). Basics of qualitative research techniques. Sage Publications, Inc.
Ward, M. K., & Meade, A. W. (2023). Dealing with careless responding in survey data: Prevention, identification, and recommended best practices. Annual Review of Psychology, 74, 577-596.
Williams, A. P., Ostwald, M. J., & Askland, H. H. (2011). The relationship between creativity and design and its implication for design education. Design Principles and Practices: An International Journal, 5(1), 57-72.
Yoon, W., & Chang, J. (2022). A Review of Domestic Creativity Researches in Design: A Systematic Literature Review. The Korean Society of Science & Art, 40(2), 255-267.

People's Park: A Manifestation of the Societal and Cultural Changes Through the Lens of Chinese Marriage Market

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Abstract

Over the past two decades, China has undergone rapid urbanization and economic advancement, leading to significant shifts in societal and cultural values. Modernized values have profoundly influenced major cities in contemporary China, prompting a paradigmatic change in the societal and cultural landscape. This transformation has been marked by urbanization, a booming housing market, the empowerment of women, and a rising trend of "individualism" and "liberalism." Consequently, these changes have caused a clash between traditional Chinese family values and evolving perspectives on love and marriage.

As a result, there has been a noteworthy delay in marriage among young adults of marriageable age, while the divorce rate in the country remains high. A fascinating response to these changes has been the emergence of marriage markets, organized by parents, within central parks of major Chinese cities since 2004. This unique urban typology, particularly exemplified by the marriage market at People's Park in Shanghai, encapsulates the intricacies of people's emotions and serves as a reflection of the profound societal and cultural shifts underway.

This paper focuses on the marriage market at People's Park in Shanghai as a key site of investigation. By conducting in-depth site surveys and empirical studies, a comprehensive mapping collage of the marriage market is constructed, capturing the author's personal experiences at the park and reflecting on related issues. Through this lens, the paper analyzes the social, economic, and cultural dimensions reflected within the space, while also delving into the historical reasons that gave rise to this distinctive phenomenon.

By examining People's Park as a microcosm of broader societal and cultural changes, this research sheds light on the multifaceted dynamics surrounding love, marriage, and family in contemporary China. The analysis provides valuable insights into the implications of urbanization and modernization on traditional values, contributing to a better understanding of the complexities of Chinese society in the midst of rapid transformation.

Author keywords

Urban study, People's Park, marriage market, urbanization, public space, matchmaking, societal change, intimate landscape

1. Introduction

The traditional Confucian philosophy emphasizes stable and harmonious families, leading to assumptions about enduring Chinese marriages and families. However, statistical evidence shows China's escalating divorce rate and turbulent marriage rate, challenging this perception (World Bank, 2020). China's remarkable economic growth since the 1978 reform and opening-up policy has improved job opportunities and financial situations, especially for women, in major cities. Modernization and the influx of western values like "individualism," "consumerism,"

and "liberalism" have significantly impacted Chinese views on love, marriage, relationships, and family (Li, 2020).
The divorce rate in China has been rising since the 1980s, accompanied by a decline in the fertility rate. New regulations in 2003 aimed to promote gender equality and private life liberalization, resulting in a spike in divorces, with 2004 being called the "Divorce Year" (Xinhua, 2005). The ease of divorce is evident with the introduction of a divorce feature on WeChat, making China one of the easiest places to get a divorce (Chang, 2013).
Traditional Chinese society values stable marriages as a reflection of family virtues and political stability (Croll, 1981). Despite government efforts, the issue of divorce and declining marriage rates persists, indicating that more than governmental intervention is needed.
President Xi Jinping's emphasis on family virtues has led to a resurgence of family traditions. While traditional gender roles expected women to take on household and childcare responsibilities, many women have become financially independent, leading to delays in marriage or initiating divorce (Ji & Yeung, 2014). However, societal pressure remains on educated women, often labeling them as "leftover women" (Ji, 2015).
China's social, economic, and cultural changes are reflected in marriage and divorce rates, reflecting the impact of modernization and traditional values (Li, 2020). Since 2004, Parents in major cities have organized matchmaking markets, known as "marriage markets," to help their unmarried children find partners (Gui, 2017). Shanghai's marriage market in People's Park, established in 2004, showcases the clash between tradition and modernity.
The marriage market reflects social, economic, and cultural changes, offering insights into contemporary love and marriage in Chinese society. For this research, the marriage market in People's Park, Shanghai, will be investigated to explore societal and cultural issues in contemporary China, focusing on the complexities and nuances of love and marriage in this dynamic setting (Hui, 2014).

2.Mapping of People's Park

In this research, I draw inspiration from Diorama Map (Nishino, 2014) and collage drawing methods to craft a unique mapping approach for People's Park. This mapping aims to document my personal experiences, observations, and reflections at the marriage market, with a focus on capturing the intricate nuances of emotions and understanding the societal and cultural underpinnings behind this vibrant scene.
The mapping work I created is highly personalized, where each moment captured and reconstructed on the map is pinned to specific choreographed settings that I curated. Essentially, the map serves as a diary, vividly documenting my feelings and reflections during particular visits to the park, interviews conducted, overheard conversations among parents, and "matchmaking interviews" where parents considered me as a potential spouse for their children. By re-collaging these memories, the map becomes an assemblage of my awareness and a representation of the broader social issues and ideologies they symbolize.
To enhance clarity in the map, I established a color-coding and referencing system. Black-and-white images were taken during my site visits, while colored images were referenced from books, academic papers, or news articles.
The map serves as a guiding tool for my research, enabling a closer examination of societal problems and an understanding of the cultural and historical reasons underlying each captured scene. It is essential to note that the map may not strictly reflect the precise geographic information of the park, but rather, it is an artistic expression of my personal experiences, memories, reflections, and comprehension of love and marriage in contemporary China. Within the map, I carefully articulate the nuances of people's interactions and the emotional landscape of the marriage market.
For the research analysis component, I incorporated historic and reference images into the map, creating a cohesive mediation of different ideas and reflections related to the issues observed in the marriage market. This

approach provides a multifaceted perspective on the intricate dynamics of the market and its relevance to broader societal themes. The map, therefore, serves as a compelling representation and exploration of the marriage market's cultural significance and social implications.

Figure 1. Full Mapping and Collage of People's Park (Drawn by Jiashi Yu)

3.Contextualizing Marriage in People's Park

3.1 The Social Bonds of Parents

People's Park in Shanghai's Huangpu District serves as a prominent location for the city's marriage market, a unique social phenomenon where parents seek potential matches for their unmarried children (Sun, 2012). Despite having various public spaces available, such as squares or sports stadiums, marriage markets tend to be set up in city parks like People's Park due to their prime locations and easy accessibility via public transportation. The history of People's Park reveals that it was once a gathering place for the elderly to engage in morning exercises, forming close-knit communities where they exchanged information about their children's marital status and concerns about their unmarried status. As more young people delay marriage, this concern has grown, leading to the expansion of the marriage market as a networking platform for parents (Ji, 2017).

The one-child policy and the postponement of marriage among millennials have contributed to China's aging problem, with many retired parents facing loneliness as their children remain unmarried (Flaherty et al., 2007). The marriage market at People's Park provides a way for these parents to form a supportive social circle and alleviate the stress surrounding their children's marriage prospects. The market has evolved into an organized event taking place every weekend, drawing thousands of parents from across the city (Wong, 2013). While successful matches have been made, parents like Mr. Huang continue to visit the market regularly, forming close-knit social communities to support and motivate each other.

Interestingly, within the park, there is a section previously designated for group dances that also attracts participants who have advertisements for their unmarried children (Sun, 2012). The park serves as a central urban junction, conveniently accessible, and fosters a sense of community among the elderly. The marriage market has evolved as a subsequent function derived from the elderly's daily routines within the park, emphasizing the park's significance as a public space for socialization, exercise, and the cultivation of care and love from parents towards their unmarried children. In this warm and supportive environment, parents can share their worries and concerns while providing motivation and support to each other.

3.2 Private Life in a Public Park

In the context of the marriage market at People's Park, an interesting phenomenon is observed where parents, despite being keen on visiting the market, prefer to maintain a private and low-key presence. This concern about privacy extends to the park space on a larger scale, contributing to the market's organized and orderly nature, even with the presence of thousands of parents. The absence of chaos or loud conversations typically associated with crowded activities indicates a unique social atmosphere within the marriage market.

During visits to the park, me and my friend, both at marriageable age, encountered numerous parents inquiring about their information, which attracted considerable attention due to the relative rarity of young people in

the marriage market. The straightforward questions asked by the parents delved into the participants' marital status, hometown, household registration, education, and more. Although initially uncomfortable with such conversations in a public space, we gradually perceived the warmth and enthusiasm among the strangers they interacted with. Engaging in dialogue with parents led to gatherings of more people, and even if we were not suitable matches for some parents, the latter would refer us to other potential candidates, showcasing the sincerity and trust prevalent among the participants.

In the context of modern cities like Shanghai, where people are becoming increasingly distant from one another, interacting with strangers in public spaces is a rarity. However, within People's Park and its marriage market, the shared agenda of finding suitable matches for their children and the mutual understanding among the crowd fosters an environment where individuals can openly share their most private information without hesitation. The park provides a sense of security and belonging, creating a unique platform for genuine and uninhibited engagement among participants (Li, 2020). This environment contrasts with the typical urban experience, where interactions with strangers are often limited, making People's Park an exceptional space for the expression of personal matters and the forging of connections among its visitors.

3.3 Gender Imbalance and Leftover Women

During the late 70s and early 80s, the Chinese government implemented the "one-child policy" as a drastic measure to control the country's burgeoning population (Zhang & Wang, 2019). While the policy succeeded in reducing the nation's fertility rate, it also exacerbated gender imbalances. Historically, Chinese parents have favored sons over daughters, directing more family resources to sons due to gender-based discrimination (Ebenstein, 2010). The policy, coupled with cultural norms, led to gender-based selection and resulted in a significant gender ratio imbalance, with approximately 114 males born for every 100 females as of 2019 (Banister, 2004; Ritchie & Roser, 2019). Consequently, there are now 30 million more marriageable men than women in contemporary China (Banister, 2004). Surprisingly, however, the marriage market at People's Park demonstrates a contrasting scenario, where female candidates outnumber male candidates by a ratio of nearly 2.5 to 1 (Sixth Tone & Pengpai News, 2018). Interviews with parents and observations confirm the heightened anxiety among parents with unmarried daughters, who feel intense competition among female candidates within the market (Gui, 2017).

The societal perspective on professional, educated urban women in China has undergone considerable transformation, leading to the emergence of the concept of "leftover women". Despite their career successes and independence, these women often face familial pressure to marry, as traditional gender role expectations continue to shape parental attitudes. The documentary "Leftover Women" illustrates the struggles of professional women seeking love and meaning in their lives, despite being labeled as "leftover" by their families. While marriage is increasingly viewed as a choice for independent women, many parents still see it as an obligation. This disconnect in viewpoints drives parents to seek suitable husbands for their daughters, even against their daughters' wishes.

The gender imbalance within the marriage market can also be attributed to the "marriage gradient," where women prefer partners with superior socioeconomic backgrounds, leading to a squeeze for highly accomplished women seeking equally successful partners. Moreover, traditional perceptions of gender roles perpetuate the idea that women's contributions lie in household and childcare, whereas men's socioeconomic status takes precedence. This dynamic influences the matchmaking process in the marriage market, creating a hierarchical structure favoring men with prestigious backgrounds.

The patriarchal culture within the marriage market showcases the contradictions prevalent within Chinese families concerning attitudes toward marriage. Daughters who strive to escape gender discrimination and delay

marriage encounter parental expectations and pressure to conform to traditional gender norms. This complex interplay of historic conditions and evolving values shapes the intricate matrix of the gender imbalance observed within the market.

Through scenes from the documentary "Leftover Women," where participants return home to confront their families' contrasting views on marriage and happiness, the nuances of emotions within Chinese families about love and marriage are portrayed. While differing definitions of happiness exist, the desire for reconciliation between generations underscores their love and understanding for one another.

In essence, the marriage market at People's Park embodies the conflicts and reconciliation between generations. Despite the generation gap regarding the urgency of marriage, the market serves as a platform for parents to express their concerns and worries. It reflects the nuanced conflicts of values towards happiness and marriage, culminating in the observed gender imbalance.

4.Conclusion

This paper investigates the marriage market at People's Park in Shanghai, delving into various issues related to its cause, progression, and organization. It serves as a lens through which to understand the societal, political, historic, and cultural changes in contemporary China, with a focus on love and marriage. The mapping collage created for People's Park documents my awareness, memories, and reflections of the marriage market, presenting both subjective and objective viewpoints. The map comprises numerous images taken during my visits, capturing different moments and personal observations. Simultaneously, the research offers an objective analysis and reflection without emotional bias, exploring the contemporary issues intertwined with love and marriage.

Rather than presenting a simplistic judgment of the marriage market, the research seeks to unveil the nuanced social and historic reasons behind its existence. It addresses various factors, such as economic advancement, urbanization, the booming housing market, modernized values, the revival of family values, traditional gender roles, the impact of the one-child policy and son-preference culture, intergenerational conflicts, the empowerment of women, and the expanding homosexuality. All of these issues manifest in different ways within the marriage market and are examined from a personal and private level, through the lens of love and marriage. The research provides evidence of how these factors influence the organization and progression of the marriage market, along with the nuances of the emotional landscape it encompasses.

5.Acknowledgments

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References

Agence France-Presse. (2017). Secrets and Wives: Gay Chinese Hide Behind 'Sham Marriage'. NDTV [Online]. Available from: https://www.ndtv.com/world-news/secrets-and-wives-gay-chinese-hide-behind-sham-marriage-1778249 [Accessed 20 July 2023]

Banister, J. (2004). Shortage of Girls in China Today. Journal of Population Research (Canberra, A.C.T.), 21(1), 19–45.

Croll, E. (1981). The Politics of Marriage in Contemporary China. Cambridge: Cambridge University Press.
Chang, J.F. (2013). Social Analysis on the Phenomenon of "Quick Marriage and Quick Divorce" among the Youth Born in the 1980s. Journal of Shanxi College for Youth Administrators, 03.
Gui, T. (2017). "Devalued" Daughters Versus "Appreciated" Sons: Gender Inequality in China's Parent-Organized Matchmaking Markets. Journal of Family Issues, 38(13), 1923–1948.
Ji, Y., & Yeung, W.J.J. (2014). Heterogeneity in Contemporary Chinese Marriage. Journal of Family Issues, 35(12), 1662–1682.
Ji, Y. (2015). Between Tradition and Modernity: "Leftover" Women in Shanghai. Journal of Marriage and Family, 77(5), 1057–1073.
Li, M. (2020). A Longitudinal Study of the Long-Term Predictors of China's Divorce Rate. Marriage & Family Review, 56(3), 217–240.
Nishino, S. (2014). Diorama Map. Sohei Nishino [Online]. Available from: http://soheinishino.net/dioramamap [Accessed 20 July 2023]
Ritchie, H., & Roser, M. (2019). Gender Ratio. Our World in Data.
Sixth Tone & Pengpai News. (2018). We made six visits to the marriage market, collected 874 marriage posters. Pengpai News [Online]. Available from: https://www.thepaper.cn/newsDetail_forward_2351635 [Accessed 20 July 2023]
Sun, X. (2012). The People's Park Matchmaking Corner. Anthropology Now, 4(3), 41–45.
Wong, M.W. (2016). Past matchmaking norms and their influence on contemporary marriage markets in China. Journal of the Anthropological Society of Oxford, 8(3), 372–384.
World Bank. (2020). Overview [Online]. Available from: https://www.worldbank.org/en/country/china/overview#2 [Accessed 20 July 2023]
Xinhua. (2005). China's divorce rate up 21.2 percent in 2004. China Daily [Online]. Available from: http://www.chinadaily.com.cn/english/doc/2005-03/01/content_420456.htm [Accessed 20 July 2023]
Xinhua. (2016). President Xi stresses familial virtues. The State Council Information Office of the People's Republic of China [Online]. Available from: http://www.scio.gov.cn/32618/Document/1535406/1535406.htm [Accessed 20 July 2023]
Xinhua. (2021). What's the Effect of the "Cooling-off Period"? Xinhua Net [Online]. Available from: http://www.js.xinhuanet.com/2021-04/14/c_1127329757.htm [Accessed 20 July 2023]

Integrating Creative Art in the Healing Arts: Facilitating Positive Emotional Changes and Releasing Negative Emotions

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Abstract

In recent years, there has been a surge in interest in the use of the healing arts and creative arts to improve psychological healing and emotional well-being. Empirical studies have demonstrated that using creative art in the framework of the healing arts is extremely useful in promoting positive emotional changes and reducing negative affective states in people. Participating in the creative arts enables people to successfully express their feelings, explore their sense of self and discover new opportunities, all of which contribute to the development of emotional control and psychological well-being. Adding creative art may increase the therapeutic efficacy of healing art therapy. This study uses a mixed-methods approach to data collection to evaluate the influence of creative art activities on emotional regulation, the reconstruction of life experiences, and the promotion of good affect. This study aims to investigate the possible therapeutic benefits of creative art in stress management, anxiety reduction and the development of self-awareness. This is achieved through study into how individuals perceive and express their emotions via art. Furthermore, through studying and encouraging emotional healing and personal growth via healing arts that incorporate creative art, individuals may improve their overall mental health. Through this research, more will be learned about the advantages of the healing arts and creative art, as well as their potential contributions to the healing arts aimed at improving mental health. Future studies may investigate the efficacy of the healing arts as therapy for a variety of mental health disorders. Such research will further contribute to understanding the therapeutic value of the healing arts while promoting emotional regulation and psychological well-being among people of all ages and socioeconomic backgrounds.

Author keywords

Healing arts; creative art; design and emotion; emotional well-being; emotional expression.

Introduction

The field of healing arts has gained recognition and proven efficacy in facilitating psychological recovery and promoting emotional well-being (Nash, 2020). The utilisation of creative art has been found to be particularly advantageous in facilitating positive emotional transformations and alleviating negative emotions. Using creative art as a means of self-exploration and emotional expression has been found to have a profound impact on psychological well-being, hence establishing it as a potent healing strategy. This research investigates the possibility of integrating creative art and the healing arts to enhance their therapeutic effects (Welling, 2022). It aims to better understand how creative arts practices impact emotional regulation, rebuilding life event narratives and inspiring pleasant feelings in people with different emotional needs (Ho, 2021). Creative healing

arts can improve an individual's overall well-being. Data from participants in healing arts creative art activities was collected. Observations, surveys, interviews and other empirical data were collected using a variety of approaches. Overall, this study sheds new light on the benefits of creative art in the healing arts. It demonstrates that creative art is a valuable tool for improving emotional control and psychological well-being, contributing to a higher quality of life.

The benefits of integrating creative art into the healing arts

The use of creative art in the healing arts sector provides many benefits to persons suffering from a range of mental health or emotional disorders. By engaging in creative expression, individuals may benefit from a unique and successful technique for better communicating complicated emotions and challenging concepts than when transmitted merely via spoken language (Gill, 2022). Participating in artistic activities within a therapeutic framework provides individuals with a secure and caring setting to explore and express their inner ideas and emotions. Moreover, it has been shown that engaging in artistic endeavours may have therapeutic and calming effects that aid in mitigating stress and fostering relaxation, which are essential factors in enhancing psychological well-being (Webb, 2023). Clients may also use creative art as a means to cultivate interpersonal connections with their therapists, fostering enhanced levels of communication and general understanding. This therapeutic intervention has the potential to facilitate the formation of enduring coping mechanisms and foster personal empowerment; therefore, it affords clients the opportunity to delve into their inherent capabilities, learn novel skills and uncover alternative approaches to enhance self-assurance and deepen self-awareness. The use of creative art in the rehabilitation process has the potential to aid in emotional restoration. Clients are able to enhance their ability to perceive and express emotional symptoms, facilitating the process of identifying and understanding unique emotional experiences (Gill, 2022). They have the opportunity to receive therapeutic intervention aimed at facilitating their progress towards recovery, personal growth and emotional well-being by acquiring an enhanced understanding of their emotional experiences. Incorporating creative art into the healing arts sector provides novel approaches to addressing a wide range of mental health and emotional well-being concerns. Individuals may express themselves and recover through this method, which is both effective and interesting.

Healing arts and creative art may help people express themselves

Creative art is a distinct kind of nonverbal communication that may be used in the healing arts to assist individuals in more successfully expressing their feelings. Art, via symbolism, colour and imagery, may serve as a supplementary medium of communication, allowing individuals to transmit complicated emotional states that may be difficult to explain with spoken language alone (Benedek et al., 2020). Healing arts create a setting where people may freely express themselves without fear of being judged or reprimanded, allowing them to explore repressed emotions and achieve a better knowledge of themselves. Artistic expression may also help people develop self-awareness by allowing them to find previously hidden emotions and explore the deep recesses of their emotional experiences. An individual's emotional experiences are validated and acknowledged through the creation of art, which provides physical evidence of their sentiments. This unique approach to the healing arts can improve a person's sense of being noticed and understood, increasing emotional processing and resulting in higher emotional wellness.

Helpful techniques for assisting persons in coping with emotional challenges

Individuals struggling with the aftereffects of traumatic situations might benefit from artistic expression in the healing arts. Trauma can cause psychological symptoms such as anxiety, depression and emotional detachment (Perryman et al., 2019). Individuals may express and control their emotions via artistic expression, aiding the processing and management of overwhelming sentiments. This procedure is very effective for people who have dissociated as a result of trauma. The introduction of creative art into the healing arts can provide individuals with the ability to develop resilience and coping strategies in response to the negative impacts of trauma. This helps human development by establishing internal resilience and facilitating successful navigation of future obstacles; the creative process may also give a sense of control, boosting optimism through symbolic ownership and validation. This can help decrease unpleasant feelings connected with traumatic situations, such as sorrow, regret and loneliness. Overall, the use of creative art in the healing arts provides a secure and supportive setting for individuals to express, manage and develop resilience in the face of trauma.

Creative art in the healing arts can help individuals develop self-awareness

Creative art is an important part of the healing arts because it promotes self-awareness through the six techniques illustrated in Figure 1. It encourages people to reflect on their experiences, ideas, and emotions, helping them better understand their overall health. Self-reflection is vital for personal growth because it helps people to comprehend their own feelings and experiences. Healing arts artistic expression allows people to focus on their inner feelings, allowing them to interact with personal situations. This practice assists people in recognising repeating patterns in their behaviour, understanding their emotions and gaining useful insights from prior experiences. Artistic expression promotes significant human growth by increasing identification and affirmation of an individual's thoughts and emotions. In conclusion, using creative expression in therapeutic arts promotes self-awareness, deeper cognition, emotional healing, general well-being and individual growth.

Figure 1. Six methods of creative art in the healing arts for fostering the development of self-awareness

Individuals may express their ideas and feelings through a visual medium that connects with their own viewpoints and life experiences using the healing arts. Therapists frequently employ inventive forms of artistic expression to figuratively describe emotions, bringing new views on the profundity of their thoughts and experiences. Individuals can use this approach to make works of art that symbolically portray their own experiences, allowing for self-expression, self-understanding and emotional healing. A healing arts programme offers participants a one-of-a-kind chance for self-reflection on their self-concept, including self-perception, personal strengths, areas for progress and overall sense of identity. Examining one's self-concept is critical to personal development since it allows for a greater knowledge of one's emotional and cognitive states, potentially improving one's psychological and emotional well-being. Participating in artistic pursuits may lead to feelings of self-acceptance, personal growth and emotional well-being since they bring new perspectives on one's life and experiences (Candy, 2019). Healing arts practitioners have the rare opportunity to engage in activities that can enhance sensory experience by activating not just one but several senses simultaneously, including touch, smell, sound and sight. People who often engage in creative

pursuits may develop a more acute sense of observation, perception and sensitivity to their surroundings. This has the ability to improve an individual's emotional health by encouraging reflection and developing insights into emotional challenges that may have been there from the start. Through the creative process (Chau & Ho, 2023), people would be more able to combine their past experiences into their current thinking and ideas, which explains why creative art is increasingly used in the field of the healing arts. This is a fresh and powerful tool for introspection and growth. An artist's understanding of oneself and his/her subjective experiences can be expanded via the use of metaphorical language, sensory study, introspection and self-concept inquiry. Participants in a healing arts programme have a unique chance to integrate their personal histories via the process of making art. Their creative process can help people make peace with their past by giving them a safe space to explore and understand their feelings about those experiences. Recalling past events through creative means helps individuals get a fresh understanding of their experiences. By its very nature, creative work encourages personal reflection, which may result in fresh viewpoints on the past. Individuals can obtain a deeper awareness of their identity and emotional control by proactive exploration of past experiences, including the study of the emotional implications and the purposeful confrontation of residual trauma and unpleasant emotions. The healing arts have been shown to significantly improve people's self-awareness, affective regulation and overall psychological health by enhancing their ability to emotionally integrate prior events.

Research method: Semi-structured interviews

This qualitative exploratory study was conducted to identify the processes by which creative art in the healing arts may assist in positive emotional shifts. This was achieved by discovering the most effective healing art and creative art interventions that promote positive emotional changes and emotional release. In addition to a comprehensive examination of relevant scholarly works, semi-structured interviews were used to acquire data for the study. These techniques were employed to collect data from individuals who have received healing arts services, as well as art therapists and other healthcare professionals. The collected data was subjected to thematic analysis to identify significant themes pertinent to the research objective. The anticipated results of this study encompassed the identification of optimal strategies for integrating creative art into the healing arts with the aim of promoting positive emotional transformations. In addition, the study aims to identify the most effective forms of healing arts and creative art interventions for augmenting positive emotional changes and alleviating negative emotions. Furthermore, the study sought to offer insights into the utilisation of creative art as a means to facilitate the expression of challenging emotions while also contributing to the advancement of guidelines in this field. This research aimed to affect the formulation of evidence-based recommendations that promote a comprehensive approach to the healing arts, fostering positive emotional changes and contributing to individuals' overall emotional well-being.

A total of 15 sample questions were curated for the purpose of conducting semi-structured interviews about the use of creative art in the field of the healing arts, with a specific focus on its potential for boosting emotional well-being and facilitating the healing process.

1.Could you tell me what creative art in the healing arts means to you?

2.Based on your expertise, what is the significance of creative art in augmenting emotional well-being and facilitating the process of healing?

3.Which creative art treatments have been identified as effective in facilitating emotional healing?

4.In what manner might creative art be used to facilitate the expression and processing of challenging emotions

by clients?
5.Could you provide an illustrative instance of how creative art has been seen to facilitate the process of healing within the context of therapy?
6.In the context of dealing with patients who possess varying degrees of expertise in creative art, how do you modify your approach?
7.In your research, which particular demographics have you identified as being most receptive to creative art interventions?
8.In the context of artistic activity, what methods are used to assess the efficacy of creative art interventions?
9.Could you provide instances of hurdles or obstacles that have been encountered during the use of creative art within the context of the healing arts?
10.Have you seen any variations in the efficacy of various forms of creative art in addressing distinct emotional concerns or objectives?
11.How can one effectively manage and mitigate resistance or reluctance shown by customers who may have hesitancy towards participating in the creative art process?
12.In your perspective, what attributes or competencies are indicative of a proficient, creative art therapist?
13.What recommendations would you provide to those seeking to integrate creative art into their therapeutic practice?
14.Has cooperation between creative art therapists and other professions, such as doctors or social workers, been noticed in the promotion of emotional well-being?
15.To what extent has personal engagement in creative art shaped one's therapeutic methodology?

The provided questions served as a foundational framework for conducting semi-structured interviews and may have been tailored to align with the interviewee's specific background and knowledge.

Findings

This study found that applying creative art in the context of the healing arts was useful in assisting persons in managing stress and anxiety. Researchers found that those who engaged in creative healing practices had a deeper understanding of themselves and their emotions. People of all ages can benefit from the emotional healing and growth the healing arts provide. The healing arts have been demonstrated to be an extremely useful tool for promoting the psychological well-being and growth of people of all ages. Forty-eight participants in this study showed that the creative healing arts can help people deal with stress and anxiety (Webb, 2022). Participants in creative therapeutic arts had more insight into their own mental and emotional states. This shows that patients may benefit from engaging in creative therapeutic arts to better understand and communicate their feelings. Furthermore, studies have shown that expressive therapeutic arts can help with emotional healing and growth. Engaging in artistic pursuits has been shown to boost self-awareness and general mental wellness. According to the available research, creative healing arts show promise as a method of treating mental health problems. The impact of expressive therapeutic arts on mental health and emotional regulation should be investigated in a thorough study.

Conclusion

The expressive and communicative abilities of individuals have been proven to be enhanced via participation in the healing arts. Participation in creative healing arts was connected with better mental health, stress reduction

and personal growth in a study involving 48 participants of diverse ages (Webb, 2023). Painting and sculpture were more popular with older adults, whereas digital and new media art were more popular with younger participants. However, some participants expressed apprehension over the cost and accessibility of treatment modalities. Researchers have shown that engaging in creative healing arts might help people feel less alone and more in control of their own emotions. Therefore, it stands to reason that incorporating many therapeutic approaches can help with emotional and psychological healing.

References

Benedek, M., Bruckdorfer, R., & Jauk, E. (2020). Motives for creativity: Exploring the what and why of everyday creativity. The Journal of Creative Behavior, 54(3), 610-625.

Candy, L. (2019). The creative reflective practitioner: Research through making and practice. Routledge.

Chau, P. W., & Ho, A. G. (2023). Understanding the roles of art and design technology and art therapy. In: HO, A. G., (eds) Human Factors in Communication of Design. AHFE (2023) International Conference. AHFE Open Access, vol 90. (pp. 186-193). AHFE International, USA.

Gill, D. V. (2022). Unmasking the artist within: A global exploration of social-emotional expression, through storytelling, and its effect on enhanced learning [Doctoral dissertation, Pepperdine University].

Ho, A. G. (2021). The role of affective concerns in user experience design. New Design Ideas, (5), 2, 114-120.

Nash, G. (2020). Response art in art therapy practice and research with a focus on reflect piece imagery. International Journal of Art Therapy, 25(1), 39-48.

Perryman, K., Blisard, P., & Moss, R. (2019). Using creative arts in trauma therapy: The neuroscience of healing. Journal of Mental Health Counseling, 41(1), 80-94.

Webb, A. J. (2023). Expressive arts therapy for anxiety disorders: Reducing stress and improving coping skills. Authorea.

Welling, K. N. (2022). Beyond drawing breath: A self-exploration of breathwork and art as therapy [Doctoral dissertation, Pratt Institute].

A Tribute to A Mother's Love: Black Hair and Empowerment

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Abstract

This study explores black hair's aesthetic value through a blend of contemporary art and design, specifically via reinterpretation through a garment collection. As a personal homage to my mother, a single mother of West African descent, I have chosen this topic as my inspiration to develop a series of garments using various traditional craft techniques. The development approach used in these garments' blends hairstyling, fashion, recycling, traditional West African art, and contemporary fashion design techniques. This garment collection references traditional West African weaving and crochet methodologies and alludes to the visual importance of black hair in African culture, both historically and in contemporary society.

The accompanying garment collection is based on my relationship with my mother while exploring my memories of her in a predominantly visual and abstract manner. The garments in this memorial collection were made instinctively, based upon an open-minded contact with materials and processes inspired by traditional West African crochet techniques. Through the personal narrative I explored while developing this collection, this study aims to investigate some of the challenges of inherent single motherhood and how these challenges impact outward expressions of identity through one's appearance. In many communities, a woman's societal role is often measured by her outward appearance. For example, in West Africa, a woman's hair is admired based on the hair design, which is often styled and braided hair based on the cultural norms of the local community. In this setting, a woman with long, thick hair demonstrates a visual expression of a vibrant life force deemed valuable by the West African community: representing prosperity, beauty, and the promise of a fruitful life via many healthy children (Byrd & Tharps, 2014). Black hair designs comprise many hairstyles and haircuts explicitly created for a particular hair type. These black hair designs can be adapted and personalized to suit individual preferences, making a daring statement about culture, heritage, and personal style. This research explores how some of the triumphs and hardships of single motherhood are made visible through individual expressions of dress, hairstyles, and other forms of adornment. These outward expressions of identity reflect their role as a single mother in society and a dual commitment of their love to themselves and their children, and are reinterpreted here visually through this garment collection.

Author keywords:

Black hair, Parenting, Arts, Fashion, Adornment

Introduction

Parenting, while challenging, can be increasingly difficult for those who bear the burdens by themselves as

single parents. Elliott et al. (2013) found that households run by a single mother are more likely to be poor than other households. The financial burdens in single-parent households are often linked to increased stress, inferior child outcomes, and maladaptive parenting behaviors (Ed, 2002); (Philippot & Feldman, 2004); (Berryhill & Durtschi, 2016). Single parents often try to disguise these struggles through outward expressions of appearance, such as their clothes and hairstyles.

This study was inspired to memorialize my mother, who raised me and my siblings as a single mother in West Africa in the 1980s. Specifically, I wanted to explore culturally specific expressions of adornment, seen through the lens of the various hairstyles my mother adopted for special occasions and significant events that she participated in while caring for her children. This study merges personal reflective narrative, arts, crafts, and fashion design into a fusion of mediums to pay homage to my mother and the sacrifices she made for her children throughout her life. Through this personal narrative and a blend of craft and fashion design, this paper's collection embodies a visual interpretation of identity and empowerment as a memorial to West African single motherhood. In these designs, I have attempted to embody the tenderness, hope, tension, success, and empowerment made visible through the hairstyles, weaving techniques, and choice of color incorporated into these pieces.

My purpose in this study is to tell a story through hair, art, and fashion design. The study explores black hair's role as an expression of identity and empowerment and its role in single parents' lives. This research uses art to explore the hidden story behind black hair's aesthetic, beauty, and empowerment. The emphasis on black hair was one of the subjects that emerged from this study. However, black hair cannot be effectively discussed without referencing its use in contemporary history and West African society. According to Ellington (2023), highly textured hair, commonly found in black people and people of African descent, can be manipulated as a sculptor works with clay. Hair of this type can be stretched by pulling, separating, and wrapping.

In some cases, sculpted forms of highly textured hair can defy gravity. Young girls in West African society are often taught how to braid hair as a family tradition (Ellington & Underwood, 2020). As in West Africa, black women across Europe and the Americas explore the importance of natural black hair texture, which can be a sense of pride and personal identity. The goal of this study is to bring to the awareness of the audience the significance of black hair in the black community through the exploration of various art forms.

Literature Review

Social Significance of Black Hair

In West Africa, social norms place a high value on a woman's hair, especially if it is long, curly, and thick. A woman with long, thick hair visually embodies the life force, with her hair representing a specific form of prosperity, which Byrd and Tharps (2014) describe as a green thumb for raising bountiful farms and many healthy children (Byrd & Tharps, 2014). In many black communities, one cannot escape noticing the presence of hairdressing salons for ladies, barbering shops for men, and hair products, many of which market themselves using the 1960s slogan black is seen as beautiful (Owusu, 2006,).

Black hair is versatile and can be styled in numerous ways, allowing for various design possibilities. For example, the afro, characterized by its rounded shape and voluminous appearance, is one of the most iconic and timeless black hairstyles (Ellington (2023). However, beyond the classic afro style, black hair designs comprise various styles and cuts created specifically for distinct texture and adaptability inherent in black curly hair. Hair of this type can be styled in various inventive ways that highlight its unique qualities. These black hair designs can be adapted and personalized to suit individual preferences, making a daring statement about culture, heritage, and personal style.

Natural hair has significant implications for transformations in black women's conceptions of identity, social network, community health, and self-care empowerment. Sufficient time to attend to something, such as a hairstyle requiring more time and products, can be perceived as feminine and affluent across class, gender, and culture. Historically, hair maintenance was an intimate affair where the hairdresser was regarded as a master of their craft and was only permitted to style the hair of someone of the same sex (Ellington, 2023). However, there is a growing preference among black women to renounce conventional straightening hairstyle, and styling matters have been identified by parties vested in the subculture of black women and men who wear natural hair as going natural or being natural (Ellington & Underwood, 2020).

The social significance of black hair is peppered throughout in its historical, cultural, and personal significance for black people and people of African descent. Throughout history, black hair has been subject to social, political, and aesthetic standards, frequently leading to prejudice, stereotypes, and unequal treatment (Byrd & Tharps, 2014). Individuals with ebony hair have experienced exclusion, limited opportunities, and a lack of acceptability due to these discriminatory practices. For example, workplace policies and school dress codes have disproportionately targeted hairstyles traditionally worn by black people, which include styling features such as braids, locks, and natural afros as unprofessional or distracting (Byrd and Tharps (2014) This cultural bias can result in limited opportunities for people of color, deemed non-conformant compared to traditional codes of Euro-centric Western beauty.

Methodology: Design Analysis

Design as a Form of Self-expression

Art and design are powerful mediums for expressing one's identity, and it is essential to recognize the intricate connection between visual expression and personal identity. Whether through paintings, sculptures, graphic design, or fashion, artists and designers often seek ways to express and convey their unique selves to the world. The colors, shapes, and patterns chosen in this design symbolize cultural and personal experiences and a sense of belonging, and the medium I have chosen to communicate through is fashion design.

The influence of personal identity and the homage to my mother through design takes a unique dimension. My mother's fashion choices, hairstyle, and trading serve as a source of inspiration for these garment designs. They become not just fashionable attire but also wearable works of art that carry the legacy of my mother's life choices, allowing her memory to live on through the clothing I created. In this case, fashion becomes a vehicle for preserving and celebrating personal identity and paying a heartfelt homage to the maternal influence shaping my design journey.

Garment Collection as a Homage

This project was inspired by memories of my mother's life, as explored through some of the different hairstyles she adopted for special occasions and significant events, such as school activities, cultural celebrations, weddings, religious gatherings, and many more.

This project explores how art and fashion may express a narrative visually and abstractly. This collection visually depicts an impression of African black hair and the complexity of crochet to convey some of the struggles of life as a single parent. Combining crocheting and upcycling techniques, both looks represent some of the black hairstyles explored in this study.

I infused contemporary Western fashion design development processes for this collection with traditional West African craft techniques. The garments spotlighted in this study were designed using crochet techniques and upcycling secondhand t-shirts. In these garments, the use of crochet is not only functional but also holds a

symbolic purpose, as it is used to represent the ups and downs and difficulties in the day-to-day life of a single mom.

The colors in this product assortment also carry symbolic significance. The colors represent specific emotions, such as joy, hope, stress, and achievement. Color placement is also used for accents to emulate the hairstyling look within the garment's adornment. In these garments, black represents a woman's hair, and the stress experienced as a single mother. Green represents joy and hope for a better future, and blue represents joy, happiness, and hope for a better future. At the same time, yellow represents some of life's achievements as a single parent.

Detailed Garment Descriptions

Design 1: Different-colored secondhand T-shirts were utilized in all project procedures. The T-shirts were cut to a width of 0.5 inches, which was used for the dress's crochet and hair braiding. Before attaching the spiral-shaped breast cup, the body was crocheted intermittently in all the required colors. The garment was crocheted wholly by hand in accordance with the design. The entire garment's body was crocheted from a green, yellow, pink, and blue finish with black braids attached to the sides, sleeves, and back. The garment was designed to reflect the contemporary lifestyle, hairstyle, and strength of a child from a damaged home; therefore, the garment's design depicts an abstract face.

The front depicts a face, with the breast cup representing the two eyes. Its varied colors signify youth's many opportunities. Yellow depicts the nose, pink the mouth, and blue the jaw. The braided hairstyle on the clothing represents one of a black woman's multiple hairstyles; some of the hair drapes on the dress's back and sleeves. All the hair draping from the dress is embellished with golden jewels to demonstrate how black hair has been adorned in ancient and modern times and to illustrate how many women enjoy wearing jewelry. The back and front were crocheted normally, the breast cup was crocheted using an innovative technique in a spiral shape, and the side was twisted like hair and joined to the side panel. The inspired outcome was achieved using various methods on different garment portions.

Figure 1. Front view of design 1 with an anstrach face.

Figure 1. Back View of Design 1.

Design 2: This garment was made using methods of hand crochet. For the base fabric, T-shirts were cut into stripes and woven based on crochet methods to emulate black hair styling and finished with black stripes. The main garment was designed to look like an abstract version of a woman's face and hairstyle. The abstract face was made using green, black, blue, and yellow, based on scraps from the t-shirt after cutting. Above this face is the hair, made with strips cut from the t-shirt. Some of the hair is shown falling by the fabric draping down, which is designed to represent how, when

the parents become too busy to style the hair, sometimes the hair will not be taken good care of because there is too much stress.

Figure 3. Front view of design 2 an abstract face.

Figure 4. The back view of Design 2.

Summary and Conclusions

This study explores the significance of black hair as a cultural symbol and a means of personal expression in the context of single motherhood in West African society. Through the fusion of personal narrative, art, and fashion design, this work seeks to contribute to the discussion of adornment and how fashion as an artistic artifact can convey a rich tapestry of historical, social, and individual meanings. The garments in this collection celebrate the love and beauty of black hair and are a touching homage to the courage and sacrifices of single mothers, portraying their resilience and unique identity.

References

Berryhill, M. B., & Durtschi, J. A. (2016). Understanding single mothers' parenting stress trajectories. Marriage & Family Review, 53(3), 227–245. https://doi.org/10.1080/01494929.2016.1204406

Byrd, A. D., & Tharps, L. L. (2014). Hair story untangling the roots of black hair in America. St. Martin's Griffin.

Elliott, S., Powell, R., & Brenton, J. (2013). Being a good mom. Journal of Family Issues, 36(3), 351–370. https://doi.org/10.1177/0192513x13490279

Ellington T. N, 2023. Black Hair in a White World, The Kent State University Press.

Philippot, P., & Feldman, R. S. (2004). The regulation of emotion. L. Erlbaum.

Ellington, T. N., Underwood, J. L., & Rogers-Lafferty, S. (2020). Textures: The history and art of black hair. The KSU Museum.
Owusu, K. (2006). Black British culture and society: A text reader. Routledge.

Towards, Inwards, Outwards, Onwards
Dancing with interdependence through design

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Abstract

To understand interdependence as love, means focusing on the relationality and directionality of its nature. The contribution frames contemporary, polycritical times as wounded by distance and separateness, where the rational myth fails to grasp the entanglement of relationships we are immersed in. The crises we are facing unfold on an ontological scale, unveiling the gaps and rifts of knowledge and ways of knowing. Thus, an ontological shift is required, whose foundation lays in transformation and how it is going to be translated from an academic concept into an assemblage of normative policies and practices, and how this process might shape social, political, and environmental change.

Thus the contribution, by building on the european context of the Next Renaissance, that is fostering the power of creativity in realizing our interconnected existence and stimulating critical imaginaries of collective transformation, the paper addresses contemporary crisis in ways of knowing and the consequential need for other relationships to knowledge, and ultimately even a new conception of it. This is certainly a matter of design too, whose contributions participate in shaping our understanding and sensemaking, along a scale of intervention that goes from narrating the world to whispering to the self.

As such, spaces and instances of reflection are needed and they might be accessed through approaches to knowledge stemming from transformation of how we relate to the world, to ourselves, to each other and to the future. Throughout this transformative process, design stumbled on the language of togetherness, "the manner of co-existence, the biology of love" developing the ability to meaningfully synthesize transformati vewaysofknowingbypracticing relational moves withtheworld: Towards/Inwards/Outwards.Thesemovesco-respondtohow design has been modulating the language of aesthetics in its phenomenological modes aer encountering interdependence, letting it start a processofontologicaltransformationindesign itself, ultimately committing to the urgetonurtureitthroughmodesofExploration/Experience / Performance. Thus, the paper will unpack each move in light of the set of lenses, aiming at participating in decision making discourse by nurturing transformation literacy from a designerly perspective, namely a perspective stemming from a discipline whose existence is boundtorelationalitytotheother-theinterlocutor,thedancer,thelover,andtheloved.

Author keywords

designerly ways of knowing; aesthetic engagement; cognition; interdependence; transformation.

1. Losing touch: of gaps, rifts and divides

Distance is the dimension that seems to guide recent phenomena in both human and more-than-humanhappeningsandbecomings.

From pandemics to wars, from wildfires to floods, we carried out our existence in polycrisis (Lawrence et al., 2023)asdivided,separated,disconnectedbodiesfromnature,fromeachother, from our own self. By outlining a trifold divide, Scharmer (2009)clearlypinpointswhatisbeing lost as those ris grow in depth, dividing us more and more: in the ecological divide we are confronted with the loss of nature, in the social divide we dwell in thelossofcommunity,and, lastly, in the spiritual divide we trudge in the loss of meaning. Such divides dilate the fabricof reality, distancing each other to the point that it seems impossible to sit at a table and decide about our common futures, since "not only are we divided among different parties, different factions, religions, ideologies; but also, and maybe more deeply, each of us is divided inside ourselves"(Latour,2014).

However, it is by overcoming the illusion of separateness (Bateson, 1982),andstartingdancing with complexity (Meadows, 2001), that we recognise the entanglement of interdependent relationshipsweareimmersedin(Barad, 2007;Haraway,2016).

With polycrysis bringing economical, social and environmental conflicts,wearefacing,divided, ontological conflicts, namely conflicts over life itself, challenging our very modes of existence (Steffen et al., 2015; Bratton,2022).Thus,anontologicalshi isrequired,whosefoundationslay on turning "humanactivityfromdestructio ntoparticipation[...inthehallmarksof]largenessof heart, breadth of perspective, practical competence, moralsta minaandthekindofintelligence that discerns ecological patterns (Orr,2002).Thecallforacertain"kindofintelligence "suggests exploring ways of knowing that differ from the ones through which we "measured the world", thinkin gitin"bitsandpieces"(Orr,2002).

This is a challenge especially to decision makers - i.e. policy makers -, since it addresses how they usually learn from and about the systems they have agency on and how those same systemsrespondtothoseinterventions (Cugueró-Escofet&Rosanas,2017).Asaresult,themyth of "rational mastery" falls as the need of transformation through transition (United Nations 2015; Olsson et al., 2017) poses layered, interconnected and multifaceted challenges to world-building practices, since it depends on how transformation is being translated from "an academic concept into anassemblageofnormativepoliciesandpractices,andhowthisprocess mightshapesocial,p olitical,andenvironmentalchange"(Blytheetal.,2018).

Divides and distances of our times are a symptomofthegapsandrisofknowledgethatwould be needed to navigate polycrises in search for pathways to better, sustainable, and desirable futures.

1.1 Aim and methodology

With the Next european Renaissance fostering the power of creativity in realizing our interconnected existence and stimulating critical imaginaries of collectivetransformation(Ehn, Nilsson,& Topgaard 2014; Irwin, Kossoff, & Tonkinwise, 2015; Light et al., 2022), the paper addresses contemporary crisis in ways of knowing and the consequential need for other relationships toknowledge,andultimatelyevenanewconceptionofit. Thisiscertainlyamatter of design too, whose contributions participate in shapingourunderstandingandsensema king, alongascaleofinterventionthatgoesfromnarratingtheworldtowhisperingtotheself.

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loration/Experience/Performance. The tri-faceted, co-responding model is being developed,exploredandtested withinadoctoral research carried out by the author. It can be thought of as a set oflensescomingfromexisting mo delsthatmightbelinkedtotheinterdisciplinaryfieldoftransformationliterature:

1.Scharmer's (2009) trifold conditions - Quality of Attention / Quality of Intention / Quality of Presence-combinedwiththeirtrifoldresults-OpenMind/OpenHeart/OpenWill.

2.Walsh et al. (2020)'s framework about Relational Modes in Knowing - Epistemology / Being -Ontology/Doing-Ethics.

Thus, the paper will unpack each move in light of the set of lenses, aiming at participating in decision making discourse by nurturing transformation literacy from a designerly perspective, namely a perspective stemming from a discipline whose existence is bound to relationality to theother-theinterlocutor,thedancer,thelover,andth eloved.

2. Leaning towards: explore

By losing touchoninterdependence,weexperienceaprofoundalienationleadingto"thefailure to imagine differently" (Del Sesto, 2022) within infrastructuralandhard-wiredlock-ins.Thefirst step to healing lies, then, in the reawakening of social imagination and how werelatewiththe world. For Mills, sociological imagination is a modeofthoughtthat"enablesustograsphistory and biography and the relations between thetwoinsociety",repre sentingthe"capacitytoshi' fromoneperspectivetoanother"(MillsinDelSesto,2022).

Thus, the pathway towards ontological change starts in attitudes and stances of leaning towards: it is in the Quality of Attention that one brings to any situation (Scharmer, 2009) that interdependence is unveiled; it is innoticing(Tsing,2015)andco-responding(Ingold,2017)that new perspectives ariseinthecreationofintegrativekno wledge,takingthefirststeptorepairthe distancethroughalternativewaysofknowing.

By framing design as a mode of social action (Resnik, 2019), designedstuffturnsintodesigned something (Sanders & Stappers, 2013), embedding its practices into everyday life through intervention with real people in real places.Itisaworld-buildingpracticewhosespecialgripon the experientiallayerofeverydaylife,eventually participatesinshaping-morethandistributing - the sensible (Dixon, 2020).Here,speculativedesign(Dunne&Ra by,2013)provokes,questions, frictions, pushes out of the comfort zone, cultivating sociological imagination through prototypes, here understood as "staging ground[s] that help visions of society take form by activating the civic imagination through making and theuseofmadethings"(DiSalvo,2022).In fact, leaning towards through design means activating relational modes of Knowing thanks to prototypes framed as "as both modes of knowledge-production and cultural and sociological styles of exchange and interaction" (Corsín Jiménez, 2014). Here,designcontinuouslyreframes its own lenses to interpret the world, to carve new tools and practices out of philosophies of interdependence to open new perspectives in design practices (Tassinari, Manzini & Escobar, 2020). Prototype's invitation to exploration, curiosity and playfulness nurture the Open Mind addressing the quality of Attention, in a way that social dreaming is made lively again in the renewed encounter of astonishment and awe behind alternative ways of thinking, and, thus shorteningthedistancethroughrelational modesofKnowing.

3. Turning inwards: experience

Underneath possibilities - and their real-life transposition through prototypes-liesthebroader theme of agency, power and the double-faced concept of capability: on one side, one's own possibility to enter the system's grid andactonit;ontheotherhand,thecapacityofthesystem to be actionable. Drawing from philosopher Martha Nussbaum (2011), capabilities can be understood as the ability of being and doing, enacted in opportunities to choose and toact.In this sense, capabilities embody the meeting point of the possibility to act in the system

according to our inner drives. Before any action to be taken - doing -, the path towards transformation goes through the being, namely the "source from which we operate in the system,[...]theinteriorconditionoftheintervener"(Scharmer,2009).

If leaning towards creates awareness about interdependence as systems' default mode of functioning through the openness of mind, then we need to turn inwards to heal the cracks in aspiration to future(s) and achieve the flourishing of deep empathy, of the Open Heart. This means that the unfolding of one's own life in a system draws primarily on personal wellbeing and their Quality of Intention. Just as recalling the "spell of the sensuous", talking to the innermost self means talking thelanguageofperception,which,designerlyspeaking, translates in "aisthesis", the Greek word for "sensuous sensing" and, therefore, "sensuous knowing". To heal interdependence means to reactivate the sense of interdependence: we need contextual, situated knowledge (Haraway,2020)tobecra'edbythosewhoexperiencethesystemandwhat they actually experience within the system. In other words, we need to feel interdependence, unlocking Relational modes of Being through an act of "letting oneself be touched" (de la Bellacasa,2017).

Design talks to the senses by demanding presence of mind and heart: the experiential component of design artifacts - whether they being material and or immaterial - stimulates emotional responses and cultivates intimacy with one's own self. Reconnecting to personal emotional intelligence is the way to acknowledge the value of first-person perspectivesandits related ways ofperceiving-and-knowing(Desmet,&Hekkert,2007;Berleant,2010;Dixon,2020). This is a designerly reading of Scharmer's (2009) presencing, namely the experiential engagement in sensemaking and actualization of our agency in situations leading to new relationships with meaning and metabolism of those same relationships: in other words, presencing through design could intensify experiential and expressive depth in how we make senseoftheworld.

4. Stepping outwards: perform

Moving inwards creates awareness about our "relation to the possible" (Del Sesto, 2022), our empowered stance, as social creatures to work within the cracks and failures of reality. Following Nussbaum's (2011) unpacking of capabilities as made of doing and being, we understood that by moving inwards through design we might better inform our choices of actions, which wouldstemfroma"more-than-itself"self. AswekeeponbuildingbridgestohealdividesweknowhaveanOpenMindandOpenHearttomoveoutwards,andmanifestScharmer's OpenWill,ourownagencyininterdependence.

This resonates with how design is currently working with "real people", namely agents whose agency participates in interdependent relationships. "In a world in rapid and profound transformation, we are all designers": what Manzini (2015) is that the more unstabletheworld becomes, the more people "must learn to design their own lives": here, by recalling the taoist teaching "give a man a fish andyoufeedhimforaday. Teachamantofishandyoufeedhimfor a lifetime"(Tse,ed.2011)Manzini'sreadingofdesign'scapabilityapproachis aboutwellbeingas emerging from people's capability to shape it. However, to do so, they need to be properly informed. As such, capabilities are transmitted through designed situations - actionable conversations, provocations - that bring individuals togetherincollectiveinstances,wherethey are empowered and called to perform their Open Will.Co-designpractices(Björgvinsson,Ehn& Hillgren, 2010; Britton,2017;Meroni,Selloni,&Rossi,2018)unfoldinaspacewhereparticipants' knowledge and perspectives connect, friction, merge. Here, design unlocks shared leadership emerging from being together and enacting decentered modes of decision and action by steppingoutwards:invitingcollectiveactionwhileembodyingtheinterdependence.

Stepping outwardsthroughdesignmeanspracticingcareasstewardship,enteringthepossibility of embodying different roles and "becoming" change: here, the Quality of Presence unfolds through an embodied awareness,

staged through design's peculiar modesofcreatingaesthetic engagements of inclusive intention and effective, convivial action. Designed instances of Relational modes of Doing trigger more-than-contemplative practices, in which design contributes to not only spreading the seed of transformative ways of knowing, but, most importantly it creates evidence towards the reassessment of embodied cognition (Varela, Thompson & Rosch, 1991) as a valuable means of knowledge generation to ultimatelyhealthe separationofbodyandmind.

5. Learning onwards: it takes two to tango

"I certainly feel such division. Indeed, it is to this place of internal conflict that I look for the couragetoaddressyoutonight".

With these words Latour (2014)openshislecture,whose"Wearedivided"aimedathighlighting what has keptondividingus,thatis,towhathasdestroyedthefeelingofinterdependence.With distance manifesting as "anaesthesia", namely the abstraction and alienation coming from the missed engagement insituations,decisionmakersareinsearchforintegrativewaysofknowing, todancewithinterdependence.

Here, thanks to design's grip on the sensuous layer ofreality,wecantapintomore-than-verbal ways of knowing. Following Maturana andVarela's(inEscobar,2018)comment,againstmodern logocentrism "we have only the world that we bring forth with others, and only love helps us bring it forth". This is an ode to relationality and design naturally co-responds to relationality, since it aims at intervening inone'sownlifethroughformsthatfollow function,or,rather,forms following inclusion, participation, collaboration, respect, consciousness, compassion. All these values are framed, practiced and performed in embodied, and, thus, transformative ways of knowing: by triggering alternativeresponsesthroughtheirpresence,designedartifactscultivate interdependence as a mode of living autonomously the communal, integrating intimate intentionality with the collective will to attending to future(s), both openedupandresponded towhileexploring,experiencing,andperformingtogether.

In this sense, a lifelong journey through the lenses of design awaits: we willbelearningtostay with the trouble in interdependence by doing moves on the music of interdependence, responding to its rhythms, whilebeingresponse-ableforitspolyphony.Stemmingfromsuchan awareness in responsibility lies a designerly caution,theattitudethatTomàsMaldonado(1971) invites in designers, who, in times of polycrisis, turn into visionaries in service of society, "inventors of scenarios and strategies [who] must play in the territories of the imagination to createnewstories,newfictions,whichwilladdtothethicknessofthereal"(Branzi,1999). With transformative ways of knowing being more and more practiced, further research questions would inquire about modes of sustainability of such practices, namely working on their legibility in the eyes of decisionmakers,whichgrowswithtransformationliteracy,namely the unpacking of transformative processes. Indeed, this opens to a paradigmatic challenge about what set of stances and language, as well asinfrastructuresandnetworkswouldworkto build on embodied transformation as a source of integrative knowledge intimesofpolycritical transitionstowardscommon,desirablefuture(s).

References

Barad, K. (2007). Meetingtheuniversehalfway:Quantumphysicsandtheentanglementofmatter andmeaning.DukeUniversityPress.

Bateson,G.(1982).StepstoanEcologyofMind.JasonAronson.

Berleant,A.(2010).Artandengagement.TempleUniversityPress.

Björgvinsson, E., Ehn, P., & Hillgren, P. A. (2010). Participatory design and" democratizing innovation".InProceedingsofthe11thBiennialparticipatorydesignconference,41-50.

Blythe, J., Silver, J., Evans, L., Armitage, D., Bennett, N. J., Moore, M. L., ... & Brown, K. (2018). The

dark side of transformation: latent risks in contemporary sustainability discourse. Antipode, 50(5), 1206-1223.
Branzi, A. (1999). La casa calda: esperienze del nuovo design italiano. Idea Books.
Bratton, B. (2022). The revenge of the real: Politics for a post-pandemic world. Verso Books.
Britton, G. (2017). Co-design and social innovation: Connections, tensions and opportunities. Taylor & Francis.
Corsín Jiménez, A. (2014). Introduction: The prototype: More than many and less than one. Journal of Cultural Economy, 7(4), 381-398.
Cugueró-Escofet, N., & Rosanas, J. M. (2017). The ethics of metrics: Overcoming the dysfunctional effects of performance measurements through justice. Journal of Business Ethics, 140, 615-631.
de La Bellacasa, M. P. (2017). Matters of care: Speculative ethics in more than human worlds. U of Minnesota Press.
DelSesto, M. (2022). Design and the Social Imagination. Bloomsbury Publishing.
Desmet, P., & Hekkert, P. (2007). Framework of Product Experience. International Journal of Design, 1 (1), 13–23.
Dunne, A., & Raby, F. (2013). Speculative everything: design, fiction, and social dreaming. MIT press.
DiSalvo, C. (2022). Design as democratic inquiry: putting experimental civics into practice. MIT Press.
Dixon, B. S. (2020). Dewey and design: A pragmatist perspective for design research. Springer Nature.
Ehn, P., Nilsson, E. M., & Topgaard, R. (2014). Making futures: Marginal notes on innovation, design, and democracy. The MIT Press.
Escobar, A. (2018). Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds. Duke University Press.
Fry, T. (2010). Design as politics. Berg.
Haraway, D. (2020). Situated knowledges: The science question in feminism and the privilege of partial perspective. In Feminist theory reader, 303-310. Routledge.
Haraway, D. J. (2016). Staying with the trouble: Making kin in the Chthulucene. Duke University Press.
Ingold, T. (2017). On human correspondence. Journal of the Royal Anthropological Institute, 23(1), 9-27.
Irwin, T., Kossoff, G., & Tonkinwise, C. (2015). Transition design provocation. Design Philosophy Papers, 13(1), 3-11.
Latour, B. (2014). War and peace in an age of ecological conflicts. Revue juridique de l'environnement, (1), 51-63.
Lawrence, M., Homer-Dixon, T., Janzwood, S., Rockstrom, J., Renn, O., & Donges, J. F. (2023). Global Polycrisis: The causal mechanisms of crisis entanglement. Available at SSRN 4483556.
Light, A. (2022). Ecologies of subversion: troubling interaction design for climate care. Interactions, 29(1), 34-38.
Light, A., Gray, C. M., Lindström, K., Forlano, L., Lockton, D., & Speed, C. (2022). Designing transformative futures. In Proceedings of DRS2022.

Maldonado, T. (2022). La speranza progettuale: ambiente e società. Feltrinelli Editore.
Manzini, E. (2015). Design, when everybody designs: An introduction to design for social innovation. MIT press.
Maturana, H. R., & Verden-Zöller, G. (2008). The origin of humanness in the biology of love. Imprint Academic.
Meadows, D. (2001). Dancing with systems. Whole Earth, 106, 58-63.
Nussbaum, M. C. (2011). Creating capabilities: The human development approach. Harvard University Press.
Olsson P, Moore M-L, Westley F R and McCarthy D D P (2017) The concept of the Anthropocene as a game-changer: A new context for social innovation and transformations to sustainability. Ecology and Society 22(2).
Orr, D. W. (2002). The nature of design: ecology, culture, and human intention. Oxford University Press.
Redström, J. (2017) Making design theory, The MIT Press.
Resnick, E. (Ed.). (2019). The social design reader. Bloomsbury Publishing.
Sanders, E. B. N., & Stappers, P. (2013). Convivial Toolbox: generative design research for the fuzzy front end. Amsterdam: Bis Pub.
Scharmer, C. O. (2009). Theory U: Learning from the future as it emerges. Berrett-Koehler Publishers.
Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., ... & Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. Science, 347(6223), 1259855.
Tassinari, V., Manzini, E., Escobar, A., Huybrechts, L., & De Rosa, A. (2020). The politics of nature. Designing for an ontological turn. DESIS philosophy talk# 7.2. In Participación (es) Otras/Participation (s) Otherwise (3), 488-493. Universidad de Caldas.
Tse, L. (2011). Tao te ching. Mauad Editora Ltda.
Tsing, A. L. (2015). The mushroom at the end of the world: On the possibility of life in capitalist ruins. Princeton University Press.
UN. (2015). Transforming Our World: The 2030 Agenda for Sustainable Development. Rome: United Nations.
Walsh, Z., Böhme, J., Lavelle, B. D., & Wamsler, C. (2020). Transformative education: Towards a relational, justice-oriented approach to sustainability. International journal of sustainability in higher education, 21(7), 1587-1606.
Varela, F.J., Thompson, E., & Rosch, E. (1991). The embodied mind: Cognitive science and human experience. Cambridge, MA: MIT press

Textile accessories as meaning making for Contextualizing Museum archives

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Abstract

Cultural changes and technological advancement have become an integral part of our society and all fields of Art and Design. New challenges like technology and economy give an impression of aesthetics in which digital printing has become a common technique in developing the textile surfaces. Historical images of antiquities are more accessible through digital mediums. Contrary to this, the primary data from archives is a part of empathy associated with the historical collections in the museums of Lahore, Punjab, Pakistan. The museum archives having history accessible only to researchers. As mentor researches and images from repository became topic to make aesthetic images accessible for young graduates of BS design. As a mentor it is important to inspire young undergraduates and enable them to connect with museum archives to empathize in reviving the imagery into their work. Mughal miniature Art is in the permanent collection of the government museum's display and archives. Second collection of images with historical reference having hybrid imagery in miniature are with private collectors in Lahore and in connecting. These repository have social and cultural influences of the past in which Chinese imagery is one of the components. Primary data of multi-culturalism is gathered from the museums for the undergraduate students becomes the part of their meaning-making process for textile ornamentation. The archives have the references of multiple works and practices of the past done in multiple techniques of Art and Design which were manually created through ornamental techniques like painting, illustration and products. Currently for design students there is variety to develop ornaments manually and with computer-added design. Multiple influences of Chinese flora and fauna with the mythological stories can be observed in the collections of Lahore Museum's folios. The contribution as mentor was to make it available for access. It is not directly available as the student number is large so as researcher images were taken and shared with BS students of Textile Lahore College for Women University through storytelling and building narratives. In Foundation Year studies students of design foundation course briefing was given by discussing miniature visuals and gallery present within museum. To engage the learner's archive images played vital role for themes and in narrative building. The limited accessibility to museum archives is a reason of promoting dialogue between student and mentor. For the data analysis, students start with writing notes, journaling, manual and digital photomontages to interpret their work accessories in textile materials. This study will provide a pre-context for art and design instructors to contribute further in connecting with their heritage and bringing it down to the undergraduate design students interpreting their work as part of their course. Theoretical research uses inductive method and practice emerged strategies more as a delegator and facilitator to generate argument from analogy to a more causal inference. The engagement with heritage may result in academic projects and skilled based learning of under graduates.

Author keywords

Art and Design, Inherited Heritage, Museums. Chinese influences, undergraduates, Textile and Fashion.

Introduction

The inherited collection in the Museum of Lahore Pakistan is accessible to all but in limited ways. The reason is the protocols related to visits which are maintained due to the perishability of collections in archives. Students re-contextualize inherited history as folios of Miniature Art with Chinese imagery in their work for textile accessories to find out images that are present in the visual vocabulary but the historical links are less explained.

Pakistani culture is combined with indigenous cultures prevailed geographically. The variability in culture was adapted due to in-land invasions in which Alexander's route of invasion to South-Asia was through the areas of Punjab, Pakistan. Other cultural influences were aesthetically intertwined due to the constant shift of anarchy in Punjab Pakistan Chinese, Persian, and later Sikh and British laid down multiculturalism effected and built areas in aesthetic field of Art and Design work present in museums of Lahore to communicate visual evidence of past influences.

This study will incorporate the role of a mentor to make students available to the visuals that have foreign influences in which Chinese reflection is prominent due to its traditional vocabulary and regional connectivity present in Museums. The purpose of working with archives is to contextualize and bring the effects of multiculturalism in the works of BS-Design students at Lahore College for Women University as an external examiner for their thesis of final year and with the foundation year students (II semester) of Pakistan Institute of Fashion and Design, Lahore. Work interpreted design thinking process for design basic learning. The teaching methodology was to maintain analogy to make the students connect and feel independent to propose and express inductive observation. The external queries and communication was done digitally by showing primary data in Pakistan Institute of Fashion And Design during teaching historical and cultural narratives in studio class. Greene educationist explains relation of mentor and student has assessed the experience of students as a principal in art education concepts concluded that art and design education needs to be slightly modified to engage and enhance the creative expression of the student's narrative/story telling in one of its component to motivate. (Greene. B, 1948). Concepts were primarily based on four principles: objective viewpoint, flexibility, working independently, and socialized individuals to communicate.

(Kroeber & Kluckhohn, 1963) explains that the culture is multifaceted culture, vibrant, shared, learned, and can be transmitted from generation to generation or group to group. Further stated culture reveals an interconnectedness of key elements and responses to fundamental changes in the conditions and circumstances of life.

Nieto (2002) defined cultures as ''the ever-changing values, traditions, social and political relationships, and worldview created, shared, and transformed by a group of people bound together by a combination of factors that can include a common history, geographic location, language, social class and religion''

(Bhatti, 2012) writes in her book Translating Museums "A counter-history of South Asian Museology" reveals the local perceptions and uses of museums in non-western societies to be fraught with social, political, and cultural implications and appropriations museums are one of the biggest challenges faced in multiculturalism, Bhatti examines the history for exchange between multiple influences gathered under a roof which is beyond the limits of borders and states but more of inheritance applied on visual culture.

One example is the fashion line of Pakistani female shirts with dupatta/head scarfs designed with Chinese motifs. It was a pluralistic imagery of Chinese culture. The fashion/textile line Gul Ahmed a well well-known Pakistani textile industry introduced it for females in 2018. Chinese elements of flora, fauna and architecture as printed on female tunic/shirt to showcase pluralism within cultures and a variety of pattern was presented

in the Pakistani collection, Figure1 (GulAhmedshopblog.com, 2018). The art of digital prints with architectural environment portrayed in the miniature images of the Lahore Museum thoughtful cultural and historical context of the time line is expressed of traditional architecture. Figure 2. The event were mythological written or painted Chinese dragon with Chinese facial expression are common. There are a variety of designer houses in Lahore where most of the textile and fashion designers are the graduates of Lahore Institutes. The institute courses have multiple examples of cultural adaptation and are part of their Art and Design BS-design courses students learning is reflected through elements in collection of fashion and textile designers one of collection is of Gul Ahmed collection.

Figure 1. Gul Ahmed/shopblog,2018

Figure 2. Lahore Museum A-809

Figure 3. Manuscript

Pedagogical cycle for research-based learning for students of Art and Design

The pedagogical cycle for a mentor is to guide the student to do step-wise; first part is to make student explore and to collect observational data from museum's collective/archives later to be interpreted in solutions by narrowing themes for surface ornamentation or of products for textiles. The parameters were suggested by instructor like milestone exploration/storytelling, showing visuals of archives through museum visits and research presented with the mentor. Interpretation of the students was communicated through reflecting to the research/theme, collages and photomontages. During ideation phase, the students discussed their scope of interest by narrowing down the list of collected images. Evolution is part of the final product objects developed with Chinese work and inspiration. (Gavin, Harris, 2015) This article introduces approaches of teacher/mentor response towards students' analytical approach of work done through research of museum archives.

Exploration

Students communicated their part of understanding after looking at the images physically in the Museum or digitally present in their design studios. Students responded through decision-making; areas of interest were narrowed down through writing reflection. The parameters were suggested by the teachers and in this article the process/ pedagogy supports the student-centered learning.

Interpretation

The collected data by students are images. The collection of images is further used to overlap collages manually and photomontages digitally. The results are considered as research/theme boards. They were expressing

their thoughts by analyzing shapes, patterns and textures. The miniatures provided from Lahore museum gives vision into the artistic techniques and styles of the era with attire of figures, as well as the social and political values of the emperor who commissioned these piece of Art. Documenting these images, art and design students can gain knowledge and appreciate the role of art to be used as tactile surface by replicating the sensual effect. To connect with the atmospheric effect of Chinese repository elements shown to students of Lahore museum miniatures and Sikander Nama from private collection of Hur Gardezi from Multan Punjab, Figure 3.

Ideation

Observational data interpreted as boards are part of the process of product making having the theme/narrative reflecting. Students learned hand skills like composition, overlapping, creating textures, and rendering. Analytical decision-making in the area of working on theme boards is one of the milestones. A mentor is to encourage and communicate with visual language about the appropriation of selected images and recreating the effect to reflect into textile surfaces and objects. Figure 4.

Experimentation

Figure 4. Water color renderings

Figure 5 pencil color renderings

The students' work is connected to the social and cultural innovation comes to the implementation phase through sketches and low fidelity part which gives students an opportunity to express the chosen areas of experiment as a response or dialogue which was created by the initial part of the discussion of showing Chinese elements portrayed in visual vocabulary. The color palette is chosen to achieve the serene atmosphere and to achieve the Chinese concept of fire, earth, wind, water and metal where all hues and shades of colors are inspired by nature. Student were asked to recall the environment and approaches connecting their work with a critical awareness of nature as part of the culture they endure and reflect in their work to achieve true essence. Sketches measured the number of products and few areas were rendered with two-dimensional tools to attain the effects that symbolize the traditional Chinese element's inspiration.

Figure 6 Water color renderings

Figure 7 Textile thread work

Evolution/results

The works displayed by students as a result were wall panels, digital prints for shirt, scarves, and table runners there was numerous surface renderings that were on display.

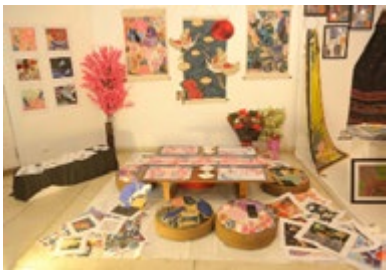

Figure 8 Display of work Chinese elements Textile accessories

Figure 9 Chinese display Lahore Museum

Figure 10. Hanfu Lahore Museum

Figure 11 Lahore Museum, Ivory soldiers.

Conclusion

The foundation year studies students at Pakistan Institute of Fashion And Design were 15 to 20, among 240 students who directly selected the elements and essence of Chinese elements whereas in Lahore College for Women University where my role was mid and final juror, there was a thesis student of final year BS textile Design who expressed a style away from their space and inhabitants developed through the lens of visual culture which is in the museums of Lahore as still display in Chinese gallery at Lahore Museum. The recent exhibition in the Lahore museum in May 2023 Figure 9, 10, 11. Mr. Hao, Director of the international office of Hebei Academy of Fine Arts and from Pakistan Dr. Zarawar Khan, Department of Tourism and Hospitality, University of Swat paid their compliments on merging Chinese art, craft and displayed historical details to communicate the cultural communication between the two countries, Pakistan and China (pakisatntoday.com, 2023). This study is associated with the border spectrum of teaching and learning pluralistic images as our own and as mentors identifying the foreign influences like Chinese imagery to communicate as historical love and empathy. This study communicates multiple level mentorship, assigning step by step-by-step milestones for students to achieve through the process of analytical skills by acquiring primary data and skills to develop a gradual interpretation of work from two-dimensional to three-dimensional for the students of art and design. Following two examples 2023 mid-season Maria. B collection with Chinese elements. This example explains the students of Pakistan Institute of Fashion and design past learning of inherited elements during their BS course reflecting again after years of span of graduation.

Figure 12 Design by Maria B 2023. Image Maria B Boutique, Emporium Mall Graduate. Pakistan institute of Fashion And Design

Figure 13 Sleeve with Chinese, Wabei design. Image Mari B, Boutique

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References

Bhatti, (2012) Translating Museums A counter history of South Asian Museology, Taylor and Francis pp.97

Gavin, Harrison (2015) Design Thinking for visual communication, Blooms Bury Academic. UK. pp. 61-79

Kroeber,A.L., Kluckhohn. D (1963) Culture A critical review of concepts and definitions. New York, NY: Vintage Books pp.48

Nieto,S (1999). The light in their eyes: Creating multicultural learning communities. New York, Teacher College Press pp.48

Naz, Saba. (2018). Accentuate you Look. The evocative land of China, in particular. The Oriental Collection Gul Ahmed Fashion, https://www.gulahmedshop.com.

Maria.B boutique Emporium Mall Lahore. Mid-season collection 2023.

Echoes of affection: crafting spaces of healing in sheltered workshops for the elderly

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Abstract

Sheltered workshops in Hong Kong play a pivotal role for individuals with intellectual disabilities (IDs), offering both skill development and social integration. However, many current workshop designs overlook the specific needs of ageing trainees. This paper identifies primary design shortcomings in these workshops, pinpointing issues like constrained space, insufficient lighting, and overstimulating materials. By emphasizing healing space as an expression of love, we put forth interior design principles aimed at fostering positive mental health outcomes. Central to our recommendations is the creation of inclusive spaces that resonate with the holistic needs of ageing trainees. This includes strategic decisions regarding colour, lighting, spatial layout, and material choices, all anchored in an ethos of empathy. Drawing inspiration from the Optimal Healing Environment (OHE) framework, this study advocates for a design approach that elevates the well-being and autonomy of ageing trainees with IDs, pushing for a more inclusive and considerate design paradigm.

Author keywords

Sheltered workshop; ageing; inclusive design; interior design; healing space;

Introduction

Globally, about 1% of the population, translating to approximately 78 million people, lives with an intellectual disability (ID), which includes conditions like Down's syndrome and Autism Spectrum Disorder (ASD) (Hirtz et al., 2007). Alongside these challenges, they often grapple with issues like sensory loss and deteriorating social skills. Historically, societal misconceptions have led to the stigmatization of these individuals. Such prejudices don't only amplify their personal challenges but also sideline them from key decisions, especially in the development of sheltered workshops, which play an essential role in their community integration (Li, 2004).

As the global elderly population swells, so too does the number of aging individuals with IDs. This trend is projected to persist into the foreseeable future (Reppermund & Trollor, 2016). This burgeoning segment of

population poses distinct challenges to socio-economic structures. Adding complexity to ageing, people with IDs have a heightened risk for several health conditions, including diabetes, hypertension, obesity, cardiovascular diseases, and mental disorders, compared to the general population (Reppermund & Trollor, 2016). Despite ample research on general aged care, studies on the aging ID population remain scarce. As a response, the World Health Organization's report on Ageing and Intellectual Disabilities calls for tailored national health and social policies to adequately support this demographic as they age (Janicki & World Health Organization, 2001).

Extensive research in environmental and architectural psychology underscores the profound influence of the physical environment on both mood and behaviour (Ashik et al., 2020). Beyond shaping our day-to-day experiences, our surroundings exert both immediate and enduring effects on health and well-being (White et al., 2020). Urban emergencies, such as the pandemic, have further spotlighted the importance of environment, where increased isolation has exacerbated feelings of loneliness and disconnectedness, especially among vulnerable groups (Lai et al., 2021; Wang et al., 2023). Such events amplify the essential role the built environment plays in preserving the mental health and enhancing the quality of life, especially for individuals with intellectual disabilities (Roos et al., 2022).

Sheltered workshops, distinct from traditional workplaces, are tailored to empower individuals with IDs. Instead of the conventional boss-employee dynamic, these environments have "supervisors" mentoring "trainees". A workshop is often part of a residential facility and thus shares some of the goals as such an institution: to protect communities from deviants, to protect inmates from being exploited, and to assist them in rehabilitating themselves. In Hong Kong, sheltered workshops aim to bolster both the social and economic potential of these individuals, transitioning them from passive support recipients to active societal contributors (Chow et al., 2018).

Individuals with IDs bear unique vulnerabilities, such as heightened stress susceptibility and limited coping strategies. Consequently, they often become deeply reliant on their surrounding environment. In this context, sheltered workshops transcend their traditional definition of workplaces. For those with IDs, these spaces emerge as safe haven—connecting them with the community, nurturing self-identity, and offering the profound experience of human connection. They are supposed to be places of solace, providing a comfortable environment that caters to their physical and mental well-being (Roos et al., 2022; Schoufour et al., 2014).

Despite the many benefits of sheltered workshops, there's a notable gap: while considerable research has been conducted on the built environment's influence on the quality of life for people with IDs, very few attentions has been given to the interior environment of sheltered workshops and its impact on aging trainees (Roos et al., 2022). The potential and importance of an inclusive environment within sheltered workshops with age-friendly considerations, especially in places like Hong Kong, are yet to be fully explored and appreciated.

Given these challenges, it's crucial to adopt innovative strategies that can usher in a transformation, making the environment more age-friendly, the societies more inclusive and welcoming. This study embarks on an initial exploration of introducing space of healing within the sheltered workshops, to create a more inclusive environment of the sheltered workshop focusing on the ageing trainee.

Special needs of ageing trainees in Hong Kong's sheltered workshop

Ageing in itself is a complex transition, but for individuals with IDs, it can be accentuated with sudden realizations of bodily changes, making it overwhelming to adapt. Individuals with intellectual disabilities are aging at a faster rate than their counterparts in the general population. This expedited aging process results in a range of challenges, from physical declines in body function and mobility, a decline in social and previously

acquired skills, decreased physical acuity marked by diminished sight, and hearing, balance, and flexibility, alongside increasing aches and pains, to significant shifts in psychological conditions (García-Domínguez et al., 2020). Coupled with this is the increased susceptibility to a slew of age-related disorders (Schoufour et al., 2014). Notably, dementia poses a particularly grave threat, with people with ID facing a risk four to five times greater than that of the general populace (Schepens et al., 2019). Especially at risk are those with Down syndrome, who often witness an earlier onset of symptoms, including cognitive decline (Reppermund & Trollor, 2016).

Sheltered workshops are now facing the challenges of an aging demographic. As these trainees age, their care requirements become more specific and complex, adding layers of management intricacies. What's notable is that many of these individuals often remain anchored to the interests of their younger selves, displaying a fondness for music, movies, games, and attire from bygone eras. As age advances, this nostalgia, combined with the emotional isolation of growing older, can lead to a grumpy disposition (Evenhuis et al., 2012). Interventions need to be ranged from simple positive affirmations about their appearance, promoting better grooming and hygiene, to structured guidance ensuring they understand they aren't alone in these experiences. It's also prudent for service providers to develop a tailored "training list" for assistants in the workshop to better cater to the evolving needs of aging trainees. In addition to ageing trainees' needs, public health emergencies such as the COVID-19 pandemic also called for better hygiene in the workshop facilities to prevent the spread of the deadly virus among vulnerable, ageing trainees.

Despite these challenges, global strategies emphasize the need for tailored approaches, such as pre-employment transition services and customized employment options, aiming to bridge the gap between vocational training and sustainable employment for this vulnerable demographic.

Healing Spaces as Expressions of Love

Love in design signifies care, empathy, and a deep connection, shaping spaces that emphasize well-being and connection between individuals and their environment (Arman & Rehnsfeldt, 2006; Helne, 2021). This philosophy, rooted in a respect for nature, views the built environment not just as aesthetics, but as a reflection of our bond with the environment and each other (Hanna et al., 2019; Mondal & Majumder, 2019). More than its physical manifestation, love in design promotes inclusivity, championing spaces that are accessible and welcoming to everyone, irrespective of their age or abilities. Spaces like sheltered workshops are clear indicators of societal values, showcasing our commitment to supporting vulnerable groups, such as those with intellectual disabilities (Jian et al., 2020; Siu et al., 2017). Central to this consideration is the concept of an Optimal Healing Environment (OHE), a setting where individuals are surrounded by elements that amplify their innate healing capacities (Sakallaris et al., 2015). As further delineated by DuBose et al. (2018), this OHE framework evolves into four primary categories, each epitomizing a facet of the healing experience (Figure 1).

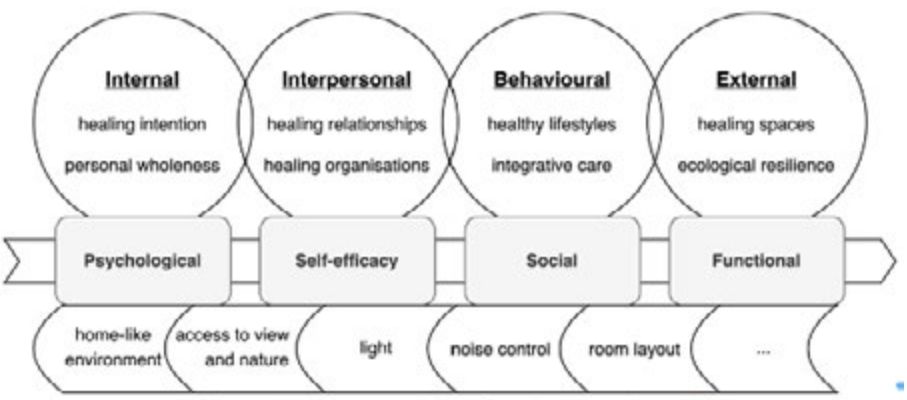

Figure 1. Healing spaces, adapted from (DuBose et al., 2018)

Specifically, the highlighted spatial factors are home-like environment, access to view and nature, light, noise control, barrier free environment, room layout (DuBose et al., 2018). To elaborate, a healing space should feel more like a comforting home. Such settings result in reduced pain and emotional distress, less behavioural issues and increased patient engagement in household tasks and individual activities. Another critical facet is its ability to connect trainees to the natural world. Spaces offering views of nature or incorporating indoor plants can considerably decrease stress levels while enhancing trainees' satisfaction. Customizing rooms with personal items and diversifying decorations throughout the facility can positively impact behaviour and integration. Eliminating mobility barriers not only fosters social interactions but also elevates self-care capabilities. Spaces that accommodate visual, auditory, and physical impairments bolster trainees' independence and autonomy. Essentials such as carpeting, handrails, and specialized furnishings cater to trainees with disabilities. Utilizing our sensory experiences transforms spaces into holistic healing environments. When designed with autonomy in mind, combined with assistive technology, these spaces not only empower trainees but also nurture emotional connections with visitors.

Spaces of healing in sheltered workshops for the ageing trainee

Current design issues and design principles

The researchers have conducted case studies, both foreign and local, as well as unobtrusive observations in sheltered workshops located in Hong Kong. In our case study analysis of sheltered workshops in Hong Kong, we identified several design inadequacies, some of which have become more pronounced when considering the ageing population within these workshops. Currently, these facilities do not make full use of available space, leading to both work and leisure areas being restrictively narrow, a concern that can be particularly challenging for the elderly who may require additional mobility aids. Moreover, there's a noticeable deficiency in natural and suitable indoor lighting—essential for ageing individuals with deteriorating vision. The chosen materials in these settings also often lead to unnecessary sensory stimulations, which can be overwhelming for older attendees. To remedy these gaps, our design guidelines emphasize an environment that takes into consideration colour choice, lighting, material selection and spatial layout.

Colour choice and visual sensitivity

Visual hypersensitivity and hyposensitivity influence the behaviour and interaction of ageing workshop trainees. Those with visual hypersensitivity may find brightness and certain colours overstimulating. They might be prone to distraction by movements and could fixate on particular objects or individuals during tasks. Conversely, trainees with visual hyposensitivity might miss out on nuances, recognizing only the broader outlines of objects. They might find brighter colours and robust sunlight beneficial, enhancing their reading capabilities and overall comprehension. Designing with these sensitivities in mind ensures an environment that is accommodating and supportive.

The visual perceptions of individuals with ASD are distinct and can be further nuanced as they age. Some older ASD patients might display intensified visual hypersensitivity. For instance, they may increasingly avoid direct eye contact as they age, becoming more reliant on peripheral vision to navigate their surroundings. Their gaze might be more fleeting, but it's essential to see this in the broader context of their ageing process and not merely as a trait of ASD. With age, while some sensory abilities might diminish, their cognitive strengths often remain robust. Many possess heightened spatial abilities, which, even in their later years, can translate into elevated levels of creativity and problem-solving skills. Recognizing and accommodating the evolving sensory needs of ageing ASD individuals ensures a supportive environment, allowing them to leverage their unique strengths and insights effectively.

Lighting

It's pivotal to incorporate soft lighting and ensure windows are unobstructed to allow ample natural daylight, benefiting both the overall mood and the visual needs of the ageing population. The effective lighting design in sheltered workshops encompasses the source, intensity, and luminance of light. Natural light is pivotal for enhancing mood and performance, but it's essential to ensure that such illumination, especially for ageing eyes, doesn't cause distractions or glare. Artificial lighting, specifically softer lamp lights, can be tailored to individuals with visual hypersensitivity, a condition possibly accentuated with age. Such soft lighting aids relaxation and maintains focus, proving particularly beneficial in settings where attention is paramount. As individuals age, a balanced approach to lighting, prioritizing both visibility and comfort, becomes crucial.

Material selection

When selecting interior materials, especially flooring, for sheltered workshops catering to the ageing population with unique sensory experiences, such as ASD patients, several key considerations come to the forefront. Primarily, slip resistance is paramount, ensuring the floor remains safe to navigate even when wet. Given the inevitability of falls, it's crucial that flooring offers a cushioned impact to mitigate severe injuries. This softness, while protective, also eases joint strain, making for a more comfortable walking experience. In relation to traversal, the floor's surface should be smooth and devoid of potential tripping hazards, enabling unimpeded movement whether on foot or with mobility aids. Durability is a requisite; flooring should withstand decades of use, resisting water damage, scratches, and general wear and tear. Lastly, while aesthetics is a consideration, it's secondary to the safety and comfort features. In tandem, furniture surface materials should also be chosen with these principles in mind, emphasizing safety, comfort, and functionality over mere stylistic appeal. These choices not only ensure physical safety but also empower ASD patients to navigate spaces more intuitively.

"Escape" Spaces

In designing sheltered workshops, especially keeping in mind the ageing population, the spatial layout warrants meticulous attention. Recognizing the evolving needs that come with age, it's imperative to offer a blend of shared and private "escape" spaces. This not only fosters community interaction but also provides much-needed solace for those moments when solitude is preferred. Taking ASD individuals as an example, their unique sensory processing necessitates a distinct approach to spatial sequencing. Some studies suggesting that ASD or ID patients is rather concern about the personal space, studies indicating that the average intimate distance is around 6-18 inches (0.15 – 0.457m). Meanwhile the Personal distance for interaction among good friends or family members is around 1.5 - 4 feet (0.457 – 1.219m). According to our research, the public circulation is typically crowded. Therefore, shorten hallways and corridor is a way to reduce unwanted social behaviour. Other than that, escape space in very beneficial in reducing disruptive behaviours and tantrums. ASD often remove herself from the group and sit in a corner, they would look over their shoulder at the escape space but could stay focused on the task at hand as if knowing the escape space was there if needed was sufficient for her to continue. In this case, spaces should be clearly delineated into zones, with each zone dedicated to a singular function or activity. Integrating sensory elements into the surroundings can bridge the gap between sensory experiences and behavioural performance, ensuring that ageing individuals, especially those with ASD, navigate and utilize the space with enhanced efficiency and comfort.

Conclusions

The essence of design in the context of sheltered workshops environments extends beyond aesthetics—it becomes an embodiment of societal love and commitment to those with IDs. The post-pandemic "new normal" presents novel challenges in daily living patterns, emphasizing the need for additional support for these

vulnerable groups. It's a mission to craft environments that not only enhance functionality but also evoke a sense of belonging, value, and growth for every individual. Recognizing the unique needs of aging trainees in Hong Kong's sheltered workshops, we underscore the imperative of adopting proper interior design principles that prioritize positive mental health outcomes. As we advocate for these transformative spaces, it becomes evident that design, at its core, can be a profound expression of love, inclusivity, and empathy, making a tangible difference in the lives of our society's most vulnerable.

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References

Arman, M., & Rehnsfeldt, A. (2006). The presence of love in ethical caring. 41(1), 4–12.

Ashik, F. R., Mim, S. A., & Neema, M. N. (2020). Towards vertical spatial equity of urban facilities: An integration of spatial and aspatial accessibility. Journal of Urban Management, 9(1), 77–92. https://doi.org/10.1016/j.jum.2019.11.004

Chow, B. C., Choi, P. H., & Huang, W. Y. (2018). Physical activity and physical fitness of adults with intellectual disabilities in group homes in Hong Kong. International Journal of Environmental Research and Public Health, 15(7), 1370.

DuBose, J., MacAllister, L., Hadi, K., & Sakallaris, B. (2018). Exploring the concept of healing spaces. HERD: Health Environments Research & Design Journal, 11(1), 43–56.

Evenhuis, H. M., Hermans, H., Hilgenkamp, T. I., Bastiaanse, L. P., & Echteld, M. A. (2012). Frailty and disability in older adults with intellectual disabilities: Results from the healthy ageing and intellectual disability study. Journal of the American Geriatrics Society, 60(5), 934–938.

García-Domínguez, L., Navas, P., Verdugo, M. Á., & Arias, V. B. (2020). Chronic Health Conditions in Aging Individuals with Intellectual Disabilities. International Journal of Environmental Research and Public Health, 17(9), 3126. https://doi.org/10.3390/ijerph17093126

Hanna, P., Wijesinghe, S., Paliatsos, I., Walker, C., Adams, M., & Kimbu, A. (2019). Active engagement with nature: Outdoor adventure tourism, sustainability and wellbeing. Journal of Sustainable Tourism.

Helne, T. (2021). Well-being for a better world: The contribution of a radically relational and nature-inclusive conception of well-being to the sustainability transformation. Sustainability: Science, Practice and Policy, 17(1), 220–230.

Hirtz, D., Thurman, D. J., Gwinn-Hardy, K., Mohamed, M., Chaudhuri, A., & Zalutsky, R. (2007). How common are the "common" neurologic disorders? Neurology, 68(5), 326–337.

Janicki, M. P. & World Health Organization. (2001). Ageing and intellectual disabilities: Improving longevity and promoting healthy ageing-summative report.

Jian, I. Y., Luo, J., & Chan, E. H. (2020). Spatial justice in public open space planning: Accessibility and inclusivity. Habitat International, 97, 102122.

Lai, D. W., Chan, K., Daoust, G., & Xie, X. (2021). Hopes and wishes of clients with mentally illness in Hong Kong. Community Mental Health Journal, 1–10.

Li, E. P. Y. (2004). Self-perceived equal opportunities for people with intellectual disability. International Journal of Rehabilitation Research, 27(3), 241–245.

Mondal, G. C., & Majumder, P. (2019). Ecofeminism: Encouraging interconnectedness with our environment in modern society. American Journal of Educational Research, 7(7), 482–484.
Reppermund, S., & Trollor, J. N. (2016). Successful ageing for people with an intellectual disability. Current Opinion in Psychiatry, 29(2), 149. https://doi.org/10.1097/YCO.0000000000000228
Roos, J., Koppen, G., Vollmer, T. C., Van Schijndel-Speet, M., & Dijkxhoorn, Y. (2022). Unlimited surrounding: A scoping review on the impact of the built environment on health, behavior, and quality of life of individuals with intellectual disabilities in long-term care. HERD: Health Environments Research & Design Journal, 15(3), 295–314.
Sakallaris, B. R., Macallister, L., Voss, M., Smith, K., & Jonas, W. B. (2015). Optimal healing environments. Global Advances in Health and Medicine, 4(3), 40–45.
Schepens, H. R., Van Puyenbroeck, J., & Maes, B. (2019). How to improve the quality of life of elderly people with intellectual disability: A systematic literature review of support strategies. Journal of Applied Research in Intellectual Disabilities, 32(3), 483–521.
Schoufour, J. D., Evenhuis, H. M., & Echteld, M. A. (2014). The impact of frailty on care intensity in older people with intellectual disabilities. Research in Developmental Disabilities, 35(12), 3455–3461.
Siu, K. W. M., Wong, Y. L., & Lam, M. S. (2017). Inclusive play in urban cities: A pilot study of the inclusive playgrounds in Hong Kong. Procedia Engineering, 198, 169–175.
Wang, Q.-C., Liu, X., Jian, I. Y., Zhang, E.-J., Hou, Y.-T., Siu, K. W. M., & Li, Y.-B. (2023). Community resilience in city emergency: Exploring the roles of environmental perception, social justice and community attachment in subjective well-being of vulnerable residents. Sustainable Cities and Society, 104745.
White, M. P., Elliott, L. R., Gascon, M., Roberts, B., & Fleming, L. E. (2020). Blue space, health and well-being: A narrative overview and synthesis of potential benefits. Environmental Research, 191, 110169.

Insights into Sustainable Design Innovation Strategies for SDGs: A Study of 527 iF Design Talent Awards from 2020-2023

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Abstract

The Sustainable Development Goals (SDGs) is the common development vision of all mankind. However, its current speed and scale of realization worldwide faces certain difficulties and challenges. This study utilizes textual analysis methods to provide insights into the design descriptions of 527 sustainable design winners of the iF Design Talent Award from 2020 to 2023. By analyzing high-frequency words, semantic networks, and specific cases, we propose 5 strategies for sustainable design innovation: "Measuring the gap between reality and SDGs", "Finding and Enhancing Connections among SDGs", "Focusing on systematic objects and thinking","Making good use of recycling and modularization" and "Incorporating emotional guidance and feedback". Our aim is to enhance the capability of designers and organizations in sustainable design innovation and accelerate the achievement of the SDGs.

Author keywords

Sustainable Development Goals; sustainable design; iF Design Talent Awards; text analytics

1 Introduction

In September 2015, 193 UN member states officially adopted 17 Sustainable Development Goals (SDGs) during the Sustainable Development Summit, aiming for integrated social, economic, and environmental development by 2030. However, current global practice indicates that achieving the SDGs still encounters difficulties and challenges, despite progress (Guterres, 2020). In 2022, UN Secretary-General Guterres cautioned that persistent negative factors, such as climate change, air pollution and energy prices, are derailing SDG progress. Maintaining the status quo will undoubtedly lead to ongoing crises and destructive risks in the future.

How to realize SDGs timely and orderly in the complex context of the times has become an essential and urgent issue. As one of the largest and most prestigious competitions for young designers in the global design field, the iF Design Talent Award, organized by Germany's IF International Forum Design, has been based on the theme of the SDGs 01 to 15 since 2020(Fig.1). The winning works all have the potential to achieve the SDGs, whether they are simple or complex. Therefore, the study aims to gain insights into sustainable design innovations from them at the mid-point of the fifteen-year sustainability plan, in order to contribute to the realization of the SDGs.

2 Metods

This study used the web crawler technology(Castillo, 2005) to collect the winning SDGs award from the IF Talent Design Awards website as a data source. And 527 award-winning works between 2020 and 2023 were gathered. These data were recorded in Excel, and each entry includes color images, product names, product categories, and textual descriptions. The Textual descriptions textualize the design work's challenges, key features, uses, and social value. Therefore, this study intends to utilize text mining, a research method that can get the essence through objective and quantitative description of explicit content (Yang et al., 2013), to discover the core information hidden in the textual descriptions. By deconstructing the semantic paths, associations, and meanings among keywords (Wang et al., 2015), we can refine the design innovation strategies for SDGs. Furthermore, we use case studies to illustrate the effectiveness of these strategies.

3 Results

3.1 Theme Distribution Analysis

The SDGs cover 17 Sustainable Development Goals, and it represents 5 aspects: people, planet, prosperity, peace and partnership (Witte & Dilyard, 2017). The iF Design Talent Award primarily focuses on People, Prosperity and Planet. The theme with the highest number of entries is 03 good health and well-being (145 pieces), while 08 decent work and economic growth has the lowest number (8 pieces). Among the 15 participating themes, six have above-average winning entries (35.1), whereas seven themes have fewer than 20 award-winning works (Fig.2). This reveals an imbalance in design interventions within the SDGs, hindering the comprehensive promotion of sustainable development through design.

3.2 Frequency Analysis

The word frequency analysis in this study focuses on design concerns in different categories of sustainable design works. By using ROST CM 6.0 software to extract high-frequency feature words from design descriptions and eliminating meaningless words, we summarize the top 30 high-frequency words (Sun & Ni, 2018), as shown in Table 1.

Regarding service targets and purposes, People and Prosperity mainly focus on "Children", "Patient", "Woman", "Parents", "Baby"and "System", "Children", "Environment", "Society", "Culture", respectively. Planet focuses on "Ocean", "Animal", "Ecology", "Plant", and "Birds". At the goal level, "Health" is the first high-frequency word in both People and Planet, indicating its importance for both human and ecosystem well-being.

Regarding common high-frequency words, "Problem", "System" and "Environment" are the main words, showing that the role and impact of them need to be focused on, regardless of the type of sustainable development pursued. In the intersection of People, Prosperity, and Planet, "Children", "Time", "Application", "Module", "Recycling", and "Plastics" are the main high-frequency words. "Children" means that the issue of child development is crucial. "Application" represents the use of Internet technology can connect different resources widely and quickly. "Module" and "Recycling" imply that resources should be reshaped to make the most efficient use. Plastics-related problems are also the current focus of sustainable attention.

3.3 Semantic Network Analysis

Semantic networks express knowledge through conceptual and semantic relationships, revealing connections between things, concepts, and other elements (Wang et al., 2015). People, Prosperity, and Planet semantic networks all present a "Design-Problem" core structure. People's semantic network connects "Design" with words like "Children," "Use," "Patient," "Simple," and "Help," while "Problem" connects to "System," "Environment," "Region," and "Safety."(Fig.3) Prosperity's semantic network links "Design" to "Service," "Use," "Material," "Safety," and "Daily," and "Problem" to "Environment," "Plastics," "Process," and "Reduce."(Fig.4)

In Planet's semantic network, "Design" connects with "Facilities," "Convey," "Medium," "Interaction," and "Recover," while "Problem" links to "Ocean," "Environment," "System," and "Ecology."(Fig.5) Among them, "Protect", "Restore" and "Prevent" are common to both "Design" and "Problem," reflecting that protecting and restoring the original ecological landscape and preventing further damage are the main ideas for the sustainable development goals of climate action, Marine and terrestrial ecology.

Taken together, "Environment" is linked to the core layer of "problems" across the three dimensions, highlighting its priority in the SDGs. "System" is also appeared in all three dimensions, underscoring the importance of systemic issues and methods. Additionally, People's and Prosperity's networks encompass a circle focused on "Use," reflecting the influence of human behavior towards achieving related SDGs.

4 Insights

Based on the quantitative analysis of the award-winning works and the qualitative study of some typical cases, the study identifies SDGs-oriented design innovation strategies.

4.1 Measuring the gap between reality and SDGs

"Problem" as a keyword is the main guide for sustainable design for SDGs, but how to identify problems more accurately is not an easy task. The essence of problems is the gap between the desired situation and the current situation, which can be categorized into three types by McKinsey Company: "restoring the original state," "preventing potential," and "pursuing the ideal" (Table 2). SDGs serve as an ideal future condition for humanity, enabling designers to assess reality and determine if it meets SDG standards or has optimization potential. This approach helps identify the gap between the current and desired situations, categorize problem types, and employ appropriate solutions. For instance, keywords like "Protect," "Recover," and "Prevent" in Planet denote a typical "restore" and "prevent" problem and solution.

4.2 Finding and Enhancing Connections among SDGs

It is clear from the common high-frequency words that there are intertwined links between the SDGs, such as the treatment of "plastic pollution", which is addressed in SDGs 03, 04, 06, 09, 11, 12, 14, etc. Skene & Malcolm (2019) also identified association between SDGs through questionnaires and data analysis. For example, goal 03 is related to 6 SDGs, and goals 02, 03, 06, and 15 have an association density of 6 or more (Fig.6). This nested relationship among people, economy, environment, and society allows designers to consider achieving multiple sustainability goals with fewer resources. The "ACTION FOR FOOD Exchange" serves as a typical example, where users are encouraged to return plastic bottles in exchange for expiring food. This approach simultaneously addresses the issues of plastic waste, food waste, and hunger in marginalized communities. The judges also noted that the Children's study bed design addresses SDGs 03, 09, and 12 concurrently.

4.3 Focus on systematic objects and thinking

The winning works related to the high-frequency word "System" were distributed across 14 themes, except for "08 Decent Work and Economic Growth". These works can be broadly grouped into two categories. One category addresses problem related to systemic objects like marine, terrestrial and climatic ecosystems. For instance, the award-winning Cyclic Growth Base (Fig.8) tackles ecosystem destruction in northwestern China by using biomimetic technology to support new vegetation survival in harsh environments. The other category employs systems thinking to tackle unsustainable issues, as individual products or services are insufficient to address the increasingly complex sustainability issues now. GreenCircle (Fig.9) is a systematic solution for kitchen waste recycling and food consumption. First, users convert kitchen waste into organic fertilizer using a composter and send it to a community collection center in exchange for reward points. The fertilizer is then sent to organic farms to support food production, which is supplied to community stores. Users can subsequently

purchase organic food with reward points at a lower price, creating a sustainable recycling-utilization model.

4.4 Make good use of recycling and modularization

"Recycling" and "Module" are the high-frequency words in descriptions. We can summarize the multiple meanings of "Recycling" from these works:1) Recycling wastes generated by human production activities that interfere with natural ecosystems and cause disruptions in the ecological cycle (e.g., non-degradable plastics, oil spills). The Deoiling Machine uses the cyclone principle to suck the mixture of oil and water into the cyclone to recover the leaking crude oil. 2) Recycling the products of nature's metabolism for human use. For example, based on the principle of plant aerial roots, The Source of Life uses a recyclable membrane as an internal condensation device to help humans obtain clean water from the air. 3) Recycling reusable waste resources (e.g., metal, food waste). The Sound of Music is a wind instrument made from a combination of various waste materials.

The keyword "Module" reflects the importance of modular design in saving resources. It can enable products with similar structures to reduce the repeated development of components in production, like the MOMENT LIFE multifunctional rescue vehicle for different disaster scenarios. Its modularized body can be installed with different components like excavation and detection, so that the search and rescue work can be launched in different scenarios efficiently and quickly. On the other hand, modular forms also facilitate part replacement and unit expansion, as seen in the Two-in-one Modular Rescue Product, which combines a life jacket and life buoy function. It can save space on the rescue vessel and shorten the rescue time. Moreover, the infinite expansion of modularity can also save more lives.

4.5 Incorporate emotional guidance and feedback

An insight into the high-frequency word "Use" reveals that a key point in determining the effects of sustainable design is its ability to continuously influence, optimize, or change the behavior of users. Sustainable design often requires individuals to sacrifice short-term benefits for long-term benefits based on constraints of morality and responsibility. The difficulty is that weak-willed users may struggle to consistently adopt and maintain such behavior. While, emotional design, which focuses on the user's emotional experience, can capture attention and elicit unconscious emotional responses, increasing the likelihood of desired behaviors (Tang & Chen, 2021). Consequently, incorporating emotional factors in pre-use guidance and post-use feedback of a product or service can enhance user motivation and long-term engagement in sustainable activities. The Waste Battery Wall is a winning project that creatively transforms the act of disposing of old batteries into illuminating patterns on a lamp wall, encouraging user participation in battery recycling (Fig.10). A similar project is the Interactive Glass Recycling Bin, designed to recycle glass bottles.

Conclusions

Studying the 527 iF Design Talent Award-winning designs, we extracted 5 design heuristics. Firstly, use SDGs as a measure for real-life, production, and consumption to identify more unsustainable problems and adopt appropriate solutions faster. Secondly, clarify the linkages between the SDGs, and design to achieve multiple goals with fewer resources. Thirdly, focus on production and consumption systems. In the face of complex environmental, social/ethical, and economic system problems, designers need to use systematic thinking to promote effective communication between internal and external, and then make decisions. Lastly, explore sustainable innovation opportunities through the lenses of "Recycling" and "Module" while incorporating emotional guidance and feedback. Despite young designers' possible lack of design vision and experience, their imagination and innovation in sustainable design serve as a powerful driving force for sustainable development. We hope our research can inspire designers to think beyond traditional approaches and offer creative solutions

to sustainability challenges.

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References

Guterres, A. (2020). The sustainable development goals report 2020. United Nations Publication Issued by the Department of Economic and Social Affairs, 1–64.

Castillo, C. (2005). Effective web crawling. Acm Sigir Forum, 39(1), 55–56.

Skene, K. R., & Malcolm, J. (2019). Using the SDGs to nurture connectivity and promote change. Design Journal, 22, 1629–1646. https://doi.org/10.1080/14606925.2019.1594996.

Sun, X., & Ni, R. (2018). Product cognition, emotional expression, and brand perception of Chinese cruise tourists: A content analysis based on online reviews. Geographical Research, 37(6), 1159–1180. https://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2018&filename=DLYJ201806009&v=.

Tang, Y., & Chen, Z. (2021). Development trends of emotionally oriented product design under the concept of collective consciousness in Turgan. Art Baijia, 37(6), 167–173. https://kns. cnki.net/KCMS/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2022&filename=YSBJ202106023&v=.

Wang, Y., Wang, M., Li, R., & Wu, D. (2015). Research on the perception of tourism destination image of Phoenix Ancient Town based on network text content analysis. Geography and Geo-Information Science, 31(1), 64-67+79. https://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2015&filename=DLGT201501014&v=.

Witte, C., & Dilyard, J. (2017). Guest editors' introduction to the special issue: The contribution of multinational enterprises to the Sustainable Development Goals. Transnational Corporations, 24(3), 1–8. https://doi.org/10.18356/799ae8b0-en.

Yang, K., Ji, M., & Chen, Y. (2013). Analysis of destination image of Tibet tourism based on online travelogues. Tourism Forum, 6(3), 60–65. https://doi.org/10.15962/j.cnki.tourismforum.2013.03. 016.

Fig.1 iF Design Talent Award

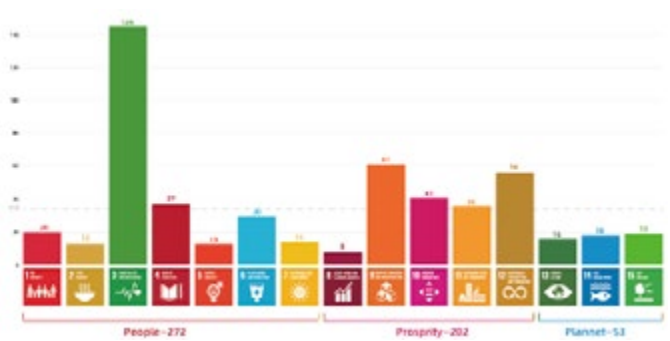

Fig.2 The number of the iF Design Talent Award from 2020 to 2023

Table.1 High frequency words for design instructions of award-winning works

	People	Prosperity	Planet		People	Prosperity	Planet
1	Children	Use	Ocean	16	Women	Rescue	Nature
2	Use	Problem	Environment	17	Africa	Package	Recover
3	Patient	System	Animal	18	Parents	Device	Soil
4	Problem	Safety	Protect	19	Tool	Public	Platform
5	Region	Children	Ecology	20	Care	Waste	Collect
6	Health	Environment	Plant	21	Cost	Technology	Excess
7	Environment	Recycling	Plastics	22	Detection	Communication	Waste
8	Medical treatment	Tradition	Problem	23	Baby	Society	Climate
9	Application	Module	Birds	24	Disinfect	Degradation	Filter
10	Study	Time	Forest	25	Recycling	Resource	Seaweed
11	System	Material	Coral	26	Operation	Culture	Decompose
12	Simple	Toy	System	27	Module	Consumer	Material
13	Time	Plastics	Organism	28	Easy	Automatic	Structure
14	Education	Tool	Destruction	29	Family	Transport	Efficiency
15	Disease	Application	Health	30	Automatic	Serve	Interaction

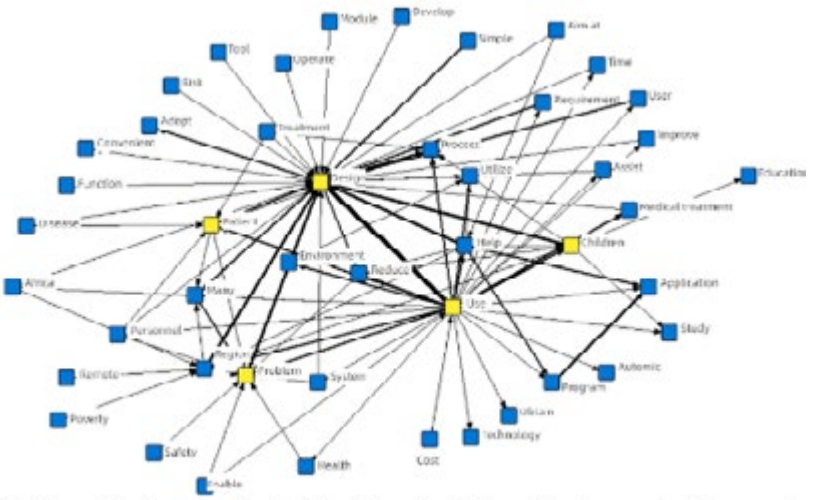

Fig.3 Semantic network analysis of the design description of People award winning works

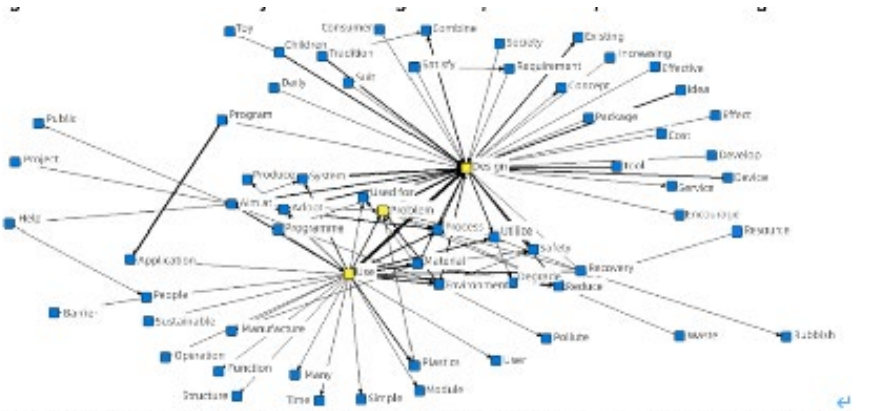

Fig.4 Semantic network analysis of the design description of Prosperity award winning works

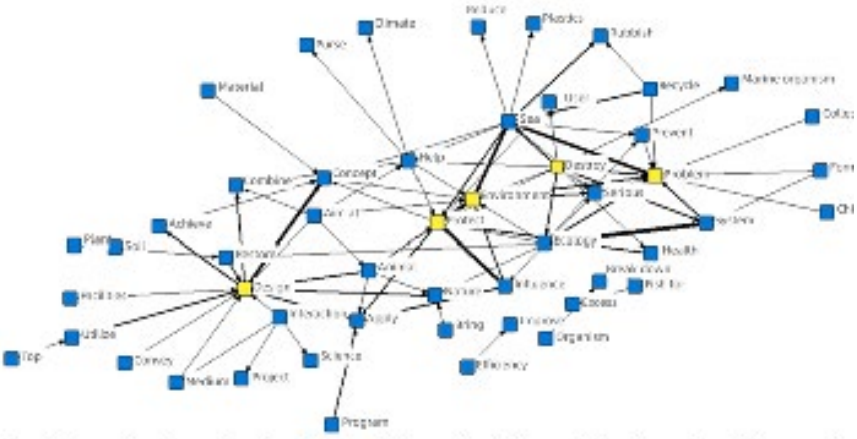

Fig.5 Semantic network analysis of the design description of Planet award winning works

Table.2 Problem type and description

Table.2 Problem type and description

Type	Description
Restoring the original state	Restoring the original state refers to treating the initial condition as the desired outcome.
Preventing potential	These problems do not involve damage at the present stage but anticipate future potential issues that require maintaining the current state.
Pursuing the ideal	While significant harm may not be present, addressing the problem necessitates achieving an ideal state as the current situation falls short of expectations.

Fig.6 The correlation between SDGs in student projects

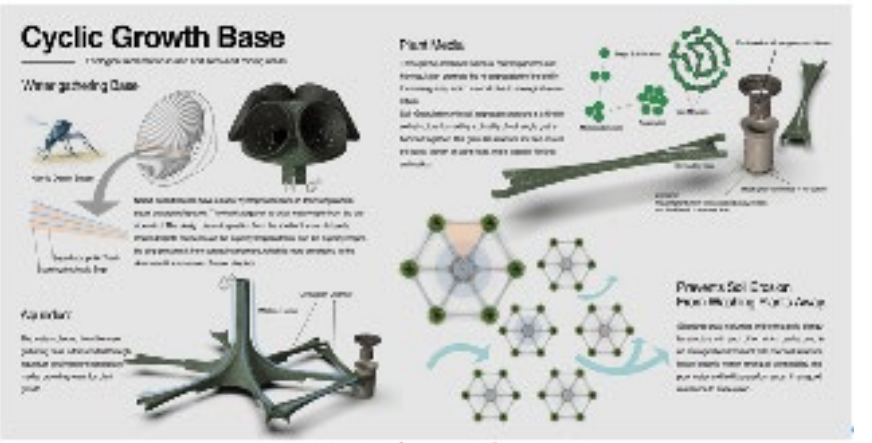

Fig.8 Cyclic Growth Base

Fig.9 GreenCircle

Fig.10 Waste Battery Wall

"Architectural Ornament" after the Postmodern Era

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Abstract
This paper mainly discusses the state and performance of architectural ornament after the postmodern era, reviewing the development of ornament with a focus on "horror vacui"; it raises the potential problems of modernist criticism of ornament, tries to explain the situation of ornament after postmodernism with the intertextuality theory, further elucidates the influence of image and computer technology on the development of ornament. Retrieve the "love" and humanistic care of everyday life from architectural ornament's physical experience, textual attributes and pleasure.

Author keywords
Architectural Ornament; Pleasure; Horror Vacui; Intertextuality; Image and Algorithm Technology

Introduction

In the rational concept of the western world, ornament has long been suppressed and excluded. After a series of major social changes including the Enlightenment, the rise of science, the religious reform, the industrial revolution, and the innovation of artistic concepts, excessive ornament became a representative of conservatism and luxury. By the beginning of the 20th century, the pioneers of modernism completely nailed ornament on the "column of shame". A hundred years later, as we look back at this argument from a contemporary perspective, we find several problems hidden in it: 1. Ignoring the physical experience of ornament. 2. The lack of humanity and psychoanalysis. 3. Ignoring the textuality of ornament.

After the post-modern era, especially in the consumer society with developed information technology, the state and performance of ornament has once again become one of the main issues concerned by design.

Starting from "horror vacui"

Ornament originated from humans' instinct desire for pleasure, and it was after the emergence of social and class forms that they began to be consciously recognized and artistically reproduced. In Neanderthal times, Homo sapiens learned to sew hides to keep warm and string animal bones together as jewelry, discovered that stones could be used as tools, and learned to weave hedgerows for defense. The traces of those available natural artifacts and stitching or weaving gradually became the origin of sculpture and patterns. Alois Riegl held that "They have obviously not been copied from nature but are purely decorative patterns intended to adorn a given surface. Their creation was guided by the same desire to decorate, or horror vacui." (Riegl, 2016:p.32) (Fig.

1-4) It is undeniable that the physicality of these primitive ornaments is also the gene of ornament after civilized society. Since then, ornament, on the one hand, became a symbol of faith, power and wealth, and on the other hand, it became an object discussed by visual taste of the elite, presenting a triadic structure: pleasure and beauty, social status and prestige, communication and knowledge. Vitruvius of ancient Rome emphasized that architecture should be practical and beautiful, and the vigilance of ornament accompanied the progress of civilized society. The rich and wonderful research results and the progress of the times have also been in a state of dislocation, and are wantonly abused by the dignitaries. (Fig. 5)

Figure 1. Facial tattoos of women from an aboriginal tribe in New Zealand. The Grammar of Ornament by Owen Jones.

Figure 2. An decoration on the paddle handle of an aboriginal tribe in New Zealand. The Grammar of Ornament by Owen Jones.

Figure 3. Fur clothing of early humans. Primitive Man by Figuier Louis.

Figure 4. A primitive hut. On Architecture by Marc-Antoine Laugier.

At the beginning of the last century, the pioneers of modernism, believing that industrial production was the way to the future, launched a fierce criticism of ornament. To varying degrees, architects such as Augustus W. N. Pugin, Viollet-le-Duc and Karl Friedrich Schinkel emphasize the structure, function, material authenticity and decorative applicability of buildings. Morris founded the decorative arts firm and sincerely practiced design. They studied and summarized the rules based on the decorative ontology, and provided aesthetic standards and rules for decorative design in the face of the disorderly, cumbersome and abusive situation.

Figure 5. The interior design of a bathroom by Mott Steel Works in New York in 1888. New York Public Library

The pioneers of modernist architecture were more determined, Louis Sullivan believed that "forms follow functions" and that "organic ornament should be the stage to follow the purge of all ornament which had to come."(Pevsner, 2019: p.20) Adolf Loos said, " cultural evolution is equivalent to the removal of Ornament from articles in daily use…Don't you see that the greatness of our age lies in its inability to produce a new form of decoration? We have conquered ornament, we have won through to lack of ornamentation.…As ornament is

no longer a natural product of our civilization, it accordingly represents backwardness or degeneration." (Loos, 2021: p.69-75)Le Corbusier admired machines and aspired to the satisfaction of operational needs as well as precise machining and efficient operation. Ornament, on the other hand, is far from this direction, and is limited to those things that satisfy etiquette, that are a state of conceiting errors or facilitating replication and addition.

In 1925, The International Exhibition of Modern Decorative and Industrial Arts became the "battlefield" of fierce struggle. "Art Deco" as the national strategy of France, modernism, which was represented by Le Corbusier, and constructivism, which was represented by Milnikov and Alexander Rodchenko, clashed head-to-head. Le Corbusier's "New Spirit" pavilion was built in a corner, a reinforced concrete pavilion against the "plaster palaces." The Soviet Union Pavilion designed by Milnikov was also highly praised (Fig. 6-11).The ideals and practices of modernism fully stepped onto the historical stage. In 1968, Mario Praz once again used the concept of "horror vacui" in his criticism of the dazzling, suffocating ornaments of Victorian interiors. Ornaments that originated in filling the instinct of "horror vacui" died in the desire to over-satisfy the "horror vacui".

Figure 6-7. The Lafayette. Gallery and the Italian Pavilion at the expo continued the decorative style, Arthurchandler.
Figure 8-9. The New Spirit Palace with a modernist style, Foundation Le Corbusier.
Figure 10-11. The form of the Soviet Union Pavilion revealed a touch of constructivism, The Charnel-House

Re-understanding of architectural ornaments: the implicit intertextuality

In the 19th century, the discussion of architecture by such rational philosophers as Kant, Hegel, Schelling and Schopenhauer provided strong support for the real issues concerned by modern architecture. Ornaments, however, failed because of the lack of ideological and theoretical support.

The pioneers of modernism should be "fans" of Kant's critique of pure reason. Pure reason was transcendental and metaphysical, as if it were the "foundation" of architecture, while pleasure, experience, and form were not in the realm of pure reason, which gave rise to the assertion of "purposiveness without a purpose." Kant likened ornament to the frame of a painting, a carved dress, or a porch around a palace.(Kant, 2007: p.234) The frame was an addition to the painting and had nothing to do with the painting itself, and the metaphor of the ornament as a "frame" implied the opposite relationship between buildings themselves and additional ornaments. Therefore, modernist architecture seeks "purposeless" beauty by removing ornaments and meanings. Le Corbusier praised the white paint, saying that "If the house is all white, the outline of things stands out from it without any possibility of mistake; their volume shows clearly; their colour is distinct. The white of whitewash is absolute, everything stands out from it and is recorded absolutely, black on white; it is honest and dependable. (Corbusier, 2009: p.85)" Le Corbusier certainly believed that white presented the "purposeless" beauty and expressed the need for "purposiveness". However, in the 1960s, the public began to resent the elitist teachings of modernism, and the concept of architecture shifted to memory, emotion and experience. Le Corbusier's "white myth" was another form of "horror vacui" for the public.

Jacques Derrida believed that the frame is also a part of the painting, and as an ornament, the frame is like 'the other' in the painting. The frame is both on the edge of the work and in the environment of the work, and it serves as the background of the work, and is not separated from the work. In short, the frame is not the frame itself, its value lies elsewhere, like a human statue serving also as a stone pillar of a building.(Shang, 2021) The frame is no longer the outside part of the painting, nor is the subject of the painting the center, and there forms a sort of "intertextuality" in language rhetoric. The frame as the edge is the "addition" when comprehending the painting, or there is no such thing as a center, and the edge is the state of "différance" in Derrida's thought.

For example, the image of this space itself has an edge, which defines the boundary when the image is read. (Fig.12) In the image of this space, three paintings are hung on the three walls, which seem to be decorative objects in the space. But every painting has its own edge, and every wall on which it is hung has its own edge. A subtle dialogue is formed between the shape and position of the edges of the painting and the opening of the wall and the light. In the space, the elements are neither core nor partial, but rather work together to build the overall readability through mutual interpretation and reference.

Figure 12. Apartment Glòries, Sandy Brunner Architektur

In addition, Derrida's "the death of the author" and "writing degree zero " opened up a new perspective for understanding ornament again. He emphasized that writing should not be done with a certain purpose preset by the author, but should go beyond the binary relationship between the author and the work, and be done from the "blank". One of the characteristics of post-modern architectural ornaments is to participate in space reading through "writing degree zero ". The author's own purpose is hidden, or is in an open conclusion or an unfinished process, thus needing to be explained many times by different participants. For example:

The two images are of an antique and sundry store and a study full of books. Both spaces are filled with full information, constitute a rich decorative effect. The ornaments do not belong to the building space itself, but form a spatial interface. Objects or books have their own origins, but there is no clear logic to their organization. They are juxtaposed or stacked together, creating some sort of new relationship, which does not belong to the original authors, nor can it be expressed by the new owner. The decorative result does not know who the author is, and its state is "writing degree zero ". Ornaments may have constructed an unreal "the other" in the real space, a surreal imaginary subject.

Figure 13. Papaya Studio antique shop in Thailand, Papaya Studio.

Figure 14. The family library of Umberto Eco, philologist

The turning of architectural ornament: poetry and surface

Constructing poetry

The turning of postmodern philosophy paved the way for the study of ornament; the rise of material culture and mass consumption provided new soil for ornament; architectural ornament was reborn in the aspects of concept, method and state, and has been expressed in the field of design

with many possibilities. With corporality as the origin, on the one hand, it dives into the bottom of material organization and technical logic, and participates in the construction of "poetic" spatial semantics; on the other hand, it returns to the desire for "pleasure and attraction" in human genes; in addition, resetting or rewriting the organizational relationships between spatial elements and existing objects evokes potential associations between different objects.

The classification of architectural ornament accepted by previous researchers is roughly "ornament" (structural) and "decoration" (functional)(Frampton, 2007: p.19). However, after the concept of taking the body as the origin entered the field of architecture, the situation changed. According to Maurice Merleau-Ponty, the body was point zero of the space. The body was reflected in the space, and the space was around the body rather than in front of it, the space was not what is seen, but what was felt by the body. Decoration and ornament had been combined, thus becoming ornament regardless of primary or secondary importance. Both pointed to a new goal: to be a "object" not a concrete object, not a "duck" as Venturi termed it(Harries, 2001: p.70); it is rather a system of symbolic totality of "object" from Baudrillard's perspective. So, instead of being explicitly independent, as it used to be in the past, architectural decoration must participate in the construction of a sort of poetry, and the expression form and experience state of the "object" of the symbol is the core task of contemporary design, and there will not be only one answer of this kind in the consumer society.

What modernist architects would never admit is that their efforts in building materials, textures, surface techniques, structural connections, node details, masonry methods, etc., also became a charming decorative language hidden in the technical path. (Fig. 15-18) This is what Frampton termed the constructed poetry, a picture of social wonders made up of fragmented, mixed, collage "decorations" perceived by the body. The current architectural decoration has no clear identity or meaning, it hides itself in the logic of construction, and reproduces the poetic identity of the other in imagination.




Figure 15. The gloss paint of The Brummel House by Loos, DIVISARE.
Figure 16. The marble wall of the Germany Pavilion, Mies Van der Rohe Foundation.
Figure 17. Traces of formworks of Unite d'Habitation, Le Corbusier Foundation.
Figure 18. The brickwork texture of Aalto's Phil Coffey, Architects' Journa

Surface and image technology

In the field of practice, the combination of architectural surfaces with images and algorithmic technology is the most active expression of architectural decoration. Picon believes that the development of decoration has gone

through the stages of rules, tolerance, and aversion, and now it is returning. He pointed the return to the rise of computer algorithms and architectural skins. Indeed, computer algorithms have greatly aided the construction technology, pushing the precision, efficiency and complexity of processing to a new height, and at the same time, the decorative expressiveness they produce is unprecedented. (Figs. 19-24) This concept of skin can be traced back to Gottfried Semper, who summarized architecture into four elements in 1851: "roof, enclosure, hearth and mound" . The enclosure "defines a 'new spatiality', or the formation of an internal space, which is separated from the outer space and protected: -- it takes the fireplace as the social and spiritual heart of the home, and the enclosure gains architectural value.(Semper, 2016: p.23)" The enclosure is like the "coat" of the building, it is like a curtain dividing and sheltering the space, and colors and decorations are the surface of the enclosure. Now, the skin, which is the enclosure of the building, is a medium that creates a wonderful intersubjectivity between the skin and the structure, as well as between the skin and the interior. Computer imaging technology can simulate the "illusions" of the past and the present, and combine with architectural surfaces to form an unpredictable experience. (Figs. 25-26) Architectural decoration can express itself through the adjustment of rules or codes to achieve pure and infinite changes. The static, monotonous, and specific viewing mechanism has been replaced, and the temporal nature of architectural decoration has also changed fundamentally, with the key being "immersion".

Figure 19. Shanghai Arts Centre, the combination of parameters and masonry, Archi-Union.

Figure 20. Hermes Amsterdam Shop, new materials continuing traditional textures, MVRDV.

Figure 21. John Lewis Department Store, multiple layers forming a deep skin, Lube Saveski.

Figure 22. The light construction logic, Sarbalé Ke.

Figure 23. The contemporary transformation of Baroque scroll, Moon Jelly.

Figure 24. Combination of parameters and tensioned films in Lumen installation, JENNY SABIN STUDIO

Figure 25-26. The multimedia skin & NFT of Casa Batllo

Conclusion: returning to pleasure and the everyday life

Since ancient times, ornament has been a practical means of human pleasure, and a representation of cultural and national characteristics. Design is the thinking and practice activity of creating artificial things with humans as the origin. Therefore, the issue of decoration will always accompany the study of design, but different periods have to face the problems of their own times. Today's concept of decoration clearly rejects the control of power and status, and has a closer relationship to everyday life and consumption scenes. Ornament has gained a new identity in the turn of postmodern philosophy and the amazing development of material science, image and

computer technology. Its appeal lies in the fact that it returns to the instinctive desires of human beings and can enter the core of contemporary theoretical vision, while at the same time making substantial connection with the new frontiers of design and manufacturing. In the future, the role of architectural decoration is to help us achieve a sense of pleasure and everyday existence. As an intermediary between physical desire and technological progress, its function is to help us live a wider variety of life scenarios at both virtual and real levels.

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References

Bright, D. (2006), Pleasure & Ideology in the Visual Arts (Zhang, H., & Tian, L., & Wang, C., Trans.) (1st Ed.). Nanjing: Phoenix Publishing & Media Group, Jiangsu Fine Arts Publishing House.

Frampton, K. (2007), Studies in Tectonic Culture–The Poetics of Construction in Nineteenth and Twentieth Century Architecture (Wang, J., Trans.). Beijing: China Architecture & Building Press.

Grosse, E. (1984), The Beginnings of Art (Cai, M., Trans.) (2nd Ed.). Beijing: The Commercial Press.

Harries, K. (2001), The Ethical Function of Architecture (Shen, J., & Chen, Z., Trans.). Beijing, China: Huaxia Press.

Hay, J. (2017), Sensuous Surfaces : the Decorative Object in Early Modern China (Liu, Z., & Fang, H., Trans.). Beijing: Central Compilation & Translation Press.

Kant, I. (2007)The Complete Works of Kant, Vol. 5: The Critique of Judgement (Li, Q., Trans.). Beijing: China Renmin University Press.

Kurakata, S. (2011), Decoration as Anti-modern/Decoration as Anti-reproduction (Li, Y., & Ping, H., Trans.) Shanghai: Time Architecture.

Le Corbusier. (2009), L'Art décoratif d'aujourd'hui (Sun, L., & Zhang, Y., Trans.) (1st Ed.). Beijing: China Architecture & Building Press.

Leatherbarrow, D., E., & Mostafavi, M. (2010), The Appearance of Covering (Shi, Y., & Hua, Z., Trans.). Shanghai: Time Architecture.

Loos, A. (2021), Ornament and Crime 1900-1930 (Xiong, X., & Liang, Y., Trans.) (1st Ed.). Wuhan: Huazhong University of Science and Technology Press.

Pevsner, N. (2019), Pioneers of Modern Design (He, Z., & Lu, Y., Trans.) (1st Ed.). Hangzhou: Zhejiang People's Fine Arts Publishing House.

Picon, A. (2013), Ornament: The Politics of Architecture and Subjectivity. John Wiley & Sons Ltd.,.

Riegl, A. (2016), Problems of Style: Foundation for a History of Ornament (Shao, H., Trans.) Hangzhou: China Academy of Art Press.

Semper, G. (2016), The Four Elements of Architecture (Luo, D., & Zhao, W., & Bao, Z., Trans.). Beijing: China Architecture & Building Press.

Shang, J. (2021), Deconstructing Kant's Aesthetic View: Reading Derrida's Truth in Painting. Social Science Front.

Shi, Y. (2013), Surface Layer and Surface: The Decline and Rebirth of an Architectural Theme. Beijing: Journal of

Architecture.

Creating creativity; radical pedagogy as a narrative of transformation.

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Abstract

Within any design academy in The Netherlands, remnants and opaque waypoints of various schools of thought, ideologies, methodologies and legislatures can be found, which seem to have found a type of gridlocked balance in between these - often antagonizing - influences. At the same time the output and level of education is considered to be of high quality, so any incentive to make a change in this system comes with its own procedural and strategic resistance. A proverbial way of describing this condition is to state that after subtraction of all legal, methodological, disciplinary, logistic and all other stimuli that are related to this type of education, the amount of freedom to change anything is less than 2%. However, the urgency of the actions needed to answer the most pressing problems humanity is faced with, also demands a much greater ability to be flexible in the way we organize and execute our education. In an attempt to address all these aforementioned issues, an experiment has started at the faculty of Art and Design of ArtEZ University of the Arts in Zwolle, The Netherlands. In this – currently ongoing – process, a narrative of transformation is sketched in which all existing strengths and weaknesses of the existing education are considered. Rather than inventing the notorious wheel once again or getting lost in a hunt for utopian pedagogies, this process forefronts a redesign of the parameters of its core assets and facilitates a tailormade design process that involves many of the stakeholders of the existing educational infrastructure. The main premise underneath is the notion that the single most outstanding competence that can be taught in the art and design school is that of fostering creativity. Yet this ability is mostly put into use within the artistic process, following a specific path of aesthetical and inquisitional waypoints. Our idea is that the ability to create creativity is of crucial importance and of urgent need in many disciplines and areas of decision making which are currently not connected to the world of design (education). This holistic approach is both empowering us as well as making "our business" vulnerable as we will share what we do best, yet for us there is no alternative, the societal stakes are simply too high to act smallminded and defensive. The outcome will not only be the formation of a new department which complements the existing, but also brings

a transformative voyage to all those who are involved, enabling to rethink and reshuffle the already existing without necessarily having to perform 'the new'. Afterall, the journey is always more informative than the destination, and likewise is the narrative more interesting than the finale.

Author keywords
Radical pedagogy; transformation; creating creativity; curriculum; sharing; daring; caring.

Introduction
This is an account and theorization of an ongoing trajectory that will lead to the development and start-up of a new bachelor outflow profile within ArtEZ Art & Design Zwolle with the (provisional) name "Try Out". This profile would be situated next to the existing departments Fine Art and Design in Education, Interior Architecture, Graphic-, Illustration-, Comic- & Animation Design and will build on the knowledge, skills & strengths of all these departments. The reasons for developing this profile can be described through two axes: from a substantive vision and from (strategic) positioning, its strength and unique contour will lie at the intersection of both. The main feature of this profile is that its study program does not start from a specific medium or within a particular discipline, but from the employability of the students' creative ability as an instrument in different domains. Ideas, processes, and competencies are value-adding products that can be deployed independently of an artistic skill. Among other elements, this process builds on a few guidelines (Boumeester, 2017) that have been sublimized from specific research:

- Asignification and non-representation: we believe that the complexity of the world cannot be reduced to macro or micro systems or models.

- Heuristics: in a complex world there is no relevant linearity, learning can only be useful in a non-linear process of trial/failure and embracing serendipity.

- Multiple optima: in a nonlinear process, there can never be one relevant outcome; the outcome can only be determined in retrospect, never as the result of a predetermined procedure.

Setting up this department from a different premise than those already in place, creates a radical development space while simultaneously accentuating and enforcing the medium discipline driven departments. This creates a profile that is unique to ArtEZ's undergraduate education and complements the course offerings within her portfolio. The process itself follows that of a transformative narrative in which several stakeholders represent potentially dissimilar values and fortes. By not necessarily striving for compromises or consensus, different voices will be kept audible throughout the process and have their unfiltered influence on the results. This approach is unprecedented within our university (and widely beyond, to our knowledge) and could be of inspiration to others.

Why
Every art academy in the Netherlands has been in some way established on basis of medium-disciplinarity and carries much of the Bauhaus in structure in it. The rise of the Bauhaus was a reaction to the rapidly developing 19th-century industrial society and advocated a return to the traditional values of craft without separating the disciplines. Emerging during the 2nd industrial revolution - which focused on mass production and

standardization in the physical domain - Bauhaus founder Gropius (1919) made clear that: "There is no essential difference between the artist and the artisan. The artist is a craftsman who surpasses himself. [...] However, no artist can do without the basis of the handicraft. That is the origin of the artistic process.". Yet today we are at the end of the 4th industrial revolution, in "The Imagination Age" in which creativity and imagination in the virtual domain are the main creators of economic value. The main characteristics of Bauhaus, such as the physical proximity of design process and production/prototyping, multidisciplinarity and "making it yourself" are still central to the design school. This all has clear and valid reasons, though the question is justified whether the 21st century does not also demand other perspectives. Especially because with the mental and physical craft structure comes an institutional texture that prevents certain expansions and flexibilities within a program of study. This is sometimes colloquially referred to as the "institutional curriculum" meaning that no matter what subject, desire, topic or reform one aspires to implement in the academy, the mere structure of the institution draws every initiative within its own lines (the aforementioned 2% rule). This regularly and almost across the board leads to certain discrepancies between what is the basis of vocational art/design education and what the vocation itself increasingly demands of us. As widely known, a vast number of professions have both been added and disappeared in our professional sector over the past decades, according to the World Economic Forum, about 85 million jobs will disappear by 2025 due to the accelerated adoption of technology and automation, while at the same time 97 million new jobs will be created due to new forms of work adapted to the changing economy and society. At the same time, digitalization has not only created an entirely different balance between knowledge and skills but has also created a whole new perspective on "making (it) yourself" in the professional field. Therefore we can consequently find (in the past and coming decade) creativity, critical thinking, and the ability to grow in the top five most sought-after skills. Moreover, the concept of "profession" has most often been transformed into the concept of "role," in which individual competencies (such as soft and social skills) are often more important than the professional knowledge applied in an education. Besides that, the choice of a work environment is increasingly playing an almost political role: work climate and individuality is increasingly more important than the position itself, with the choice of a self-employed career - with multiple roles - also being made more thoughtfully and consciously (Van Winkel et al. 2012).

These changes are expected to continue unabated, so the fundamental question is whether we can continue to fulfill our mission within these changes by starting primarily from media disciplines. Even more important perhaps is the question of whether, in response, we should modify our existing departments to the point of diluting their character. Earlier reforms in the last decades showed that rash and substantive changes can easily disrupt a carefully balanced curriculum. Therefore, we chose not to alter any of the existing, because we know that all our departments offer a high degree of specialization and high-quality, sought-after profiles that are crucial to the professional field. As mentioned, there is much good in the interests of making and the discipline driven concentration (10,000-hour rule) has great formative value. At the same time, there has long been the question of how best to deal with the schism of specialization versus generalism that does not seem to be answered exclusively within the current structure. In earlier research (Boumeester, 2014) it was already suggested that we should be opting for something radically different in addition to the existing, which can both provide development space for the new department itself, and provide it to others. This space is needed to answer the question, how to use creativity as a tool in a targeted way within different domains. Transversal- and lateral thinking are valuable unbounded competencies that are of great value in many market domains. The academy is very good at building creative ability (number one of the competencies set), as a development tool and product for this, design work is used, but this is not a necessity. Partly because of the (somewhat justifiable)

protective nature of the art colleges themselves, there has been room for the emergence of a range of courses within other types of colleges and universities that sail under the banner of "creation". By protecting our sector, we preserved something very beautiful, namely the purity of arts/design education. At the same time, this also gave room for the emergence of a lot of opportunistic noise in the educational landscape: a range of courses has emerged with "creativity" somehow incorporated into the title offered by universities that have no inherent knowledge about how to build this competence. Yet this attracts also potential students who find the path to art school too narrow, too elitist, or "unmarketable at home," while the creative content of such a course is often very disappointing and rarely correctly defined. This is one of the reasons why we also keep failing to be truly inclusive and multi-vocal; after all, protection is also exclusion (by definition). Therefore, it was high time to take a stake in this ourselves and start a department that works on the development of our students' creative ability in a medium-independent (or even medium-less) and domain-transcending (or even domain-creating) way. Without a priori making a hard division based on artistic talent, but where, instead, we will build on the 21st-century skills that candidates already have. In nurturing sisterhood alongside our current educational offerings and with an urgency recognizable to students.

What

In the early days of the development phase a fairly random list of subject ideas, learning objectives, methodologies & innovations that stakeholders think/know was useful to support ideating the department. This led to the composition of a statement that is still both leading and supporting:

'As in current educational offerings, the individual development of students is central. Developing the ability to create and generate creativity as an untethered, freely employable competency is the main goal. Sub-goal is to prepare students to acquire a sustainable income position in a fluid field of supply and demand for creativity and imagination. The department will consciously relate to societal urgencies with respect to e.g., climate, socioeconomics, energy transition & de-industrialization and specifically focus on the shifts from profession to role, from industry to movement, from task to goal, from ambition to urgency, from method to serendipity and from identity to option. To this end, the department presents itself as a collective with an inquisitive nature rather than an entity with a sharply defined identity, and positions itself emphatically as inclusive, postcolonial, and pro-collectivist, including through its own admission criteria.'

Multiple types of voices are asked to the table in the development of the department as we are aware of the blind spots we have as experienced art school professionals. There is room for new forms of transfer of knowledge and skills, as the development sessions will show. In any case, what will be considered is to give the department a "compatible" shape so that cooperation or quartering is possible. This can be done through a few avenues, for example by dealing cleverly with learning objectives and competencies, with credits (smaller blocks are not necessarily easier to link and large blocks require a lot of commitment) or with work forms (not everything works well, but not everything has been tried either). In the development of the curriculum, we keep close to the origin of the provisional title: "Try Out". It stems from the inversed principle of the "Versuchsplatz" which was projected by Walter Gropius in his Bauhaus Diagram (Figure 1). The free translation of Versuchsplatz is Try Out. In the Bauhaus model, the educational structure starts with elementary learning, passes through mastering skills, research, and materials towards the end goal of "BAU". In contrast, Try Out starts experimenting through materials, into undefined knowledge, un-asked questions, and unexpected skills into the elementary understanding of sound, shape and space (Figure 2).

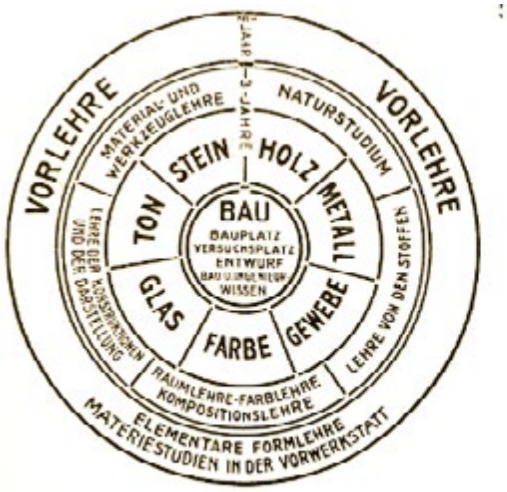

Figure1, Bauhaus Diagram, Walter Gropius, Weimar 1922

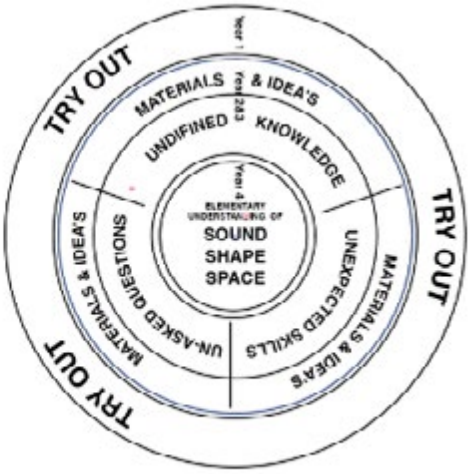

Figure 2. Model Try Out ArtEZ Zwolle 2023

The Bauhaus model is today still inspiring due to the central positioning of the learning community, which focusses on individual skills developed in a collective environment. The collaboration within collectives - regardless of the composition of the collaboration - always results in a work, a performance, a thing. Alongside, we share the concern that in its conventional form, pedagogy relies too heavily on a transfer methodology which emphasizes representation for its effectiveness. This leads to the belief that pedagogy should only be employed in its least rigid form. In simpler terms; learning should primarily stem from direct experiences, fostering a diverse range of outcomes rather than adhering to predefined objectives. This approach is commonly known as a "pedagogy of the senses" a concept embraced by both media theorist Marshal McLuhan (1960, 1964) and philosopher Gilles Deleuze (1987). It is undeniable that this approach to learning faces numerous practical challenges. However, given the right circumstances, it is feasible to incorporate this type of learning into traditional educational settings like universities or art schools. Therefore, the phases of designing the What and the How - based on these beliefs - will run parallel.

How

In this context How has a double meaning and intention. It is intended to indicate the design of the pedagogy of the program meaning the way in which the content (the What) will be taught. Simultaneously, the How is also defined the way in which this design itself is constructed, here - once again - form and content overlap and regularly switch positions. The narrative of transformation that is being told within the academy to come to the design of this new department, is also exemplary of the pedagogy that will be used in the new department. In this way all stakeholders can participate – with or without the responsibility to deliver a new curriculum – and the insights and understanding that are being generated through the process can also be taken back to the respective departments and disciplines. To facilitate this, several projects have been launched, which are running simultaneously and reinforce each other. A few that can be mentioned are; a 'transplorative' summer school for Animation Design, an in situ collaboration at the Provincial Government, establishing a research workshop next to the existing crafts workshops and the further development of the minors Liberal

Arts and Creating Creativity. In addition, a process has started for the development of a central location where all disciplines of ArtEZ in Zwolle should be housed in the future. All dance- music and visual arts- and design disciplines will be situated in a redeveloped factory-hall in the heart of the city as opposed to the situation now, where all disciplines are in different venues throughout the town. It needs no argument that bringing together these disciplines will have great advantages for future cross-fertilization. The architectural development of this site will entirely be done by our own Temporary Architectural Firm (TAB) which will employ alumni and students in the design process.

All these mental and physical processes together create a type of mobile à vent (like Alexander Calder's, Big Red, from 1959) which is a metaphor for an interplay of entities moved by the kinetic energy of the academy. Parts or wholes of the outcomes of the projects again serve as part of the development of this department, while the development of the department itself contributes greatly to the development of the architectural program of the uni-location development. A project space (700m2) is set up in the railroad zone from which projects and development sessions can be facilitated and developments directed. Students will also work in this space to closely follow and contribute to the developments. A magazine with the name "TIER!" will be published to describe the progress of projects and serves as a mouthpiece to inform the different tiers of each other's movements. From the movements generated by these developments, several mindsets can be distilled that are helping to shape the department. These directions are like vectors; they have a force and energy, but no predetermined starting and ending points. The vectors are being explored lead; towards a (partly joint) curriculum, towards methodology, towards the collective and towards identity/diversity. These vectors will be further matured in working sessions in several Tiers so that the content can smoothly transition into implementation and where a feedback loop has been established. A Tier is not so much a group but more a stage in the development to which different stakeholders contribute. Figure 3 sketches how the different stakeholders are grouped into the tiers they participate in; each higher tier is a new entity yet also contains the earlier tiers.

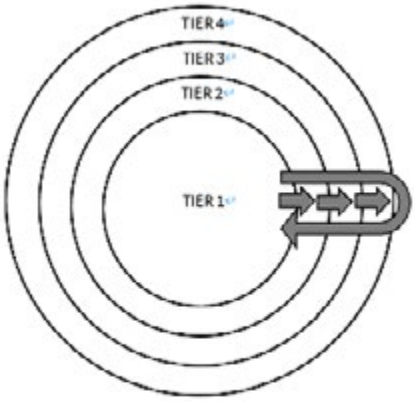

Figure 3. Scheme of the development structure of Try Out.

Conclusion

There's little argument that humans have a big role in the significant challenges facing our planet. The partnership between humans and the natural world has mainly been seen through anthropocentrism and hylomorphism, limiting the development of discussion in a one-sided way. This viewpoint creates some friction, which is essential for finding answers to our central questions. However, it's possible that the conversation about why humans think they are exceptional becomes even more important than finding definite answers. Considering this, it's a strong call for a more careful approach to how we use the power we have. Education is clearly the best place to promote a different perspective.

This text had the intention to share our initiative to develop a type of education that creates creativity, with the purpose to implement that competence in fields that are in urgent need of social-economic transformation.

Based on our own understanding of occupational biases, this design cannot follow any other path than the one it advocates. Therefore, this process is a collective narrative that has room for all stakeholders and a valuable output for all, regardless of if this is part of the new education. We have started this journey and by sharing our process with you we both hope to gain more perspectives and insights as well as invite you to learn from us. In our view radical pedagogy is circular with multiple optima; what and how is taught alternate in position, who teaches and who is taught as well. Non-lineair, non-binary, non- signifying.

References

Boumeester, M. (2014) De gespecialiseerde generalist; Kunst en Design en het Osmotisch Oxymoron, Cahier, volume 6. Tilburg: Fontys Press.
Boumeester, M. (2017) The Desire of the Medium. Arnhem: ArtEZ Press.

Deleuze, G. ([1968]2012) Difference and Repetition. London and New York: Continuum.

McLuhan,M. (1960) Report on Project in Understanding New Media. Washington, DC: National Association of Educational Broadcasters.

McLuhan, M. (1964) Understanding Media: The Extensions of Man. New York: Basic Books.

Van Winkel, C., P.J.D. Gielen, K. Zwaan. (2012) De hybride kunstenaar; De organisatie van de artistieke praktijk in het postindustriële tijdperk. Den Bosch: AKV/St. Joost.

How Cats Connect Community

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Abstract

In the midst of the global COVID-19 pandemic, strict lockdown measures were implemented worldwide, and a lot of people had to isolate themselves at home. This leaves the residents who have just moved into the student apartments facing a deeper sense of isolation before the community forms. However, the cats that appeared in the apartments' public courtyard unexpectedly disrupted the sense of isolation among the community members, becoming a catalyst for connecting the entire community.

This article traces the gradual formation of the cat community, starting with the emotional bonds sparked by interactions with the cats in the courtyard. The interactions between humans and cats shattered the prevalent sense of loneliness, prompting residents to step out of their confines and engage in shared public spaces. Subsequently, it elucidates how these cats evolved into idols within the community. This transformation stemmed from the connections formed between the cats and multiple caregivers, as well as the broader community of cat enthusiasts, giving rise to a unique community cat culture. This influence was magnified through interactions with the cat enthusiast community, highlighting the role of common interests in fostering community cohesion.

Furthermore, the paper explores how cats as intermediaries facilitated indirect communication among residents. This non-traditional form of interaction not only helped people establish connections but also paved the way for diverse and innovative strategies for future community engagement. It suggests the potential of using objects and design interventions to promote social interaction, which could enhance community bonds while adhering to minimal contact principles.

Through the intricate process of cultivating connections through shared experiences with cats, this article underscores the transformative potential of non-traditional approaches in community building. This exploration aligns with the theme of "narratives of love," demonstrating how seemingly simple interactions with cats can inspire innovative social design, foster a sense of belonging, and promote the development of resilient communities.

Author keywords

Community cats; emotional support; community building; symbiosis; collective trauma; social connections.

Introduction

All observations took place in the small courtyard within the student apartments, a space where residents sought fresh air during lockdown. Several cats frequently roamed the courtyard, led by a female cat named Diana. Residents found solace and shared fleeting yet wonderful moments with the cats in this miniature haven. The presence of the cats shattered the mutual isolation within the community, gradually becoming a catalyst for connecting individuals and fostering community awareness. Over the course of more than six months, transitioning from lockdown to reopening, the author continued to observe and document the subtle changes within the community and created an Instagram account named @Dianadoesntgohome to share these photos within the community, garnering interactions from residents including cat owners, neighbors, former residents, and even their partners. Thus, a cat-centric community gradually emerged, with cats seemingly becoming the symbol of emotional bonds throughout the entire community.

Emotional Support of The Cats

"Were it not for these cats, I would have grappled with depression long ago." said by the resident Jing. "The confinement of a small room all day can be quite disheartening, but observing these fluffies has a calming effect." the courtyard appears to operate as a sanctuary for residents to unwind. The presence of cats serves as an emotional balm, rendering them the most accessible and intimate companions in this unfamiliar and restricted setting.

While imperative for curbing virus transmission, social distancing measures may have inadvertently led to detrimental health outcomes by amplifying social isolation. Research has demonstrated that pets serve as a refuge, indicating their inclination for connection and reassurance during distressing times (Kurdek, 2008). Furthermore, several studies have underscored how pets assume the role of security and solace, functioning as a dependable foundation (Archer 1997). The Guardian also highlighted pets offering unwavering affection during lockdowns, with the headline "Our rescue cat rescued us: how pets can alleviate anxiety" (Wood and Jolly, 2021).

The advantages of owning pets are manifold, encompassing alleviation of loneliness, facilitation of social interactions, provision of security, and companionship (Antonacopoulos and Pychy, 2008), as well as promotion of overall well-being . There is also evidence supporting the idea that pets can fulfill the role of attachment figures. The companionship and unconditional love of pets, much like emphasized in the theory of well-being,

bring about positive emotions and a sense of fulfillment for individuals. When facing stress and anxiety, pets become a source of emotional support, thereby elevating overall well-being.

Cats Break The Panopticon

Architectural design has the power to facilitate or hinder encounters (Newman 1972). Upon the initial occupancy of newcomers, few individuals spend prolonged periods or engage in conversations within the courtyard, this could be attributed to the design layout resulting from limited public space.

The structure of the student dormitories is surrounding the courtyard on three sides, it create a structure which like a stage, Turning the residents behind the courtyard-facing windows into potential spectators. This structural configuration strikingly resembles the Panopticon. Individuals within this space seem exposed to scrutiny, consequently undergoing an inherent process of self-examination. The phenomenon pervasive in densely populated areas. In an era marked by traffic cameras, "Big Brother," closed-circuit television, selfies, and Google Glass, modern individuals contend with the pressure of observation and ongoing management of personal performances.

However, the introduction of cats as constituents of the social space ushers in a transformation. The allure and liveliness of cats draw the attention of community member, allowing them to momentarily forget self-examination. Lacking the capacity for judgment and scrutiny of human conduct, cats alleviate the pressure felt by community residents, enabling a more authentic self-expression. They leading to congregations sparked by a shared affection for and interactive experiences with cats.Cats provide the audience with the illusion of escaping surveillance. They beckon individuals to envision a world in which constant awareness of human and technological monitoring does not persist. This projection is realized through a narrative constructing cats as embodiments of liberal ideals—free, autonomous, and indifferent. This narrative affords people the potential to emancipate themselves from the surveillance of technocratic society and the self-discipline imposed upon their compliant bodies. The unrestrained demeanor of cats presents the audience with a prospect of living devoid of the gaze of surveillance. Through cats, people celebrate untamability. As biological entities, cats introduce a dynamic distinct from human social behavior. The presence of cats also modulates the dynamics of interaction among community residents to some extent, transforming the courtyard from a static monitoring space into a vibrant hub of social interaction.

Hence, by applying social space theory to the courtyard as a communal setting, we gain deeper insights into the behaviors of community residents within an observed environment, as well as how the inclusion of cats as part of this social space influences their self-presentation and social interactions. This theoretical framework offers a comprehensive perspective, illuminating intricate and intriguing interactions between community residents, their environment, and other biological elements. Thus, it presents avenues for devising solutions to break the ice in public settings.

Cat as a Community Icon

In the realm of digital landscapes, cats stand as paramount cultural symbols, exerting profound influence on people's perceptions. Residents not only fervently follow the updates on Diana but also share their own cat videos and images across various social media platforms. These shared posts, with titles like "Queen Diana Patrolling the Rooftop" or "Bramble's Temper Due to Hunger," adeptly illustrate this trend. The allure of cat photos stems from individuals projecting their understanding of feline personalities onto these enigmatic beings, a cat's countenance resembles a blank canvas, which the sociable nature of humans compels them to fill (Tucker, 2016). This projection is emblematic of inherent human sociability. Cats emerge as conduits for

emotional release, affirming shared values and fortifying community identity.
Upon an in-depth analysis of cat photos shared online, it becomes evident that cats, as symbols of societal construction, play pivotal roles in showcasing distinctive personalities and fostering positive interactions. Cat-centric online communities actively draw observers, nurturing virtual social bonds (Austin and Irvine, 2020). Offline interactions offer a richer cat experience and deeper emotional engagement. Social connections have shifted from physical reality to what Bakardjieva (2003) defines as "virtual communities," rooted in existing relationship networks. Users deliberately shape these digital networks to fortify connections with acquaintances (Serafinelli, 2017).
In the realm of social media, the amalgamation of images, narratives, and discussions shapes the perception of cats, leaving indelible imprints in people's cognizance. This interactive process not only crafts superficial feline representations but collaboratively constructs a collective cat culture. Real-world interactions solidify the cat-centric community. Cats transcend mere roles as pets, becoming symbols of emotions and embodiments of community attributes.

Collective's Community Cats

According to residents' recollections, Diana would occasionally disappear for an afternoon and return with her fur cleaned and emitting a fragrant aroma. In reality, the cats that frequently visit the courtyard seem to have "owners," although in a partial capacity. Humans intentionally provide food, medical care, and shelter for cats that are not considered personal property, a phenomenon referred to as "semi-ownership" (Toukhsati, Bennett, & Coleman, 2007). Regardless of their sociability, this widely used descriptor is employed to refer to those unowned, freely roaming cats, categorized as community cats. The popularity of this term partly arises from its implicit recognition of cats as a symbiotic species, garnering extensive approval from numerous residents. Community cats typically thrive within a collective group comprising related felids. This group occupies and defends a specific territory, providing sustenance and shelter (Wald, Jacobson, & Levy, 2013). In fact, they spend most of their time in the courtyard, waiting for students to feed them. At 5 PM, they visit the first "owner" for an appetizer, at 6 PM, they approach the second "owner" for the main course, and then return to the apartments for dessert. They have even expanded their dining options to include the neighboring homes on the second floor. Cats, being cunning thieves, engage in multiple ownership within the community, often having at least one backup "owner." These "owners" are aware of and accept their semi- owner status, while students perceive them as collectively owned cats. This universality of collective ownership fosters a sense of collective identity among people. However, this characteristic of communal property also facilitates interaction and connection throughout the entire community. For instance, when Diana doesn't come home for a few days, her semi-owner will worry and go to the student dormitories to inquire about her whereabouts. When the cats exhibit decreased appetite, speculation arises about the presence of new feeders. When cats appear a bit downcast, residents will discuss whether they are sick or feeling disheartened due to losing fights.
The care extended to these cats prompts residents to recognize each other's presence and consequently engage in interaction, enhancing communication and bring people closer to each other. Community cats, through their presence, seem to act as the "glue" of the community, connecting the entire geographical area through their footprints and weaving individuals into a collective, ultimately constructing a more expansive cat community.

Indirect social interaction

InteractionCommunicating through cat-related items:
In addition to providing food and water for the cats in the courtyard, residents also place blankets to keep the

cats warm. However, the rules of the apartment are not pet-friendly, administrators quickly remove these blankets. Nevertheless, anonymous residents promptly

place new blankets again, and administrators repeat the process of removal. It is said that these blankets come from different residents. Placing items in public spaces constitutes a silent dialogue between individuals and regulations: residents express their hope that the kittens won't be frozen by placing blankets, administrators convey the message "cats cannot live here" by removing the blankets, and residents once again placing blankets signifies "please let them stay here, we need them." People act in the cats' best interest by using blankets, engaging in an indirect conversation with regulations in public spaces. This approach represents a form of interaction with regulations through the use of objects.

Creating conversation through cat-related items:

The author placed cardboard boxes in the yard, hoping that the cats would use them as shelters, but never witnessed the cats doing so. One day, the author unexpectedly came across a photo on social media, of a cat hiding in cardboard boxes, which sparked an engaging conversation with the poster and led to the author making a new friend who shared the same expectations. By introducing items to stimulate environmental interaction, the cats began to engage with these objects. This heartwarming scene was captured and shared on social media by concerned community residents, generating increased interest. After discovering this photo, the author actively engaged in in-depth discussions with neighbors who shared a strong interest in the project. Through interactions with the cats, items, and social media, community members established deeper connections.

Influencing the community through cat broadcasts on social media:

Several confirmed cases of COVID-19 occurred within the apartment complex, causing unease to spread throughout the community. Some residents of the community proactively placed self- testing kits in the courtyard for everyone's convenience. The cats sat quietly next to the self- testing kits, emitting soothing purrs, as if signifying that they were keeping watch, alleviating any concerns. The author captured this heartwarming scene and shared it on social media, aiming to convey feelings of comfort and care amidst the pandemic, and encouraging community residents to face the challenges with positivity.

Conclusion

In the backdrop of crisis, community cats have acted as alleviators of anxiety, offering precious solace to the community. The sense of ease they bring liberates individuals from self-reflection, encouraging active engagement in shared spaces. Concurrently, these cats ignite a distinct cultural ambiance within the community. Through interactions with cats, people establish a unique culture revolving around them, intertwining emotions among members beyond the feline realm. Common interests forge connections, infusing fresh vitality into community cohesion. The multi-faceted ownership of community cats fosters a shared sense of resonance among residents, instilling an awareness of collective existence. Lastly, these cats spark indirect exchanges within the community, presenting diverse possibilities for social design. By connecting people in novel ways, they cultivate a more robust and harmonious community. Guided by the narratives of love and the principles of social design, cats become the binding force, amalgamating individuals into a collectively flourishing entity within the tapestry of the community.

References

Antonacopoulos, N. M., Duvall, M., & Pychyl, T. A. (2008). An Examination of the Relations between Social Support, Anthropomorphism and Stress Among Dog Owners. Anthrozoös, 21(2), 139–152. doi: 10.2752/175303708X305783.

Archer, J. (1997). Why do people love their pets? Evolution and Human Behavior, 18(4), 237–259. doi: 10.1016/S0162-3095(99)80001-4.

Austin, J., & Irvine, L. (2020). "A Very Photogenic Cat": Personhood, Social Status, and Online Cat Photo Sharing. Anthrozoös, 33(3), 441–450. doi: 10.1080/08927936.2020.1746533.

Bakardjieva, M. (2003). Virtual Togetherness: an Everyday-life Perspective. Media, Culture & Society, 25(3), 291–313. doi: 10.1177/0163443703025003001.

Batchen, G. (2000). Vernacular photographies. History of Photography, 24(3), 262–271. doi: 10.1080/03087298.2000.10443418.

Baym, N. K. (1998). The Emergence of On-Line Community. In N. K. Baym (Ed.), Cybersociety 2.0: Revisiting Computer-Mediated Communication and Community (pp. 35–68). Thousand Oaks: SAGE Publications, Inc.

Beck, A. M., & Katcher, A. H. (2003). Future Directions in Human-Animal Bond Research. American Behavioral Scientist, 47(1), 79–93. doi: 10.1177/0002764203255214.

Boyd, D. M., & Ellison, N. B. (2007). Social Network Sites: Definition, History, and Scholarship. Journal of Computer-Mediated Communication, 13(1), 210–230. doi: 10.1111/ j.1083-6101.2007.00393.x.

Brignall, T. (2002). The New Panopticon The Internet Viewed as a Structure of Social Control. In Internet Research Annual Volume 1: Selected Papers from the Association of Internet Researchers Conferences 2000-2002.

Field, N. P., et al. (2009). Role of attachment in response to pet loss. Death Studies, 33(4), 334– 355. doi: 10.1080/07481180802705783.

Foucault, M. (1977). Discipline and punish: The birth of the prison (1st American ed.). New York: Pantheon Books. ISBN: 978-0-14-013722-4.

foxxio. (2021). The Colony has Fan Art! (Repost) [Sketch]. London. URL: instagram.com/foxxio (visited on Jan. 27, 2022).

Geddes, L. (2022). Why do Brits talk about the weather so much? URL: bbc.com/future/article/ 20151214-why-do-brits-talk-about-the-weather-so-much (visited on Jan. 27, 2022).

Google Maps. (2022). Satellite View of Chesterman House. Chesterman House, London. URL: google.co.uk/maps/@51.475564,-0.03532,27m (visited on Jan. 28, 2022).

Newman, O. (1972). Defensible Space: Crime Prevention Through Urban Design. Macmillan. ISBN: 978-0-02-000750-0.

Kurdek, L. A. (2008). "Pet dogs as attachment figures." Journal of Social and Personal Relationships, 25(2), 247–266. doi: 10.1177/0265407507087958.

Kurdek, L. A. (2009). "Young adults' attachment to pet dogs: Findings from open-ended methods." Anthrozoös, 22(4), 359–369. doi: 10.2752/089279309X12538695316149.

Lugano, G. (2008). "Mobile Social Networking in Theory and Practice." First Monday. doi: 10.5210/FM.V13I11.2232.

Sable, P. (1995). "Pets, Attachment, and Well-Being across the Life Cycle". Social Work, 40(3), 334–341. doi: 10.1093/sw/40.3.334.

Serafinelli, E. (2017). "Analysis of Photo Sharing and Visual Social Relationships: Instagram as a case study".

Photographies, 10(1), 91–111. doi: 10.1080/17540763.2016.1258657.
Serpell, J. A. (2003). "Anthropomorphism and anthropomorphic selection–beyond the "cute response"". Society & Animals: Journal of Human-Animal Studies, 11(1), 83–100. doi: 10.1163/156853003321618864.
Stammbach, K. B., & Turner, D. C. (1999). "Understanding the Human—Cat Relationship: Human Social Support or Attachment". Anthrozoös, 12(3), 162–168. doi: 10.2752/089279399787000237. Toukhsati, S. R., Bennett, P. C., & Coleman, G. J. (2007). "Behaviors and Attitudes towards Semi- Owned Cats". Anthrozoös, 20(2), 131–142. doi: 10.2752/175303707X207927.
Tucker, A. (2016). The Lion in the Living Room: How House Cats Tamed Us and Took Over the World. Simon & Schuster. ISBN: 978-1-5011-5447-8.
Turkle, S. (2013). Alone Together: Why We Expect More from Technology and Less from Each Other. Basic Books. ISBN: 978-0-465-03146-7.
Vásquez, C., & Aslan, E. (2021). ""Cats be outside, how about meow": Multimodal humor and creativity in an internet meme". Journal of Pragmatics, 171, 101–117. doi: 10.1016/ j.pragma.2020.10.006.

Wald, D. M., Jacobson, S. K., & Levy, J. K. (2013). "Outdoor cats: Identifying differences between stakeholder beliefs, perceived impacts, risk and management". Biological Conservation, 167, 414–424. doi: 10.1016/ j.biocon.2013.07.034.
Waycott, J., et al. (2017). "A virtual panopticon in the community of practice: Students' experiences of being visible on social media". Internet and Higher Education, 35, 12–20. doi: 10.1016/j.iheduc.2017.07.001.
Wood, Z., & Jolly, J. (2021). "Pets at Home hits £1bn sales record as lockdowns spur 'pet baby boom'". The Guardian. URL: theguardian.com/business/2021/may/27/pets-at-home-tops-1bn- sales-record-as-lockdowns-spur-pet-baby-boom (visited on Jan. 27, 2022).

Investigating the use of street furniture in central London to understand multiple levels of conflict found in public spaces

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Abstract

People who use public furniture to live in public spaces have different characteristics. For some people, it is a source of leisure and social happiness. For others, it is the preferred choice for street sleepers and alcohol drinkers. Therefore, not all forms of Public Furniture are equal. This report briefly takes central London as an example to explore the design of street furniture in today's urban spaces, as well as the values and conflicts created using different groups of people. At the same time, think about how to explain "Narratives of Love" in the class from the perspective of social design.

Keywords

public space, street furniture, benches, quality design, speculative design, adversarial design

Background and history of street furniture

Public open spaces are seen as part of a society's social capital and means to be used in preventing social fragmentation and alienation (Madanipour, 2003). The study find that street furniture is a very valuable resource, especially for those who may be on the margins of society design refused many people to enter the outdoor space. In the following chapters, key conclusions and key points are presented. Although street furniture is often seen as a pleasant and sometimes romantic place, the study also investigates various aspects of confrontation and control. Hutton said the many types of benches throughout history have offered unique ways of sitting and interacting with the surrounding environment. "Different materials and inclines generate different social realities." Benches can either be "solitary or social, exclusive or inclusive." While they are often "invisible in the landscape," public benches are central to our appreciation of landscapes, as they "organize the scope and our scoping strategy." In the 18th and 19th centuries, communities started creating the "rustic twig bench," which reflected a "transcendental, natural philosophy." Hutton said these were "very uncomfortable," largely because they were meant to be "show seats when not occupied." In the 1860s, the first comfortable, mass-produced, iron garden chair was created, the Central Park settee, one of the first designed, stationary public benches, was made with a mix of iron handles with wood slats. (Jared Green，2013)

Figure 1. Central Park settee

Research and design analysis of examples of street furniture

Street Benches Design and Materials

These public seats belong to the street furniture system, including information exchange, leisure and so on.

Therefore, their design is affected and restricted by their own design factors, that is, designers are required to consider the social status, world view, cultural and economic differences of most users when designing, and design suitable products for different groups of people according to the needs of different groups of people seat type. Along with examining the history of street furniture in the past, research and analysis was carried out on street furniture in central London.There are many kinds of furniture with different functions on the streets of London. Made of many materials and with many intentions, sometimes hostile, sometimes passionate. Street furniture with hostile design can be classified according to different intentions. Some are people against homeless people falling asleep on chairs, while others stop young people from bumping skateboards. According to different hostility, there are different designs and different materials, and the same hostility can be expressed in different forms and materials. Material is the most essential and important part of street furniture. Not only does it constitute the substance of the street furniture, but the different materials also have a rich sensory character. The sensory properties of a material are mainly the texture of the material, which is the response of the human sensory system to the material due to physiological stimuli or the information obtained by the human sensory system from the surface of the material, including physical properties, physiological properties and psychological properties, where physical properties refer to the material The comprehensive characteristics of texture, color, luster, texture and other category properties and physical and chemical category characteristics. Physiological and psychological properties refer to the stimulating information that the material surface acts on the human tactile and visual systems, such as rough and delicate, gorgeous and simple, heavy and light, hard and soft, transparent, turbid and other sensory characteristics.

For instance, on the benches at the entrance of the Royal Court of Justice in London, the materials used are stone and iron. (Figure 2) These stones have several major advantages such as hardness, corrosion resistance, impact resistance, and decoration. At the same time, the obstacles made of metal material cast iron to divide the seat space, and if there are homelessness People who lie on it will feel uncomfortable, but at the same time it will also cause inconvenience to people who want to sit on it. The space is unreasonably divided, and it is not possible to sit on it comfortably and talk. Similarly, the bench next to the lawn of St. Paul's Cathedral is made of wood. (Figure 3) The wood has a good touch, and the material has strong processing properties. The treated wood also has strong durability. This bench is like a splicing of several single chairs, and the divided space is just the right position for one person, and there is no possibility for people to lie down. Not only these bench partitions that prevent people from lying down, but also the studs or bolts installed on the sidewalk in front of the building (especially the covered area), the diagonal rods fixed in the corners, and the benches equipped with metal handrails or rods. The hostile shapes made by these different materials have a variety of forms such as straight, curved, point, block and so on. (Figure 4) The different material is that the benches at the bus station are all made of plastic. Plastic material is easy to process and rich in color, it is generally suitable for the seat surface. The bracket part is made of other materials. It is warm and comfortable to sit on. At the same time, it is painted with red paint, which echoes with the buses in London. (Figure 5) And some seats are made


Figure 2. Royal Courts of Justice


Figure 3. St Paul's Cathedral


Figure 4. Soho


Figure 5. Bus stop


Figure 6. Bus stop


Figure 7. Bus stop

of iron sheet and stainless steel. They are particularly cool in cold weather and tend to get hot in hot weather. The ordinary wooden waiting stool has poor firmness, is easy to crack and damage, and is not easy to carry out, cleaning and high cost. At the same time, some seats take up a lot of space and cannot be used effectively. (Figure 6)

The multi-layered conflict generated by street furniture

Multi-level crowd class conflict

Street furniture is a key place where people often "hang out". The research explored the stories, memories and locations of activities of those who used the facilities and looked at how they used them. In addition to the fact that the seats in the park can make people feel uncomfortable, the unified seat design cannot fully meet people's seat needs. Therefore, the use efficiency of the public seat is low, and the effect of the bench is not really brought into play. At the same time, some behaviors classified as "antisocial behavior" are seen as behaviors of different social classes. Although crimes such as violence should be actively combated, it should not be at the expense of the quality of bench facilities or public spaces. The use of benches should be encouraged through comprehensive planning, design and management. This should be the love explained by social design. For some intentional, obstructive designs, following the "just" principle is sufficient. Different from private products, the allocation of public facilities pays more attention to equal participation and rational use. The main manifestation is that public facilities are not restricted by gender, age, cultural background, and education level, and should be used fairly by all users.

Urban Design and the Conflict of Citizen Needs

In the user-centered design concept, the needs and experience of urban residents are the focus of the design. However, in the actual operation process, because the cost of design research and public facilities restricts production and investment, designers intentionally or unintentionally reduce urban facilities to meet differentiated needs. Obviously, this simple design method will inevitably limit the development of urban facilities, urban characteristics and even the city itself, and cannot meet the diverse needs of modern cities (Ma Guangtao, 2014). Some public facility designers have noticed the above problems and put forward personalized solutions for different design problems. However, due to the lack of comprehensive analysis based on individual dimensions, the relevant schemes have inherent design flaws. There are iron partitions on the seat, which divide the seat into three parts. The designer's original intention was to prevent
homeless people from lying down and cause bad use and social security problems. But in actual use, it brings inconvenience to the normal use of many users. The concept of "public" itself implies the concept of social justice, as well as the embodiment of "Narratives of Love". This requires the design of urban facilities not only to meet the single needs of some target users, but also to provide diversified functions and service experiences through careful design.

The Conflict of Accessible Design and Restrictive Design

In public facilities, avoiding certain behaviors or consequences can only rely on expectations, but in actual use, any situation may occur, so avoidance design is limited to a relatively low-level way. Guidance is to play the role of guidance, education, and regulation, telling people what to do and what not to do, and finally guiding people to regulate their behavior and achieve their goals. Modulate people's behavior over time. Take public seating as an example, public seating is one of the most typical products in public facilities and can be seen in any public place. For this reason, the design of public seats also has different concepts. The value of the bench

is: people, equality, freedom. The role of the bench is a social resource, they can be flexible and responsible, serve the public, and they can kill time. In public places, it is not uncommon for people to lie on seats surrounded by trash. Such public facilities not only cannot operate normally but form a vicious circle and breed uncivilized phenomena. The "expression of love" in social design is the respect and care for people embodied in humanized design, and it is the concentrated expression of humanistic spirit. The humanized design of facilities in public places refers to the design of facilities including ergonomics. It is necessary to fully consider people's psychological and physiological factors, establish a harmonious relationship between people and products, maximize their potential, and protect people's health. As a public facility, the "human" factor is an important condition. The design and manufacture of public facilities focus on the safety, convenience, comfort and beauty of public facilities, that is, the greatest needs of human beings.

Conclusion

By studying the design of street facilities in public space, this paper suggests that there are many kinds of conflicts in public space, not just these public seats or some obstacles, but that different designs bring different life experiences to people of different classes. The richness of material civilization and spiritual civilization has intensified the diversified subdivision of society, making people have higher and higher requirements for the different functions of urban furniture. At the same time, many vulnerable groups or minority groups are increasingly eager for the attention of society and the government. Expressing "Narratives of Love" in public space through social design also refers to caring in the human-machine-environment system, which not only considers the use function of special groups of people, but also considers the emotional meaning.

References

Arefi, M. & Meyers, W.R. (2003). What is Public about Public Space: The Case of Visakhapatnam, India? Cities 20: (5), 331-339.

Burns, A. (1997). Design Recommendations for an Outdoor Public Space in Downtown Edmonton, Alberta.

Cooper Marcus, C. & Francis, C. (1998). People Places: Design Guidelines for Urban Open Space, Second Edition, Wiley, 384 pp., New York.

Everyday public spaces and their implications for well-being and social relations. Health & Place, 14, 544-561.

Francis, M. (2003). Urban Open Space; Designing for User Needs. Landscape Architecture Foundation, Island Press, 96 pp., Washington.

Ruki, A 2015, 'Police remove benches from canal towpath following reports of drug dealing, Manchester Evening News, 15 July 2015.

Lyle, J.T. (1970). People Watching in Parks; a Report from France and California. Landscape Architecture, October, 31-51, 52.

Mehta, V. (2007). Lively Streets Determining Environmental Characteristics to Support Social Behavior. Journal of Planning Education and Research 27,165-187.

Mumcu, S.; Düzenli, T.; Özbilen, A. (2010). Prospect and refuge as the predictors of preferences for seating areas. Scientific Research and Essays 5: (11), 1223-1233.

Punter, J. Urban Design and the British Urban Renaissance [M].London, 2009

Siu, K.W.M. & Wong, K.S.L. (2015). Flexible design principles: Street furniture design for transforming environments, diverse users, changing needs and dynamic interactions. Facilities, 33: (9/10), 588-62.

The Young Foundation (2012) A Nod is As Good as a Wink London: Young Foundation.

Tibbalds, F. (2000). Making People Friendly Towns: Improving the Public Environment in Towns and Cities, Spon

Press, 128 pp., London, UK.
UTF (Urban Task Force).Towards an Urban Renaissance[R].London: Department of Environment, Transport and the Regions and Thomas Telford Publishing, 1999.

Creative Actors in Place-making: Creations of Individual Experience and Collective Memory

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Abstract

The development of place-making as a social process has been studied in various disciplines. Urbanization, globalization, and the homogenization of urban landscapes have sparked interest in the creation of places that are unique, authentic, and expressive of local identity. In the past decades, there has been a focused debate on the role and cooperation approaches of various actors in place-making. However, not much consideration is given to the creative actors in place-making compared to their active practices in urban life in recent years. This paper discussed the composition, creations, and motivations of creator actors in place-making through the analysis of literature and observations from one empirical case. The conclusion of this paper suggests creators' actions stem from their love of place. Creating inclusive online and offline connected creative environments for creators and valuing their emotional expression will help encourage sustainable development and innovation in local culture.

Author keywords

Creative actors; Design; Inclusive; Local development; Place-making;

Introduction

In the process of globalization and modernity, the homogenization of cities has become a normal status. City managers employed the strategy and framework from enterprise branding to refine the city's characteristics (Kavaratzis, 2004). Earlier studies have shown the effectiveness of place branding strategy in enhancing the city's competitiveness (Kavaratzis, 2009). City branding has traditionally focused on creating an image or identity for a place, often with an emphasis on marketing strategies to attract tourists, businesses, and investment. Over recent years, however, there has been a growing recognition of the need for a more holistic and participatory approach to promoting sustainable and livable communities (Braun et al., 2013; Lucarelli & Brorström, 2013).

As a response to the limitations of place branding, place-making emphasizes the active participation of residents, stakeholders, and communities in shaping their own environments (Eggertsen Teder, 2019; Richards, 2017). It involves the collaborative design and development of spaces that prioritize social interaction, cultural expression, and a sense of belonging. The emergence and development of the creative class also has had a much more radical impact on the local environment and culture than when Florida introduced the concept twenty years ago.

In the new phase of urban development, cities are being built with a focus on the experience of individuals and the potential of communities. This is a return to the focus on people as the users of the city. Existing studies have explored the role of the various actors in place-making in terms of theory (Ellery et al., 2021), approach (Eggertsen

Teder, 2019), factors (Akbar & Edelenbos, 2021; Othman et al., 2013), and creative practice (Giraudy and Kampen, 2021). The detailed analysis of the subject of creation has a marginal presence in the literature. This paper aims to combine literature and empirical study in a regional development aspect following the research questions: (1) Who are the creative actors in place-making? (2) What do they create? (3) How to understand their creations? Answering these questions may help the subsequent study to select specific groups and sites for in-depth exploration of their creation and collaboration methods.

One ongoing case was chosen for discussion. Mui Wo Chill Imagine, which took place on Lantau Island, Hong Kong, reflects a high level of participation by local creators in the form and is characterized by innovation that is different from previous ones. Therefore, it was chosen to discuss the relationship between creators and space from the perspectives of the content of the event, the information of the stallholders, and the experience of the event.

The Emergence of Creative Place-making

Before the review of 'place-making', it is necessary to clarify the three spellings of it: (1) 'place making' is the most inclusive usage of this concept; (2) 'place-making' is usually used in the context of citizen-driven and natural processes; (3) 'placemaking' is more common in government-driven and strategy (Lew, 2017). Since this paper focuses on the spontaneous creative actions of individuals or groups, the spelling "place-making" is selected for the demonstration. Considering that not all studies make a distinction between spellings, all three spellings were applied as keywords in the literature search from Web of Science and Scopus. The keywords related to actor and creator were also limited. Filtrate criteria were whether the research topic was concerned with space and creative practice.

Place-making is the design or transformation of specific places by people through formal and informal behaviors or processes that make space meaningful. While the original concept focused on the physical changes and outcomes of place, the current one assumes that urban places are produced through social practices that reflect connections between people, connections, and interactions with space (Akbar & Edelenbos, 2021; Basaraba, 2023). It employs Lefebvre's spatial production as a theoretical tool, arguing that place-making is produced through social practice (Akbar & Edelenbos, 2021).

The shift in the concept of place-making is believed to have started in the 1990s, which cannot be separated from the research exploring the relationship between people and place proposed by Jane Jacobs and William Whyte in the 1960s (Akbar & Edelenbos, 2021). Place-making is now an overarching and more complex concept that involves interdisciplinary studies (Dupre, 2018). Beyond the physical structures and design processes involved in the built form of space, it also involves the construction of collective memories and narratives (Markusen & Nicodemus, 2014). Place-making then extends from geography and urban studies to the creative field. Individual and community experiences with creative practice are also believed to enable change in the future (Giraudy and Kampen, 2021). Around 2015s, place-making appeared in media studies, then digital place-making became the emerging focus (Basaraba, 2023). This raises the question of how to create an inclusive digital environment (Tang, 2023).

Creative Actors and Actions in Place-making

Existing studies have already discussed the roles and associations of diverse actors, including policymakers (Akbar & Edelenbos, 2021), city planners (Stevens & Ambler, 2010), residents (Ramsden et al., 2011), tourists (Dupre, 2018; Lew, 2017), and other stakeholders (Fernandez De Osso Fuentes et al., 2023; Najafi et al., 2022).

Among the various actors, creative actors may be one of the main contributors to shaping the physical and

cultural aspects of a place. They bring their skills and perspectives to inject creativity, energy, and identity into the local environment, becoming the driving force of urban regeneration. A recent report released by Creative Class Group demonstrates how creator economy growth in the digital age (Florida, 2022). It also reflects the fact that creative content, whether it's video, design, or art forms, is becoming a creative force influencing urban life (Li & Duan, 2018). Habibah et. al maintain that place-making refers to the understanding of a place in terms of stakeholders' visions, strategies, and practices, which is simply an individual's perception or construction of a destination or its experience (2013).

For a long time, under the influence of modernist concepts, the planning of cities has been characterized by the pursuit of order. But urban space is not static space, it contains diverse behaviors and activities. People's everyday practices form the vitality and dynamic of urban spaces (Siu, 2007). Recently, design and art-oriented events have become prevalent, which reshape the lifestyle and urban space. In this perspective, those designed events can be seen as a type of tool for place-making. They could mobilize local groups and increase cohesion from a social perspective (Othman et al., 2013; Richards, 2017). For instance, in a marketplace, visitors do not just observe the environment from a distance but enter it to explore, experience, and interact (Folkmann, 2010). They can touch the objects on display, take photos with the decorations, communicate with the vendors, and interact with other visitors. The images and videos which carry their memory of the event might be posted on social media, which creates a loop to attract more visitors to come. Moreover, the local community could improve the quality of tangible and intangible designs based on visitors' comments and feedback. When the visitor encounters these objects, experiences the environment, interprets their meaning, and appreciates them through their own eyes, it creates the possibility of empathy, connection and understanding.

Figure 1 The analysis of Mui Wo Imagine.

Mui Wo Imagine

Mui Wo Chill Imagine, initiated by local teams Ground Work and 2 Square Metres, is a series of regional experiments planned for 2023 to discover the identity and possibility of Mui Wo.

In February 2023, the project's Instagram official account, Mui Wo Imagine was launched. Although there are not many stalls introduced in their first event, each stallholder has a promotion. According to the content, individual creators, community-based brands, and eco-friendly brands take up a large proportion. They are illustrators who enjoy painting the local flora and fauna, workshops that using natural materials, community-based family restaurants, etc. Most of the stalls are characterized by independent creativity, self-expression, and community-friendliness. The goods sold at the market are basically produced in a small amount. These tangible creations, whether in the form of handicrafts, prints, or products, are an extension of personal identity and a reflection of unique individual experiences.

One quite innovative experience in Mui Wo Market is that visitors can earn bonuses by collecting stamps, such as receiving rewards at the stalls and earning discounts. In this way, event stalls are not linked to each other in the normal linear or separated way but are connected to each other through a reward mechanism. Visitors may thus be able to have more interactions with the space and the people. These reflect how people relate to their surroundings, creating a deep connection to the art and environment. Through this form, collective memory can

be created.

Recently in September, Mui Wo Collective started the second place-making attempt. This time, in addition to the increased number of stallholders at the market. The event also added some interactive installations for exploring the history of Mui Wo. The organizers also invited two experts to explain the local ecology and history of Mui Wo.

Towards an Inclusive Approach

The rapid process of urbanization, homogenization and unequal development have brought about the characteristics and contradictions of contemporary life, such as mobility and temporality. This also affects the lack of "publicness" of urban space. Placemaking offers creators the possibility to reimagine and transform their environments, challenging the traditional top-down approach to urban development. In bottom-up and collaborative place-making, more diverse groups can have a voice in urban development. It is worthwhile for local government and professionals to consider the local lifestyle and multiple actors in the place-making process, creating a diverse and vibrant living environment (Siu, 2007).

The collective memory creation to enhance place attachment is not a passive process, but one that requires the active participation of individuals and communities. It involves the constant negotiation, reinterpretation, and adaptation of cultural practices, reflecting the changing needs and aspirations of a society. Designed events such as Mui Wo Market promote community and local community engagement by creating opportunities for social interaction (Markusen & Nicodemus, 2014). Gathering people from different backgrounds and interests together creates a sense of community and revitalizes some neglected urban spaces in an inclusive way. There is a need to provide more inclusive creative environments and platforms for creators. Online and offline place-making need to form a loop to achieve local sustainable cultural development.

Conclusion

Gill and Cadman (2016) posed an inquiry in their book: Why Love Matter? Under the narrative of place-making, this paper will end by providing the answer that love is the emotional expression of an individual's attachment to what their heart is bonded to. This is the gathering of many individuals to lead their beloved place from the past to the future. The impetus behind the creation of these individuals is rooted in an emotional bond and connection.

The challenge for designers is to provide more inclusive approaches that encourage effective connections between all professionals and non-professionals. Personal narratives, emotions, and perspectives can be embodied through design. After all, creation is unconscious design; design is conscious creation. The sustainable development of local cannot be achieved without the creativity of all actors.

Due to the limited length, only one case was briefly discussed. Further research will focus on the collaboration network, and how the creative actors influence urban public spaces and cultures. The methodology will integrate more quantitative and mixed methods to provide more solid and detailed knowledge. It is hoped that the study will ultimately provide a more inclusive way to realize creative place-making and promote the sustainable development of local culture.

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References

Akbar, P. N. G., & Edelenbos, J. (2021). Positioning place-making as a social process: A systematic literature review. Cogent Social Sciences, 7(1), 1905920. https://doi.org/10.1080/23311886.2021.1905920

Basaraba, N. (2023). The emergence of creative and digital place-making: A scoping review across disciplines. New Media & Society, 25(6), 1470–1497. https://doi.org/10.1177/14614448211044942

Braun, E., Kavaratzis, M., & Zenker, S. (2013). My city – my brand: The different roles of residents in place branding. Journal of Place Management and Development, 6(1), 18–28. https://doi.org/10.1108/17538331311306087

Dupre, K. (2018). Trends and gaps in place-making in the context of urban development and tourism: 25 Years of Literature Review (2018). Journal of Place Management and Development. https://doi.org/10.1108/JPMD-07-2017-0072

Eggertsen Teder, M. (2019). Placemaking as co-creation – professional roles and attitudes in practice. CoDesign, 15(4), 289–307. https://doi.org/10.1080/15710882.2018.1472284

Ellery, P. J., Ellery, J., & Borkowsky, M. (2021). Toward a Theoretical Understanding of Placemaking. International Journal of Community Well-Being, 4(1), 55–76. https://doi.org/10.1007/s42413-020-00078-3

Fernandez De Osso Fuentes, M. J., Keegan, B. J., Jones, M. V., & MacIntyre, T. (2023). Digital placemaking, health & wellbeing and nature-based solutions: A systematic review and practice model. Urban Forestry & Urban Greening, 79, 127796. https://doi.org/10.1016/j.ufug.2022.127796

Florida, R. (2022). The Rise of the Creator Economy. creative class group.

Folkmann, M. N. (2010). Evaluating Aesthetics in Design: A Phenomenological Approach. Design Issues, 26(1), 40–53.

Kavaratzis, M. (2004). From city marketing to city branding: Towards a theoretical framework for developing city brands. Place Branding, 1(1), 58–73. https://doi.org/10.1057/palgrave.pb.5990005

Kavaratzis, M. (2009). Cities and their brands: Lessons from corporate branding. Place Branding and Public Diplomacy, 5(1), 26–37. https://doi.org/10.1057/pb.2008.3

Lew, A. A. (2017). Tourism planning and place making: Place-making or placemaking? Tourism Geographies, 19(3), 448–466. https://doi.org/10.1080/14616688.2017.1282007

Li, X., & Duan, B. (2018). Organizational microblogging for event marketing: A new approach to creative placemaking. International Journal of Urban Sciences, 22(1), 59–79. https://doi.org/10.1080/12265934.2017.1343155

Lucarelli, A., & Brorström, S. (2013). Problematising place branding research: A meta-theoretical analysis of the literature. The Marketing Review, 13(1), 65–81. https://doi.org/10.1362/146934713X13590250137826

Markusen, A., & Nicodemus, A. G. (2014). Creative Placemaking: How to Do It Well. Community Development Investment Review, 2, 35–42.

Najafi, P., Mohammadi, M., Le Blanc, P. M., & Van Wesemael, P. (2022). Insights into placemaking, senior people, and digital technology: A systematic quantitative review. Journal of Urbanism: International Research on Placemaking and Urban Sustainability, 1–30. https://doi.org/10.1080/17549175.2022.2076721

Othman, S., Nishimura, Y., & Kubota, A. (2013). Memory Association in Place Making: A review. Procedia - Social and Behavioral Sciences, 85, 554–563. https://doi.org/10.1016/j.sbspro.2013.08.384

Ramsden, H., Milling, J., Phillimore, J., McCabe, A., Fyfe, H., & Simpson, R. (2011). The role of grassroots arts activities in communities: A scoping study.

Richards, G. (2017). From place branding to placemaking: The role of events. International Journal of Event and Festival Management, 8(1), 8–23. https://doi.org/10.1108/IJEFM-09-2016-0063

Siu, K. W. M. (2007). Guerrilla Wars in Everyday Public Spaces: Reflections and inspirations for designers. International Journal of Design, 1(1), 37–56.

Stevens, Q., & Ambler, M. (2010). Europe's City Beaches as Post-Fordist Placemaking. Journal of Urban Design, 15(4), 515–537. https://doi.org/10.1080/13574809.2010.502341

Tang, Z. (2023). Technology-empowered Humanity: Inclusive Design in Digital Place-making. 44（2）, 396–403.

A Narrative Approach to Exploring Values: Fashion Show as A Case Study

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Abstract

As an effective means of presenting brand narratives, brand fashion shows are characterized by high cost-effectiveness, flexibility and participation. There is a lack of theoretical discussion on the internal logic and core elements of brand narratives presented in fashion shows. To address this issue, this paper discusses and summarizes the core design and elements of brand fashion shows in the context of narratology from the perspective of theoretical research, and selects several representative fashion shows of the brand Chanel in the past 20 years, in order to conduct a case study on the specific elements of the composition. This paper investigates the narrative logic of the brand's fashion shows, which can provide a reference for the subsequent design of fashion show activities in line with the brand's values and core. Grounded in the intersection of fashion, design and culture, it explores emotion, growth and human experience. With the interpretation of love, the narrative leads towards sustainable healing, the transformation of the new economy and the transcendence of ideas in constructing design research methodologies.

keywords

Narratives in Design ; Values ; The CHANEL Fashion Show ; Design Method ; Branding.

Introduction

The narrative of fashion show is a systematic thinking and design of the whole chain and all-round of the brand activity of fashion show, however, at present, the narrative design of fashion show is still facing the following challenges: (1) the problem of sustainable development. (2) Inclusiveness and diversity. (3) The problem of unclear narrative mode and core elements. Therefore, it is necessary to conduct further research on the conceptualization, design, and execution of fashion shows in the context of narratology. This paper first introduces the core elements and perspectives of narratology, discusses and summarizes the core design and composition elements of the brand fashion show, and then selects several representative fashion shows of the luxury brand Chanel in the past 20 years, and through case studies and analysis, further clarifies the design and implementation standards of the successful brand fashion show in terms of each design narrative element.

The core elements of the design narrative summarized in this paper help to construct logical guidelines for brand narratives; by summarizing the design standards of each element, it helps to broaden the dimensions of brand narratives. In terms of industry and practice, this narratological perspective emphasizes the importance of coherence and consistency in brand narratives.

Key Features of Narrative

Hinchman provide a useful definition of narrative, suggesting that narratives in the humanities should be provisionally defined as discourses with a clear sequence that connect events in a meaningful way and provide insights about the world to a particular audience. This definition provides the framework for the current discussion. the six elements of structure (abstraction-orientation-complex action-resolution-conclusion-evaluation) proposed in Labov and Waletzky's seminal work. This paper emphasizes three key features of narrative. First, it has a time-space or temporal dimension. Second, it conveys the meaning of an event or experience through the use of evaluative statements and through the temporal configuration of events. Third, the social dimension of narrative: Narrative is ubiquitous in society.

Narratives in Fashion Brand

Fashion is regarded as one of the important signs of modernity (Swenson, 2006), and taking fashion as a phenomenon, I can clearly see that fashion is the center of the modern world (Swenson, 2006). Fashion is intangible, a symbolic product that has no content substance in itself. Fashion provides some kind of extra added value to clothing and is an abstract socially constructed phenomenon.21 At the beginning of the 21st century, Lawrence Vicente formally introduced brand narrative in his book Legendary Brands: Interpreting the Charm of Narrative to Create Winning Marketing Strategies, introducing narrative from story marketing into the realm of branding. Brand narrative is represented by Lawrence Vicente's "Legendary Brands: interpreting the charm of narrative to build winning market strategies", Klaus Fog's "Storytelling to build a practical strategy for branding", "Your Brand Needs a Storyteller" (Richard, 2018), "Interpreting Narrative" (Miller, 2002), "The Story Behind the Brand-. -Corporate Culture and Global Brands (Albright, 2006), Contemporary Narratology (Martin, 2006), and so on, analyze the relationship between narrative and brand, value, method and other dimensions, proving that narrative is an effective means of branding in the initial building, value enhancement, and other development of the whole path, and to be methodologically refined.

Contemporary Interpretation of Fashion Show Narratives

Fashion shows bring the scene to the temporal and spatial aspects of the narrative, providing the conditions for the communication and social impact of the narrative. Enweser and Rocamora's (2006) interpretation of the fashion show in site theory is an important approach when evaluated with the participants, the audience, the journalists, the designers, and the presentation venue. Thus, the artistic and technical manifestations of storytelling, as well as their philosophical interpretations and the elaborate myths of the fashion show, create links between the actors in the field. Designers intensify their interaction with the audience to convey the right effect or message through the performing arts.The catwalk is a clear field where identity is created through very visible performances (Enwistle and Rocamora, 2006).

A first look at the brand Chanel's narrative approach in the Four Dimensions

As Tiziana Ferrero-Regis argues in "The Construction of Social Relationships in Chanel Shows," Chanel's shows have been hailed as one of the most spectacular productions on the Paris Fashion Week calendar. Taking nearly 20 years as a time coordinate, Chanel's shows have always ignited a creative spark within the industry and influenced a shift from a one-size-fits-all style to something more unique and daring.

Narrative model construction is a method of storytelling narrative construction based on the narrative structure of abstraction-orientation-complex action-resolution-conclusion-evaluation proposed by Labov and Waletzky as a model, presenting four dimensions of storytelling narratives from low to high with the structure

of storytelling thinking space. This chapter is based on the theoretical analysis and empirical demonstration of how the context, content and formal development of specific cultural objects and symbols are intertwined in the fashion show through the content analysis of the exhibition video and leads to preliminary design guidelines.

Symbolization

Roland Barthes first applied symbols to the study of fashion, and Chanel subverted the fashion of its time by materializing social change or transformation through its unique aesthetic sensibility. The "spirit" of Chanel's founding designer was entwined with the commodity, seemingly following Bourdieu and Delsaut's analysis of the "magic" of haute couture. She created symbols with a new style that she initiated to influence others. The designer's aura spreads across all products and services. The presence of the spirit of Chanel is integral to the success of the brand.

The symbolic narrative of a fashion brand involves creating a visual and conceptual language that communicates the brand's identity, values and story. This can be achieved by ensuring that the narrative design is consistent across all brand touch points; conveys clarity (including symbolism and messages that should be consistent with the brand's values and mission); authenticity; versatility; adaptability; emotional connectivity; cultural relevance; timelessness; sustainability; differentiation; consumer stickiness; and long term vision as a design guideline.

Figure 1.CHANEL, THE TOWER, Haute Couture Spring/Summer 2006, Paris

Landscaping

The commodification of everyday life, where everything becomes a commodity to be bought and sold, including our own experiences and desires. (Guy Debord, 1967). The illusion of immortality is not limited to being Gabrielle Chanel's physical body, but also extends to the places she has inhabited, fusing the brand's image with theatrical backdrops and installations. For example, in the 2006 Haute Couture SS/2006 collection, the mysterious staircase of Chanel's former apartment was recreated, revitalized through the symbolic function of the staircase, revitalizing the founder's soul, and rejuvenated by the illusion created by the collision of past and present. However, it is important to note that the recycling of materials used in the construction of the scene is an environmental issue that has been criticized even by the brand.

Figure2 .CHANEL，Protest，Spring/Summer Collection 2015

Landscaping the narrative of a fashion show involves creating physical or virtual environments that enhance

the presentation of the collection and reinforce the brand's identity. Everything from the staging to the lighting should contribute to a unified and coherent experience; thematic integrity; audience engagement; aesthetics and ambience; practicality; innovation and creativity; sustainability; adaptability; emotion; accessibility.

Participatory storytelling

With the widespread spread of the art of fashion performance and the development of public catwalks, fashion shows are increasingly becoming part of public entertainment (Xu and Zhang, 2011). Chanel set up its runway as a supermarket for its Fall/Winter 2014 collection, keeping the entire show incredibly lighthearted, incorporating supermarket elements of everyday life into the show. The show allowed the audience to participate in the process and the story that was created (King, 2014). The spring 2015 show extended the Chanel woman's ideology of freedom and equality from her work to the show, telling every woman that she should be brave enough to be herself and fight for the rights that belong to her. Inclusive and diverse, the core elements of the narrative are clear. By inviting the audience to a more participatory stage, the role of the audience is changing from watching things to being the thing to be watched in the narrative, which can be defined as an important shift from the traditional fashion show.

Storytelling narrative design criteria require coherence and consistency; emotional engagement; character development; visual narrative; narrative arc; symbolism and metaphor; audience participation; narrative cohesion; narrative message; and audience interpretation.

Ritualization

Chanel's narrative follows a set of "magical ritual frameworks" that mediate and rationalize the narrative through rituals in which the audience witnesses the transformation of intangible myths or visions of commodity spectacle into tangible phantasms. In the construction of the phantasmagoria through the repetition of formal, regimented sequences, ritual rhythms, the performances are ritualized and mediated between the artistic directors and their particular publics, and rationalized through their artistic talents and imagined 'dreams'. The dream of purchasing the immaterial becomes the impression of fashion as a complement to the immaterial, blurring the boundaries between art, religion and luxury fashion. Chanel's shows are highly ritualized and highly praised by multiple stakeholders in the fashion industry. A complete narrative is created through the narrative of the show to the experience and paraphrase conveyed to the audience.

Ritualized narratives include defining the ritual theme; symbolism and iconography; creating a ritual sequence; use of music and sound; set design and lighting; narrative elements; values evocation; audience participation; emotional engagement; continuity; reflection and contemplation; capturing and sharing the experience; feedback and adaptation; and respecting cultural sensitivities.

Conclutions

Fashion show narratives can optimize communication effects, accumulate brand equity, and help increase the value of fashion brands. The conclusions of this paper can also be extended to the fields of brand planning and industrial design to construct narratives with narrative extension, resonance, and symbolism. It can bring inspiration for design method innovation in reverse. The number of research case studies is still limited, and the reliability of the summarized principles needs to be further improved and revised. In the future, it is proposed to study more brands' fashion show narrative cases to further improve the fashion show narrative principles proposed in this paper.

References

Arnold, Rebecca. (2009). Fashion: A Very Short Introduction, New York: Oxford University Press.
Barnard, Malcolm. (2013). Fashion as Communication, New York: Routledge.
Barthes, Roland. (2013). Fashion Language, Sydney: Bloomsbury.
Baudrillard, J. (1996/1968), The System of Objects, London: Verso.
Benjamin, W. (1969/1935),'The Work of Art in the Age of Mechanical Reproduction', in Hannah Arendt (ed.), lluminations, trans. Harry Zohn, New York: Schocken Books.
Bourdieu,Pierre. (1993).The Field of Cultural Production: Essays on Art and Literature, Cambridge: Polity.
British Pathé(1925),'Liverpool Civic Week'. Available online https://www.youtube. com/watch? v=4ZmdqetvOb8
Colman, David. (2014). The Cloud-Filled Set of Marc Jacobs's Fall 2014 Fashion Show, https://www.architecturaldigest.com/story/marc-jacobs-fall-2014-fashion-show-clouds (Accessed on: 02.11.2018).
Currid, Elizabeth. (2007). The Warhol Economy: How Fashion, Art & Music Drive New York City, New Jersey: Princeton University Press.
Duggan, Ginger Gregg. (2001). "The Greatest Show On Earth: A Look At Contemporary Fashion Shows and Their Relationship to Performance Art", Fashion Theory, 5(3), pp. 243-270.
Entwistle, Joanne. and Rocamora, Agnès. (2006). "The Field of Fashion Materialized: A Study of London Fashion Week", Sociology, 40(4), pp. 735-751.
Finkelstein, Joanne. (1996). Fashion: An Introduction. New York: NYU Press.
Kepes, Gyorgy. (1996). "Kent Ölçeğinde Dışavurum ve İletişim Üzerine Notlar", Cogito, 8, 177-190.
King, Joyann. (2014). "Karl Lagerfeld Stages Chicest Supermarket Ever at Chanel", http://www.harpersbazaar.com/fashion/fashion-week/a1774/chanel-grocery-store-show/ (Accessed on: 11.06.2016).
Kuruc, Katarina. (2008). "Fashion as Communication: A Semiotic Analysis of Fashion on 'Sex and the City'", Semiotica, 171, pp. 193-214.
Loschek, Ingrid. (2009). When Clothes Become Fashion: Design and Innovation Systems, Berlin: Berg.
Marshall, G. and Scott, J. (1998). "A Dictionary of Sociology", United States: OUP Oxford.
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Figure 1 https://www.artsy.net/artwork/simon-procter-chanel-the-tower-haute-couture-spring-slash-summer-2006-paris-grand-palais
Figure 2 https://thekit.ca/news/celebrity/radar-chanel-spring-2015-protest/

Revitalizing the Traditional Game Vitality: An Innovative Design for Children's Outdoor Play Spaces in the Park City

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Abstract

As an important part of Chinese traditional culture, traditional games have multiple meanings for the education and development of children. However, some games are out of touch with the times and urgently need to be inherited and updated. Outdoor play space as a carrier of children's games can well awaken the value of traditional games. The study analyzes the development status of traditional games, investigates the current construction status of outdoor play spaces at home and abroad, and analyzes the characteristics of children's psychological behavior to obtain children's demand for outdoor play space design. Deduce the design mode of children's outdoor play space based on the theory of Tour-Art-Learning, and apply the design mode with the core of suitable recreation experience, traditional culture reproduction, and learning and education guidance to design innovation for demonstration. Carrying traditional games in the Park City outdoor play space can not only better awaken its vigor and vitality, promote the inheritance and development of Chinese fine traditional culture, but also highlight the development value of traditional games on children's physical, social, and emotional development, and promote the construction of an urban environment with humanistic care, and better reflect the society's deep concern for children.

Author keywords

Traditional games; Culture; Children; Outdoor play spaces; Park City

Introduction

Traditional games are an activity that gradually formed in people's long-term common life and are passed down to the present through practice tests. It has distinctive local characteristics and is significant to children's growth. Because traditional game materials are mostly taken from nature, children have extensive contact and experience with nature through games. Since the mid-to-late 1980s, the game location has shifted from outdoors to indoors resulting in decreased natural components and increased commercial components. A plethora of commercially produced toys inundates children's lives, intruding on the territory of traditional games. Furthermore, the emergence of electronic devices has led to a decrease in children's engagement in hands-on toy crafting and a decline in group activities. Important traditional game elements such as cooperation, hands-on, and sports have been transformed into electronic games on mobile phone screens. As an indispensable way of survival for children, traditional games are fading out of people's sight and away from children's lives (Liu & Shen, 2012).

Therefore, how to combine traditional games with outdoor space to create a space for children that can carry traditional games and promote multi-faceted development has become an urgent problem to be solved.

Park City Construction Calls for Innovative Design of Children's Play Spaces

Children are the future masters of society and guarantee the sustainable development of the city. Therefore, strengthening the supporting construction of spaces, venues, and facilities such as children's entertainment, physical fitness, and natural science education can provide children with a better growth environment. Chengdu's (Capital of Sichuan Province, China) Top Ten Happiness and Beauty Projects proposes to build a child-friendly city by the end of the 14th Five- Year Plan, emphasizing the importance of outdoor play space and the development of children's amusement facilities. Park City regards park recreation services as basic urban public services that meet people's needs for a better life and build a happy homeland, emphasizing people-centered inclusiveness, fairness, and diversity of vitality. However, due to the limitation of residential space and consciousness in urban communities in China, the amusement facilities suitable for children present a single quality. Facing many problems such as the lack of children's amusement facilities and the uneven quality of children's outdoor play spaces, combining traditional games into the construction of children's play spaces can provide effective strategies for the development of children's amusement facilities, which can better promote the development goals of Park City. Create a more inclusive play environment that promotes children's overall growth and development.

The Necessity of Children's Outdoor Play Space Carrying the Vitality of Traditional Games

Traditional games, also known as folk games, use rich connotations and forms to reflect the colorfulness of real life. In the 1950s and 1960s, traditional games permeated children of different ages and had a positive effect on children's growth (Zhao et al., 2010). However, after the reform and opening up, the urbanization process accelerated, and the appearance of high-rise three- dimensional residential buildings made children more accustomed to staying in the bedrooms and living rooms at home. Meanwhile, the rapid development of the city has caused the traditional neighborhoods to disappear rapidly, and children's playgrounds are gradually decreasing. Not only that, the changes in society, the advancement of science and technology, and the increase in educational pressure are all reasons why traditional games have become precarious. There is no doubt that the survival and development of traditional games have become imminent. We should promote the sustainable inheritance and development of traditional games loved by the public, and inject vitality and vitality into traditional games (Zeng, 2009).

Children's outdoor play space includes playgrounds and amusement facilities. As the medium and carrier of children's games, it can create rich game opportunities for children to carry traditional games and play value. Since the last century, developed countries such as Europe and the United States have gradually paid more attention to children's playgrounds and proposed that amusement facilities should be used to effectively guide and promote children's social skills (Hu, 2015). China's amusement industry started relatively late and often exhibits age ambiguity and functional concentration. Although some scholars and designers have begun to pay attention to outdoor play spaces should pay more attention to the development needs of children's psychological behavior, and pay more attention to the aesthetics and interactivity of the facilities (Yu, 2017), most of them are in the initial stage and require new design theories and modes support the development of children's outdoor play space. To better inherit traditional games in children's outdoor play spaces, it is necessary to carry out appropriate transformation and innovation on the content and form of traditional games according to the actual situation, to ensure that the games are comprehensive and consistent with children's developmental level (Ma,

2021). Most traditional games possess characteristics of being enjoyable, easy to initiate, and having flexible rules. Children can innovate in combined gameplay through different game categories to stimulate children's creativity in games. At the same time, the psychological and behavioral needs of children in different age groups are not the same. According to the cognitive- development theory of Swiss psychologist Piaget, the different learning content, and methods of children at different ages can be divided and summarized (Table 1). Therefore, an in-depth and systematic analysis of the outdoor play space design and the value of traditional games can ensure the scientific combination of traditional games and the environment, so that traditional games can be revitalized in modern society.

Table 1 Physical, psychological, and behavioral characteristics of children in different age groups

Generation	Physical characteristics	Psychological characteristics	Behavioral characteristics
Sensory motor stage (0-2 years old)	From walking to running	develop thinking in concrete things	Know the world by the five senses
Preoperational stage (2~7 years old)	Start the initial game activity	Concrete mental processes	Imitate adult activities
Concrete operational stage (7-11 years old)	Rapid physical development	Abstract thinking develops rapidly	Variability fades away
Formal operation stage (After 11 years old)	Physical fitness close to adult level	Logic gradually increases	Enjoy challenging activities

Tour-Art-Learning Design Mode of Children's Play Space Integrating Traditional Games

Children are the center of gravity of human beings and the hope of society. The design of outdoor play spaces suitable for children should not only conform to the state of children's physical and mental development but also play the role of entertaining and teaching (Wu & Xia, 2014). Supporting the design of children's outdoor play space through the theory of Tour-Art- Learning can pay attention to the integration of children's game experience, artistic atmosphere, and learning and education in the design process. This design mode can provide a certain reference for designers so that the design of venues and facilities can better accommodate children's various behaviors in traditional games.

Suitable Recreation Experience of "Tour"

Suitability includes two aspects: first, the design of children's play space needs to adapt to the walking tolerance and behavior characteristics of children of different ages, set up facilities according to children's physical dimensions classification, and form a variety of configuration options such as physical training and interactive devices (Wang et al., 2021). 60%-80% of children are injured by falling from amusement facilities due to improper setting of swings, slides, and other amusement facilities. Therefore, it is necessary to pay attention to the application of game equipment and materials during design. Measures such as anti-skid, durability, stability design, and good maintenance will help to improve the security of children's use (Qi et al., 2013). Secondly, children's outdoor play space should guide children's play and tour behavior through site design, so that children can have full fun and interaction from the starting point to the destination. The space design should consider children's playfulness and autonomy, and provide them with opportunities to explore freely and temporarily organize games so that they can have a positive experience during play.

Traditional Culture Reproduction of "Art"

As a basic activity for children, games are also an expression of children's free spirit. Children use games to create a connection between their subjectivity and the external objective world, thus acquiring the character of homogeneity and isomorphism of humanistic culture (Ding, 2009). In the wave of digitalization, the impact of traditional culture is inevitable. It is difficult for children to return to the beautiful childhood their parents had. Increasingly marginalized in spiritual life (Ding, 2010). The spirit of childhood is facing "disappearance" and traditional games have fallen into a development dilemma. In the current era, the call for diverse and shared cultural consciousness is undoubtedly aligned with the humanistic spirit of child development and childhood culture. Secondly, by integrating traditional games and regional culture reconstruction, a game venue with a unique humanistic and artistic atmosphere is created to meet children's needs for a humanistic spirit and childhood culture.

Learning and Educational Guidance of "Learning"

For children, games offer opportunities for free exploration and interaction with their surroundings. The various forms of independent activities involved in the gaming experience provide a developmental platform for children's creativity, imagination, manual dexterity, self- regulation, and long-term learning and life skills (Ren & Conor, 2021). Cai F. M. mentioned in "History of Games" that when children adopt rules and regulations in traditional games, it helps them establish correct values. Joint discussion, negotiation, and resolution among children promote understanding of rule generation, enhance social problem-solving, and help children learn to control their emotions and behaviors (Cai, 2007). Meanwhile, children learn about regional cultural customs in the game, which continuously strengthens the cultural foundation of children's development. Therefore, at the level of "learning", the play space can become a meaningful learning environment. Guide children to think and learn by setting explicit or implicit themes. Such a design can stimulate children's curiosity and thirst for knowledge, allowing them to gain knowledge and experience growth in games.

Innovative Design Practice of Traditional Games in Park City Children's Outdoor Play Space

In the design of outdoor play spaces for children in Park City, traditional games, as valuable cultural heritage, carry rich traditional and historical significance. To incorporate traditional games into the design of outdoor play spaces for children in Park City, the Tour-Art-Learning theory can be employed for corresponding design practices to ensure that play facilities meet children's entertainment needs while also inheriting and promoting traditional culture.

The design is situated in Chengdu Wuhou Sports Park, a significant urban park that integrates sports, leisure, and culture. Moreover, it is surrounded by the famed Three Kingdoms culture and the historical Wuhou Temple relics. This design aims to innovatively incorporate traditional game elements, together with the renowned Three Kingdoms culture and Wuhou Temple features, to create a fun and educational outdoor play space for children (Figure 1).

Figure 1. Innovative design renderings of traditional games in children's play space

Building Upon Tour: Innovative Design of Children's Game Experience

Natural materials are mostly used in the design of outdoor play spaces to ensure the safety of children during play. In addition, the partition design is carried out through wooden piles, so that children can enjoy different fun in different areas. In the design, it is designed according to children of all ages. For example, the design elements of the lotus climbing facilities are derived from the lotus in nature, extracted from the lotus pattern of the Three Kingdoms period, and set up three types of heights for climbing facilities for children of different ages to play. At the same time, an unconventional game environment is created to provide unlimited routes. Children can exercise strength and body through various suspension bridges, ropes, escalators, and climbing nets. In the play space, a small area is also set up for children to play hide-and-seek and catch people's games. To improve the playability of the game, pipes and small hills are added, so that children can freely shuttle among them, and at the same time, compete with partners and agree on the rules of the game together, which is conducive to the establishment of children's socialization and helps children jointly build an orderly game environment (Figure 2).

Figure 2. Amusement facilities carry the function of free choice of path in traditional games

Inspired by Art: The Integration of Traditional Culture and Amusement Space

Traditional Chinese games are the crystallization of the collective labor and wisdom of the Chinese nation in the long history. Carrying out traditional cultural education in childhood can allow children to understand the essence of Chinese traditional excellent culture through feeling, appreciation, and experience. It is especially important for cultivating children's good character (Chen & Yang, 2012). As the enlightenment of life, childhood should provide children with the most valuable and classic content. For example, the lotus heart seesaw imitates the shape of the lotus heart in nature to arouse children's curiosity, and children will choose bright colors more consciously. At the same time, the seesaw with 4 seats can meet the needs of more children playing together, and multiplayer games can satisfy children over 3 years' understanding of the rules. There are also musical instrument facilities of the Three Kingdoms in the venue. By extracting the shapes of the most common national musical instruments of the Three Kingdoms, the lyre, chimes, and drums, and combining the shape of Zhuge Liang's hat, these musical instruments are arranged and distributed according to different scales. Children can work with their peers or parents to make beautiful music, and musical games can provide children with a sense of music and guide them to experience the beauty of art (Figure 3).

Figure 3. Amusement facilities carry the function of experiencing cultural artistry in traditional games

Learning as a Goal: Children's Education and Play Scenario Creation

Children's outdoor play space is not only an entertainment scene, but also a meaningful learning space. A reasonable setting of educational elements related to the theme of the game can stimulate children's curiosity and thirst for knowledge. For example, the seat designed by using the tangram (traditional Chinese block puzzle) can not only be used as a rest but also can be used to create a new arrangement by cooperating to push and pull the seat with rollers at the bottom. The tangram can be spliced into more than 1,600 patterns and images through different combinations, which can develop children's brain intelligence and allow children to fully feel the hidden creative skills and elegant artistic taste in the changes of the tangram. The lotus leaf swing is designed to accommodate five people to play together. The swing can not only rely on the children's strength to make the swing move but also let the companion push forward to make the swing higher and higher. During play, children can exercise their balance ability, muscle strength, and grasp of time rhythm and movement sequence. Playing swing games together is effective for social-emotional outcomes, and social skills are enhanced when children negotiate and cooperate in the direction of swing games and show concern for their peers (Figure 4).

Figure 4. Amusement facilities carry the function of stimulating intellectual learning in traditional games

Conclusion

Outdoor play space is an indispensable sport and play environment for children's healthy growth. Now when the traditional game culture is gradually passing away, it is necessary to innovate and inherit the traditional game culture in Park City outdoor play space. Applying traditional games to the development and design of site and amusement facilities provides new possibilities for inheriting and carrying forward the value of excellent traditional culture, and adapts to the needs of modern society for the comprehensive development of children. By screening all kinds of traditional games that are beneficial to children's physical and mental development, and combining Tour-Art-Learning theory to explore the design mode suitable for children's outdoor play space to carry traditional games, it can make traditional games transform and develop creatively, and provide new ideas for the innovation of children's amusement facilities through design exploration and diverse and integrated cultural concepts expression. In the future, we should conduct more in-depth research on the integration of traditional games and amusement spaces, and create more innovative and cross-cultural amusement spaces, and children's amusement facilities with more Chinese characteristics and cultural connotations. At the same time, we should start by caring for children and use Children's happiness as the goal, Love is integrated into every detail of the design to create a better environment for children's healthy growth, so that children can feel love and care in games, thus contributing to the improvement of children's well-being.

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References

Liu, L. Q., & Shen, L. (2012). On the Traditional Country Games' Disappearing. Studies in Early Childhood Education, (03),58-60. http://doi.org/10.13861/j.cnki.sece.2012.03.014

Zhao L. H., Fu, H. Y., & He, X. L. (2010). Hedge against the Disappearance of Traditional Games in the Process of Urbanization. Journal of Guangzhou Sport University, (04),1-4. http://doi.org/10.13830/j.cnki.cn44-1129/g8.2010.04.002

Zeng, Q. H. (2009). On Difficulties for Development of Folk Children's Games. Journal of Capital University of Physical Education and Sports, (02),235-237. http://doi.org/10.3969/j.issn.1009- 783X.2009.02.025

Hu, R. (2015). Enhancing the Play Value of Children's Outdoor Play Facilities Design. Packaging Engineering, (16),95-98. http://doi.org/10.19554/j.cnki.1001-3563.2015.16.026

Yu, B. (2017). Outdoor recreation facilities for preschool children of the community. Packaging Engineering, (02), 221-225. http://doi.org/10.19554/j.cnki.1001-3563.2017.02.051

MA, X.Y. (2021). Logical Construction and Future Direction of Education Value of Children's Folk. Contemporary Education Science, (10), 37-42. http://doi.org/10.3969/j.issn.1672- 2221.2021.10.006

Wu, X. W., & Xia, Y. C. (2014). Public Entertainment Facilities Design for the Demand of Children Development. Packaging Engineering, (22),45-48+126. http://doi.org/10.19554/j.cnki.1001- 3563.2014.22.011

Wang, X., Lü, P., Wang, X. Q., Tian, Y. H., & Zhang, B. (2021). Research on the Construction of Outdoor Game Space in Child-Friendly Community. Chinese Landscape Architecture, (S1), 62- 67. http://doi.org/10.19775/j.cla.2021.S1.0062

Qi, S. P., Qi, C. H., & Wang, P. (2013). Study on Safety of Children's Outdoor Playground. Chinese Landscape Architecture, (05),81-84.

Ding, H. D. (2009). Humanistic Interpretation of Children Spiritual Characteristics——from the view of the dualistic theory on culture. Studies in Early Childhood Education, (09),13-17+25.

Ding, H. D. (2010). On the Humanization of Children's Education. Journal of Shandong Normal University (Social Sciences), (05),121-125. http://doi.org/10.16456/j.cnki.1001- 5973.2010.05.028

Ren, K., & Conor, M. G. (2021). From "Play-based Learning" to "Guided Play": Reflection on Children's Play in European Preschool Education History. Studies in Early Childhood Education, (10),72-82. http://doi.org/10.13861/j.cnki.sece.2021.10.008

Cai, F. M. (2007). History of Games. Shanghai: Shanghai Literature and Art Publishing House.

Chen, W. Y., & Yang, M. H. (2012). Research on the development and application of early childhood education

resources based on Chinese traditional culture. China Educational Technology, (08),97-101. http://doi.org/10.3969/j.issn.1006-9860.2012.08.019

Co-Design Sessions at Revigrés: Workshop 1.0 as a Catalyst for Design-Led Innovation and Transformative Culture

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Abstract

This article presents the findings from Workshop 1.0 of the Co-Design Sessions at Revigrés, part of an ongoing Ph.D. investigation. The Co-Design Sessions explore the potential strategic role of a Chief Design Officer (CDO) in driving innovation and fostering a design-oriented culture at Revigrés, a leading Portuguese ceramic tiles manufacturer. This article focuses on the first workshop of a series of four, engaging stakeholders from industry, retail, and research fields.

The workshop, held in January 2023, aimed to test assumptions regarding the CDO's strategic responsibility for evolving the product range, educating stakeholders about design value, improving creativity through open communication with multidisciplinary participants, and leveraging design principles and methodologies in a corporate environment. Designed around "kinetic tiles" and "smart tiles" themes, Workshop 1.0 envisioned innovative multi and plural-function ceramic products and experiences to position Revigrés as an industry leader. Facilitation work showcased how CDOs foster a design-oriented culture and inspire participants through tailored methodologies.

The workshop's relation to the conference theme of "Narratives of Love" is evident through empathy, collaboration, and envisioning products that enhance lives, aligning with the conference's vision of love as a driving force for cultural and societal positive change and innovation.

This study highlights the significance of multidisciplinary collaboration in driving innovation, while the iterative nature of design thinking enabled continuous improvement. Facilitation effectively balanced open and closed briefing paradoxes, nurturing creative freedom while offering a sense of direction. Implications for Revigrés include fostering creativity, identifying diverse perspectives, and unleashing the power of design thinking. The practical results of this study yielded four project proposals to be developed in the forthcoming workshops.

Workshop 1.0 exemplifies design thinking's role in shaping a design-oriented culture, guided by a CDO, to drive innovation at Revigrés. The multidisciplinary collaboration and interactive nature of the workshop underscore the value of design thinking as a common practice employed by CDOs. Furthermore, the workshop showcased the potential strategic role of a CDO, mediating and bridging the gap between design and business objectives, and propelling Revigrés towards a design-led future. Moreover, the workshop's alignment with the conference's theme highlights the exploration of empathy, innovative solutions, and a transformative mindset as key elements in fostering a culture of love-driven innovation at Revigrés. As the company continues its co-design journey, Workshop 1.0 serves as a visionary stepping stone, offering insights that will propel Revigrés into a future of boundless innovation and design excellence.

Author keywords
Co-Design Sessions; Chief Design Officer (CDO); Innovation; Design-Oriented Culture; Empathy.

Introduction

Building Design-Led Innovation at Revigrés: A Journey of Co-Creation

This article fits into the scope of ongoing Ph.D. research led by the research team, aiming to explore and affirm the role of a Chief Design Officer (CDO) in a corporate environment having Revigrés as a platform for strategic experimentation.

In the prototyping length of this Ph.D. research, a series of four co-creation design sessions were meticulously organized by the research team, engaging various stakeholders from industry, retail, and research fields. Under the format of workshops, they were designed with a focus on innovative product development, and leveraged design principles, techniques, and methodologies to explore two distinct themes within the context of Revigrés, a prominent Portuguese manufacturer of ceramic tiles. The overarching goal of these sessions was to experiment with how to drive design-led innovation and to show the potential strategic role of a CDO within the company. Held between January and May 2023, in three different locations, these workshops aimed to test key assumptions, foster a design-oriented culture, and develop groundbreaking concepts that could shape Revigrés' future product range.

Since these activities are part of a study in which the goal is to assert the CDO role in businesses, the research team approached the workshops with specific assumptions to validate. Previous studies and activities such as case studies and interviews have shown some practices applied in the design function of companies like Philips, 3M, PepsiCo, and J&J, led by CDOs. The inputs gathered in these studies and the literature review prompted several research questions and hypotheses that have since been tested by the research team.

The first assumption aimed to explore how the CDO's strategic responsibility for evolving the product range could lead to more creative solutions and broaden the company's offerings. The second assumption examined whether the CDO's role in educating stakeholders about the value of design would enhance their understanding of the design function and its activities. The third assumption sought to determine if open communication with multidisciplinary participants in the design process could improve creativity and lead to more innovative concept generation. Finally, a fourth assumption delved into the challenge of embedding and scaling up a design culture within the organizational context, making it a key goal for the CDO.

Furthermore, the Co-Design Sessions emphasized two central themes devised by the research team. The first theme focused on the development of kinetic energy ceramic tiles, exploring how this technology could enhance the product range and boost the company's innovative performance. The second theme, centered around "smart tiles," sought to envision new products, services, and experiences integrated into intelligent ceramic tiles that optimize spaces and fulfill multiple functions. These themes emerged from the research team's design vision to develop multi and plural-function products for Revigrés, as a catalyst of innovation aligned with the strategic guidelines defined to implement a design function within the business environment.

The overarching goals of this Co-Design Sessions initiative were threefold. Firstly, the research team aimed to build design-oriented innovation processes for Revigrés, ensuring that design played a central role in driving innovation within the company. Secondly, the team sought to explore the implementation of design culture within Revigrés, fostering a mindset of creativity, collaboration, and user-centered thinking. Thirdly, the initiative aimed to develop a range of concepts for innovative multi and plurifunctional products that would position Revigrés as a leading player in the market.

Specifically, the set of workshops aimed to demonstrate the importance of collaboration and multidisciplinary approaches in the creative process. By bringing together stakeholders from various backgrounds, the research team intended to showcase the transformative impact of incorporating design thinking methodologies into project and corporate development. Through a co-creative design-driven process, the workshops were dedicated to developing the concept of "kinetic tiles" and "smart tiles." By involving stakeholders with diverse expertise, the sessions aimed to capitalize on a wide range of know-how and perspectives.

The research team anticipated gaining valuable insights into the impact of collaboration, multidisciplinary practices, and design thinking on product innovation at Revigrés. Observations and feedback gathered during the sessions were expected to provide significant contributions to the understanding of creative processes and design culture. Ultimately, the workshops were envisioned to yield two or more distinct product concepts, arising from collaborative processes with various stakeholders. These concepts were intended to form the foundation for potential final products, showcasing the CDO's contributions through both a contributory structure, guided by designers and specialists, and a collaborative structure, driven by all stakeholders.

The workshops aimed to extract insights on effective approaches to both restrictive and non-restrictive briefings by observing participants' difficulties, needs, and aspirations during the co-creation journey. The goal was that these workshops would serve as a relevant contribution, demonstrating how design dynamics integrated with collaborative and multidisciplinary methodologies could amplify the creative process for innovation. Additionally, the research team intended these sessions to be a vehicle for the application of new design-led innovation processes within the organizational culture at Revigrés, fostering a transformative design-thinking culture that permeates the entire company.

Exploring the Narratives of Love: Workshop 1.0

This article focuses only on the first workshop in the set of four Co-Design Sessions and represents a crucial early stage in the design process, where exploration and divergent thinking are at the forefront. Held at Revigrés on the 31st of January of 2023, this kick-off workshop aimed to inspire and provide a solid framework for investigating the challenges at hand. The primary goal was to define intentions, contexts, and the pertinence of proposed concepts through a collaborative and multidisciplinary approach.

With a diverse audience comprising individuals from different contexts, ages, and genders, the workshop embraced inclusivity and collective creativity. The methodology of the Co-Design Sessions was introduced, outlining the scope of development, objectives, and anticipated results. Participants were welcomed into a world of design-thinking methodologies, empowering them to explore innovative solutions for the two presented themes.

As a starting point for the Co-Design Sessions, this workshop stimulated participants to exponentiate creative confidence mindsets, sparking inspiration and igniting a passion for tackling challenges. Through collaborative discussions and a wealth of perspectives, four proposals emerged, two for each of the themes: "kinetic tiles" and "smart tiles." This dynamic and engaging workshop set the stage for the subsequent sessions, promising a transformative journey of creativity and innovation at Revigrés.

This workshop seamlessly aligns with the conference's focus on ideology and ideality, exploring the theme of "Love" as a driving force in human civilization. Just as love permeates every aspect of human existence, the initiative described in this article embraced the multifaceted concept of design thinking and user-centricity to delve into innovative product development for Revigrés.

Within the realm of ideology, the initiative described parallels the conference's goal of exploring loving multiple dimensions. By gathering a multidisciplinary and diverse audience, the workshop fostered discussions on a symbiosis between humans and nature, the compatibility of heterogeneous perspectives, and the stability

of social structures. These themes echo the design-oriented innovation processes pursued in the Co-Design Sessions. Through collaborative efforts, the participants sought to create concepts that reflect cross-cultural characteristics, bridging differences and integrating elements of different cultures.

The topics to be discussed at the conference, including ecological technology, sustainable design, material culture, social design, and civic education, intersect with the design principles and methodologies applied in this session. Workshop 1.0, with its exploration of "kinetic tiles" and "smart tiles", embodies the conference's quest for cross-cultural wisdom in shaping the future directions and methodologies of design. Furthermore, the exploration of empathy, an essential aspect of design thinking methodologies, directly relates to Workshop 1.0's collaborative and multidisciplinary approach. The research team, akin to the conference's goals, aimed to foster a design-oriented culture and nurture a transformative design-thinking mindset within Revigrés.

Research Methodology

This study explores the experimentation of a process of building design-led innovation at Revigrés through a journey of co-design and multidisciplinary workshops, according to the following research methodology.

Participant Selection Process and Workshop Promotion

The co-design sessions were promoted both within the university where the doctoral research undergoes and within Revigrés. The workshop promotion included a detailed description of the objectives of the co-design sessions, the specific objectives of each workshop, the agenda, duration, location, and facilitators' descriptions. For the university participants, enrolment was open to students, teachers, and researchers from any course or degree. The workshop had a limited capacity of 15 seats and the selection process was based on a first-come-first-served basis. The aim was to encourage a diverse range of perspectives and expertise among the university participants.

For Revigrés' employees and stakeholders, the remaining half of the workshop seats were reserved. The selection process for this group was based on nominations and recommendations from the company's management to ensure representation from different departments and roles within the organization.

Data Collection Methods

The research methodology adopted a mixed-methods approach, integrating qualitative and quantitative data collection methods to gather comprehensive data on the impact of design thinking and the role of CDOs in enhancing the innovation process within the company. The study involved four co-design sessions, each focusing on different phases of the design thinking process inspiration, ideation, prototyping, and validation. Data was collected through participant observation, feedback surveys, and interviews.

The research utilized a sequential exploratory strategy, which involved an initial qualitative phase (participant observation, document analyses, and interviews) followed by a quantitative phase (feedback surveys) to corroborate the qualitative findings. This approach allowed for a holistic understanding of the co-creation process and the participants' perspectives. The main data collection methods were:

Participant Observation: participant observation was conducted during the co-design sessions to capture real-time interactions, collaboration, and problem-solving processes among the participants. This method allowed the researchers to immerse themselves in the co-creation environment, facilitating and gaining deep insights into the dynamics of the workshops, and understanding the participants' experiences and interactions.

Interviews: Semi-structured interviews were conducted with some participants, including Revigrés' employees, students, researchers, and staff, to gather in-depth insights into their perceptions, experiences, and learnings from the co-design sessions. These interviews explored participants' attitudes toward design thinking and the impact of the workshops on their creative thinking.

Feedback surveys: post-workshop surveys were administered to assess participants' satisfaction with the co-design sessions, the effectiveness of the design thinking methodologies, and their perceptions of the value of design-led innovation at Revigrés. Questions like "What worked well?", "What could be improved", "Ideas?" and "Questions?" were set.

Document Analysis: Documentation of the co-design sessions, including canvases, brainstorming results, and prototype designs, was analyzed to identify themes, patterns, and innovative concepts that emerged from the workshops. Document analysis provided valuable qualitative data that complemented the interview and survey findings.

Qualitative data from participant observations, interviews, and document analysis were analyzed. The data were transcribed, coded, and categorized into themes and patterns, capturing participants' experiences, challenges, and creative outputs during the co-design sessions. The quantitative data from feedback surveys were analyzed using descriptive statistics, providing insights into participants' overall satisfaction and perceptions of design thinking methodologies.

Triangulation was employed to ensure the validity and reliability of the research findings. Data triangulation involved cross-verifying information from multiple data sources, including participant observation, interviews, surveys, and document analysis. The convergence of findings from different data collection methods added credibility to the research outcomes and was converted into infographics to be communicated to the company and design community.

Ethical Considerations

Ethical considerations were given due importance throughout the research process. Informed consent was obtained from all participants before data collection. Anonymity and confidentiality were ensured to protect participants' privacy and identities. The study complied with the ethical guidelines outlined by the company ethics board.

Limitations

The research faced some limitations, including the relatively small sample size of participants, which may limit the generalizability of findings. Additionally, the four-hour duration of each co-design session may have constrained the depth of insights that could be obtained. Nevertheless, efforts were made to mitigate these limitations and draw meaningful conclusions from the available data. Nevertheless, each workshop data analysis helped to improve the next one, contributing to a continuous improvement in the facilitation procedure and the session structuring.

The mixed-methods approach allowed for a comprehensive understanding of the impact of design thinking on product innovation within the company. The findings shed light on the value of design-led practices through methodological experimentation, the role of CDOs experienced in the facilitation role, and the transformative potential of co-design workshops in the mindsets and ways of working of the participants. This research contributes to the growing body of literature on design thinking in corporate environments and offers valuable implications for companies seeking to foster innovation and creativity in their product development processes.

The Value of Design Thinking for Companies: The CDO Perspective

Design thinking has become a common and transformative practice exploited by CDOs to drive innovation, foster creativity, and create user-centric solutions within companies. As strategic leaders responsible for the design function, CDOs employ design thinking methodologies to address complex challenges, enhance collaboration, and cultivate a culture of innovation (Pinheiro & Franqueira, 2021; Ignatius, 2015).

At the core of design thinking lies a human-centered approach, focusing on understanding the needs and

desires of end-users. CDOs spur their design team to use methods such as empathy mapping and user interviews to gain deep insights into users' experiences and pain points (Porcini, 2023). By placing the user at the center of the design process, companies can develop products and services that address real-world challenges, enhancing customer satisfaction and loyalty. Moreover, Brown and Katz (2019) emphasize the importance of empathy in design thinking, which aligns with CDOs' efforts to place stakeholders at the center of decision-making. Research by Liedtka and Ogilvie (2011) supports the effectiveness of human-centered design in generating successful solutions that meet user needs, while Lafley and Martin (2013) reveal the importance of relating and communicating with stakeholders in design strategy.

CDOs embrace an iterative and experimental approach to problem-solving. They encourage teams to prototype and test solutions rapidly, seeking feedback to refine and improve designs. Different authors (Mootee, 2013; Lewrick et al., 2018) underline the significance of prototyping as a means of learning and exploration, while research by Cross (2011), Dorst (2015), and Martin (2009, 2022) support the iterative nature of design thinking in achieving effective solutions for businesses. CDOs understand that early prototypes help identify flaws and opportunities for enhancement, minimize risks and resource wastage, and support a mindset of experimentation (Quint et al., 2022).

Chief Design Officers cultivate a culture of creativity and innovation within their organizations, by inspiring and encouraging the design team and other functions to think creatively, explore new possibilities, and challenge the status quo. Kelley & Kelley (2014) concept of "creative confidence" is reflected in CDOs' efforts to unleash the creative potential of their teams. Research by Hennessey and Amabile (2010) further supports the positive impact of a creative work environment on employees' intrinsic motivation and innovative outputs.

On the other hand, CDOs need to embrace ambiguity and uncertainty, recognizing that design thinking is an iterative and non-linear process. They encourage teams to adopt a design thinking mindset, characterized by curiosity, openness to failure, and a bias towards action (Porcini, 2023). This approach is aligned with the advocacy for embracing uncertainty and viewing failures as learning opportunities. CDOs understand that a design thinking mindset fosters resilience and adaptability in the face of challenges (Brown & Katz, 2019).

Design thinking is a continuous learning process, and CDOs actively promote a culture of learning and adaptation. They encourage teams to gather feedback from users and stakeholders, using insights to refine and optimize solutions (Quint et al., 2022). CDOs implement post-project evaluations to capture lessons learned and apply them to future initiatives. Deserti and Rizzo (2014), on innovation culture, highlight the importance of continuous learning in driving organizational performance, supporting CDOs' commitment to learning and improvement.

To scale up design in companies, CDOs actively promote cross-functional collaboration to harness diverse perspectives and expertise. Cross's (1982, 2011) research highlights the value of multidisciplinary collaboration in design, which resonates with CDOs' aim to create holistic and innovative solutions. For this reason, this article explores how design thinking workshops and co-creation sessions involving stakeholders from different functions may be a valuable initiative to foster a collaborative environment where individuals from background work together towards a shared goal.

Overall, CDOs leverage design thinking as a common practice to foster innovation, collaboration, and user-centricity within their organizations. By employing a human-centered approach, embracing cross-functional collaboration, and cultivating a culture of creativity, CDOs drive transformative solutions and position their companies at the forefront of innovation. The iterative and experimental nature of design thinking enables CDOs to navigate uncertainty and adapt to dynamic market demands. Through a design thinking mindset

and continuous learning, CDOs promote a culture of innovation that empowers their organizations to thrive in the face of evolving challenges and opportunities. As research supports the effectiveness of design thinking in driving successful outcomes, CDOs' strategic adoption of these methodologies proves crucial in shaping a successful and innovative future for their companies.

Workshop 1.0: Inspiring Innovation at Revigrés

Workshop 1.0 of the Co-Design Sessions initiative aimed to set the stage for a transformative journey of innovation at Revigrés by achieving inspiration, defining intentions, relevance, and contexts. The overarching goal was to lay the foundation for subsequent sessions, promoting collaborative creativity, and driving design-led innovation. With a four-hour duration, the workshop engaged participants in a process of idea generation, concept development, and scenario definition.

Divided into four groups with five to seven people each, attendees were driven through a collaborative process, to foster a design-oriented culture, nurturing creativity, and promoting networking opportunities among students, researchers, and Revigrés employees. With an emphasis on empathy and inclusivity, Workshop 1.0 set out to validate some of the assumptions regarding the role of a CDO in driving innovative product development and cultivating a design mindset within the company.

The Attendees

Workshop 1.0 brought together a diverse group of 25 participants, including 14 students and researchers, and 11 Revigrés' employees. To foster multidisciplinary collaboration and embrace cross-cultural wisdom, individuals from different internal functions were invited, such as representatives from R&D, marketing, commercial, HR, environment, quality, production, logistics, top management, cleaning, and canteen staff.

Participants were distributed in pre-constructed groups, to ensure that for each group there was an equitable cross-section between Revigrés employees and members of the educational institution. Therefore, a wide range of knowledge and thinking was guaranteed amongst the 25 participants, from 14 different areas of knowledge, spread across the four groups that made up workshop 1.0. The two challenges were also distributed by the team, resulting in Team A and C with the Smart Solutions challenge and Team B and D with the Kinetic Tiles challenge. In this workshop, four different project proposals were achieved.

The research team identified the specific needs and aspirations of the participants during the session to ensure a fruitful and enriching experience. The clarity in communicating the workshop's objectives was crucial to fostering engagement and active participation. Moments that provided networking opportunities were sought, promoting interactions between attendees from different backgrounds. Energizing moments were incorporated to maintain enthusiasm and momentum throughout the session, while also providing relaxation and minimizing evaluation moments to create a safe and supportive environment for Revigrés employees.

Revigrés management saw the workshop as a platform for nurturing partnerships, networking, and potential impacts on the company.

Program and methodologies

The workshop commenced with an engaging introduction, wherein facilitators (research team) set the stage for the Co-Design Sessions, providing participants with a clear understanding of the workshop's scope and objectives. A brief definition of design thinking methodologies and the design mindset laid the foundation for creative exploration. Additionally, the workshop's themes, fundamental rules, program, and expected results were outlined, setting the tone for an inspiring and collaborative experience.

A 15-minute ice-breaking activity followed, which served as an effective warm-up to familiarize participants with one another. Participants engaged in a creative and fun ice-breaker, where they passed around a roll of toilet paper and were asked to take out as much as needed. Then, in line with the number of sheets of

paper withdrawn, they revealed truths about themselves, introducing their names and areas of training/ professional activity. This activity facilitated networking and promoted a friendly and open atmosphere. After this action, the participants were organized into pre-constructed groups and directed to their respective worktables, each assigned a specific challenge related to the workshop's themes.

To enhance problem understanding and generate ideas, the participants engaged in "Reverse Brainstorming". This technique encouraged teams to think about potential obstacles to success rather than diving into immediate solutions. By identifying and questioning challenges, teams initiated the idea-generation process. An energizer activity arose, in the form of dance to stimulate creativity, collaboration, and group dynamics. This activity served as a refreshing break, invigorating participants for further engagement.

Following idea generation, participants refined and stated two concepts. Brainstorming sessions were conducted to explore and develop structured ideas for the two selected hypotheses.

In the decision-making phase, participants engaged in a "Speed Dating" activity, where each group pitched their ideas in a 3-minute presentation. All participants voted for their favorite ideas, which were then selected for further development.

To gain inspiration and analyze the impact of current actions on the future, "Future Backcasting" was introduced. Participants envisioned future scenarios and explored how present actions could shape desired outcomes. After that, the participants synthesized their ideas and presented their concepts, showcasing the innovative concepts generated during the workshop.

The workshop concluded with a feedback exercise, providing an opportunity for participants to share their thoughts and reflections on the session. A goodbye drink was offered, allowing for informal networking and a chance to celebrate the successful completion of Workshop 1.0.

Space Organization, Ambiance, and Materials

The workshop's ambiance was carefully curated to promote a relaxed and creative environment. The spatial organization, combined with thoughtful materials and narratives constructed by facilitators, fostered a sense of collaboration and ideation.

Revigrés provided the venue for the workshop. The room was thoughtfully divided into five spaces: four areas designated for the work of the four teams and one space for facilitators and material disposal. Additionally, Revigrés' showroom space was made available for networking moments, such as the coffee break and goodbye drink, providing participants with an opportunity to immerse themselves in the context of the ceramic industry.

An assortment of materials, including markers, pencils, post-its, and cardboard, were thoughtfully provided to support the creative activities. For specific exercises like Reverse Brainstorming, Concept Generation, and Future Backcasting, canvases with instructions were available, facilitating seamless and fluid activities.

W1.0 core activities: the power of inspiration and curiosity

Workshop 1.0 aimed to establish in essence an inspirational phase. In the design thinking process, framing a well-defined question is foundational to the success of ideation and problem-solving. As discussed by Brown and Katz (2019), starting with curiosity and a beginner's mindset is crucial for uncovering challenges and opportunities.

Since this was a limited four-hour workshop, users' interviews and observation weren't plausible methodological options, so the research team felt the need to boost creativity and enhance ideas, using the participant's unique and diverse perspectives to identify and frame a problem. It was by setting a compelling question, fostering curiosity, building idealistic scenarios, and encouraging analogous inspiration, the

research team guided the participants toward creating innovative ideas. Reverse brainstorming and future backcasting were the two core activities chosen to build this inspirational framework, along with decision-making and generative exercises like "speed dating" and "concept generation", as previously described.

Reverse Brainstorming is a technique used in design thinking workshops to facilitate ideation about a specific problem by focusing on potential causes and negative aspects rather than traditional solutions. This approach builds on the cognitive ability of individuals to recognize problems more readily than envisioning solutions, making it an effective tool to uncover critical issues and gaps in a project (Evans, 2012). By examining potential failure points, teams gain valuable insights into the underlying challenges and can subsequently identify strategies to achieve the opposite effect.

Reverse Brainstorming normally falls under the ideation phase of the design thinking process, where teams aim to understand the problem deeply before generating solutions (Lewrick et al., 2020). However, the methodology was chosen because the audience was diversified and multidisciplinary, requiring greater alignment and a framework that encouraged problem-orientated rather than solution-orientated thinking. Since this was the first workshop, there was no pretense to find final solutions, but rather to introduce ideation techniques that would lead to diversity and divergent approaches. The primary objective of this technique is to foster critical thinking by exploring potential causes and negative consequences related to the challenge presented. By shifting the focus from solutions to potential issues, participants can gain a comprehensive understanding of the problem space and identify opportunities for innovative approaches.

Reverse Brainstorming is grounded in cognitive psychology and the understanding that individuals may find it easier to identify problems rather than propose solutions. Research by Paulus and Yang (2000) on group creativity highlights that brainstorming is often biased toward generating positive ideas, leading to the exclusion of critical evaluations. Reverse Brainstorming counteracts this bias by encouraging teams to examine potential failure points, thereby ensuring a more comprehensive exploration of the problem space.

The first step of this activity involved clearly defining the goal or problem that the team aims to address. This ensures that participants have a clear understanding of the scope and context of the challenge. After that, instead of directly brainstorming solutions, the team deliberately considered potential causes or negative aspects that could exacerbate the problem. This shift in perspective enables teams to explore different angles of the problem and uncover hidden complexities. In the next step, participants generated potential solutions to the problems identified in the previous step. The emphasis is on divergent thinking, encouraging the team to generate multiple ideas. In another step, the team engaged in a discussion to evaluate the feasibility and practicality of the ideas generated. By considering the reverse perspective, participants assessed the potential consequences of implementing each idea.

To conclude the activity, from the pool of ideas formulated in the previous step, the team collectively selected two ideas that stand out as feasible and promising. These selected ideas become the basis for further development and prototyping.

On the other hand, Future Backcasting is a forward-thinking methodology with a primary objective to envision and plan for an ideal future state that aligns with the concept statement formulated based on previous results (Bibri, 2018).

Given the perceived need to open mindsets and stimulate a collaborative exchange of ideas from participants with different backgrounds, it was relevant to test a methodology that would encourage futuristic thinking. It was hypothesized that this methodology could cause divergent thinking by considering ideal scenarios and not locking into current problems. By putting the lens of analysis from the future to the present, this approach fosters the ideation of innovative ideas by understanding how present actions can impact and shape the desired

future (Bibri, 2018). By projecting into the future and then working backward to the present, participants were able to identify the necessary actions and steps required to bridge the gap between the present and the desired future.

Future Backcasting is rooted in the theory of strategic foresight, which is an established field of study focused on anticipating and preparing for future developments. According to Bishop et al. (2007), strategic foresight methodologies, including backcasting, provide a structured and systematic approach to envisioning possible futures and designing pathways to achieve them. Research by Adegbile et al. (2017) further highlights the effectiveness of backcasting in innovation processes, enabling organizations to create long-term visions and plan for transformative changes.

The exercise steps included a concept statement, which involved formulating a concise and well-defined question that encapsulates the vision of the concept. This statement served as the guiding framework for envisioning the future, twenty years from now (2043). Participants were, also encouraged to imagine and describe various possibilities and scenarios in the future that relate to the defined concept statement. The emphasis is on creativity and envisioning ideal scenarios, regardless of current technological or financial limitations.

In the next step, the focus shifts from the future (2043) to the present (2023), and participants work backward to identify the necessary steps to connect the desirable future to the present, jumping every five years. For each future scenario, teams map out the specific actions required to bring that scenario into reality. Upon returning to the present (2023), participants reflected on the insights gained during the exercise and identify actionable steps that need to be taken today to move towards the ideal future. These steps form the basis for strategic planning and innovation initiatives.

Insights Gained from Workshop 1.0

Workshop 1.0, the initial phase of the Co-Design Sessions, provided valuable insights into the application of design thinking principles and methodologies in fostering innovative solutions for Revigrés. Through an iterative approach encompassing gathering inspiration, framing problems, questions, ideal scenarios, and ideation, significant findings emerged, aligning with established scientific research on design thinking and innovation.

Valuable insights into a multidisciplinary collaboration, the iterative nature of design, the facilitator's work, the paradox between an open and a more closed briefing, time constraints, and adaptability, were plain throughout the workshop. These aspects encouraged active engagement and idea generation to foster a culture of creativity and collaboration within Workshop 1.0 and helped formulate derivations to improve future workshops.

Multidisciplinary Collaboration as a Driver of Innovation

A notable insight gained from Workshop 1.0 was the power of multidisciplinary collaboration as a driver of innovation. The multidisciplinary approach, which included a diversity of participants, including students, researchers, and Revigrés' employees from various departments, proved instrumental in broadening problem-solving horizons and exploring innovative solutions.

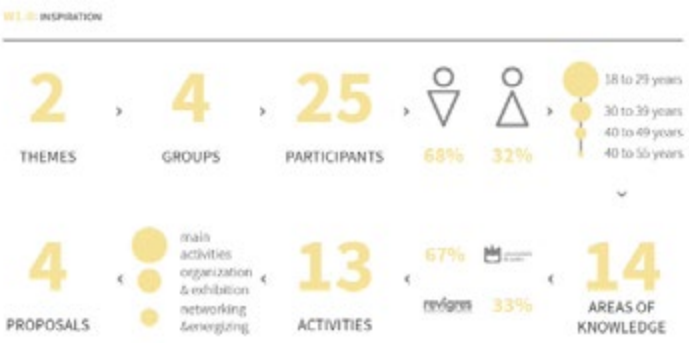

Figure 1. Workshop 1.0 in numbers.

Figure 1 demonstrates the diversity and inclusivity of Workshop 1.0 through quantitative analysis. This visual representation emphasizes that among the 25 attendees representing 14 distinct areas of knowledge, 13 different activities were addressed. The observed diversity and multiplicity of thought led to positive feedback.
As mentioned by Cross (2011), design thinking thrives on diverse perspectives, and Workshop 1.0 showcased the importance of cross-functional cooperation in unlocking creative potential and enriching the ideation process. In fact, 72% of the participant's main feedback indicated that the sharing and different knowledge within groups was crucial during the workshop activities. Inputs such as: "The multidisciplinary of the design sciences made the emergence of ideas varied and differentiated" or "The group work, and the flow of the workshop, was very enriching and appealed to each one's more creative side and problem-solving skills" were obtained.
This favorable response can be attributed to the enriching tapestry of perspectives and expertise that fostered an open and collaborative atmosphere. These findings underscore the significance of sharing and diversity, particularly in cultural inception within design and cross-functional teams. Preserving these dynamics is vital for the success of future workshops.
The iterative nature of design as an asset to Innovation
Workshop 1.0 demonstrated a synergetic landscape of design by conducting participants to define their ideas throughout a process, characterized by its iterative nature, where the stages of inspiration, ideation, prototyping, and testing are often revisited.
The framing of well-defined questions was observed to be a critical catalyst for driving creative ideation. This aligns with existing research suggesting that well-crafted questions lay the foundation for problem-solving and inspire teams to explore unconventional paths toward innovative solutions. As supported by Brown and Katz (2019), the participants' curiosity and inquisitive mindset led to the identification of pertinent challenges and opportunities.
Reverse Brainstorming was an asset since it boosted problem-solving thinking and empowered the teams to ideate and understand complex problems more comprehensively. By leveraging cognitive biases and encouraging a reverse perspective, this approach enhanced critical thinking, expanded the problem space, and provided a solid foundation to frame a question. Therefore, Future Backcasting galvanized the teams to envision and plan for a desirable and transformative future. By projecting into the future and working backward to the present, teams developed strategic pathways, actions, and innovative ideas that align with their concept statement. With this, the project proposals gained a competitive advantage by shaping a purposeful and forward-thinking approach to problem-solving and product development.
This iterative approach, as shown in Figure 2, consistent with the principles of design thinking, allowed for continuous improvement and the incorporation of feedback and insights to enhance the proposed concepts. Employing this comprehensive approach culminated in the development of four distinct project proposals, poised to be further refined and progressed in the forthcoming session.
Facilitation as an invisible guide to innovation
Workshop 1.0 offered valuable insights into the facilitation work as an invisible guide in navigating design methodologies and mindsets while enhancing collaborations among participants. Through the skillful guidance of the research team, design thinking principles were effectively applied, fostering a culture of curiosity and openness that sparked creativity among participants.
Understanding the participants' aspirations and motivations played a crucial role in tailoring the workshop's content and ensuring a meaningful experience. By acknowledging the participants' diverse needs, Workshop 1.0 fostered a sense of ownership and engagement, leading to the co-creation of innovative concepts. By providing moments for networking, recognition, and a sense of contribution, the research team instilled a feeling of

commitment to the creative outcomes. This sense of ownership played a vital role in stimulating participants' engagement and dedication to the co-creation journey. The research team's facilitation approach was instrumental in guiding participants to frame compelling questions. By drawing inspiration from design thinking methodologies advocated by design thought CDOs such as Eric Quint, Mauro Porcini, Sean Carney, and Stefano Marzano the facilitators encouraged a beginner's mindset and curiosity among the participants. This approach enabled the formulation of thought-provoking questions that acted as stepping stones for the subsequent ideation process. By encouraging analogous inspiration, problem analysis, question framing, and the visualization of future scenarios, the research team's facilitation approach propelled participants to seek inspiration from diverse domains outside their immediate context and urged them to critical and problem-orientated thinking.

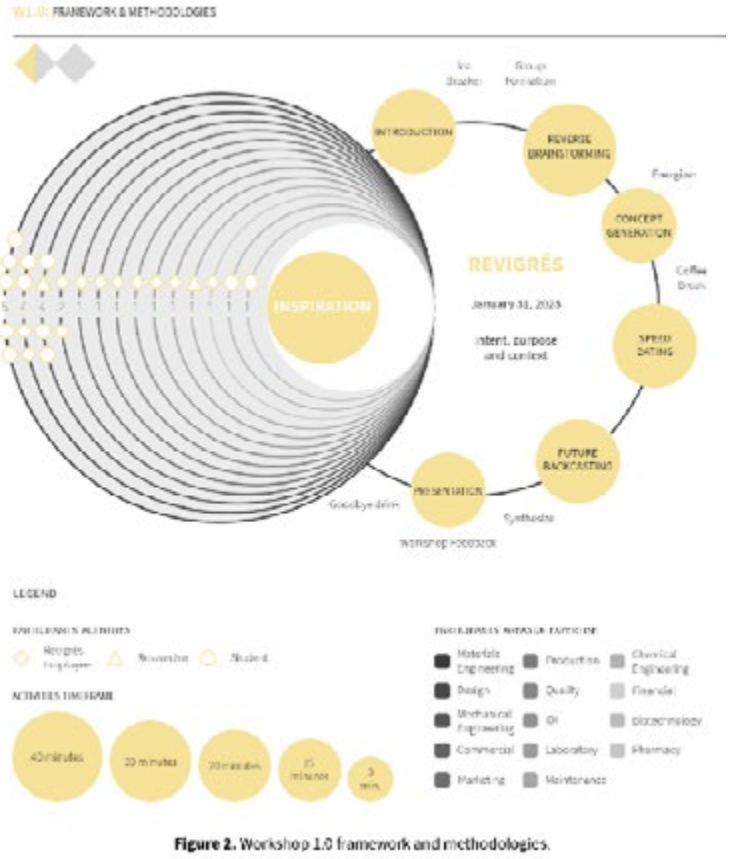

Figure 2. Workshop 1.0 framework and methodologies.

The research team's efforts in promoting collaboration and cross-disciplinary exchange were pivotal in leveraging the participants' diverse expertise. As already mentioned, design thinking scholars suggest that multidisciplinary collaboration enriches the ideation process, leading to comprehensive and holistic solutions. The facilitators fostered an environment that nurtured open communication, encouraging participants to build upon each other's ideas and perspectives. Additionally, as participants progressed through Workshop 1.0, the research team ensured that mindsets such as curiosity, empathy, and open-mindedness were continuously applied and adapted based on the evolving needs of each group.

Intertwined with the interactive approach of design revealed in Figures 2 and 3, the facilitator's role emerged as essential in steering individuals through the design process, bridging their varying mindsets, skills, and methodologies. The ability to weave storytelling within the workshop proved pivotal. Storytelling, skillfully integrated by the facilitators, aided in maintaining a seamless flow and engaging participants throughout. As affirmed by participants in feedback surveys, the dynamics of activities and the spatial organization significantly contributed to the workshop's success. Participants expressed how the collaborative atmosphere, resembling a narrative journey, enriched their creative thinking and problem-solving abilities, through statements such as: "The group work, and the flow of the workshop, was very enriching and appealed to the more creative side of each one and to the ability to solve problems" and "organization and follow-up that interconnected with each other, it was almost like following a story". Notably, 80% of attendees lauded the workshop's well-executed flow, organization, and dynamic activities. This response indicates that effective facilitation, coupled with storytelling and optimized logistics, can foster an environment where participants find themselves immersed in

a cohesive and creatively stimulating experience.

Navigating the Open vs. Closed Briefing Paradox

The workshop's theme selection introduced a nuanced balancing act between open and closed briefings as illustrated in Figure 3. To foster diverse ideas yet provide direction, challenges were structured to be open-ended yet contextually relevant to Revigrés. This equilibrium entailed certain constraints to prevent stifling creativity.

However, this equilibrium encountered unique challenges. In particular, the encouragement of divergent thinking, vital for defining contexts and design intentions, proved intricate within groups facing the broader theme. Though both briefings embraced openness, the "smart tiles" theme leaned towards a wider range since it enabled participants to collaboratively outline trends, previews, and innovative ceramic tile products, services, or experiences. Conversely, the "kinetic tiles" theme delved into kinetic absorption technology's ceramic sector potential, taking a more specialized route.

This diversity yielded varying participant feedback. The "kinetic tiles" theme drew less direct reference in feedback surveys, while "smart tiles" group participants noted its expansiveness. Facilitators highlighted challenges within "smart tiles" groups, needing more guidance in the first exercises and facilitator intervention for task adaptability. When the initial spectrum is inherently wide, the process of converging toward a defined intention gains heightened complexity. This was particularly evident since participants had such diverse backgrounds and grappled more intensely with the ambiguity. Unlike designers accustomed to navigating uncertainty, participants from various fields often found discomfort in ambiguity and lack of immediate clarity—especially present in the problem identification domain, a typical aspect of divergent thinking.

This highlights the challenge of managing openness and ambiguity, particularly for non-designers. Despite this, the iterative nature of the design process, including activities like future backcasting and decision-making exercises, aided in overcoming this complexity, helping participants transition from divergent to convergent thinking. This struggle underscores the delicate task of balancing openness and direction to harness the benefits of both approaches effectively.

Figure 3. Workshop 1.0 group structure and participants' feedback.

Time Constraints and Adaptability

The workshop's time constraints posed challenges to the ability of the participants to adapt to the exercise in the timetable defined. Indeed, 48% of the feedback given by participants rated time management less positively,

pointing out the difficulty to fulfill the objectives of the exercises in the given time. These observations were more prevalent in groups with the "Smart Tiles" challenge due to the broader scope of the topic. Given the inherent constraint of workshop duration, it is imperative to consider refining time management for exercises in upcoming sessions. This adjustment is essential to ensure the effective execution of activities within the allocated timeframe.

The research team's adaptability in leveraging the participants' diverse backgrounds and perspectives aimed to compensate for this limitation. Whenever any difficulty was identified, the facilitator approached the group to address it. This adaptation reflects the flexibility inherent in design thinking, where teams adjust methodologies to suit the context and available resources.

Implications for Revigrés: Fostering Design-Led Innovation

The implications of Workshop 1.0 for Revigrés encompass the fostering of a culture of creativity and collaboration, the identification of diverse perspectives and expertise, and the potential for disruptive product development. The study reveals how Workshop 1.0 acts as a catalyst for driving design-led innovation within Revigrés, offering valuable insights into the significance of the CDO role, the power of design thinking methodologies, and the potential for future co-creation endeavors. Implications for Revigrés were expressed by the following actions:

Identifying Diverse Perspectives and Expertise

The participant selection process for Workshop 1.0 was meticulously designed to gather a diverse group of individuals. The diversity of perspectives and expertise enriched the co-creation process, allowing for a comprehensive exploration of ideas and problem-solving approaches. By involving individuals from different backgrounds, Workshop 1.0 tapped into a vast pool of knowledge and creativity, resulting in the rise of four innovative project proposals, which will be further developed in the remaining workshops in this series. This may further evolve the product range could lead to more creative solutions and broaden the company's offerings.

Unleashing the Power of Design Thinking Methodologies

Throughout Workshop 1.0, design thinking methodologies were employed to frame problems, and generate ideas. Reverse brainstorming, a key exercise during the workshop, allowed participants to explore potential causes of failure rather than seeking immediate solutions. This approach encouraged critical thinking and enabled the identification of previously overlooked challenges. Additionally, future backcasting provided a powerful tool for envisioning the ideal future and mapping the steps needed to achieve it. Fast speeding decision-making exercises and ideation to generate concepts were also crucial exercises to a more fluid session. By applying these design thinking methodologies, Workshop 1.0 demonstrated the potential of such practices in unlocking innovation and creativity within Revigrés.

Paving the Way for Future Co-Creation Endeavors

Workshop 1.0 served as a foundational step in Revigrés' co-creation journey. The success of this workshop showcased the potential for future co-creation endeavors to drive innovation and product development. As Revigrés continues to embrace design-led practices, future co-design sessions can further enhance the organization's ability to respond to emerging challenges and market demands. The positive outcomes of Workshop 1.0 provided compelling evidence for the value of co-creation as a driver of design-led innovation, offering Revigrés the foundation structures of four different innovation design projects, that one day may position the company at the forefront of transformative product development.

Empowering the Role of Chief Design Officer

Workshop 1.0 emphasized the potential of the CDO in championing design-led innovation within Revigrés, through the exploration of the facilitator's role. Design leaders such as the CDO appeared to play a pivotal role in facilitating workshops as tools to educate and guide stakeholders through the design thinking process and promote a design-centric mindset. This way, the CDO seems to act as a catalyst for creativity and collaboration, leveraging design thinking methodologies to inspire participants and drive innovation. This workshop showcased through the exploration of the facilitator's role and the relevance of communicating and educating company functions and stakeholders. It also explored the significance of the CDO's role as a strategic leader, bridging the gap between design and business objectives, and propelling Revigrés towards a design-led future.

Conclusion

In the contemporary business landscape, the strategic role of CDOs in fostering innovation and nurturing design-oriented cultures has gained prominence. This article is an integral part of an ongoing Ph.D. research endeavor that centers on the exploration and affirmation of the CDO's significance within companies. The experimental platform for this investigation is Revigrés, a prominent Portuguese ceramic tiles manufacturer. The focal point of this article is the inaugural workshop, Workshop 1.0, of the Co-Design Sessions initiative orchestrated by the research team that delves into the intricate realms of design thinking and collaborative ideation, aimed at probing diverse assumptions surrounding the CDO role.

Workshop 1.0 encapsulated the essence of this experimental journey, strategically designed to navigate the subtle yet potent balance between open-ended and structured briefings. The facilitation work during this workshop assumed the role of an imperceptible guide, expertly maneuvering through diverse design methodologies and mindsets. The ensuing collaborative environment not only spurred creativity but also enhanced collaboration among participants from various domains. The research team adeptly balanced between offering direction and fostering creative freedom, encouraging participants to explore their unique perspectives and frame meaningful problems. The interactive nature of design thinking exercises, such as reverse brainstorming and future backcasting, promoted active engagement and idea generation, fostering a culture of constant exploration and learning.

This balance encouraged participants to think freely and explore innovative solutions within the defined context of the two challenges given, fostering a culture of curiosity and openness. The time constraints of the workshop-imposed adaptability and efficient use of time, prompting participants to prioritize ideas and refine concepts. The importance of feedback was emphasized throughout the workshop, nurturing a positive and supportive environment that encouraged iterative idea development.

The success of Workshop 1.0 was further amplified by the multidisciplinary collaboration among participants, which proved to be a driver of innovation by sparking creative idea generation and broadening problem-solving horizons. The interactive and inclusive nature of the workshop fostered collaboration and networking, leading to the formation of cross-cultural wisdom that can shape the future directions and methodologies to be applied in Revigrés.

As the workshop laid the groundwork for future co-creation endeavors, it posed intriguing questions and highlighted the main issues for the next workshop. The research team may explore how to further enhance design culture within the organizational context, promoting a mindset of continuous innovation and exploration. Additionally, the workshop's success in navigating the open and closed briefing paradox prompts further investigation into how to strike the right balance between providing a focused framework and encouraging creative freedom.

In conclusion, Workshop 1.0 of the Co-Design Sessions initiative at Revigrés exemplified the power of design

thinking in inspiring innovation and shaping a design-oriented culture. The workshop's implications span from fostering creativity and collaboration to empowering the role of the CDO in driving transformative product development. The multidisciplinary collaboration and interactive nature of the workshop underscored the value of design thinking as a common practice used by CDOs and seems to support positioning Revigrés at the forefront of design-led innovation in the ceramic tile industry. As the company continues its co-creation journey, Workshop 1.0 serves as a visionary stepping stone, offering insights that will propel Revigrés into a future of boundless innovation and design excellence.

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References

Adegbile, A., Sarpong, D. & Meissner, D. (2017). Strategic Foresight for Innovation Management: A Review and Research Agenda. International Journal of Innovation and Technology Management, 14(4). https://doi.org/10.1142/S0219877017500195

Bibri, S. (2018). Backcasting in futures studies: a synthesized scholarly and planning approach to strategic smart sustainable city development. European Journal of Futures Research, 13(6). https://doi.org/10.1186/s40309-018-0142-z

Bishop, P., Hines, A. & Collis, T. (2007). The current state of scenario development: An overview of techniques. Foresight, 9(1). DOI:10.1108/14636680710727516

Brown, T., & Katz, B. (2019). Change by Design, Revised and Updated How Design Thinking Transforms Organizations and Inspires Innovation. HarperCollins.

Cross, N. (1982). Designerly ways of knowing. Design Studies, 3(4), 221–227. https://doi.org/10.1016/0142-694x(82)90040-0

Cross, N. (2011). Design thinking: Understanding how designers think and work. BloomsburyAcademic.

Deserti, A., & Rizzo, F. (2014). Design and the cultures of enterprises. Design Issues, 30(1), 36–56. https://doi.org/10.1162/desi_a_00247

Dorst, K. (2015). Frame innovation create new thinking by design. MIT Press.

Evans, N. (2012). Destroying collaboration and knowledge sharing in the workplace: a reverse brainstorming approach. Knowledge Management Research & Practice, 10, 175–187. https://doi.org/10.1057/kmrp.2011.43

Hennessey, B.A. & Amabile, T.M. (2010) Creativity. Annual Review of Psychology, 61, 569-598. https://doi.org/10.1146/annurev.psych.093008.100416

Ignatius, A. (2015, September). How Indra Nooyi Turned Design Thinking Into Strategy: An Interview with PepsiCo's CEO. Harvard Business Review, 80–85.

Kelley, T., & Kelley, D. (2014). Creative confidence: Unleashing the creative potential within us all. William Collins.

Lafley, A. G., & Martin, R. L. (2013). Playing to win: How strategy really works. Harvard Business Review Press.
Lewrick, M., Link, P., & Leifer, L. (2018). The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems. Wiley.
Lewrick, M., Link, P., Leifer, L. & Schmidt, A. (2020). The Design Thinking Toolbox: A Guide to mastering the most popular and valuable innovation methods. John Wiley & Sons, Inc.
Martin, R. (2009). The design of Business: Why Design Thinking is the next competitive advantage. Harvard Business Review Press.
Martin, R. L. (2022). A new way to think: Your guide to superior management effectiveness. Harvard Business Review Press.
Mootee, I. (2013). Design thinking for strategic innovation: What they can't teach you at business or design school. John Wiley & Sons.
Ogilvie, D., & Liedtka, J. (2011). Designing for Growth: A Design Thinking Tool Kit for Managers. Columbia University Press.
Paulus, P. & Yang, H. (2000). Idea Generation in Groups: A Basis for Creativity in Organizations. Organizational Behavior and Human Decision Processes, 82(1), 76-87. DOI:10.1006/obhd.2000.2888
Pinheiro, G., & Franqueira, T. (2021). Chief Design Officer: O caso de Stefano Marzano e Sean Carney na Philips. ErgotripDesign, 5, 53-63.
Porcini, M. (2023) The human side of innovation: The power of people in love with people. Oakland, CA: Berrett-Koehler Publishers, Inc.
Quint, E., Gemser, G., & Calabretta, G. (2022). Design leadership ignited elevating design at scale. Stanford Business Books.

Two kinds of love between new local elites
a case study of the 'Four new types of villagers' in Pingnan , Fujian

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Abstract
New local elites are indeed a significant and evolving force in the current rural practices of China. The current macro-level discourse on new local elites is extensive, but there is a lack of comprehensive case-based experience. This article will take a case-based approach, focusing on the "Four new types of villagers" in Pingnan County, Fujian Province. It aims to summarize and categorize two types of "new local elites" as analytical subjects. The goal is to study the practical pathways of new local elites in rural areas from the perspectives of both new and original villagers. By summarizing and evaluating these two models and considering their dialectical combination, this article aims to provide insights and a methodological framework for the future promotion and deepening of new local elites in rural areas.

Author keywords
New Rural Villagers; The original villagers; Love; New Local Elites; Rural.

Introduction
Local elites are a manifestation and external symbol of China's outstanding traditional culture.1 As a unique group, local elites contribute to the preservation of rural culture, the restoration of order, the development of institutions, and economic progress through their own knowledge and noble character.2 In traditional China, "local elites" referred to individuals who were born and raised in a specific locality and possessed resources such as power, wealth, and influence based on their familial and geographical connections. These individuals held a certain social status and were highly respected. During the Republican era, a group of pioneers in rural development, led by figures like Liang Shuming, Yan Yangchu, and Lu Zuofu, conducted in-depth analyses of Chinese rural areas. They initiated localized rural experiments based on the unique characteristics of Chinese villages, encompassing political, economic, and cultural dimensions. For instance, Liang Shuming implemented the "Village School and Township School" system in Shandong's Zouping, which stimulated villagers' self-organizing awareness and propelled the comprehensive development of Zouping in politics, culture, and economics. Yan Yangchu carried out the "Common People's Education Experiment" in Hebei's Dingxian, designing the "Four Great Educations" to address the issues of rural ignorance, poverty, and weakness. Lu Zuofu, in Beibei, established local hospitals, started the Jialing River Daily newspaper, established libraries, built public parks, organized rural banks, and promoted livelihood education to revitalize the countryside. In the era of the People's Republic of China, agricultural expert Wen Tiejun rooted himself in rural areas,

providing theoretical and practical insights into China's agriculture, rural areas, and farmers, becoming a voice for farmers as an expert scholar. Liu Laoshi led a team in beneficial experiments related to farmer cooperative training, the development of farmer cooperatives, and the training of college student volunteers supporting agriculture, motivating collectives to serve Chinese farmers. Zhang Guimei, as the principal of Yunnan Lijiang Huaping Girls' High School, enabled more than 2,000 girls to leave their mountains and change their destinies through education. These cases demonstrate that local elites have a longstanding history of contributing to the development of rural China.

Traditional local elites had close kinship ties, while today's new local elites have undergone a transformation in their primary identities. First and foremost, the new local elites no longer prioritize family or kinship ties as their primary basis. Instead, they are rooted in national policies, driven by social change, and motivated by a sense of altruism. These new local elites have emerged in the rapidly evolving market economy environment, and they have gained authority by combining their moral values with their political and economic status.3 Furthermore, the ideological beliefs of the new local elites are distinct from traditional ones. They no longer center around Confucianism and local customs as their core values. Instead, their primary ideological framework is based on the core socialist values, while also incorporating elements of traditional Chinese culture.4 Finally, with the structural mobility of the population, the new local elites can encompass not only individuals from urban areas involved in rural development but also those who are part of the political system. Additionally, they may include individuals who, through their own efforts, organize rural communities to collectively work towards the betterment of the countryside. Research on the policy of new local elites in the context of rural revitalization has become quite extensive in recent years. The concept of "new local elites" was first introduced in "the draft outline of the 13th Five-Year Plan in 2017", emphasizing the cultivation of a culture of civilized rural customs, exemplary family values, and the culture of new local elites.5 In 2018, the Central Committee of the Communist Party of China and the State Council issued the "Rural Revitalization Strategy Plan (2018-2022)," which emphasized the active role of new local elites in the practice of village self-governance.6 Indeed, research on specific types of case studies involving new local elites has not been fully explored yet. Given the diversity and uniqueness of rural areas in China, as well as the uneven distribution of talents, there is a need for further classification and research on new local elites. Therefore, it is crucial to deepen our understanding of the identities of new local elites and to summarize the experiences and strategies employed by different types of new local elites during this phase of development. This article aims to gather and summarize individual cases to extract practical experiences, methods, and paradigms that have a certain value for broader applications based on specific experiences.

The case of "Four new types of villagers" in rural development in Pingnan, Fujian.

Pingnan County is located in the mountainous region of Ningde City, Fujian Province, with most areas situated at elevations of over 800 meters. The terrain is characterized by steep slopes, limited arable land, scattered villages, and limited transportation access. The rapid development of industrialization and urbanization has led to a significant reduction in the number of villages in the entire county, from nearly a thousand to around 200. Due to the geographical conditions, some small villages in Pingnan are unable to develop large-scale rural industries and enterprises. As a result of these challenges, many young people have chosen to leave their rural homes in search of employment opportunities in the county seat. According to research, in the case of Siping Village in Pingnan County, the excessive outmigration of its population resulted in the village having only 18 residents at one point, with the majority being elderly individuals. In 2017, Siping Village in Pingnan County underwent a transformation from being an "empty" or depopulated village to becoming a "Four new types

of villagers." Based on individual geographic origin and the investment of funds, assets, and resources, the population was categorized into four groups: "The original villagers," "New rural villagers," "Cloud villagers," and "Honorary villagers."

The research has found that whether they are "The Original Villagers," "New Rural Villagers," "Cloud Villagers," or "Honorary Villagers," there are new local elites contributing to rural development in common among these groups. Their commonality lies in their construction purposes rooted in "love." These new local elites localize the application of knowledge, technology, and resources and develop unique rural construction paths based on the effective utilization of local ecological resources. They use media communication methods to garner social attention, drive local cultural and tourism industry development, and bring about economic, political, and cultural benefits. Today, this region has witnessed the emergence of many "internet-famous villages." This article is based on the classification of the "Four new types of villagers" and approaches the subject from the perspective of "New Local Elites ." It categorizes two types of development subjects: "New Local Elites among The Original Villagers" and "New Local Elites among The New Villagers." Through an experiential study of these subject identities, it explores practical pathways for rural development.

The love of the new local elite among the original villagers.

The new local elites among the original villagers indirectly maintain their ties with the rural kinship society. They possess essential skills and knowledge, understanding the localized history and culture of their homeland. They have deep emotional connections to the land where they grew up. In the context of a close-knit community, they hold a certain advantage and are more relatable to the villagers compared to outsiders. Being local talents who have emerged from the community, they wield more influence and credibility in the village development process. As a result, villagers are more likely to trust their decision-making. Z, the former chairman of the Political Consultative Conference of Pingnan County, is a native of Pingnan County with a strong educational background. As a "new local elite among the original villagers," she has a deep love for her homeland. She has rooted herself in Pingnan and is dedicated to the preservation, innovation, and governance of traditional culture. Currently, Pingnan County is known for its cultural and creative industry revitalization, with Longtan Ancient Village being a representative village that combines "ecology, culture, and tourism." At the same time,as a "catalyst" for different cultural entities and the flow of urban and rural cultures, she has bridged the gap between new villagers and original villagers, as well as urban and rural cultures. She has facilitated a consensus for cooperation among various stakeholders, thereby driving rural development. She actively promotes public art education activities for artists in the countryside, serving as a bridge between villagers and elites. As a member of the Political Consultative Conference, she coordinates relationships within and outside the community, connects and unites individuals from various backgrounds, and engages social organizations such as the Beijing Little Donkey Urban Farm, Love Hometown Bookstore, and CCTV's Rural Revitalization Observation Point. This integration of internal and external resources, technologies, talents, and information, along with multi-stakeholder cooperation and interaction, has been achieved.

Z, as an institutional entity, participates in rural governance and integrates diverse talent resources for rural development. However, the majority of the rural population consists of villagers, and the colossal task of building China also requires the efforts of every individual. How to genuinely unleash the self-organizational capacity of villagers is a pending issue. It is essential to involve villagers with varying abilities in the construction process, transforming rural development from being primarily the action of a minority of institutional entities with social rights into a collective endeavor of the majority of villagers.

The love among the new local elites within the new villagers.

In addition to the native-born new local elites, there is another category of new local elites who are educated newcomers to the village. This group lacks close blood ties to the rural community and largely comprises urban middle-class individuals. Motivated by their love for the countryside, they bring with them capital and social resources to rural areas. Due to their extended period of urban living, they possess an urban perspective and urban thinking, which allows them to offer a wider range of development possibilities for rural construction. Artist L is a "new local elite" introduced by the Pingnan government, and his imaginative artistic thinking has provided Pingnan with new development pathways. L initiated the "Everyone Is an Artist" campaign in Longtan Village, redefining the concept of "artist" within the urban discourse. It offers a way for villagers to find themselves through art—a form of artistic life education that is also a practical form of art education. Here, whether young or old, male or female, everyone can become an artist. He is also committed to the development of public art, offering free art education to those who have a passion for art but limited financial means, including some disabled individuals. Additionally, L is a staunch advocate for the preservation of ancient villages. He designs buildings with a focus on "organic architecture," aiming to develop structures that respect the original ecological environment. His actions have received extensive media coverage, attracting numerous artists from both within and outside the country who appreciate the ecological beauty of ancient villages. This has not only contributed to the development of the cultural heritage of these villages but also stimulated the growth of cultural and tourism-based economies in the area.

New rural villagers can be valuable external resources for rural areas. However, if these resources are not used carefully, irreversible consequences stemming from cultural clashes can occur. This phenomenon has emerged in Pingnan, where significant cultural divides exist in the perceptions of education between new and old villagers due to differences in cultural beliefs, upbringing, education levels, and family backgrounds. Original villagers often tend to support the "scoring system," believing that academic achievements can change one's destiny, help them escape rural areas, and achieve better opportunities. On the other hand, new villagers, influenced by urban education, reject the idea of "solely focusing on scores," considering it as stifling a child's natural tendencies. They advocate for allowing children to receive education in the fields and countryside, emphasizing a more holistic and ecological approach to learning. As a result, there was a period during which new villagers took charge of education in the region. They implemented a more experiential and life-oriented approach, encouraging children to explore and play in the fields to better connect with life. However, this approach led to significantly poor academic performance among the students, which caused dissatisfaction among the original villagers. In reality, the actions of the new villagers stem from their genuine concern for the old villagers. However, they may not fully grasp that daily life and the environment in the mountains are considered normal for those who have always lived there. It's only viewed as precious by urban dwellers. The original villagers, on the other hand, often aspire for their children to gain exposure and education in larger cities. Therefore, effective communication and mutual understanding are key to reaching consensus between the new and original villagers.

Overlapping States of Love: Internalized contradictions, complexities, and possibilities

Through the study of the two distinct identities of new and original villagers, this article has found that neither new nor original villagers can independently constitute a fully diversified rural community. Among the original villagers, a sense of collective consciousness emerges based on familiarity, leading to a closed mentality. New villagers, due to their lack of experience in rural life, may generate feelings of exclusion among the original villagers when they intervene directly. New and original villagers represent the dual subjects of urban and rural

dynamics. Although differences in cultural beliefs between new and original villagers may lead to differences in perspectives on rural development, both groups are motivated by their love for the countryside. By identifying and utilizing the common ground between them, it is possible to integrate the love of new and original villagers, allowing love to interact with and complement each other. Exploring a methodological model for embedding love for the homeland holds practical value and can help foster a more cohesive and sustainable rural community.

New local elites, whether they are "new local elites among the new villagers" or "new local elites among the original villagers," can play a vital role in bridging the gap in perspectives between new and original villagers. However, for this to work effectively, these local elites must possess an open-minded attitude. Both groups, new and original villagers, should first seek to understand and engage with each other, and then collaboratively devise suitable plans to lead the community in rural development. It's important to be vigilant and ensure that this process of building relationships and understanding isn't about creating a new elite class that dominates over the villagers. Instead, it should involve thorough communication and understanding between the local elites and the villagers, with the goal of choosing the best solutions for the rural community. This relationship should be one of mutual support and collaboration rather than one where choices are imposed or sacrificed. This overlapping state of love should also extend its focus to the non-human entities within the rural environment, including love for the ecology and love for nature. In essence, each subject carries specific forms of love, and the movement of love interacting with love signifies a consciousness of embracing diversity. It's important to recognize that this broader perspective encompasses not only human relationships but also the interconnectedness between humans and their natural surroundings and the ecological well-being of the rural environment.

Conclusion

Today, our love for the countryside often reflects a nostalgia-driven love of the middle class. This form of love is a false love rooted in the consumption of rural sentiment, a projection of urban middle-class consumerism onto rural resources. In modern society, this false and consumer-driven form of love is continually amplified in the media, and it indeed warrants reflection and critical examination. What we advocate for is a genuine love deeply rooted in the rural environment, based on the identity of being part of the community, rather than a self-indulgent love driven by middle-class sentiments. However, it's only through concrete practical experiences that new local elites from urban areas can genuinely transform a concept that has been overly commercialized and simplified by the media – the rural nostalgia sentiment – into a living contemporary rural lifestyle. This transformation can create a real attraction for the middle class, making it possible for some members of the urban middle class to gradually transition into rural areas and become part of the new local elites.

The case of Pingnan provides us with an example of how diverse entities can collaborate in rural development. By activating the individual agency of old villagers and inspiring the self-awareness of new villagers, it has created an engine capable of generating momentum between different ideologies and diverse cultures, thereby propelling rural development forward. Hence, preserving rural cultural diversity requires maintaining diverse approaches to rural governance. In the future, rural areas need to delve deeper into the characteristics and

strengths of various new local elites. They

should further explore pathways for the effective integration of different types of new local elites into rural governance, aiming to achieve greater diversification in rural development.

References

Fei Xiaotong. (2017). Rural China. East China Normal University Press.

Zhixiu Liu, & Deyong Kong. (2023). Demand and Pathways for the Involvement of Local Talent in Rural Comprehensive Revitalization. Tianjin Normal University, School of Marxism.

Suike Li. (2021). The value, challenges, and optimization paths of New Village Officials in rural revitalization. Journal of Ethnic Culture.

Penghui Hu, & Jibo Gao. (2017). New Village Officials: Concept, Functions, and Error Avoidance. School of Sociology, Nanjing University;School of Humanities and Social Sciences, Xi'an Jiaotong University. Journal of Nanjing Agricultural University(Social Sciences Edition)

Several Opinions of the Central Committee of the Communist Party of China and the State Council on Deepening Agricultural Supply-Side Structural Reform to Accelerate the Cultivation of New Drivers for Agricultural and Rural Development (2017). People's Daily.

Rural Revitalization Strategy Plan (2018-2022). The Central Committee of the Communist Party of China and the State Council.

A Study of the Intentionality of Love in Chinese Contemporary Art Exhibitions over the Past Decade

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Abstract

The purpose of the essay is to explore the "intentionality of love" by observing the textual and visual representations of "love" while suspending judgments on the question of "what is love". Art exhibitions are a great research sample for observing "love" since they combine language and visual arts as a means of nurturing and igniting new concepts. This study compiles a comprehensive overview of art exhibitions centered around the theme of "love" in China between 2012 and 2022. It critically examines the curatorial texts and images associated with these exhibitions, aiming to delineate the conceptual framework of "love" in modern China from a curatorial standpoint. The findings of the study indicate that in the Chinese context, art creation serves as a significant means of expressing novel intentionality of love, as well as a method of embodying the concept of "love as activist care".

Author keywords

Love, Intentionality, Art exhibitions, Emotion, Intellectual Activity, Activist Care

Introduction

The notion of "love" is inherently fundamental and abstract, hence posing difficulties in accurately and comprehensively representing it. According to Nietzsche, the notion of reality is subjective, as he famously stated, "There is no truth, only interpretation." Hence, the concept of "love" exhibits inherent variability, manifesting diverse interpretations and manifestations across various viewpoints, allowing for the emergence of new intentionality through ongoing practice. The Pythagorean school posited that love is the fundamental basis of philosophy, whereas Descartes observed a correlation between love and power, while Hegel conceptualized love as the genesis of the subject. Additionally, religious philosophy encompasses the notion of Christ's love. Nevertheless, despite love being the fundamental basis of philosophy, it is evident that contemporary society and the realm of intellectual discourse are increasingly prioritizing science and knowledge, while gradually neglecting the significance of love.

Current research on love encompasses three primary areas of investigation. Firstly, love continues to be examined from philosophical and theological perspectives. Notably, scholars have explored the philosophical frameworks proposed by Hegel, Lacan, and Levinas, which involve the discernment of three relations of love and recognition in contemporary contexts (Wang Minan, 2022; Jiang Peng, 2017). Additionally, researchers have analyzed the intricate relationship between love" and "the world" through the philosophical lens of Arendt.

This exploration has shed light on the profound implications and multifaceted nature of this significant concept (Zhang Shuai, 2021). Secondly, there have been attempts to investigate the psychological and biological aspects of the interaction between love and the world. The wave of research, for example, will elucidate crucial linkages between love and many basic human information processing systems and look for evidence for neurological systems specialized to affective sharing and effective communication (Reis & Aron, 2008; Gammelgaard, 2011). Thirdly, in the framework of literary works (such as movies, books, artworks, etc.), the modern value of the ethical idea of love is examined. (Hao Xueqian & Chen Shu, 2015; Menike, 2020). Most studies have attempted to define and describe love, propose theories of love, and explain its significance. Issues relating to the intents of love have inspired philosophers and authors from many fields. However, few academics have thought about the word "love", the "appearance of love", and the "intentionality of love" individually using the phenomenological methodology. Additionally, they have disregarded the impact of place and time on "love" and skirted the issue of how each person perceives things differently.

An exhibition is a mass medium that includes text, photographs, and video. It is an art form that is naturally public and simple to transmit, like movies. In contrast, exhibitions focus more on textual interpretation than films do, and thus are better equipped to stimulate critical thinking and serve as a breeding ground for fresh ideas. This essay makes the case that the exhibition's perspective can include elements of history, the public, the curator, and the artist's understanding. The intention of love at the time can be shown by examining modern Chinese art exhibitions with "love" as their theme. More importantly, love and art are equally significant elements that are connected to society's adaptive resilience (Cobley, 2021) and cultural resilience (Cobley et al., 2020). We can gain an indirect insight into the psychological state of modern society by looking at how everyone knows and understands love.

This study therefore attempts to chronicle, examine, and remark on the usage of the word "love" in the discursive space of art exhibitions in order to track the alteration of love's intentionality in the modern Chinese environment. The term "love" was used as the search keyword to locate the research object for this paper in the exhibition catalog in the Annual of Contemporary Art of China (2012-2022), and it was then narrowed down by reading the texts and works. (The Annual of Contemporary Art of China is not only a reputable archive in China that regularly arranges and elaborates on new phenomena and important issues in Chinese contemporary art, but it also focuses on documenting "variables" which refers to the places where an issue has changed over the years in terms of facts, actions, or statements.) 106 art exhibitions with the concept of "love" were ultimately chosen for the study, and their texts and artworks were then thematically and narratively examined. According to the study, love's intentionality mostly focuses on human emotions. A transformation in the intentionality of love has, however, been accelerated and portrayed by the cutting-edge investigations of love by art practitioners, ranging from love of machine and love of place (i.e., Topophilia) to love as a method.

Love: multidimensional emotions

Out of the total of 106 exhibitions examined in this research, 64 were categorized as solo or two-solo exhibitions, 38 were classified as group exhibitions, and 4 were identified as participatory events. The majority of curators and producers involved in these exhibitions employed the concept of love as an underlying theme to explore human emotions. Since the Renaissance, artists have viewed people as their primary subject and have used natural landscapes, still lifes, and people as their canvas to celebrate love, emotion, and wisdom. A platform for describing or replicating "love" is provided by art exhibitions.

Love, as a unique human emotion, is fully expressed in the solo exhibition "Love Letters on Love - Pan Yuliang's Painting World" (2017). Pan Yuliang (1895-1977) was one of the most famous female painters in modern

China. The exhibition transforms "art display" into "emotional discussion," breaking the traditional exhibition pattern set by the type of works and rewriting the exhibition text in an effort to make sense of Pan Yuliang's highly romantic world. Pan Yuliang is an expert in using images to create women's emotional discourse. She is passionate about women's state of being, the assertion of personal experience, and the expression of the heart. In the exhibition, oil paintings, white drawings, and ink color drawings become "love letters", expressing Yuliang's self-analysis, the pursuit of art, friendship, affection, and love. A message wall called "Love Letters" is also set up in the exhibition, allowing visitors to interact with other visitors while viewing the artworks.

The most illustrative of the numerous typical group exhibitions that depict the deep and profound emotion of "love" is "LOVELOVELOVE The Art of Love: Global Photography and Video Exhibition" (2018-2022). It emphasizes artistic expression through the use of video, and the idea of "love" it discusses has a distinctly modern feel. The first season of "LOVELOVELOVE The Art of Love: Intimacy" (2018) focuses on five keywords: action, monologue, energy, eternity, and future. These keywords are used to investigate "intimacy" in the context of modern visual culture. Exploring love nowadays is challenging and undesirable because it has always been entwined with absence, loss, and distance. The artwork in the show explores the myths surrounding love on a variety of levels, including those of consumer culture, identity, family, and intimacy. The curators also presented "Liquid Poetry," the first crossover video work by Chinese idol Yi Yang Qianxi, which expresses a new "love" of the millennial generation and looks forward to the future of love with the younger generation, in addition to inviting the most significant female artists in the world, including Yoko Ono, Marina Abramovi, Yayoi Kusama, and Tracy Emin. The second season of "LOVELOVELOVE The Art of Love: A Garden of the Senses" in 2022 makes the case that love may address conflicts, violence, and war that are becoming more severe.

The intentionality of love in the exhibition "A Chemical Love Story" (2017) highlighted the illusory feelings induced by flight, exile, and delusion. The exhibition cautions visitors against giving in to deceptive feelings by challenging the truth of human emotions, perceptions, and love. The exhibition's organizer was inspired to create it after reading the book PiHKAL: A Chemical Love Story. The study in the book is concentrated on chemical substances that cause hallucinations. According to the authors, Dr. Alexander Shulgin and his wife Ann Shulgin, these substances are a fantastic self-awareness tool because they allow users to direct fictitious, manufactured, and unreal feelings onto the cerebral cortex (Loughran & Mannay, 2018). According to the narrative of the exhibition, illusions can also be brought on by modern technology, including social media, virtual connectedness, and hyperlinks, and they can affect the brain by way of the senses. The rhythm then sharpens and the senses become keen. However, this "full of love" parallel universe is doomed to vanish, leaving only emptiness and loss in its wake.

Even though this kind of exhibition does not explore "love" from a variety of angles, constant expression is the driving force behind a change of intention. According to philosopher Alain Badiou, "Love needs to be reinterpreted all the time. Loving is the process of discovering and understanding life" (Ye Xiaolu, 2014). Art exhibitions can be regarded as "theaters", where the actors' interpretation is the premise of the stage's existence, and the spiritual dialogues triggered by the repeated interpretations are the real value of the artworks. Therefore, these "theaters" are not only the triggering point of the artists' love instinct, but also waiting for the audience to start the collision of mind and emotion, and ultimately accomplish the significance of their existence.

Love: an intellectual activity

According to Plato, "No one can understand the essence of philosophy without taking love as a base." Art exhibitions provide an open, fluid, and multi-interpreted space of understanding for "love", where we can

slowly approach love and wisdom. Among the 106 exhibition samples studied in this paper, more than 30% of the exhibitions attempt to reflect on the emotion of "love" or interrogate the existence and the subject of "love". Each attempt is an intentional outreach.

Huang Sunquan, a social artist and exhibition curator, has consistently reflected on the so-called "love of place" in his works. His methodical study and probing of "Topophilia" is shown in "U-topophilia" (2014). "Utopia" in "U-topophilia" refers to the ideal society that does not exist as well as the spiritual drive to seek perfection, freedom, and the ideal. The emotional connection between a person and a location is known as "topophilia" (Yi-Fu Tuan, 2018). As a result, "U-topophilia" includes the contradictory meanings of loving both real locations and imaginary ones. According to Sun Quan Huang, land exclusivity is at the heart of any place's emotional connection. How can I picture falling in love with a location that isn't my home and creating a deep, lifelong "topophilia"? People who don't have a firm love of land want to live in settled cities and migrant cities. The ownership of land and the history of ownership will gradually foster a love of the land and the nation, but this is the "topophilia" that the property system ensures. The rights of others may occasionally be invaded by this emotion as it grows. The exhibition tries to make the viewer realize that everyone should leave the place to which they belong, transforming identity resistance (a force driven by local emotions, ethnicity, and interests) into programmatic resistance (an action motivated by the recognition of differences and considerations of justice and equality) (Huang Sunquan, 2013).

Another artist, Yan Bing, whose solo exhibition "Love" (2015) also attempts to break the stereotypes of love's perception and intention. The exhibition's use of iron as a visual element throughout restricts viewers' ability to imagine love. Viewers enter the exhibition space and are immediately surrounded by a chilly, dark atmosphere. In terms of narrative structure, these works appear to state, "There is no love you want here," when the spectator arrives with the imagination of love. The compositions all have the word "Love" in their titles, and although they have straightforward forms, they are not typical. Each piece bears a surface mark that resembles an incision that has been stitched together. This cut has a region comprised of wheat, which is entirely unrelated to iron. As a result of the warmth of the wheat, they are not as frigid as they appear. Because of the wheat, these iron objects become vessels and, at the same time, exhibit greater emotion (Wang Zongliang. 2015).

The exhibition "Liquid Love" (2020), a daring and audacious thought experiment on the existence of love, is also noteworthy. The curators used liquid to depict a modern society where messages are transmitted efficiently, and people move quickly. "Love" is also seen as a fluid, unstable existence. Zygmunt Bauman, in his famous work Liquid Love, mentions that we long to be tied to someone, but are more afraid of being tied down. Fear of being alone leads us to seek companionship, only to have new insecurities emerge. In Liquid Love, we come together and separate again and again (Zygmunt Bauman, 2008). Relationships in modern society are as unstable as running water. The uneasiness caused by the fragility of interpersonal bonds, and the ambivalence of longing for intimacy but not wanting to be bound are the themes of the exhibition. Using many audio-visual documents and research-based artworks, the exhibition attempts to use modern sound culture to explore the connection between human beings and society today (Hobbs, Owen & Gerber, 2017). The work moves from the love between two individuals to the family, neighborhood, city, community, territory, nation, state, and the globalized world after starting with the love between two people.

Additionally, the 2020 exhibition "AI: Love and Artificial Intelligence" is themed on the concept of "Social Intelligence" and discusses how algorithms have an impact on "Eros" and "Philia". The issue of "machine love" was studied and presented in the exhibition "Turing's Lovers: Human Emotion and Machine Emotion" that same year. The goal of developing emotional robots is for them to be able to recognize, understand, and simulate human emotions. As a result, the "emotions" that robots possess are always radiated by human emotions

(Liu Yuedi, 2019; Döring & Poeschl, 2019). Humans pride themselves on being more emotionally capable than machines. However, from the perspectives of "secret love", "loss", and "memory", respectively, the exhibition challenges the notion and explores whether the feedback from machines would conform to human expectations or vary from human expectations when humans project their emotions onto them. A consideration of what a "machine emotion" devoid of anthropocentrism looks like is presented in the final chapter "Hello, Christopher" (Yang Shuo & Wang Shuo, 2020).

Through the experience of the object, the individual achieves self-recognition and revision, transforming love's intentionality in these exhibition examples from a merely emotional experience to an intellectual activity.

Love: activist care

Many academics today argue that contemporary art no longer has a historical goal; instead, there is interpretation and more interpretation. In large-scale exhibitions, the pieces support the literary narrative, and the show ceases to be an experience and instead becomes an interpretation. According to the results of this study, there is another type of exhibitions that emphasizes the intentionality of "love" as a verb rather than a noun. The fundamental tenet of these displays is that "love" is acted rather than thought (i.e., activist care) (Hall & Silver, 2020). Such displays frequently evolve into events and interpretations. In the words of Eric Fromm, "Love is a force that inspires love." (O'Dwyer, 2011; Wu Bijian, 2020)

Only a small part of the research samples on the topic of "love" are situations of demonstrating as a practical way to address the pressing societal concerns. One intriguing and experimental effort is the collective exhibition "Love in the Park" (2015). Shanghai's parks are well-established public spaces with a rich historical background and a plethora of civic activities. The inescapable link between parks, love, and marriage perfectly exemplifies the changes in secular society and philosophy, from the iconic opening of the People's Park nightclub in the 1980s to the appeal of today's blind dating Corner. The "Free Wedding Photography" section of the show uses scene recreation to connect the aesthetic changes and growth processes of Shanghai wedding photography over the last 20 or 30 years. The "Encounter" section is based on the current practice of "blind dating" in parks, using artistic reorganization to recreate the unique Chinese dating landscape in museums, and gathering audience feedback to undertake a sociological survey. These two sections of the exhibition activities use an open and collaborative method to examine the subject and reflect on my generation's present attitude toward "love". They illustrate the various notions of love and marriage between my generation and the previous generation.

Jiang Sida's exhibition "Love Me" (2021) responds to numerous social issues and conflicts while also telling the untold story of his own heart. "Love Me" is a performance that demonstrates the artist's public aspirations as well as a group effort. By bringing faces concealed behind innumerable devices into the actual exhibition area and resonating with them, artist Jiang Sida builds a public field of empathy. "Love Me" is an experimental show that pushes the limits of the artist and reimagines social norms and interpersonal ties. Eroticism is the original driving force of expression in the four paintings titled "Love Me 1-4," in which the artist treats the canvas as if it were his lover. Another installation piece uses fabrics, gifts from fans, cigarette butts, trash, and other items connected to the artist himself to examine the link between people and objects.

Additionally, there are instances of exhibitions that are a part of charitable endeavors. Although they are not artistically representative, they managed to express the other intentionality of love. We can see from this type of display practice that art is more than just the artist's discovery and expression of love; more importantly, it has the power to ignite love in the hearts of the viewers. The exhibition as a field has the power to pique the interest of the audience and compel them to engage with it on a natural level. No matter how much or how little energy

there is, when the audience ceases to be a "mere viewer" and incorporates their own physical and behavioral actions into the work, people's internal dialogues have already occurred in the constrained "theater" given by the exhibition. Another significant distinction between modern public art and old ornamental art is this.

Conclusion and Analysis

In general, group exhibitions with the theme of "love" will be more prevalent in 2020 than solo exhibitions, see Figure 1. Group exhibitions are more representative of current trends and the shared interests of the people than merely the personal interests of the artist because they are not required to adhere to the personal style and subject matter of a specific artist. The total number of exhibitions with the theme of "love" is on the decline, see Figure 2, suggesting that the public's interest in love is waning despite the fact that inquiries into the intentionality of love have always been there.

The following details may help to clarify this: Objectively stated, the psyche of the populace has been impacted by a life of limited mobility and a volatile international environment. Second, ideology is being gradually tightened. For instance, the exhibition "Love of Christ", which ran for 5 years straight, hasn't been staged since 2014. Additionally, "Lust and Love of the Young and Liberated" was an exhibition that took place in 2012. The avant-garde displays that emphasize "sex" and "love" and view sex as a way to communicate love physically or as a way to reach an abstract "love" through physical contact are also prohibited. Thirdly, the limitations of global economic development have placed an increasing number of individuals in challenging circumstances where they have no time to ask for affection and compassion. For a very long period, the subject of "love" was dormant, and some individuals even hold the opinion that ideas about love and art are inimical to life itself.

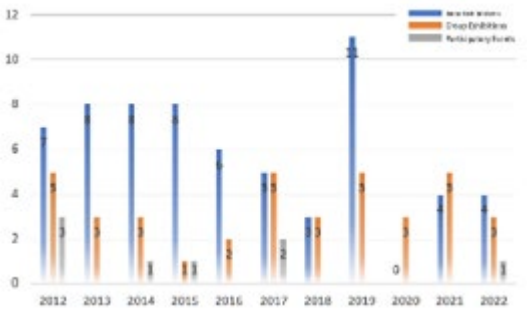

Figure 1. Number of solo, group, and participatory exhibitions with the theme "love" between 2012 and 2022.

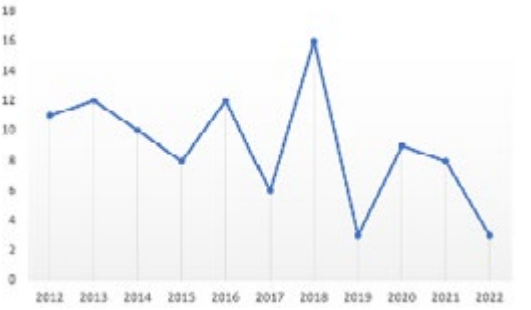

Figure 2. The total number of love-themed art exhibitions held between 2012 and 2022.

Artists ought to focus more on the function of art in society as a result of this depressing circumstance. Thankfully, there are lots of curators and artists that insist on producing shows and works of art with a loving and critical perspective. Humanistic care and a spirit of skepticism are equally necessary in this age of change, whether it is the scary alarm of disease or a life increasingly populated by virtual information (Marcussen, 2010). Many works from the extensive and varied history of Japanese art will be on show as part of the Whitestone Gallery's opening exhibition, "I Love China" (2023), which will also express the love and respect for China. These are the ways in which art exhibitions contribute to society's cultural adaptability. It aims to transform "love" into a struggle, celebration, and ritual in response to the here and now. In addition to investigating the "intentionality of love" at an ideological level, practitioners of contemporary art must also advocate for the return of "love" from the standpoint of humanistic concern.

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References

Wang Minan. (2022). Love, recognition and the master-slave dialectic - Hegel, Lacan, and Levinas on the concept of love. Jianghai Academic Journal (02), 40-47.

Jang Peng. (2017). Wagoner on the nature of love (master's Thesis, Huazhong University of Science and Technology). https://kns.cnki.net/kcms2/article/abstract?v=CvQ6TjzSIZwjEpbe9y1jFj4FL1eqNwwjcwYd4ETTVW0cQNRdStptTOELmzKFYhE1_YPxJwP9eKCawGrNjGsy1_tyz-nTHFJHNq9BdBBhLRlYSxd7pxqhN79k27EVYSfb46z6C6SZbtw=&uniplatform=NZKPT&language=CHS.

Zhang Shuai. (2021). Love and the world in Arendt's philosophy (master's thesis, Lanzhou University). https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202301&filename=1021635226.nh.

Reis, H. T., & Aron, A. (2008). Love: What is it, why does it matter, and how does it operate? Perspectives on Psychological Science, 3(1), 80-86. https://doi.org/10.1111/j.1745-6916.2008.00065.x.

Gammelgaard, J. (2011). Love, drive and desire in the works of Freud, Lacan and Proust. The International Journal of Psychoanalysis, 92(4), 963-983. https://doi.org/10.1111/j.1745-8315.2011.00355.x.

Nimmi Nalika Menike. (2020). Love beyond body offering: Literature and generosity. Journal of Human Values (3). doi:10.1177/0971685820949415.

Hao Xueqian & Chen Shu. (2015). Exploring the spirit of love in artistic creation - Taking Yayoi Kusama's self-healing as an example. Times Literature (Second Half)(09), 216. doi:CNKI:SUN: SDWL.0.2015-09-133.

Cobley, J. (2021). Museums and the pandemic, one year on: Some reflections on academic resilience. Museum Worlds, 9(1), 82-91. https://doi.org/10.3167/armw.2021.090107.

Cobley, J., Gaimster, D., So, S., Gorbey, K., Arnold, K., Poulot, D., Soares, B. B., Morse, N., Osorio Sunnucks, L., Martínez Milantchí, M. de las M., Serrano, A., Lehrer, E., Butler, S. R., Levell, N., Shelton, A., Kong, D. (Linda), & Jiang, M. (2020). Museums in the pandemic: A survey of responses on the current crisis. Museum Worlds, 8(1), 111-134. https://doi.org/10.3167/armw.2020.080109.

Loughran, T., & Mannay, D. (Eds.). (2018). Emotion and the Researcher: Sites, Subjectivities, and Relationships (Vol. 16). Emerald Publishing Limited. https://doi.org/10.1108/S1042-3192201816.

Ye Xiaolu. (2014). "Love is constantly reinventing" - Reading Badiou's "In Praise of Love". Contemporary Marxist Review (00), 362-373.

Yi-Fu Tuan. (2018). Topophilia: Study of Environmental Perception, Attitudes and Values. The Commercial Press.

Huang Sunquan. (2013). Toward a social art: Knowledge of art practice is about knowledge of socio-political processes. New Arts (10), 16-42.

Wang Zongliang. (2015). Yan Bing "labor of love". Ars Orientalis (19), 24-25.

Zygmunt Bauman. (2008). Liquid Love, Shang Zhou Press.

Hobbs, M., Owen, S., & Gerber, L. (2017). Liquid love? Dating apps, sex, relationships and the digital transformation of intimacy. Journal of Sociology, 53(2), 271-284. https://doi.org/10.1177/1440783316662718.

Liu Yuedi. (2019). Artificial intelligence, emotion Machines, and the "Emotional Intelligence paradox". Exploration and Contending (06),76-88+158.

Döring, N., & Poeschl, S. (2019). Love and sex with robots: A content analysis of media representations. International Journal of Social Robotics, 11(4), 665-677. https://doi.org/10.1007/s12369-019-00517-y.

Yang Shuo & Wang Shuo. (2020). Human emotion and machine emotion: Emotion research in artificial intelligence. Art Museum (03), 63-71.
Hall, S. M. & Silver, D. (2020). Radical care as the foundation for a better world [Online]. The Sociological Review Magazine. https://doi.org/10.51428/tsr.clmd4093)
O'Dwyer, K. (2011). Can we learn how to love? An exploration of Erich Fromm's The Art of Loving'. Self & Society, 39(2), 36-48. https://doi.org/10.1080/03060497.2011.11084197.
Wu Bijian. (2020). Reflections on the motives and foundations of love - A theory based on Fromm's "The Art of Love". Theory Horizon (05), 38-44. doi: 10.13221/j.cnki.lljj.2020.05.007.
Marcussen, M. (2010). To Kirsti: 'From art history with love…' perspective: Then and now, and artistic practice. Centaurus, 52(1), 73-88. https://doi.org/10.1111/j.1600-0498.2009.00165.x.

A Love That Never Fades Away :Relic Remembrance, Design, and Healing

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Abstract
Life and death are part of being, but most existing designs mainly focus on the present needs of human survival and the future ideal of life, and few explore the humanistic aspects of death, which makes the design fall into the caring and structural-functional narratives which is "human, too human". The thesis focuses on the importance of memorial in the life of the bereaved, and through the analysis of the practice and design of relic memorial, it is found that there is a kind of love that never fades away hide behind the mourning memorial, which enables the emotional rupture caused by bereavement to transcend and transform, but also promotes the mutual mélange of people and things, and restructures the reconciliation between human and non-human. Capturing the love of the edge can re-examine the limitations of "user-centeredness" and expand the research space and paradigm of "design for death".

Author keywords
Sustainable design; memorial; multimodality; humanism; love.

Introduction
American psychologist Maslow believes that human needs from low to high can be divided into Physiological needs, Safety needs, Love and belonging needs, Esteem and Self-actualization , only after human beings meet the lowest level of needs, there will be a step towards the higher level of needs(Koltko-Rivera, Mark E ,2006). The theory has been adopted by many designers to understand human behavior, needs and motivations to make the design This theory has been adopted by many designers to understand human behavior, needs and motivations so that designs can be maximized to match the needs of the consumer(Bishop J,2016). However, returning to the field of death research(including loss and grief research), not only do human needs not show a hierarchical relationship, but some emotional needs have been neglected for a long time and even labeled as "fragile". Among the consolations from others, the emotion support mainly focus on "restraining your grief" which means the bereaved be hoped to get over their grief as soon as possible (it can also be interpreted as don't feel too sad) rather than facing and recognizing the existence of "hurt", As a result, it leads to a lack of awareness and healing in the whole society about "grief", as well as research on the practice of healing grief and memorial design is extremely limited.
Bereavement is an inevitable experience for everyone. The pain of bereavement is so striking that it can never be healed, but it can be re-accepted in the ongoing process of 'mourning' or 'remembrance' and transformed into "a love that never fades away". This kind of love does not only come from "human beings", but also from "non-human being" that is entangled with human beings. The issue this thesis examines

is: does love disappear with the death of people? How do the "negative" emotions of grief and depression that arise from bereavement lead to transformation, healing, and transcendence? In the face of the inevitability of death and the uncertainty of the future, how does love manifest itself in 'material' and 'immaterial' forms as a force for renewal? Based on the four qualitative case studies, the thesis attempts to recapture the love hidden behind the emotion of "grief", to further interpret the universal values of human beings, and to deepen the mindset and principles of "Design for Life".

Prior Research and Related Literature

Death is an anti-structure, it exists as Dasein of "being alive ", it belongs to something that is not yet finished and constantly in deficit(Heidegge M,2016). The end of life, however, is not death, but oblivion by loved ones. In order to resist indebtedness and forgetfulness, people connect with the deceased through various tangible or intangible "objects" to achieve continuous mourning and remembrance of the deceased. Items, hair and ashes left behind by the deceased are often used as objects of memorial design, transforming the intangible thoughts into a tangible and palpable entity(Gibson, M,2010). However, researchers have pointed out that tangible objects are difficult to satisfy people's immersive emotional experience due to the lack of the function of multimodal intrapersonal interaction. The development of the Internet and digital technology has provided new mourning spaces and ways for people to honor the deceased. Increasingly personalized grief websites, virtual memorials, digital cemeteries and AI chatbots have helped bereaved people through the grieving process and conveyed new ways of thinking about life and death(Elaine, K,2020). Bereaved parents can dynamically communicate online with different bereaved people on mourning sites such as Modern life and Besupp, connecting with each other's missing love to empathize and fill in the gaps(Massimi, M., and Baecker, R. M,2011). While digital spaces can permanently store the legacy of the deceased, Joachim Pfister points out that there is also a risk that information in the digital world can be exposed before the death has been culturalised(Pfister J,2017), and that people's data can be downloaded for free or even used for commercial purposes.Michael Massimi and others'studies have shown that familiar, tangible physical objects are more valuable than their digital counterparts because they are more tangible, real, and can be touched(Massimi M, Baecker R M,2010). Based on a physicality understanding of love, only love that is repeatedly confirmed through the body is real and palpable, and the memory of the deceased's absence can be felt. However, Janet X. Chen and others have argued that physical mementos can also be tarnished with time goes by, the breakdown of kinship (divorce, remarriage) or intergenerational inheritance(Chen J X, Vitale F, McGrenere J,2021) .

In general, the above designs of remembrance, both tangible and intangible, prioritise the value of the human being and the continuing mourning of the deceased by the living, while more and more love from the "non-human" (the life of the objects, the mélange of the human-object) is neglected and forgotten by the designers. The absence of forgetting as a progressive or purposeful activity has left design in a "human, too human" situation. However, based on post-humanism explorations of design, the obscured love still needs to be taken into account, which is essential for the reconstruction of social relations.

The social healing and coping for bereavement

In the face of the inevitable event of death and the uncertainty of the future, religions in many places offer the promise of eternal life and hopes for the afterlife, but the sorrow cracks and the "negative" emotion issues left by death are often overly "medicalised"(Zhen, Y. R, Liu, W&Shi,L,2016), they are all subjected to medical and psychological treatment. Memorials as 'transitional objects' that people use to fill in the cracks of memory have also not received much attention from researchers and designers, and have even become a research

taboo. However, commemoration are part of memory, both as a reminder of the existence of relative and as an imitation and sublimation of the original love. Memorial 'objects' connect the past, present and future of the living and the dead, which sustains or shapes who we are. In memorial ceremonies, relics such as everyday objects, the hair and ashes of the deceased are often designed as memorial objects.

Object can also alive

Whether relics are conducive to oblivion or memory, it determines people's cognitive perspective and attitude towards objects. Yamashita Eiko believes that danshari (cut off, dispose, and "discard), which involves discarding or burning objects, can eliminate people's attachment to the memory of the person and the pain of bereavement (the memory of the person is more painful than the moment of loss) (Hideko, Y,2021). ,and start a new life However, for the memorial subject, the relic represents the history and inheritance of the owner, and the memory will not disappear because of the death of the relatives, on the contrary, there is always a love relationship behind the relic in the process of commemoration. Whether it is destroyed or preserved, things transcend the existing classification and value in market economic relations, especially with the change of social relations, the agency of things is constantly highlighted and always calls on people's emotional structure.

Beijing, China-based artist Song Dong's art decoration called"Make the best use of what you have" is a memorial for mourning. Its design was inspired by Song Dong's experience of bereavement(Wu, H,2011). The sudden death of his father left his mother in a state of grief. In order to help his mother "get over" her grief, Song Dong used artistic design to display tens of thousands of her mother's hoarded "old things", as well as her father's relics, it fills her mother's emotional trauma which caused of the loss of her husband, and reassure her anxiety due to fear of forgetting, also, the display evokes the logic of survival in the era of "material scarcity" experienced by Song Dong's parents. Each old object/relic is embedded with the memory of a past era, and in mourning, the old life is renewed, reincarnated and reborn, becoming a way for the living to heal themselves.

Western designers have also extended the mourning of objects to the physical perspective of the deceased, such as processing the hair or ashes of the deceased into wearable jewelry (rings, brooches, necklaces) becoming an increasingly popular mourning option(Tanderup S,2023). LifeGem in the United States is a company that offers the production and salement of synthetic diamonds for users. The diamonds are made from the ashes or hair of the user's deceased. The designers take the meaning of "immortality" from the ashes and use a warm visual language to create a unique, personal, eternal memorial for the bereaved(LifeGem,2022). Though there is a problem that is reflect uncontrolled consumption in production process , the design of the eternal memorial has an important healing value for the bereaved.

Memorial redesigning breaks the vicious cycle of "production-consumption-waste" in the previous product design, and memorial make the user and the product constantly twist each other. From the perspective of objects, objects that have some connection with the dead can be used as clues to trigger memories, and the living can generate love through physical touch; objects provide a space for the living to touch their memories.

Every tree has a soul

Unlike the object memorial, the commemoration design of burial transcends the larger-than-human system and the hpumanistic habitat of multi-species coexistence. It also invested both "human" and "non-human" with inter subjectivity. It is worth noting that the action of transforming invisible yearn into a concrete living entity provides spiritual support and cohesion for the protection of "nature".

The tree burial custom of the biasha Miao people in Guizhou, China, reveals that "death" is not the opposite of "life", but exists forever as a part of life. The creation myths of Miao people emphasizes that human life originates from trees, without which there would be no human beings(figure 1). Every tree has a soul, people and trees can be transformed into each other. Therefore, in biasha, parents plant a tree when their child is born,

the tree will grow up with the child. When people pass away, the tree will be cut down and made into coffin(Chen, F. Z,2011). Then, at the place where Miao people is buried, the relatives will plant another tree for him, signifying the immortality of life.

The biasha Miao people believe that trees, like human beings, can "think" and have consciousness, emotion and initiative, will have a relationship with human beings in life and living. The tree of life is the embodiment of human beings, if the life of the tree is luxuriant, the human beings will also be healthy and long-lived. The older the tree, the more spiritual it is. Memorial designs that integrate the living, the dead and the tree promote reverence for nature while achieving mutual transformation and the continuation or sustainable cycle of life.

Figure 1.Biasha Miao people's life tree

The practice of "human-tree being" is also ubiquitous in Western societies and is increasingly becoming a way to reduce the waste of land resources, in keeping with contemporary environmental and sustainability tenets. Italian designers Anna Citelli and Raoul Bretzel have created an organic burial pod "the Capsula Mundi ", which is made from seasonal plants such as potatoes and corn and is shaped like a giant seed. When it is buried in the earth, the seed is opened and gradually integrated into the soil(figure 2). It can be topped with a tree of the deceased's choice during his or her lifetime, and the body of the deceased will be transformed into nutrients for the tree's growth. As the tree grows, loved ones continue to care for it, and the process of caring for the tree builds a sense of permanence with the deceased(Capsula Mundi,2019). The tree serves as a permanent memorial to the deceased, and the whole community will benefit from the natural return of the person.

Figure 2. Biodegradable burial pod memory forest capsula mundi

The memorial design of tree burials sees death as the beginning of the return to nature, where the body achieves communion with nature through natural transformation and becomes a source of new vitality.

Love never fades away: as a design that trans human perspective

Although it is impossible to compare one person's grief with another's, the analytical framework of relic memorial reveals a different discourse than Maslow's hierarchy of needs, in which the "love and belonging needs" does not appear as a ladder, but rather as a continuum of human emotional needs. In mourning and memorializing, love is hiding in grief and appears in various forms, such as relics, rings, and tree-humans community. As a resort of social healing and coping for bereavement, although the practice of memorializing the dead is often individual or family-based, the love that connects the living and the dead is a common human experience.

However, most existing designs are "anthropocentric", emphasizing as much as possible that "Something has intrinsic value to the degree that it is organically uniffed. Its organic unity is its value" (Nozick R,1989)to enhance

the aesthetics of the product and the intrinsic value of the service. The principles of scarcity, attractiveness, and user-centered design, which have been so successful in meeting human needs for safety, health, well-being, and happiness, those principles may be misused from a sustainability perspective. Because user-centered humanistic design has little concern for the existence of "non-humans" or the value of "others" in the human race.

In the design of relics memorial, people don't take the "old things" out of the past time, but to reveal what is often ignored by the others, and discover the "value needs recognize beyond the existing value ", that also means the mobility and spirituality of the object, which prompts human beings to realize the mutual mingling of objects. Although commemorative activities are focused on suffering, and the value of products commemorating death fluctuates according to the proximity to the kinship system, people have discovered the love that "never fades away" in the aggregation of "human" and "non-human". "love.

In the design practice towards natural burial, although industrialized design and production constantly denies that the death of animals, plants, or people contributes to a sustainable cycle, the design of eternal memorial in which "obejects and I are intertwined" further reveals the relationship between "human" and "non-human". "non-human" (flora and fauna), and the deep connection between humans and nature/earth, encouraging us to find our place in the larger life cycle of which our loved ones have become a part(Anywar G, Kopnina H, Poldner K,2022). Ongoing memorializing and mourning prompts a greater appreciation of Mother Earth, as natural resources are not belong to non-human but made by humans and non-humans alike.

Therefore, design should also undergo a paradigm shift. Ron Wakkary notes: "In a human and nonhuman assembly of the designer of things, it is humans who speak for and among mute things and matter"(Wakkary R,2021) . However, a "transhuman-centered" design doesn't only focus on the aesthetics and functionality of the product, but also consider everything as an actor, designing with humans and non-humans, expanding the axis of "I" to "all things", such as making the design of love a living force that promotes the reconciliation between humans and nature.

Conclusion

Human progress, or human-centred design, prioritizes human values and considers almost all "non-human" beings as inspirational and exploitable resources for design. By analyzing the memorial and design of relics, the thesis expands the study of material exchange between humans into the field of memorial between humans and non-humans (objects, the deceased, ancestors, plants, etc.) to go beyond a 'human-centred' perspective to re-understand the practice of design.

This is dissolving the commonly accepted dichotomous thinking between death and life, virtual and real, and "human" and "non-human" (animals, plants, ancestors, etc.). This paper proposes the multiple material, ethical and existential affinities between "human" and "non-human", and extends the theoretical space of multi-species design.

Unlike previous studies, this paper focuses on "designing for death", especially through the study of "negative" emotions derived from bereavement, revealing that grief is not a pathological, regressive, and residual emotional experience and past, as traditionally assumed. On the contrary, it is an important part of human emotion, and even from the design and practice of mourning or commemoration, we can capture a kind of compassionate love that transcends the gap between life and death, and promotes the harmonious coexistence of human beings and nature. This provides more "positive" motivation for design to re-engage with the issue of death.

References

Anywar, G., Kopnina, H., & Poldner, K. (2022). Cradle to Cradle and Cradle to Grave: Discussing the Case of Eco-coffins. In Thinking: Bioengineering of Science and Art (pp. 693-711). Cham: Springer International Publishing.

Bishop, J. (2016). An analysis of the implications of Maslow's Hierarchy of Needs for networked learning design and delivery. In Proceedings of the International Conference on Information and Knowledge Engineering (IKE) (p. 49). The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp).

Chen, J. X., Vitale, F., & McGrenere, J. (2021, May). What Happens After Death? Using a Design Workbook to Understand User Expectations for Preparing Their Data. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (pp. 1-13).

Chen, F. Z, Yuan, X. Y&Ni, J. C.(2011). Life will finally be attentive: the theory of after basha miao village life education. Guizhou Culture and History, (1), 97-101.

Capsula Mundi (2019) https://www.capsulamundi.it/en/.

Elaine, K(2020). All the Ghosts in the Machine: Illusions of Immortality in the Digital Age, (Zhan, M, Trans). Fuzhou: Straits Literature and Art Press.
Gibson, M. (2010). Death and the transformation of objects and their value. Thesis Eleven, 103(1), 54-64.

Heidegge, M(2016). Being and time,(Chen,J. Y&Wang, Q. J, Trans). Shanghai: SDX Joint Publishing Company.

Hideko, Y. (2021) Danshari · Home Daily,(Ji,X Trans). Hunan Literature and Art Publishing House.

Koltko-Rivera, Mark E .Rediscovering the later version of Maslow's hierarchy of needs: Self-transcendence and opportunities for theory, research, and unification.[J].Review of General Psychology, 2006, 10(4):302-317.

Massimi, M, & Baecker, R. M. (2011, May). Dealing with death in design: developing systems for the bereaved. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 1001-1010).

Nozick, R. (1990). Examined life: Philosophical meditations. Simon and Schuster.
Jung, H., Bardzell, S., Blevis, E., Pierce, J., & Stolterman, E. (2011). How deep is your love: Deep narratives of ensoulment and heirloom status. International Journal of Design, 5(1).

Tanderup, S. (2023). Branding of death at Coeio and LifeGem. Res Mobilis, 13(16), 23-40.

Wu, H. (2011).Making the best use of everything : contemporary art for the common people. Shanghai People's Publishing House.

Wakkary, R. (2021). Things we could design: For more than human-centered worlds. MIT press.
Zhen, Y. R, Liu, W&Shi,L. (2016) The effect of funeral rituals on the grief reactions of bereaved relatives. Chinese

Journal of Clinical Psychology, 24(4), 695-701.

Love and Healing Embodied in Public Art: An Interpretation of the "Rubber Duck"

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Abstract
Loneliness and indifference are common emotional issues frequently experienced by modern urban dwellers. This paper aims to explore how public art can effectively connect people and convey love in urban life through unconventional design concepts and display strategies. Taking the signature artwork Rubber Duck by Dutch artist Florentijn Hofman as an example, this paper applies the methodology of semiotics and communication to analyze how the artwork can serve as a catalyst for inspiring people to reflect on the relationship between human beings and their living environments. Through a movable display method, the artwork endowed with shared values can help dissolve barriers and stereotypes between different cultures. This allows the images of art to become universally accepted spiritual symbols in transcultural exchanges, fostering a sense of interconnectedness among communities and coalescing the world as a whole.

Author keywords
public art; rubber duck; movable sculpture; communication

Introduction

Public art is an indispensable part of the city, which grows out of the city and serves it. As a cultural symbol, it can represent the spirit of the era. In the context of deepening urbanization, the living space of city dwellers is significantly reduced. The tension between individuals and communities, as well as between human beings and nature, results in urban residents experiencing increased mental pressure. For contemporary artists and designers, how to inject new vitality into urban spaces through their artworks is an urgent issue to address. This will help improve the relationship between urbanites and their living environments, as well as heal people's souls. With the development of globalization and the acceleration of population mobility, a new form of public art is challenging the traditional stereotypes and attracting a large audience. It focuses on the interaction between artworks and viewers, connecting people and conveying love. This paper explores a new mode of public art by analyzing the famous artwork Rubber Duck by Florentijn Hofman. It aims to explore the design concept and dissemination strategy, which could serve as inspiration for contemporary designers.

From toys to duck fleet: tracing the cultural evolution of "Rubber Duck"

There are many legends about the inspiration behind the world-famous "Rubber Duck". One story is that the shape of the artwork may have been inspired by the bathtub duck, a toy specifically designed for children's bath time. This toy once appeared on the famous American children's television program "Sesame Street" (1968). The protagonist Ernie has a favorite toy - a little yellow duck. He even sang a song called "Rubber Duck" that made it onto the Billboard Hot 100. The little yellow duck has since become an iconic symbol of American pop

culture. However, Hofman, the designer of "Rubber Duck", denied this association. He claims that this design has nothing to do with his childhood, and he never played with a rubber duck in the shower. In fact, he dislikes ducks. The other story is more dramatic. In 1992, a Chinese cargo ship carrying 28,000 toy ducks encountered a storm in the Pacific Ocean, causing the container of toy ducks to be dumped into the sea. After a few years, people were surprised to find that the fleet of ducks had drifted to beaches in various parts of the world. This discovery sparked a frenzy as people eagerly sought out these "survivors". This accident bestowed the image of the little yellow duck with a legendary hue, which is also seen as evidence of globalization.

Although the designer Hofman denies the above stories as his inspiration, there is no doubt that the public's acceptance of this image is strongly influenced by the historical and cultural factors embodied in it. On the one hand, rubber duckie, originally produced as a bathtub toy, can symbolize the joyful moments of our childhood. It tends to be the object of people's emotional projection, carrying common childhood memories and serving as a means to combat the tension, anxiety, and limitations caused by modern urban life. When Rubber Duck was unveiled at the 2013 Beijing International Design Week, Chinese duck fans released a song called "Beijing Nursery Rhyme". Through the fusion of contemporary melodies and traditional Beijing tunes, this song captures the emotions of urban residents coping with stress and longing for their childhood and friends. Their slogan is "Back to childhood, and design for love." (Xinhua, 2013) In this case, the rubber duck serves as a nostalgic object that helps to mend people's hearts. On the other hand, the accident involving the "Duck Fleet" has contributed to the widespread dissemination of this image. The little yellow duck represents the characteristics of optimism and perseverance in the face of difficulties. This spirit is undoubtedly a great source of encouragement for people, instilling in them the belief that as long as they persevere, miracles can occur. In this case, the yellow rubber duck is also considered an auspicious symbol, which can mean "luck".

Figure 1. "Rubber Duck" hangs in Hong Kong. DENIS BOCQUET/FLICKR CC-BY 2.

The friendly floating "Rubber Duck": the world is a bathtub

From the perspective of semiotics, the Rubber Duck, as a well-known visual symbol, can also be analyzed as a type of "signifier", with its "signified" constantly floating. In his artistic practice, Hofman frequently takes this universally accepted and beloved visual symbol out of its original context and turns it into a movable sculpture. This popular image can evoke a variety of associations and empathy in people. Hofman once wrote a poem to explain the meaning of Rubber Duck.

"The rubber duck knows no frontier
it doesn't discriminate people
and doesn't have a political connotation.
The friendly floating rubber duck
has healing properties;
it can relieve mondial tensions
as well as define them.

The rubber duck is soft, friendly
And suitable for
all ages." (Zaslabsky, 2020)

In Hofman's viewpoint, the duck is not designed solely for children, but for people of all ages. "I see it as an adult thing. It makes you feel young again," the artist explained in an interview. "It means that we're living on one planet, we're one family. All the water in the world is our global bathtub...You and me are taking the same bath." (Piejko, 2018) In this metaphor, the artist conveys a dual message. On the one hand, it illustrates the clear connection between the large yellow duck and the bathtub toy. On the other hand, it is also a brilliant metaphor for the situation of the highly globalized world. From small ducky toy to big yellow duck, from private space to public domain, this transformation reflects how the artist changes a mundane object into a public artwork. Nowadays, there is an urgent need for a closer connection between city residents and their living environment. In this sense, the Rubber Duck acts as a friendly messenger aimed at fulfilling this mission.

Figure 2. A pair of giant yellow rubber ducks are seen at Victoria Harbor in Hong Kong, south China, June 9, 2023. [Photo/Xinhua]

Giant animals and a shrinking cityscape: rethinking living conditions

Unlike other types of artworks that aim to express artist's individual thoughts and are exhibited in indoor art galleries, public art is more dependent on the environment. It closely interacts with its surroundings and reshapes the familiar landscape. Notably, the location where the rubber duck is displayed is often a scenic spot or a transportation hub in the city center, attracting a massive flow of people. In terms of design strategy, Hofman makes good use of "scale". His art often magnifies everyday objects with the aim of conveying a message of healing. Like the artist's other artworks, he creates giant sculptures by enlarging and simplifying the traditional image of the little yellow duck, which is taken from daily life, to an absurd size. This strategy aims to make people refocus on the often overlooked details of life and encourages them to re-examine and re-appreciate them. By creating a large sculpture, the artist makes the world around us seem smaller, evoking a sense of humility in viewers. "No matter what your profession or social status is, whether you are a CEO of a big company or a public figure, all people are small compared to a huge sculpture," the artist argues. (Viuviu, 2022) When a large-scale "intruder" appears, we begin to notice the places we have long been accustomed to, thus forming a connection with our environment.

On a psychological level, large toy animal figures can fulfill people's desire for love and warmth through their substantial size. It tends to make people feel healed by triggering emotional connections, providing comfort, evoking a sense of innocence and friendliness, and offering healing mechanisms. In an era where the interaction between humans and animals is becoming more intense, humans consistently assert their dominance and exhibit a strong sense of superiority. To critique this phenomenon, the artist deliberately creates oversized works, aiming to prompt people to recognize the equality between animals and humans. But Hofman's works are more than just "big animals". Although they may give you a cheerful feeling upon first encounter, they

actually possess a deeper meaning. In Hofman's words, these animals are metaphors that have nothing to do with the animals themselves. Just as fables over the centuries have always borrowed imagery from animals, he also enjoys utilizing adorable animals to convey narratives. As the artist explains, "I use animal images because I believe they are relatable to different groups of people. It's not just about animals; it's about us humans. The animals I create serve as a mirror, reflecting our human nature." (Viuviu, 2022)

From private to public space: connecting people and sharing happiness

The display of Rubber Duck reflects the temporary and "site-specific" nature of contemporary public art. Hofman's artwork was usually created to have an interrelationship with its surrounding location and blend in with the community and landscape of the region. (ART NEWS, 2023) Despite the fact that Rubber Duck has been exhibited in many major cities around the world, Hofman adheres to his principle: each rubber duck is produced locally and never leaves the water. It is a temporary public art installation, and each rubber duck has to be recreated. Hofman will redesign the size of the rubber ducks based on various local conditions, including weather and tides. What's special about this type of temporary public art is that it's ephemeral. "People see it, talk about it, and get used to it. Then, all of a sudden, it's gone again," Hofman explains. (Viuviu, 2022) Ephemeral public art provides a continuity for analysis of the conditions and changing configurations of public life, without mandating the stasis required to express eternal values to a broad audience with different backgrounds and often different verbal and visual imaginations. (Phillips, 1989) Noticeably, Hofman often "hijacks" the space and occupies it, prompting people to reconsider their surroundings. In this transformed space, the big rubber duck grants joy, childhood, and equality for all, drawing attention to public spaces that are often overlooked.

Figure 3. The duck draws crowds in Sydney. (Photo: Alfred Hernandez/Flickr CC-BY 2.0)

In terms of communication, Rubber Duck is a real "conversation starter" no matter where it is found. It is an iconic image that evokes the emotions of urban residents worldwide. The charm of this artwork largely lies in its interactive elements, which engage with spectators. These movable sculptures are often placed in areas with high pedestrian traffic or in locations of significant cultural and historical importance in the city. They are designed to attract attention, spark conversations, and encourage reflection. The sculptures are usually designed to blend well with the surrounding landscape and environment. The exaggerated and eye-catching animal figures are frequently seen in bustling harbors, rivers, or lakes, and they become the focal point of attention for the residents of nearby communities. This viewing experience often generates real-time conversations and socialization.

Displayed around the world, the Rubber Duck has become a unique symbol of youth, energy, and healing, as well as a temporary constructed cultural landscape. For urban dwellers, it is important to maintain a childlike spirit. The artist believes that as people grow up, they often pursuit perfection and become afraid of making mistakes. However, children are different; they can make mistakes and freely express their fantasies. In his

work, he hopes to free people from the deliberate emphasis on perfection. "You're free to talk about childish things, free to think and act a little silly, and free to take pictures with them." (Viuviu, 2022) Hofman's goal in introducing the duckling was to bring joy to people when they saw it, and he succeeded. Encountering a huge floating bath toy is something of a social lubricant among visitors or any strangers within eyeshot of it. On a formal level, its absurd size reduces the object to something of a cheerful, sunny blob. (Piejko, 2018) People socialize at the base of the sculpture and share their happiness. For Hofman, the viewer is also an integral part of the artwork.

Figure 4. Visitors are silhouetted against a giant inflatable rubber duck designed by Dutch artist Florentijn Hofman floating in a lake at the Parque de la Familia in Santiago, Chile. The world-famous sculpture is a part of the annual "Hecho en Casa," or Made at Home festival that celebrates urban art. AP Photo

Conclusion

Art is a symbolic way of communicating. One of the most important functions of art is to communicate, display, and reinforce important cultural themes and values. (Nanda, 1994) The visual symbol of Rubber Duck carries universal positive meanings on the one hand, and its simplicity makes it highly recognizable on the other. These two characteristics enable it to be successfully transmitted cross-culturally and widely accepted by people from all over the world. In terms of design inspiration, the artist creates artwork that resembles mundane objects, bridging the gap between contemporary art and the general public. In fact, Hofman intentionally blurs the boundary between art and life and directs people's attention to the allure of everyday objects by enlarging their size. For the approach of displaying and viewing, the giant Rubber Duck is designed as a public universal "cityscape" that residents can freely admire, without the need for any knowledge of it. The artwork's appearance inspires people to re-examine their relationship with the living space, potentially altering their impression of the urban landscape. To some extent, this public artwork serves not only a means for people to appreciate the cityscape, but also as a form that they find relaxing, easy to understand, and enjoyable to watch.

References

ART NEWS. (2023, March 16). The Transformative Journey of Florentijn Hofman's Public Art. https://www.whitestone-gallery.com/blogs/articles-post/florentijn-hofman-public-art-history

Phillips, Patrica C. (1989). "Temporality and Public Art". Art Journal. 48 (4), 331–335. doi:10.2307/777018. JSTOR 777018. Retrieved 21 September 2020.

Piejko, J. (2018). The Duckie and the Anal Plug: A global tour of contemporary public art. The Baffler, 42, 74–77. https://www.jstor.org/stable/26528724

Nanda, S. (1994). Cultural Anthropology, 5th ed. Belmont, CA: Wadsworth, p.403.

Viuviu. (2022, August 9). 环游世界的大黄鸭 (The Big Yellow Duck Traveling Around the World). Lens Welens. https://www.thepaper.cn/newsDetail_forward_19367333

Xinhua. (2013, October 30). 大黄鸭主题曲《北京童谣》——回忆童年 触动童心 (The Big Yellow Duck Theme Song "Beijing Nursery Rhyme" - Memories of Childhood Touching Childish Heart). https://www.163.com/lady/

article/9CE8U8RB00264M4F.html
Zaslabsky, M. (2020, April 7). Why do they sell rubber ducks in Amsterdam? https://amsterdamhangout.com/why-do-they-sell-rubber-ducks-in-amsterdam/

Co-Creation through Local Art Activities A Case Study of the Nezu Project and the Interdiffusion of Place and Atmosphere

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Abstract

The intersection between space and art is an argumentative issue. We argue that he relationship between people and places plays a pivotal role in shaping communal identities and experiences. Due to the complexity of residents' perceptions and physical environment, the need for a holistic understanding of regional narratives has never been more significant. Nezu, a once-thriving street in Tokyo, provides a unique setting for understanding the dynamic between place and people within the context of local art activities. To promote fair and authentic co-creation in local art activities, this study utilizes ethnographic research methods such as participant observation, interviews, photographic documentation, and note-taking. Through the lens of the interdiffusion of place and "atmosphere," the study explores the potential of local art activities to enhance residents' perception of local narratives. Based on the insights gained from the research, we propose a framework for eliciting stories about Nezu from community residents, recreating the area's historical landscape through local art activities that depict the atmosphere of the region, and fostering continuous regional expression.

Author keywords

local narratives; the aesthetics of atmosphere; sense of place; relational aesthetics

Introduction

The intersection between space and art is an argumentative issue. Our understanding of place, described by Relph (1976), centers on place's authenticity and particularity. Furthermore, phenomenological perspectives on aesthetics mentioned by Böhme, enrich our understanding of lived experience in art(Böhme, 2016). His view emphasizes the holistic, embodied experience of a place that goes beyond the conventional five senses. The phenomenological aesthetics aim to explore how to promote co-creation with residents as the main actors, focusing on place narratives that can convey the atmosphere of the place. The encounters with place shape the residents' perceptions of local narrative that can be amplified by local art activities, and the relationship between people and places plays a pivotal role in shaping communal identities and experiences. Due to the complexity of residents' perceptions and physical environment, the need of a holistic understanding of regional narratives has never been more significant. Nezu, a once thriving street in Tokyo, provides a unique setting for understanding the dynamic between place and people within in the context of local art activities. In this study, "local art

activities" is broadly defined to encompass both art and design without favoring either. Deliberately avoiding terms like "art project" or "community design," the study aims to be inclusive. The research begins by focusing on the right to narrate a place. It argues that in many existing community art projects, the right to express a place has been usurped by outside artists and capital. Building on Bhabha's 2023 framework, which argues that the right to narrate is a dialogic right, this study suggests that empowering residents to express their place and extract their "sense of place" will allow for nearly limitless unique local expressions. Through such activities, both residents and outsiders can renew their sense of personhood and perspective.

Methodology

Building upon Relph's discourses on place and Böhme's atmospheric aesthetics, the study emphasizes the intertwined relationship between "place" and "atmosphere". The relationships are not passive. They shape and are shaped through the interactions between residents and visitors. Drawing inspiration from Bourriaud, the paper focuses on a multisensory exploration of art, instead of mere physical and visual attributes of a region (Bourriaud,2020). This study proposes an enhancement of place making autonomy by incorporating the perspective of the "atmosphere" and the expression of the region, specifically through the co-creation with residents in large-scale local art activities. By utilizing life experiences and facilitating design and art perspectives, co-creation involving residents can result in an authentic expression of a region and create "interdiffusion" through local art activities. The term "interdiffusion" originally describes the process of mixing freely in chemistry to achieve a homogeneous mixture. This study suggests "interdiffusion" to argue that external stimuli are essential for the residents to build their regional image. With minimal facilitation, researchers and artists invite the residents to engage more deeply with their community and expect a possible interdiffusion between place and "atmosphere" in which the residents will gain new aesthetic experiences with new vernacular. An ethnographic approach is used to engage with Nezu, especially Kannon Street, and its community. To gain a holistic understanding of the area and inhabitants, the methodology includes participant observations, key informant interviews, photographic documentation, and reflexive notetaking. This study explores the artistic approaches for enriching residents' understandings of local narratives by intertwining the concepts of place and atmosphere. Based on Relph's view on place and Böhme's atmospheric aesthetics, we explore how art can mold, redefine, and amplify the connection between individuals and their environment. We aim to strengthen residents' understanding involving the essence of "atmosphere" that actively shapes experiences (Böhme,2016). Here, we argue that art transcends visual displays, and it is the atmosphere that facilitates the interaction between the observer and the artwork. In Nezu, collective creation helps the understanding of the locale's "atmosphere", thereby reinforcing residents' regional awareness and self-expression. Associating with Rancière's aesthetic politics (Rancière, 2009, p. 22), we see art as a communal medium expressing regional history and identity. Residents need external triggers to discover their regional perception. Emphasizing local involvement with minimal guidance, both researchers and artists empower locals to deeply immerse themselves into the community. Seeing daily life as art, residents will recognize their locale's ambiance, landscapes, traditions, and vernacular, then infuse their own context to the place. With such process, new aesthetic experiences will emerge with new regional vernaculars, and creates a dynamic cycle of "place" and "atmosphere".

The Nezu Project: Evolution and Community Revitalization Efforts

This section will discuss about how Nezu Project demonstrates the complex dynamics of the emotional perception and sharing qualities of art, the transformative power of interactions, relationship transitions, and place transformation. Artistic expression transcends mere physical representation and integrates

personal emotions, gestures, and environmental ambiance. Hence, it bridges subconsciousness and indirect communication through a "participatory approach" in art creation. "Tanzaku" and the "Museum of Living" facilitated internal interactions and reflected both perceptions of new and original Nezu residents. At the same time, the tourists also acquired a renewed comprehension of Nezu through pamphlets. Art activities empowered the residents to capture their living experiences and perceptions that further rejuvenated the regional ambiance authentically. Utilizing visual ethnography, efforts were made to frame residents' lifestyles as "self-referential expressions." Art encapsulates human emotions and the ambiance of a locale, serving as a channel for indirect communication. Through art, Nezu's historical lifestyle and landscape are re-evaluated with the emergence of a new cultural narrative. The future of community-buildings transcends mere infrastructural renewal; it's about reviving the community's essence. Engagement with art can rejuvenate interpersonal relationships, potentially delivering innovative communications. Artists can sculpt sensory experiences with regional identity and memories as Böhme's interpretation on "atmosphere". Massey's concept of dynamic places can be seen from the artists' take on emphasizing urban narrative and challenging the frames of gentrified areas (Massey, 2005).
Furthermore, Nezu has a prominent architectural and spatial characteristic. The importance of communication in the residents' memories can be observed from the close2005 distance and thinness of buildings' walls. The introduced "atmosphere" concept emphasizes this element of "communication". The theoretical framework based on theories relating to place and atmosphere stresses the continuous co-creation of regional expressions and prioritizes instinctive human "perception". The concept of "relational aesthetics" highlights the structure of experiences and audiences being participants who emerge into artwork. Art pieces that emphasize "relationships" over techniques and content are named as "relational art". They focus on the processes that foster situations, events, and most importantly, people's "participation".

Participatory Mechanisms in Artistic Creation

Understanding the historical and current dynamics of Kannon Street offers insight to the factors that led to its decline and the subsequent attempts at revitalization. The study considers both the tangible (infrastructural) and intangible (cultural, social) attributes of the district. At its core, the Nezu Project aims for co-creation, a collaborative endeavor between artists, researchers, and locals, and seeks to rejuvenate the region's historic ambiance through art and storytelling.
The three distinct participatory methods are identified as below:
1. "Sporadic" Participation: Tanzaku, strips of paper carrying thoughts from both locals and outsiders, serves as a communal diary, narrating the evolving story of Nezu.

2. Workshop-based Participation: The color flags decorating Kannon Street are made from shared perceptions of the community through workshops.
3. "Interdiffusion-style" Participation: "Nezu Neighborhood Museum" project reframes everyday artifacts as markers of regional identity.

Bridging Perception and Place through Art

Art in Nezu is not just about representation but about the act of co-creation and sharing. Through Tanzaku, flags, and the museum project, art becomes a platform for dialogue, for recognizing and celebrating the distinct "atmosphere" of the region. Moreover, these initiatives foster internal (among residents) and external (with visitors) interactions, effectively serving as catalysts for communal rejuvenation.

The transformative power of art in shaping and reshaping regional narratives is evident in Nezu. The dynamics between perception, place, and atmosphere emerge as fundamental to understanding and enhancing communal belonging. The role of relational aesthetics in this context is noteworthy, emphasizing the processual nature of art, fostering situations, events, and people's participation (Bourriaud, 2020).

Discussion and Conclusion

In atmospheric aesthetics, sensing a place embodies a certain ambiguity. It's not merely an analytical understanding through words, but also an acknowledgment of vitality, encompassing body gestures and the ambiance of the place.

The participation taken place in Nezu Project comprises three forms: sporadic, workshop-based, and "Interdiffusion-style" methods of artistic creation. "Sporadic participation" is characterized by the freedom and randomness of involvement. After securing permissions from store owners from the street, newly crafted "Tanzaku" were displayed, inviting both locals and visitors to share their sentiments about Nezu. Instead of simply following the Japanese Tanabata tradition, "Tanzaku" transformed into anonymous messages from both locals and outsiders as they walked Kannon street. The 378 Tanzaku featured different phrases and gave Nezu a distinct identity beyond generic descriptions. Tanzaku provides a platform for individual narratives and promotes inclusivity through storytelling. Moreover, the expressions shown with Tanzaku are vernaculars coming from perceptions and foster the communication of Nezu's sense of place.

For the participatory method, we used yellow and green as theme colors corresponding to the design of Kannon Street's streetlights. Then the "Nezu neighborhood museum" project is considered as a "interdiffusion-style" participation. Students and researchers examined surveys and photos for unique markers of the Nezu region, particularly those relating to daily life. Numerous potted plants can be seen in Nezu region that represents a distinctive urban horticultural scene. Besides plants, numerous external air-conditioning units scatter in the streets and become public interaction spaces making everyday lives into conversation.

The regional art event showed innovative practices and enabled attendees, including locals, to experience Nezu's beauty and the unique vibrancy of the historical commercial district. Co- creation artworks and workshops influenced by the local ambiance, culinary events, and other activities, mirror the commercial essence of the shopping street. Stemming from insights and collaborative efforts, owners of closed shops opened for sales and repurposed residential buildings offered their spaces for the project. Recreating historical vibrancy through contemporary design and art fostered heightened "participation" during the exhibit.

The study highlights the instrumental role of local art endeavors in amplifying residents' awareness and understanding of their regional narratives. Through active participation, art facilitates a merging of individual narratives into a shared memory and identity. It serves as a beacon, spotlighting the fusion of places and

atmosphere, kindling emotional ties, and bolstering communal belonging. Our findings suggest that local art activities have a profound influence on residents' perception of their locality's narratives. They interweave individual experiences and stories into a collective memory and identity. Art, acting as a catalyst, makes visible the interdiffusion of places and "atmosphere", eliciting emotional resonance, and nurturing a sense of belonging among residents. Promoting residents' perceptions of local narratives through local art activities represents an underexplored frontier in place-based practice. By recognizing and integrating the aesthetics of atmospheres and politics of aesthetics, these practices could become a transformative force for local communities. Future endeavors must assess the long- term impacts of such practices on community resilience, cohesion, and well-being. Moreover, the adaptability of these methodologies in varied cultural and geographical contexts remains for us to further explore.

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References

Böhme, G. (2016). The Aesthetics of Atmospheres (J.-P. Thibaud, Ed.; 0 ed.). Routledge. https://doi.org/10.4324/9781315538181

Doreen Massey—For Space-SAGE Publications Ltd (2005).pdf. (n.d.).

Bhabha, H. K. (2012). The location of culture. routledge.

Rancière, J. (2009). The Emancipated Spectator. Verso.

Massey, D. (2005) For Space. SAGE Publications Ltd.

Bishop, C. (2006) Participation.

Bishop, C. (2023) Artificial hells: Participatory art and the politics of spectatorship. Verso Books. Dewey, J. (1980) Art as Experience. Perigee Trade.

Helguera, P. (2011) Education for Socially Engaged Art: A Materials and Techniques Handbook. Jorge Pinto Books Inc.

Tuan, Y. (1977) Space and Place: The Perspective of Experience. Minneapolis: University of Minnesota Press.

The Intersection of Intimacy and Technology: An Ethnographic Exploration of Instant Messaging Services in Long-Distance Relationships

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Abstract

Long-distance relationships (LDRs) face challenges in maintaining intimacy, especially against the backdrop of globalization. However, instant messaging (IM) platforms, such as WeChat and WhatsApp, while crucial for communication and intimacy in LDRs, sometimes exacerbate socialization anxiety. This study aims to bridge the understanding gap of intimacy in IM services within LDRs. Goals include analyzing the divergence between messaging apps' features and LDR intimacy needs and assessing autoethnography's role in studying LDRs' communication. Employing analytic autoethnography, the research incorporates a 30-day diary, interviews with 7 participants, and virtual ethnography in LDR communities. Data is interpreted through the "Six Broad Strategy" intimacy theory. Preliminary findings suggest a misalignment between WeChat and WhatsApp's features and LDR intimacy requirements. The study develops an approach to enhance intimacy features in IM platforms and revisits the "Six Board Strategy" in the LDR context. This research augments our grasp of intimacy in IM services for LDRs, aiming for improved user experiences and contributing to the discourse of love on LDRs in today's communication age.

Author keywords

Long-distance relationships; Intimacy; Instant messaging; Analytic autoethnography.

1 Introduction

The adverse effects of loneliness and social isolation resulting from the separation from family members, friends, and intimate relationships during the COVID-19 pandemic have been substantiated as detrimental to mental well-being (Hwang et al., 2020). While the pandemic is nearing its end, instances of separation, such as long-distance relationships, continue to be prevalent due to the ongoing trend of globalization. Meanwhile, intimacy, as identified as one of the most significant influences on and mental health (Reis and Franks, 1994), holds even greater significance for individuals in long-distance relationships (LDRs) compared to other types of relationships (Frost, 2013).

In the specific context of long-distance relationships, messaging platforms and social media services play a vital role as communication tools that significantly influence the quality of intimacy experienced by the individuals involved (Vetere et al., 2005). However, the thought-provoking documentary "The Social Dilemma" highlights a concerning trend: the rapid expansion of social media technology has led to increased socialization anxiety and stress instead of fostering genuine intimate connections among individuals. Consequently, it becomes crucial to

conduct research on instant messaging applications, which are widely used for communication, to explore ways of enhancing these communication services and improving the overall user experience, ultimately leading to a higher quality of intimacy.

2 Literature Review

The prevalence of long-distance relationships (LDRs) has increased in recent times due to the globalization phenomenon, which has driven many individuals to pursue educational and career opportunities in foreign countries (Belus et al., 2018). However, the geographical separation that characterizes LDRs poses significant challenges to maintaining intimacy and closeness between partners. Such challenges include coping with time differences, the loss of physical touch, the constraints on expressing affection, and the inability to engage in shared activities in person (Zamanifard & Freeman, 2019; Yang & Neustaedter, 2020), which can adversely affect the satisfaction levels of the relationship and the mental health of the individuals involved (Reis & Franks, 1994).

In order to navigate these complex challenges, Belus et al. (2018) discovered that engaging in maintenance behaviors positively affects the continuity and overall health of LDRs. Meanwhile, current researches in the realm of intimate technology aimed at enhancing maintenance behaviors in LDRs can be categorized into two primary: (1) physical intimacy enhancement devices, such as encompassing wearable computing and smart clothing that simulate the sensation of a hug over a distance (Vetere et al., 2005) and haptic devices that can transmit the force and shape of a kiss as a tangible connection (Saadatian et al., 2014); (2) digital mediating intimacy technologies, including haptic instant messaging (Rovers & Van Essen, 2004), the "Six Broad Strategies" intimacy strategies with "awareness, expressivity, physicalness, gift giving, joint action and memories (Hassenzahl et al., 2012, p. 4) ", and social VR platforms (Zamanifard and Freeman, 2019).

Although these studies have explored various forms of multisensory communication, there is a notable neglect in improving existing digital service-based solutions. It is worth mentioning that out of 143 works, only two have focused on online service design for connecting distant individuals, while most studies still propose redesigned physical devices as outcomes (Hassenzahl et al., 2012). With the rapid development of communication technology, instant messaging (IM) services hold significant importance in fulfilling intimate interaction requirements in LDRs (Rovers & Van Essen, 2004). Among the various IM services, WhatsApp, and WeChat, which ranked as the top two mobile messaging apps with 2 billion and 1.3 billion monthly active users respectively in January 2023 (Statista, 2023), exert substantial influence on communication. Although the existing research on WeChat and WhatsApp in relation to LDRs is limited, the research outcomes show that both platforms are recognized for their positive influence on intimacy, offering flexibility in verbal and nonverbal communication through text, emojis, GIF files, pictures, and audio messages (Van & Walt, 2020; Xiong & Liu, 2022).

However, it is important to note that studies conducted by Van et al. (2020) and Xiong et al. (2022) relied on interviews as their main research method. Consequently, the explanations of their research outcomes may lack specificity and a deep understanding of the underlying thoughts and motivations behind specific intimate actions in real scenarios involving IM services. Furthermore, the current research lacks a comprehensive framework that incorporates intimacy strategies within the context of LDRs, leading to fragmented conclusions and a lack of guidance for the improvement of IM app service design. Finally, another significant gap in the existing literature is the absence of comparative analyses among different IM apps. As a result, there is a lack of comprehensive understanding regarding the user experience within the broader IM service industry, specifically

in the realm of intimate communication.

Overall, it becomes apparent that there exists a notable gap in the current understanding of intimacy within the context of instant messaging services for LDRs. This gap primarily stems from a lack of emphasis on this area of research and the need for more robust research methods. Consequently, the aim of this study is to address these shortcomings and explore an improved approach to LDR user research that incorporates a deep understanding of the Intimacy theory framework. The goal is to generate systematic and instructive research outcomes to enhance the intimate interaction of instant messaging services by fostering better intimate interactions for long-distance relationships.

3 Methodology

Given the inherent strengths of qualitative research and the ethical considerations in LDR research, this study adopts analytic autoethnography as its principal research methodology (Fossey et al., 2002; Hammarberg et al., 2016; Chien & Hassenzahl, 2017). To bolster the robustness of findings, a triangulation strategy is employed (Heale & Forbes, 2013), encompassing a 30-day reflective diary (15 days on WeChat and 15 days on WhatsApp), semi-structured interviews with seven participants, and virtual ethnography conducted within the two largest online communities dedicated to LDRs (Fig. 1). These approaches collectively furnish a comprehensive dataset for analysis. The research data are meticulously coded in accordance with the framework and key concepts of the "Six Broad Strategy" intimacy theory, as established by preceding research. Following coding, a thematic analysis takes center stage as the primary tool, skillfully weaving together the salient themes derived from the coded data, thereby enriching the discourse that unfolds in this research.

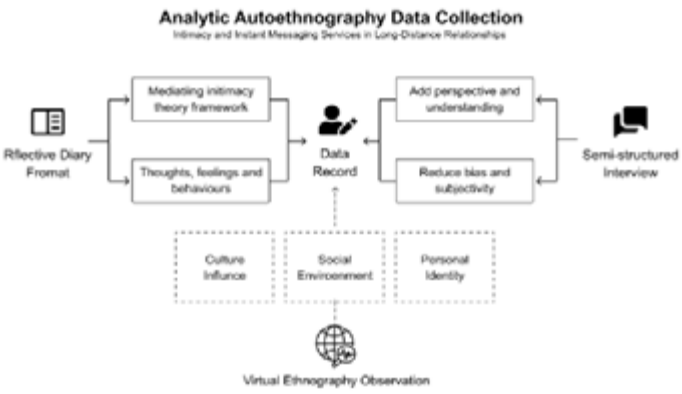

Figure 1 Data Collection Process (author's own)

4 Findings and Discussion

4.1 The theoretical optimization of the intimacy strategy based on instant messaging platforms in long-distance relationships

Through an exploration of the application of the "Six Broad Strategies" intimacy theory within prevailing instant messaging software, this study addresses the gap that has hitherto been overlooked in enhancing extant digital service-oriented remedies for intimacy-related predicaments in Long-Distance Relationships (LDRs). Through contemplative analysis of the outcomes from analytic autoethnography, these findings have been amalgamated to outline means of optimizing and refining the original theory. The researcher's redefined conception of intimacy within long-distance relationships, as contextualized by instant messaging software, is delineated as follows. This enhanced theory augments the understanding of the intricate challenges and potential avenues for fostering communication, connection, and intimacy within the realm of LDRs on instant messaging platforms.

4.1.1 'Awareness' on IM platforms in LDRs

In the "Awareness" strategy, the use of non-verbal cues and symbols (like note nicknames, chat avatars, chatting backgrounds, alert tones, status, and priority) profoundly shapes an intimate communication environment,

enhancing partner awareness on instant message platforms in long-distance relationships. Simultaneously, reinforcing intimacy is achieved through continuous, intuitive self-discourse information, employing diverse multimedia resources (text, images, sound, video) to convey "presence, mood, and activity" to the partner.

The reflective records on WeChat and WhatsApp unveil that, barring avatars, these platforms utilize a common interface for diverse recipients during initial setup. Couples in LDRs usually will reset the chatting interface with their partner's photo as background or rename their partner with a love note. If couples transition to a new platform mid-long-distance, it resets the environment, demanding time to rebuild chat intimacy. Interviews echo this, emphasizing avatars, note nicknames, backgrounds, alert tones, and chat priority as avenues to infuse partners' uniqueness into LDRs, aligning with "Living arrangements that involve sharing domestic space (Jamieson, 2007, p. 2).", signifying intimacy. The IM platform's personal chat box and interface act as a virtual touchpoint, resembling a shared "home" for LDR pairs. Consequently, this inquiry raises a prospect wherein IM platforms could advance tailored personalization attributes for individual chatting environments, thereby endowing the online conversational milieu with discernible traits such as images, sounds, or designs imbued with metaphorical resonance vis-à-vis significant others. This strategic augmentation not only facilitates the cultivation of emotional bonds between users and their LDR companions via IM platforms but also fosters intimacy by fostering a perception of familiarity through this virtual juncture.

4.1.2 'Expressivity' on IM platforms in LDRs

By means of non-verbal communication channels such as emoji stickers, audio, video, and vibration messages, alongside symbols associated with behavior such as message frequency, timing, content type, interactivity, length, and tone, individuals engaged in long-distance relationships convey their emotions and affections. This serves to amplify intimacy and provide emotional support during interactions with their partners on instant messaging platforms.

Furthermore, the contemplation upon the fundamental "Expressive" tenet, as expounded through analytical autoethnography in this study, zeroes in on a conspicuous omission: the paucity of discourse encompassing affective and emotional manifestations underlying the metaphorical essence inherent to message-associated conduct during the milieu of online discourse. This uncharted territory potentially extends the contours of ambiguous symbolism, distinct from overt channels of non-verbal communication, such as the overt transmission of emotion through emoji stickers or vibrational cues—modes unviable for the direct conveyance of metaphorical behavioral insights to one's partner within the precincts of IM communication. Hence, the visual uncharted territory encompassing these intricate metaphoric affections and the emotional subtext of text-based behaviors in LDRs warrants future exploration.

4.1.3 'Physicalness' on IM platforms in LDRs

"Physicalness" encompasses both intimate bodily contact and spatial proximity that fosters closeness. The replication of physical interactions through haptic messages and the incorporation of gestures from the language of love (dynamic emoji stickers like shoulder taps, hugs, back rubs, and handshakes) play a pivotal role in conveying empathy and extending emotional support to partners engaged in long-distance relationships (Mostova et al., 2022). Concurrently, establishing virtual environments for couples to share their presence (customized various kinds of chatting channels) while using instant messaging software can aids them in transcending the absence of physical intimacy inherent to such relationships.

4.1.4 'Gift Giving' on IM platforms in LDRs

The concept of a "gift" within a long-distance relationship encompasses various interpretations, all rooted in the fundamental essence of conveying empathy, deep understanding, effort, and care from one partner to another, whether through tangible or intangible means (Wiener et al., 2022; Stauss, 2023). Instant messaging software

incorporates specific functionalities, such as the "red packet," strategically designed to aid users in conveying and acknowledging these symbolic "gifts" and the affection they signify within the context of a long-distance relationship. The heightened utilization of these interactive features within instant messaging platforms correlates with a commensurate reduction in the constraints faced by couples when attempting to manifest their emotional support across the geographic divide of long-distance relationships. Moreover, embracing various perspectives to understanding "gifts" via multiple related functions on instant messaging platforms could lead to a heightened level of intimacy, surpassing previous limitations.

4.1.5 'Joint Action' on IM platforms in LDRs

Both synchronous and asynchronous forms of "Joint Action" play pivotal roles in fostering a profound sense of interconnectedness within long-distance relationships (Chien & Hassenzahl, 2017; Hassenzahl et al., 2012; Vetere et al., 2005; Yang & Neustaedter, 2020). Notably, during instances of disparate time zones, asynchronous joint action finds expression through the mechanisms of "sharing, receiving, and providing feedback" within the daily communication framework meticulously constructed by couples on instant messaging platforms, acting as catalysts for communication. In contrast, synchronous joint action places greater emphasis on real-time interactions and emotional exchanges through shared activities, such as video and audio calls, thereby engendering mutual experiences and an interdependence of behaviors.

4.1.6 'Memories' on IM platforms in LDRs

The strategy of invoking memories empowers individuals to relive past moments independently, without necessitating the simultaneous engagement of their partner. Within the communication milieu of instant messaging platforms, a plethora of digital metaphors are employed (like message interaction styles, emoticon usage patterns, and more) that potentially foster the cultivation of memories intertwined with the digital realm within long-distance relationships (Akgün et al., 2012). The preservation of unique moments shared by couples on these platforms (such as the recorded "historical call duration" within the "chatting history" feature) emerges as a pivotal mechanism for evoking the sensation of love in the context of distance-separated relationships.

4.2 The feasibility of analytic autoethnography in the study of LDRs

Positioned as an investigative journey into the realm of analytic autoethnography, this research discerns that the employment of a triangulation strategy aligns harmoniously with the principles elucidated by Anderson (2006). This alignment, in turn, serves to augment both the objectivity and the inherently reflective character grounded in theory that characterizes the findings, all while facilitating the acquisition of research data imbued with a wealth of

Table 1 The Feasible Triangulation Strategy of Analytic Autoethnography (author's own)

	Five Key Guidelines of Analytic Autoethnography	Research Methods related in Triangulation Strategy
1	Article Title Complete member researcher (CMR) status: Recognize and incorporate the social identity of the researcher into the research process. (Anderson, 2006; Lucero et al., 2019)	Virtual Ethnography
2	Analytic reflexivity: Understand and analyze the reciprocal influence between the researcher, the research environment, and other relevant participants. (Anderson, 2006; Lucero et al., 2019)	Reflective Diary + Semi-structured Interview + Virtual Ethnography
3	Narrative visibility of the researcher's self: Document and visualize the evolution of the researcher's experiences, thoughts, and perspectives. (Anderson, 2006; Lucero et al., 2019)	Reflective Diary
4	Dialogue with informants beyond the self: Engage in in-depth interviews or reflect on interactions with others involved in the research field. (Anderson, 2006; Lucero et al., 2019)	Semi-structured Interview + Virtual Ethnography
5	Commitment to theoretical analysis: Strive to evoke emotional resonance from a first-person perspective and translate data into the development, refinement, and extension of current theories (Anderson, 2006; Lucero et al., 2019)	Theory Framework + Reflective Diary

intricate first-person insights. The comprehensive alignment of each research method with the quintet of guidelines, encapsulated in Table 1, stands as a potent testament to the efficacy of this methodology as a valuable approach within the realm of first-person perspective studies, offering an avenue of guidance for prospective researchers.

5 Conclusion

Studying the interaction design of contemporary instant messaging (IM) platforms and its role in fostering intimacy is crucial for enhancing communication experiences in long-distance relationships (LDRs) (Tu et al., 2018). This research holds significance not only for individuals involved in romantic relationships but also extends to a wider range of interpersonal connections. Meanwhile, intimacy, characterized by emotional attachment and self-expression, is a fundamental aspect of close relationships among family members, friends, and romantic partners (Jamieson, 2007). Exploring the implications of this research on IM platforms can provide valuable insights to support the maintenance of these relationships when individuals are physically separated, thereby benefiting a diverse range of relationships.

Moreover, employing an autoethnographic exploration method, this research not only enables an in-depth analysis of the nuanced and timely feedback within IM-mediated interactions in LDRs (Chien & Hassenzahl, 2017) but also introduces a multicultural perspective to the study of mediating intimacy in such relationships. This approach is particularly relevant in the context of the researcher's educational globalization background, which enhances the understanding of cultural environment differences and their impact on intimacy dynamics. The researcher's genuine need for intimacy support from IM services in LDR serves as a unique opportunity to combine intimacy theory with firsthand, real-world user experiences within this research domain (Lucero et al., 2019). By addressing this gap in first-person research within the realm of LDRs, this exploratory study contributes valuable insights to the field.

In culmination, the profound insights gleaned from the prism of analytic autoethnography within this study underscore the promise this methodology holds within the domain of long-distance relationships (Anderson, 2006; Chien et al., 2016; Chien & Hassenzahl, 2017b; Vetere et al., 2005; Yang & Neustaedter, 2020). A compelling call resonates for more researchers immersed in heteronormative relationships to harness this inherent identity trait, embarking on a journey of first-person analytic autoethnography studies. Such an approach stands to yield a treasure trove of nuanced and comprehensive data and interpretations within this research realm. Concurrently, an escalation in first-person studies has the potential to refine and optimize this research methodology, ultimately engendering higher-caliber findings within the landscape of long-distance relationships.

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couples face. Their dedication reaffirmed my belief in the potential impact of this research on future couples.

Reference

Akgün, A. E., Keskin, H., & Byrne, J. (2012). Organizational emotional memory. Management Decision, 50(1), 95–114. https://doi.org/10.1108/00251741211194895/FULL/PDF

Anderson, L. (2006). Analytic Autoethnography. Http://Dx.Doi.Org/10.1177/0891241605280449, 35(4), 373–395. https://doi.org/10.1177/0891241605280449

Belus, J. M., Pentel, K. Z., Cohen, M. J., Fischer, M. S., & Baucom, D. H. (2018). Staying Connected: An Examination of Relationship Maintenance Behaviors in Long-Distance Relationships. Https://Doi.Org/10.1080/01494929.2018.1458004, 55(1), 78–98. https://doi.org/10.1080/01494929.2018.1458004

Chien, W. C., & Hassenzahl, M. (2017). Technology-Mediated Relationship Maintenance in Romantic Long-Distance Relationships: An Autoethnographical Research through Design. Https://Doi.Org/10.1080/07370024.2017.1401927, 35(3), 240–287. https://doi.org/10.1080/07370024.2017.1401927

Fossey, E., Harvey, C., McDermott, F., & Davidson, L. (2002). Understanding and Evaluating Qualitative Research. Http://Dx.Doi.Org/10.1046/j.1440-1614.2002.01100.x, 36(6), 717–732. https://doi.org/10.1046/J.1440-1614.2002.01100.X

Frost, D. M. (2013). The narrative construction of intimacy and affect in relationship stories: Implications for relationship quality, stability, and mental health. Journal of Social and Personal Relationships, 30(3), 247–269. https://doi.org/10.1177/0265407512454463

Hammarberg, K., Kirkman, M., & De Lacey, S. (2016). Qualitative research methods: when to use them and how to judge them. Human Reproduction, 31(3), 498–501. https://doi.org/10.1093/HUMREP/DEV334

Hassenzahl, M., Heidecker, S., Eckoldt, K., Diefenbach, S., & Hillmann, U. (2012). All You Need is Love. ACM Transactions on Computer-Human Interaction (TOCHI), 19(4). https://doi.org/10.1145/2395131.2395137

Heale, R., & Forbes, D. (2013). Understanding triangulation in research. Evidence-Based Nursing, 16(4), 98–98. https://doi.org/10.1136/EB-2013-101494

Hwang, T. J., Rabheru, K., Peisah, C., Reichman, W., & Ikeda, M. (2020). Loneliness and social isolation during the COVID-19 pandemic. International Psychogeriatrics, 32(10), 1217–1220. https://doi.org/10.1017/S1041610220000988

Jamieson, L. (2007). Intimacy. The Blackwell Encyclopedia of Sociology. https://doi.org/10.1002/9781405165518.WBEOSI071

Lucero, A., Desjardins, A., Neustaedter, C., Höök, K., Hassenzahl, M., & Cecchinato, M. E. (2019). A sample of one: First-person research methods in HCI. DIS 2019 Companion - Companion Publication of the 2019 ACM Designing Interactive Systems Conference, 385–388. https://doi.org/10.1145/3301019.3319996

Mostova, O., Stolarski, M., & Matthews, G. (2022). I love the way you love me: Responding to partner's love language preferences boosts satisfaction in romantic heterosexual couples. PLOS ONE, 17(6), e0269429. https://doi.org/10.1371/JOURNAL.PONE.0269429

Reis, H. T., & Franks, P. (1994). The role of intimacy and social support in health outcomes: Two processes or one? Personal Relationships, 1(2), 185–197. https://doi.org/10.1111/J.1475-6811.1994.TB00061.X

Rovers, A. F., & Van Essen, H. A. (2004). HIM: A framework for Haptic Instant Messaging. Conference on Human Factors in Computing Systems - Proceedings, 1313–1316. https://doi.org/10.1145/985921.986052

Saadatian, E., Samani, H., Parsani, R., Pandey, A. V., Li, J., Tejada, L., Cheok, A. D., & Nakatsu, R. (2014). Mediating intimacy in long-distance relationships using kiss messaging. International Journal of Human-Computer Studies, 72(10–11), 736–746. https://doi.org/10.1016/J.IJHCS.2014.05.004

Statista. (2023). DIGITAL & TRENDS: Mobile messenger and communication apps.

Stauss, B. (2023). Gifts in Romantic Relationships: What Enhances and What Weakens the Relationship? Psychology of Gift-Giving, 85–105. https://doi.org/10.1007/978-3-662-66393-6_7

Tu, P. Y., Yuan, C. W., & Wang, H. C. (2018). Do you think what i think: Perceptions of delayed Instant messages in computer-mediated communication of romantic relations. Conference on Human Factors in Computing Systems - Proceedings, 2018-April. https://doi.org/10.1145/3173574.3173675

Van, L., & Walt, D. (2020). The role of WhatsApp in sustaining emotional intimacy in long distance romantic relationships. The IIE. http://iiespace.iie.ac.za/handle/11622/498

Vetere, F., Gibbs, M. R., Kjeldskov, J., Howard, S., Mueller, F. "Floyd," Pedell, S., Mecoles, K., & Bunyan, M. (2005). Mediating intimacy: designing technologies to support strong-tie relationships. 471–480. https://doi.org/10.1145/1054972.1055038

Wiener, H. J. D., Howe, H. S., & Chartrand, T. L. (2022). Being there without being there: Gifts compensate for lack of in-person support. Psychology & Marketing, 39(6), 1267–1279. https://doi.org/10.1002/MAR.21645

Xiong, Y., & Liu, T. (2022). WeChat as the coordinator of polymedia: Chinese women maintaining intercultural romantic relationships. Https://Doi.Org/10.1177/1329878X221103883. https://doi.org/10.1177/1329878X221103883

Yang, L., & Neustaedter, C. (2020). An autobiographical design study of a long distance relationship: When telepresence robots meet smart home tools. DIS 2020 - Proceedings of the 2020 ACM Designing Interactive Systems Conference, 129–140. https://doi.org/10.1145/3357236.3395467

Zamanifard, S., & Freeman, G. (2019). "The togetherness that we crave": Experiencing social VR in long distance relationships. Proceedings of the ACM Conference on Computer Supported Cooperative Work, CSCW, 438–442. https://doi.org/10.1145/3311957.3359453

Archive/Album and Other Images

Filmed Photographs as tokens of well-being, past / present / future

Stephen Connolly[1]

Thank you for selecting this talk for this conference. Today I am going to talk about my film as artwork ⋯ but will not directly speak of its narrative. You can ask me for the link if you would like to watch it. In response to the conference theme, instead of relating the story of the film, I'm going to share with you a mode of visual telling that the work negotiates. By exploring a fragment of the work in terms of visual culture – this will allow us to consider how we use culture and how culture uses us. And this sub-text to the story augments the narrative in ways I will argue make speak of healing and wellbeing.

Let us frame this talk with these lines by Hannah Arendt -

"⋯ even in the darkest of times we have the right to expect some illumination, and that such illumination might well come less from theories and concepts than from the uncertain, flickering, and often weak light that some men and women, in their lives and their works, will kindle under almost all circumstances and shed over the time span that was given to them...."

Hannah Arendt 1970

Arendt's conventional equation of light as a metaphor invokes images – and cinema in particular - and 'kindle' refines these images as personal and invested with care and attention. These are images that intend to outlive their time and be handed to the present. Although images created in this context may not have been intended, this combination of personal value through care and a temporal reach foster continuities of wellbeing between past, present and future. If the social practice of making – kindling - images rather than their overt content is foregrounded, we can explore the continuities of care and love they possess.

As you may have guessed, my film as artwork is built from an archive of personal, family images. It was assembled in dark times, during covid lockdowns in the UK. The film makes oblique reference to lockdown and its social and spatial restrictions – anchoring the production of the work in place and time. Snatched GoPro landscapes of my local parks taken while – strictly following the regulations allowing the walking of dogs – evidence this. The images try to focus on the materiality of these un-exceptional places – a landscape in an inner city was hard to accomplish during this time of confinement. Accompanying these, the film placed an emphasis was placed on the act of looking and sorting the personal images; performatively selecting and sequencing them, - kindling - them with care into a narrative. As an audience is asked to do when viewing the work.

Let us dive into the images. A camera was one of the first things my father purchased after migrating across the Atlantic from the UK to Canada. After the monochrome 1950s of northern England, he encountered a - to

him - novel consumer society. In Canada he switched to Kodachrome slide film, on sale everywhere. At that time, Kodachrome was an advanced imaging technology within the reach of any consumer – and its images are luminously available to us 60 years later.

Let us consider the photograph as a product of a performance - a visual artefact as an outcome of negotiation between photographer; photographed; and audience. Broadly speaking, this is Areilla Azoulay's "civil contract" of photography - image making reframed as a social activity foregrounding the encounter between - image makers and subjects, - to make visual statements in and of the world - to be mutually recognised by others, an audience.

In this case - the outcome of the photographic encounter is destined for a family archive. This is visual (auto) biography; a sequence of visual documents that complements and supplements the movement of the family unit through time. This temporal gesture invokes Derrida's notion of an archive as a reach to the future and an instruction -

the archive has always been a pledge ⋯ a token of the future ⋯what
is no longer archived in the same way is no longer lived in the same way.

(Derrida 1996 pp18)

The family archive creates messages – suggestions - for generations to come.

So – to an image - showing my father Albert at the wheel of a new car in 1963. The photographer is my mother Julie who has flown to Canada to join him. The municipal building where they will be married is behind them.

The archive context of this photographic encounter reveals the image is one of four in a deliberate photo session – an encounter of couple, automobile and location. I'm guessing the first shot is top left - it feels hurried and poorly framed. The car moves location slightly and next two shots - taken by my mother - show my father at the wheel. This image is prominently feature in the family album – a selection from the archive. In the last image - the couple swop roles again - and my mother simulates driving the car.

These multiple takes indicate a deliberate performance and staging for an image. We can accept this action of visualisation as a communication for the future - the results of which are destined for the family album. They have a new car - and they literally possess it - dad in his sunglasses posing as "mastering" - simulating driving the car. This is an enactment of an idea of a person in control of a machine enabling movement and a sense of future and destiny. A moment implying a biographical trajectory, a promise of things to come. And although at this moment they cannot share the visual field – the contemporary selfie is 40 years in the future – the couple do swop roles as the driver of the car. Conventionally, my mother is the more accomplished photographer - her composition and framing possess sculptural form, a command of the relationship between lens, object and human subject, and an evident visual facility.
I would argue this image is a token for a future. I am not claiming is not unique or ground-breaking, but it does mark a rupture with the conventions of a previous generation of photography in terms of its performance as social activity. As a social artefact it carries its own new meanings of negotiating a subjectivity with an object of some meaning to them - in comparison with an image from another branch of my family in a nearby city taken

2 generations before. This studio encounter is with a professional; it is ritualised; staged within tight constraints and using the objects of the photographer. The objects are perfunctory, assisting a pose they remain ambiguous. These ritualised images are documents guaranteed by the studio and their contemporary of axis of contact with an audience is a scan for familial likenesses – for an audience that may be restricted to the family concerned.

How do we use culture and how does culture use us? Let's consider the wider visual repertoire of the popular representation of automobiles at that time. We can see similarities with the presentation of cars as markers of social status and convention on the left; and the association of cars with ideas of movement and a projection into the future on the right. I would suggest that my parents channelled both visual motifs, prevalent in the North American media of this time, into their social performance visualising their new car.

If we look to the advertising visualisation of their brand of car in 1963 – we can see a visual form that places emphasis on the technical specifications of the object itself. In a sense, my parents were sensitive to the audience and social context they were in.

Here are images of the brand 10 years later. The advertising visualisation for this car has caught up with my parent's efforts. We maybe see more overt expressions of the possibilities of ownership for fostering relationship. Women are now the target audience for this car. There are shifting dynamics of gender, mapped onto the roles of driver and passenger, albeit within a hetero-normative paradigm. The car emerges an enabler of spaces for intimacy - yet the social cachet carried by the car is also messaged clearly.

And of course - these performative images of car ownership are abundant in our present.

This car brand was a premium industrial object in the UK, signalling social class and wanton consumerism. Considered from another perspective, the production of this car won the attention of the filmmaker Jean-Luc Godard as he entered his Dziga-Vertov phase of militant filmmaking. His work British Sounds (1968) exposes the fabrication of this consumer object in a ten-minute tracking film shot featuring the cacophonous and injurious sound as a mask for the social relations of production. It is the sound of this image that inhibits communication and overwhelms the encounter of filmmaker, subjects, and audience – but this is another subject.

Citing Godard's film, I hope it is understood am not advocating consumerism or the buying of cars in particular. Rather I am making an argument for some images of the past as possessing potentials, latent potentials for future audiences in today's present. Viewed as the consequence of performative actions, these 'tokens of the future' are examples of people using culture as culture uses them to communicate across generations. And this dialogue with images as visual culture can intersect with claims for personal and social wellbeing that are being articulated at this time.

An influential framing of well-being in the present suggests performative actions as key to 'experiencing positive relationships, having some control over one's life and having a sense of purpose.' (nef 2008) I would argue that the interchangeable photographer and subjects of this short sequence of photographs were enacting most of the well-being suggestions within their performative image-making. Albeit intended to be private, I have tried to show these images transcend a small audience by locating them in a wider circulation of images – so they have something to offer to many.

And as Kodachrome slides, they have a medium specific resonance. Unlike the black and white photographs as objects which may find a home in a book - the slide only reveals itself on projection. As sequenced in the film Archive/Album and Other Images - we see these Kodachrome slides near to the intended mode of reception of the slide image - the projected still image. These spectatorial conditions as advocated by the makers are close to cinema or the moving image.

Once images are projected - in sequence - we begin to lay the conditions for temporality – begetting unfolding and narrative for sharing. These images act as kindling to a re-imagining of living in the present, connected to a past yet also, in the performance of their production, projecting ourselves into the future. For the small audience of my family, these images enact a narrative of love and hope. I hope to have modelled, for a wider audience, images of this kind, framed in this way, can be considered a gift, offerings from many pasts. Images that have been created, handled – kindled – with care that can excite curiosity and reflection in this present. As - tokens of the future – this is the gift of personal photographs for us today.

Thank you for your time.

Bibliography

Aked, J. et al. (2008) Five Ways to Wellbeing [Online]. Available at: https://neweconomics.org/2008/10/five-ways-to-wellbeing [Accessed: 19 November 2023].
Arendt, H. (1970). Men in Dark Times. New York: Harcourt.
Azoulay, A. (2012). The Civil Contract of Photography. New York: Cambridge, Mass: Zone Books.
Derrida, J. (1996). Archive Fever: A Freudian Impression. University of Chicago Press.

Benevolence in the Details: Exploring Compassionate User Experience in Sustainable Design

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Abstract

This paper investigates the integration of benevolence ideology with sustainable design practice to enhance inclusive and emotionally resonant user experiences. Benevolence, rooted in Confucian thought, aligns with sustainability principles of revering life, seeking harmony, cultivating values, and respecting diversity. However, current sustainable design research remains technique-driven, with limited exploration of humanistic facets like benevolence. Through comparative case studies, semantic analysis, and designer interviews, this paper develops a Benevolent Design framework encompassing ethical, emotional, and relational dimensions to examine the infusion of compassionate ideals into built environments. The findings reveal recurring strategies, like equitable access, cultural continuity, and environmental restoration that successfully instantiate benevolence. This advances scholarly discourse on emotional and experiential factors within sustainability, affirming design's transformative capacity for healing, transformation, and transcendence. The conceptual framework and empirical insights provide practical guidance for manifesting love, care, and universality through thoughtful choices that shape perceptions and values. This pioneering trajectory signifies subtle transformations towards sustainability and social equity through cultivation of an empathetic sensibility. The paper contributes theoretical scaffolding and evidence-based strategies for embedding benevolence within design intricacies, resonating with the conference themes of cultivating narratives of love, healing, and transcending binaries through creative practice.

Author keywords

Benevolence; Sustainable Design; User Experience; Cases Comparison; Semantic Analysis.

Introduction

The Concept of "Benevolence" and its Relevance to Sustainable Design

The term "Benevolence" plays a significant role in traditional Chinese culture, often associated with benevolence, charity, and goodwill. Especially within Confucianism, benevolence is regarded as a noble moral quality, emphasizing care, respect, and kindness for others(Chan, 1955). Confucius proclaimed, "The benevolent loves others", signifying the treatment of others with compassion, reflecting harmonious interpersonal relations. Benevolence represents a mindset of social awareness, empathy and sharing, which ideally forming the foundational ethics of design. The association between benevolence and sustainable design rests on four dimensions: both emphasize the reverence and safeguarding of life, focusing on human interests, also on the value and rights of other creatures and natural resources; they advocate prioritizing harmony to eschew violence and conflict, seeking consensus and collaboration to achieve societal equity and harmony; they demand the cultivation of proper values and consumption perspectives, shedding excessive material desires and wasteful behaviors in favor of a simple, efficient, and healthful lifestyle; they accentuate the perpetuation and innovation

of local culture, respect for cultural and species diversity, while opposing blind globalization and homogenization. Approaching design from a perspective of benevolence entails the foremost consideration of elevating shared resources, fostering emotional bonds, and supporting solutions for scenarios facing societal, economic and environmental injustices. This paper based on the principles of benevolence and illustrates how the ethical concept of compassion can direct an emotionally empathetic user experience, thereby connecting strategies and acts related to spatial sustainability and social justice. The intent is to offer a feasible path for infusing the philosophical concept of "benevolence" into the details of sustainable design practice.

The Significance of User Experience Consideration in Sustainable Design

While past research in the realm of sustainable design has primarily centered around enhancing energy efficiency(Chel & Kaushik, 2018), prioritizing eco-friendly materials(Khan et al., 2021), and mitigating resource wastage(Lehmann, 2011), a comprehensive exploration of user experience aspects within this context remains somewhat underexplored. Caring for the user experience embodies individuals' perception of self, sensitivity to surroundings and the connections established therein. It involves shaping cognitive and emotional factors that contribute to user comfort, satisfaction, sense of belonging and overall well-being. Attending to user experience is pivotal within the domain of sustainable design, as it conveys two critical points: acceptance and engagement. Neglecting experiential quality may lead to the failure of sustainable design solutions due to their inability to gain traction. In terms of daily life events, biodegradable paper straws entered the market with environmentally conscious features, yet faced vehement criticism and resistance due to inferior user experiences. Similarly, the low-carbon and economical concept of "bike-sharing" encountered sustainability challenges owing to mismanagement, lack of communication and collaboration between users and operators, ultimately fostering negative attitudes and impeding the sustainability of the product in daily activities. Caring implies a profound receptivity to users' needs concerning personal and life quality. Sustainable design necessitates reaching and resonating with individuals' innermost thoughts through positive and intuitive experiences, inspiring positive attitudes toward nature and peers. Designing with benevolence at its core entails crafting spaces that uplift the human spirit, calling for the harmonious coordination of priorities with humanistic concerns for prosperity.

Literature Review

Universal design principles promote inclusivity, but literature on their deployment in built environments has concentrated more on accessibility than affective aspects. (Gossett et al., 2009; Steinfeld & Maisel, 2012) have examined universal design applications in architecture and public spaces, this research has informed guidelines for equitable spaces. While research affirms the benefits of inclusion, the role of emotional design in shaping attitudes and engagement with sustainability has been relatively underexplored in literature. The majority of sustainable design research concentrates heavily on technical elements like energy efficiency, materials, and waste reduction, as seen in the work of authors (Giussi et al., 2019), (Shen et al., 2023), (Tarayre et al., 2016). While this is important, this dominant focus overlooks the emotional and experiential dimensions of sustainability. Scholarship on emotional design and human-centered methodologies provides relevant context(Cooper, 2008; Triberti et al., 2017). (Demirbilek & Sener- Pedgley, 2003) explored theoretical issues in product design semantics and how to evoke positive emotions through attributes that communicate meaning to users. (Huang et al., 2023) developed a content analysis model to investigate human-virtual environment interactions in room-oriented immersive systems. Scholars including (Lr et al., 2020) have focused on designing for subjective well-being, pleasure, and positive emotional experiences. However, implementing empathic and human-centered strategies remains limited in design practice. Their intersection with sustainable goals requires further scholarly exploration. (Cole, 2012) contrasted green, sustainable, and regenerative building design approaches, arguing that regenerative design emphasizes strengthening natural systems through an adaptive partnership. But

emotional factors are underexamined.

Confucian benevolence provides a salient philosophical foundation emphasizing care and social consciousness(Fengyan, 2004). This expands scholarly discourse on emotional and humanistic facets within sustainable design contexts. This research aims to address gaps at the intersection of benevolence, emotion, experience and sustainability through a proposed Benevolent Design framework. It employs empirical methods to uncover strategies for manifesting care and universality through choices that engender positive perceptions, memories, and values. The research expands scholarly discourse on emotional design, experience, and humanistic concerns within the context of sustainability.

Research Methods

The Conceptual Framework Guiding Research on Benevolent User Experience Design

In this paper, we synthesize insights from the literature on universal design, design methodologies and the philosophy of benevolence, introducing a conceptual framework for "Benevolent Design" to steer the infusion of compassionate and inclusive ideals into sustainable design and its resulting user experiences. The framework is structured around three intersecting dimensions for operationalizing universal

Table 1. The Conceptual Framework of Benevolent Design

Ethical Dimension	*Care-oriented design choices*	Prioritizing social equity and environmental sustainability
	Empathetic design processes	Taking an imaginative leap to understand different users
		Paying close attention to the needs of disadvantaged groups
	Pursuing goals of social justice	Eliminating prejudice and discrimination
		Achieving fair distribution of opportunities and resources
Emotional Dimension	*Design qualities eliciting positive emotions*	Creating a warm, comforting ambience
		Avoiding triggering negative affect
	Providing diverse sensory experiences	Engaging visual, auditory, tactile, olfactory dimensions
		Creating a rich, harmonious holistic experience
	Designing connections with personal and collective meaning	Evoking cherished memories and affect
		Enhancing sense of identity with the locality
Relational Dimension	*Promoting participatory design processes*	User participation in different design stages
		Opening access to power and resources for users
	Pursuing equitable accessibility of spaces and services	Accommodating diverse needs fully
		Removing barriers to participation
	Upholding dignity of users	Designing with respect for diversity
		Avoiding stereotyping and labeling

benevolence (as shown in Table 1). It provides a scaffolding to investigate how these dimensions manifest in shaping creative decisions for sustainable and affable user experiences.

Table 2. Case Studies Involving Three Dimensions

Project	Ethical Dimension	Emotional Dimension	Relational Dimension
Zero House in Daxing	Energy efficiency, rural development	Livability, affordability	Reconnects rural and urban, community-environment synergy
Shigeru Ban Emergency Shelter	Humanitarian aid, social responsibility, respecting dignity	Security, instilling hope and symbolizing solidarity	Links humanitarian aid and community restoration
New York High Line Park	Historic and cultural preservation	Aesthetic, leisure and natural experiences	Integration of urban and natural elements, fostering community
Shanghai Houtan Park	Environmental restoration, ecological education	Comfort, biodiversity aesthetics, environment-assisted living.	Fusion of natural and artificial, ecological restoration
CopenHill Energy Plant	Optimizing resource utilization, community amenity	Recreation, public acceptance, enjoyable experiences	Synthesizes urban resource management and recreational spaces
Seattle Central Library	Equitable access to resources, knowledge sharing	Comfort, interactivity	Blending architecture and environment
Green School Bali	Responsibility for environmental education	Participation, ecological literacy	Unites education, environmental preservation and community
Bloomberg European HQ	Respect for culture, history, innovation	Emotional connection to history, culture, era	Harmonizing architecture with urban context
UN Headquarters Retrofit	Preserving history, promoting environmental awareness	Functionality, security	Synergy between history and modern technology

T h e Methods Used in Collecting and Analyzing Data

This study employs a mixed-method approach to explore the research question through case studies, semantic analysis and interviews with architects/studios. A comprehensive selection of 9 representative sustainable design cases spanning detached residences, urban parks, public spaces, historical structures, and commercial buildings has been undertaken. Analysis was conducted on detailed documentation grounded in design methodologies to unveil strategies that activate benevolence across ethical, emotional, and relational dimensions (as shown in Table 2).

Table 3. Interviews with designers/studios are case-based text descriptions

Studios	Design Motivation	Design Concept	Societal Impacts
Tenio	Responding to the environmental crisis	Near-zero energy design	Prototype for rural areas
Shigeru Ban	Provide disaster relief housing	Low-cost humanitarian architecture	Rapidly deployable refugee housing
James Corner Field Operations	Revitalize abandoned infrastructure	Adaptive reuse, urban renewal	Enhancing community interaction
Turenscape	Remediate industrial brownfield	Ecological restoration	Wetland habitat, Urban natural interaction
Bjarke Ingels Group	Resource utilization and urban function integration	Waste-to-energy, co-location	Promoting resource recovery and urban vitality
OMA/Rem Koolhaas	Create iconic civic space	Civic architecture, promote exchanges	Public education and community hub
KieranTimberlake	Achieve carbon neutrality	Zero-energy learning environment	Sustainable education model
Foster+Partners	Offer a healthy and efficient workspace	Set new standard for eco-architecture	Improve employee well-being and productivity
SOM/Skidmore, Owings & Merrill	Update efficiency and accessibility	Historic preservation, deep energy retrofit	Preserve historic landmark, possibility of green transformation

Semantic analysis involves interpretive textual examination of design descriptions,critic comments, and user testimonials related to the cases. Interviews with 9 architect groups, coupled with qualitative analysis of textual transcripts, a synthesis is conducted across multiple facets, including design motivations, design concepts, key methods and societal impacts to extract creative insights that permeate affable experiences (as shown in Table 3). A triangulation of results from the three methodologies offers a multi-layered analysis of design practices and theories for achieving benevolence. This triangulation ensures that the insights are genuinely integrated into the experiential realm of sustainable environments.

This approach possesses complementary advantages, enabling the exploration of the research question concerning the universality of benevolence achieved through sustainable design practices. Comparative case studies are conducive to scrutinizing and theorizing specific contexts that remain beyond the realm of controlled contemporary sustainable design practices. Semantic analysis furnishes an interpretation of the language, meaning, and discourse of affable design, aiding in uncovering emotional qualities that quantitative methodologies might overlook. Interviews delve deeply into the narratives and reflections of architectural teams, transcending observations to unveil the cognitive processes, values, and motivations that shape design choices, thereby providing a rich experiential perspective. Textual data sources encompass project archives, architects' critiques, and media coverage, thus affording triangulation validation.

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Findings and Discussion

Benevolent Design Strategies for Caring User Experiences

Based on the synthesis and analysis of the cases, we have identified recurring design strategies that establish the foundation for effective benevolent user experiences. These strategies encompass five key aspects: (i) Provision of equitable public resources and spaces: For instance, projects like the Seattle Central Library offer educational resources, the High Line Park in New York provides recreational spaces, and the renovation of the United Nations headquarters enhances operational efficiency. By improving public buildings and spaces, these projects optimize the sense of accessibility and engagement for users from diverse backgrounds, while fostering community cohesion. (ii) Environmental restoration and conservation: examples like the Shanghai Huangpu River Park and the Copenhagen waste-to-energy plant take an innovative approach to environmental design. These initiatives reconstruct local ecosystems while engendering a harmonious connection between design and nature, providing users with a sense of balance. (iii) Responding to vulnerable local communities: projects including Shigeru Ban's emergency shelters and Tenio's Zero House are tailored for impoverished, disaster-affected groups, or rural. Through affordable and humane green design, these endeavors fulfill the designers and architects' social responsibility and humanitarian care. Moreover, they enhance the sense of security and dignity for the users. (iv) Cultural heritage and continuity: the High Line Park in New York preserves industrial heritage and the maintenance of the United Nations headquarters upholds historical symbolism, thus endowing projects with both functional and cultural legacy values. This strengthens users' sense of cultural identity and participation. (v) Sustainable systems and resource utilization: many cases integrate renewable technologies with solar power and rainwater collection etc., while repurposing abandoned spaces and materials, thereby achieving synergies between environmental, economic, and social benefits. This demonstrates the designers' holistic perspective and environmental responsibility.

These strategies reappear consistently across multiple cases, suggesting their reference value and reliability in achieving benevolent design within the realm of sustainable design. The cases underscore design's role in generating public spaces and community vitality. The evolution of these strategies will further propel multidimensional connections within the field of design, integrating sustainable development, spatial justice, social responsibility and wholistic care.

Conclusions

This research expands scholarly comprehension of benevolence in design, transforming it from an abstract philosophy to a strategy for realizing sustainability and social equity through enhanced inclusive, comforting, and empathetic user experiences. Benevolent sustainable design requires creative approaches beyond functional solutions, integrating ethical, social, aesthetic and experiential considerations. The comparative case studies,

semantic analysis, and architects' interviews offer a multi-faceted investigation into the contexts, motivations, and processes through which principles of universal benevolence embedded in the design of sustainable buildings and public spaces. The proposed conceptual framework of Benevolent Design provides an operational scaffolding to examine how the ethical, emotional, and relational dimensions of benevolence manifest in shaping decisions that engender positive user experiences. The empirical findings reveal certain recurring strategies, towards providing equitable public resources, environmental restoration, responding to vulnerable communities, cultural heritage and sustainable systems that successfully manifest benevolence throughout the cases. This affirms the practicality of actualizing benevolent ideals within the intricates practice of sustainable design, also expands academic discourse on emotional, experiential, and humanistic aspects of sustainable design, clarifying the transformative potential of ethics and compassion. It offers reflective insights for designers to uplift the spaces of the human spirit through caring and universality. The empirical findings provide concrete best practices that can be translated into guidelines for benevolent sustainable design.

Here remain ample opportunities for further research. More cases across diverse geographies could provide additional perspectives. Experimental studies might empirically validate the ties between benevolent design strategies and attitudinal as well as behavioral impacts. A limitation is the inherent subjectivity in evaluating emotional user responses. Nonetheless, this study pioneers a trajectory to embrace the benevolent sustainability through attention to detailed design choices that shape perception, emotion, and values. It signifies that it is achievable to channel positive shifts in the details of design by catching a sensibility to universal care.

References

Chan, W.-T. (1955). The Evolution of the Confucian Concept Jên. Philosophy East and West, 4(4), 2 95–319. JSTOR. https://doi.org/10.2307/1396741

Chel, A., & Kaushik, G. (2018). Renewable energy technologies for sustainable development of en ergy efficient building. Alexandria Engineering Journal, 57(2), 655–669. https://doi.org/10.10 16/j.aej.2017.02.027

Cole, R. J. (2012). Transitioning from green to regenerative design. Building Research & Informati on, 40(1), 39–53. https://doi.org/10.1080/09613218.2011.610608

Cooper, R. A. (2008). Quality-of-life technology. A human-centered and holistic design. IEEE Engi neering in Medicine and Biology Magazine: The Quarterly Magazine of the Engineering in Medi cine & Biology Society, 27(2), 10–11. https://doi.org/10.1109/emb.2008.915492

Demirbilek, O., & Sener-Pedgley, B. (2003). Product design, semantics and emotional response. E rgonomics, 46, 1346–1360. https://doi.org/10.1080/00140130310001610874

Fengyan, W. (2004). Confucian thinking in traditional moral education: Key ideas and fundament al features. Journal of Moral Education, 33(4), 429–447. https://doi.org/10.1080/03057240420 00327984

Giussi, J. M., Cortez, M. L., Marmisollé, W. A., & Azzaroni, O. (2019). Practical use of polymer brush es in sustainable energy applications: Interfacial nanoarchitectonics for high-efficiency devi ces. Chemical Society Reviews, 48(3), 814–849. https://doi.org/10.1039/C8CS00705E

Gossett, A., Gossett, A., Mirza, M., Barnds, A. K., & Feidt, D. (2009). Beyond access: A case study on the intersection between accessibility, sustainability, and universal design. Disability and Re habilitation: Assistive Technology, 4(6), 439–450. https://doi.org/10.3109/17483100903100301

Huang,M.,Chabot,S.,Leitão,C.,Krueger,T.,&Braasch,J.(2023).Spatially-awaregroupinteract ion design framework for collaborative room-oriented immersive systems. Applied Ergonomi cs, 113, 104076. https://doi.org/10.1016/j.apergo.2023.104076

Khan, N., Jhariya, M. K., Raj, A., Banerjee, A., & Meena, R. S. (2021). Eco-Designing for Sustainabili ty. In M.

K. Jhariya, R. S. Meena, & A. Banerjee (Eds.), Ecological Intensification of Natural Reso urces for Sustainable Agriculture (pp. 565–595). Springer. https://doi.org/10.1007/978-981-33 -4203-3_16

Lehmann, S. (2011). Optimizing Urban Material Flows and Waste Streams in Urban Development through Principles of Zero Waste and Sustainable Consumption. Sustainability, 3(1), Article
1. https://doi.org/10.3390/su3010155

Lr, T., R, N., A, T., Cr, L., & E, H. (2020). Designing Well-Being: Using Design Thinking to Engage Re sidents in Developing Well-Being Interventions. Academic Medicine : Journal of the Associatio n of American Medical Colleges, 95(7). https://doi.org/10.1097/ACM.0000000000003243

Shen, S. C., Khare, E., Lee, N. A., Saad, M. K., Kaplan, D. L., & Buehler, M. J. (2023). Computational Design and Manufacturing of Sustainable Materials through First-Principles and Materiomic
s. Chemical Reviews, 123(5), 2242–2275. https://doi.org/10.1021/acs.chemrev.2c00479 Steinfeld, E., & Maisel, J. (2012). Universal design: Creating inclusive environments. John Wiley & S
ons.

Tarayre, C., De Clercq, L., Charlier, R., Michels, E., Meers, E., Camargo-Valero, M., & Delvigne, F. (2 016). New perspectives for the design of sustainable bioprocesses for phosphorus recovery f rom waste. Bioresource Technology, 206, 264–274. https://doi.org/10.1016/j.biortech.2016.0 1.091

Triberti, S., Chirico, A., Rocca, G. L., & Riva, G. (2017). Developing Emotional Design: Emotions as Cognitive Processes and their Role in the Design of Interactive Technologies. Frontiers in Psy chology, 8. https://doi.org/10.3389/fpsyg.2017.01773

"Love is the one thing that transcends space": Design of an online healing platform based on family constellation

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Abstract

The COVID-19 pandemic has sparked tension and anxiety worldwide, exacerbating the crisis in people's mental health when public health systems are already under strain. The family unit serves as the most fundamental form of social organization, and the family environment plays a vital role in the mental well-being of its members. By focusing on literature research and practical interventions based on family therapy, we can contribute to reconstructing a healthy and harmonious society. This research begins with a comprehensive literature review to analyze various methods of family constellations. Subsequently, analyzing various stakeholders' experiences, observations, and interviews to formulate online healing design strategies. Then we establish an online healing platform based on the family constellation to demonstrate strategies more vividly. Furthermore, we invite expert groups to evaluate the efficiency. This paper delved deeply into the family constellations, extracting key elements to guide the design of online services. The aim is to assist individuals and families in overcoming the trauma caused by the pandemic and to help rebuild a warm and harmonious society.

Author keywords

Human-centered computing; concepts and paradigms; Cross-computing tools and techniques

Introduction

The widespread transmission of COVID-19 has resulted in a significant number of infections and fatalities, overwhelming public health systems globally and causing heightened anxiety and social tensions (Vannini, 2023). The necessary social isolation measures implemented during the pandemic have led to profound loneliness, as individuals lack human interaction and support systems, subsequently experiencing emotional distress and psychological challenges (Milea-Milea et al., 2023; W. Zhou et al., 2023). Additionally, the substantial impact of the pandemic on the economy has resulted in widespread financial hardship, unemployment, and uncertainty, further exacerbating psychological pressure for many individuals (El Khoury-Malhame et al., 2023; Thompson & Christian, 2022). The profound grief and trauma caused by losing loved ones, friends, or relatives make them carry heavier emotional burdens (García et al., 2022; Shi et al., 2020). It is crucial to acknowledge that the psychological effects of COVID-19 can persist for extended periods, lasting anywhere from 10 to 20 years (Su et al., 2023). Therefore, tailored psychological supports are essential to assist community residents in coping with and

mitigating these challenges effectively.

The family unit holds significant importance as a social system, providing a nurturing environment that fosters self-esteem and self-confidence among family members, thereby facilitating personal growth [Kaplan, 2014]. Amidst the challenges posed by the pandemic, family healing becomes paramount, enabling the reconstruction of the affected family environment (Liu et al., 2021). This process optimizes family relationships, addresses psychological issues within the family, and promotes its members' mental well-being while fostering the development of close and intimate bonds. Family psychotherapy extends beyond individual healing, emphasizing the overall health of the family system. By establishing a healthy and harmonious family environment, the impact of such therapy extends to societal harmony and beauty as well (Carroll et al., 2023; Whitaker, 1986). Thus, conducting theoretical research and implementing design practices related to family psychological healing hold significant urgent, relevant, and practical importance. These endeavors aim to enhance the happiness index of family members, improve understanding and interaction within the family unit, and prioritize the mental health and well-being of individuals, families, and society.

FAMILY CONSTELLATION

Family constellation is a valuable tool frequently employed in psychological counseling, therapy, and assessment (Yasgur, 2013). In this approach, counselors assist clients in expressing and exploring their inner experiences, hidden emotions, and thinking patterns through specific objects or symbols (Weinhold et al., 2013). A series of action figures holds a prominent position among the widely utilized physical tools. Family constellations can play a healing role in several ways.

Expressing emotion

Visitors can utilize physical objects such as dolls to stimulate emotional expression and empathy (Bell et al., 1985). With the counselor's guidance, clients can visually depict complex emotions through the selection and arrangement of dolls, providing a non-verbal avenue for experiencing and expressing their feelings more directly. This process not only fosters personal emotional exploration but also promotes resonance and connection among family members. By facilitating understanding and building connections, dolls contribute to developing and restoring intimate relationships within the family. Engaging in such emotional expression and resonance is beneficial for the adjustment and processing of emotions, ultimately facilitating the healing of the family unit.

Metaphor and symbol

Family constellations use dolls to symbolize family members and their relationships, allowing visitors to observe and actively engage in the arrangement process (Gyimesi, 2023). This practice seeks metaphorical and symbolic meanings, enabling a deeper understanding and insight into family dynamics. This process of externalization assists in transforming ambiguous memories into tangible forms, facilitating the recognition and treatment of family issues (Konkolÿ Thege et al., 2021). The symbolic transformation and resolution process in family system arrangement facilitates a fresh perspective for family members.

A sense of security and control

The counselor establishes a nurturing and non-judgmental environment, fostering free expression (Hunger et al., 2015). This safe and liberating space encourages participants to open their minds and delve into their deepest emotions and confusions. Through reflection, selection, and prioritization, clients engage in profound contemplation regarding their position, identity, role, and responsibilities within the family system. This exploration of self-identity enables family members to gain a sense of control and contributes to a clearer understanding of themselves.

Visualization

Family constellations use dolls to visually represent the experiences and emotions of family members, allowing

visitors to observe and explore their family system from a unique perspective. This visualization serves as a peephole into the family dynamics, enabling a more precise recognition and understanding of underlying issues. By utilizing figurines, visitors can experiment with different problem-solving approaches and explore alternative family bonding patterns within a safe and supportive space (Turns et al., 2019).

DESIGN RESEARCH ONFAMILY CONSTELLATION

Family constellations should ideally take place in a quiet and private environment and require a set of standardized doll tools (Yasgur, 2013), as depicted in Figure 1. Traditionally, visitors would schedule an appointment with a counselor and meet them in person at the counseling room. However, with the surging demand for family healing following the pandemic, some counselors have opted for online services through video conferencing (Zhou J., 2022). Currently, online family constellations face several challenges. Communication barriers between participants may arise, making conveying information difficult. Furthermore, some limitations exist while transmitting intuitive information through online platforms. Presently, there is a lack of dedicated platforms that offer professional support specifically for online family constellations.

Steps of family constellation

Figure 1. Example of family constellation dolls

We invite five psychological counselors who specialize in the family constellation and conduct interviews with them to understand the specific steps involved in the process. With their permission, we observed online and offline family constellations and inquired with the visitors about their positive emotional journey during the experience. We observed ten sessions and conducted them with fourteen visitors. Additionally, researchers engage with counselors as visitors to personally experience the family constellation arrangement process. As shown in Figure 2, we created a journey map of the family constellation based on the information gathered.

Strategies for online healing platform design

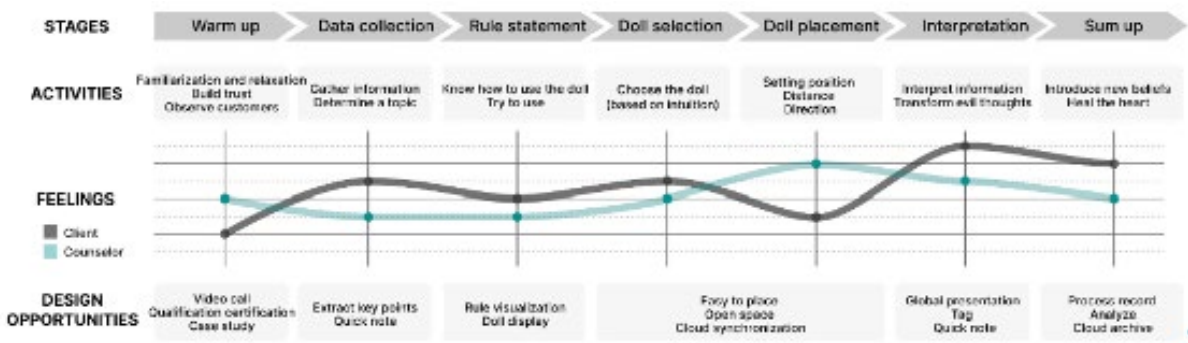

Figure 2. Journey map of the family constellation

The design strategy for the online family constellation platform is proposed based on previous user research. By implementing these design principles, the online family constellation platform can enhance the overall experience for both consultants and visitors, facilitating effective communication, promoting emotional well-being, and empowering individuals to take an active role in their healing journey.

Convenient Communication

The online platform could offer convenient counseling services through digital methods, emphasizing the importance of smooth and effective communication between consultants and visitors. This platform includes user-friendly interfaces, clear operating instructions, and dolls that can be easily placed as accessible communication tools to ensure effective interaction during the therapy process.

Comfortable and Harmonious Sensory Experience

During the consultation process, visitors' attention is fully engaged with the platform's content, and it is crucial to provide a comfortable and harmonious sensory experience that enhances immersion. The design strategy aims to create an environment that facilitates concentration for visitors, which involves visually appealing designs, calming color schemes, and thoughtful use of audio elements for a successful family constellation therapy.

Independent and Objective Decision-Making

To ensure the authenticity of information expression and effective communication, it is essential for the platform to refrain from influencing visitors' behavior and instead encourage them to express their genuine inner thoughts. The platform should serve as a supportive space where individuals feel comfortable sharing their inner emotions and experiences without external pressures or biases. By upholding this principle, the platform promotes inclusive and honest communication, respects individual autonomy, and supports visitors in their journey of self-exploration and decision-making.

DESIGN AND EVALUATION OF ONLINE HEALING PLATFORM

Online healing platform design

Based on established strategies, we develop the prototype design of the online family constellation platform, as depicted in Figure 3.

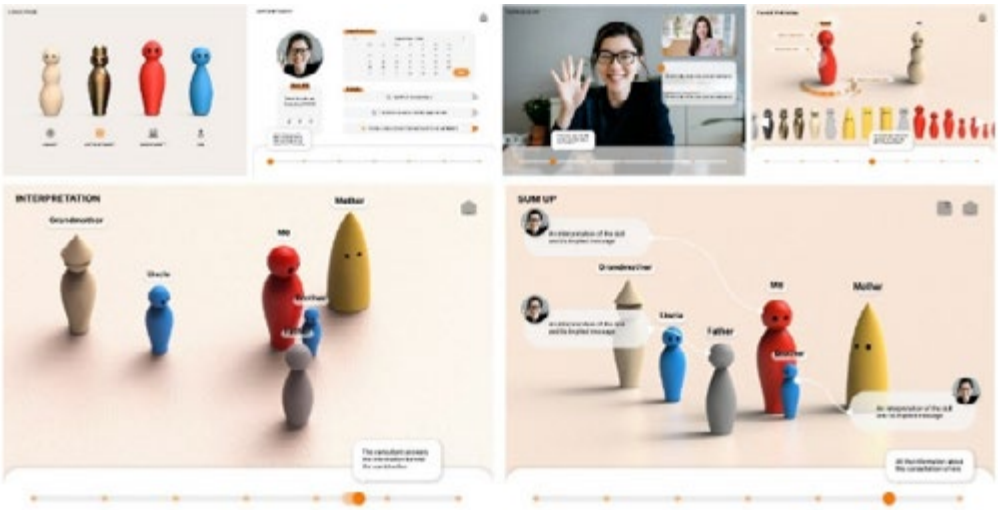

Figure 3. Prototype design of the online family constellation platform

platform comprises various interfaces, including the homepage, user information, communication community, and consulting service. This research primarily focuses on designing the consulting service interface. During the consultation, the screen will display essential information shared by the consultant and client, ensuring that important details are easily visible. Continuous video calls maintain a steady connection between both parties, fostering effective communication. A progress bar below the screen serves as a visual reminder of the consultation's various steps, ensuring well structured and organized process. The platform provides a wide range of digital models for their arrangement. Consultants can view the sand table from different angles, enabling them to interpret and provide comments on the arrangement of the digital dolls. After the consultation, authorized doll combinations and interpretation cases can be shared in a dedicated forum.

Design evaluation

After presenting the design prototype for the new family constellation therapy method, we distributed the evaluation questionnaires based on a 7-point scale (Jebb et al., 2021) to three psychological counselors, three design professors, and four visitors with previous experience. After that, we collected, sorted, and calculated the average scores for questionnaire responses to evaluate the online therapy method objectively. The results of the questionnaire are presented in Table 1.

Table 1. Evaluation of different family constellation methods

	Offline Counseling	Online Meeting	Online platform
Healing effect	2.2	1.1	1.9
Privacy	1.9	0.8	1.7
Aesthetic	1.5	1.0	2.0
Information transmission	2.3	1.8	2.4
Communication efficiency	1.1	1.4	2.0
Doll placement	2.1	0.6	2.3
Explanation	2.4	2.0	2.0

[a] 3 satisfied extremely, 2 very satisfied, 1 satisfied, 0 medium, -1 dissatisfied, -2 very dissatisfied, -3 dissatisfied extremely.

The results indicate that the online family constellation platform offers a superior experience compared to existing online methods. The online platform outperforms traditional offline methods regarding communication efficiency, doll placement, and aesthetics with the help of newly proposed design strategies.

CONCLUSION

Mental health recovery and maintenance in the aftermath of COVID-19 have become significant concerns for many stakeholders. Approaching this issue from a family perspective proves to be an effective method for reconstructing a warm society, with the family constellation technique offering a means to facilitate healing for individuals and families. Conducting user research on family constellations, extracting design elements, and formulating strategies centered around behavior, sense, and decision-making can contribute to developing effective design practices. Based on the research above, we establish the family constellation healing platform, which will provide digital toolkits for consultants and visitors to engage in family constellation arrangements, standardizing the consultation process and breaking down physical barriers through virtual spaces to provide a comprehensive healing experience. Additionally, exploring various forms of physical healing objects can be

integrated into the platform to enhance efficacy. By harnessing the power of design, the platform will play a vital role in promoting individuals' and families' overall mental health, bridging the gap between visitors and therapists, and allowing the family constellation technique to contribute significantly to social and psychological well-being, let love transcend distance and radiate among people.

References

Bell, N. J., Schoenrock, C. J., Young, M., Avery, A. W., Croft, C. A., & Lane, S. (1985). Family Constellation, Social Competence, and Sex-Role Development. The Journal of Genetic Psychology, 146(2), 273–275. https://doi.org/10.1080/00221325.1985.9914454

Carroll, K., Pottinger, A. M., Bailey, A., Watson, T., & Frederick, S. (2023). Living with the Threat of Covid-19: Exploring the Psychological Impact of Covid-19 in Those who Conceived Through ART Versus Spontaneously. Maternal and Child Health Journal, 27(1), 117–125. https://doi.org/10.1007/s10995-022-03537-9

El Khoury-Malhame, M., Rizk, R., Joukayem, E., Rechdan, A., & Sawma, T. (2023). The psychological impact of COVID-19 in a socio-politically unstable environment: Protective effects of sleep and gratitude in Lebanese adults. BMC Psychology, 11(1), 14. https://doi.org/10.1186/s40359-023-01042-4

García, M. J., López-Morales, H., del-Valle, M. V., Canet-Juric, L., & Urquijo, S. (2022). COVID-19 in Lifespan: Psychological Impact between Young and Older Adults in Argentina. Advances in Gerontology, 12(4), 417–422. https://doi.org/10.1134/S2079057022040075

Gyimesi, J. (2023). Family Constellation Therapy in the Context of Esotericism. Perspectives on Psychological Science, 18(4), 749–761. https://doi.org/10.1177/17456916221120424

Hunger, C., Weinhold, J., Bornhäuser, A., Link, L., & Schweitzer, J. (2015). Mid- and Long-Term Effects of Family Constellation Seminars in a General Population Sample: 8- and 12-Month Follow-Up. Family Process, 54(2), 344–358. https://doi.org/10.1111/famp.12102

Jebb, A. T., Ng, V., & Tay, L. (2021). A Review of Key Likert Scale Development Advances: 1995–2019. Frontiers in Psychology, 12, 637547. https://doi.org/10.3389/fpsyg.2021.637547

Kaplan, E. (2014). Every family has a north star: Family healing and recovery. Psychiatric Rehabilitation Journal, 37(3), 261–262. https://doi.org/10.1037/prj0000094

Konkolÿ Thege, B., Petroll, C., Rivas, C., & Scholtens, S. (2021). The Effectiveness of Family Constellation Therapy in Improving Mental Health: A Systematic Review. Family Process, 60(2), 409–423. https://doi.org/10.1111/famp.12636

Liu J., Que J., Zhang A., & Lu L. (2021). The impact of COVID-19 on the mental health of children and adolescents and countermeasures. Science & Technology Review, 39(18), 20–24.

Milea-Milea, A. C., Fernández-Pérez, D., & Toledano-González, A. (2023). The psychological impact of the COVID-19 pandemic on children/adolescents with ASD and their family environment: A systematic review. European Child & Adolescent Psychiatry. https://doi.org/10.1007/s00787-023-02151-6

Shi C., Qian Y., Li X., Li X., Yang L., Liu Q., Pan C., Sun X., Huang X., Liu X., Jiang S., Ma X., Sun W., Xu J., Xing Y., Wang T., Liao J., Zhou S., He Y., … Lyu Q. (2020). Psychological self-help practice technique during the COVID-19 epidemic. Chinese Mental Health Journal, 3, 286–295.

Su S., Gong Y., Zhao Y., Ni S., Shi L., Bao Y., & Lu L. (2023). Challenges of and Responses to Mental Health Problems in the Post-COVID-19 Era. Journal of Sichuan University (Medical Sciences), 1–6.

Thompson, L., & Christian, C. (2022). "…It just broke me…": Exploring the psychological impact of the COVID-19 pandemic on academics. BMC Psychology, 10(1), 289. https://doi.org/10.1186/s40359-022-01008-y

Turns, B., Springer, P. R., & Sibley, D. S. (2019). Removing the "mystery" in therapy: Transparency as a continuous

intervention in family psychotherapy. Journal of Family Psychotherapy, 30(1), 1–19. https://doi.org/10.1080/08975353.2018.1488127

From Loneliness to Trust: Exploring the Value Co-Creation Model of Collective Elderly Care Services for Older Women

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Abstract

With the serious problem of population aging, the problem of elderly women's old age has become the key to cope with the problem of population aging, and since the traditional way of old age care can no longer meet the needs of modern elderly women, it has become the trend of the times to solve the problem of elderly women's old age care in a group. This study proposes to use the method of service value co- creation in order to solve the problems of trust and sustainability of the current collective elderly care. Through the participation and interaction of older women, a sustainable core trust construction for collective elder care is constructed. The strategy of this study includes the hug service organization phase, the co-creation phase, and the sustainability phase. The construction of a co-housing community for elderly women centered on the group to meet their needs at the emotional, leisure and health levels, thus assisting them to move from a state of isolation to a trusting living environment.

Author keywords

collective elderly care; Service value co-creation; Older women; Service Design

Introduction

As the problem of population ageing continues to intensify in China, a clear "feminization of the ageing population" has emerged, and it has become crucial to solve the problem of old-age care for older women. The traditional way of providing for the elderly no longer meets the needs of modern elderly women; on the one hand, the cultural level of elderly women has improved and their pursuit of self-worth has changed. On the other hand, the development of social economy makes the traditional way of family old-age care suffer, and the widowed and living alone old women need to face the challenges of old-age life independently.

In recent years, urban elderly women have begun to organize themselves into small groups to spend their old age together. However, due to the lack of unified management, constraints, and support from social forces, this kind of senior living based on acquaintance relationship is often disbanded due to the differences in living habits and rupture of interpersonal interactions among members. In this paper, we propose a sustainable path to realize the construction of an urban elderly women's collective elderly care service system from the perspective of service value co- creation.

Overview

collective elderly care

"Co-housing" is a new and diversified approach to old age in China. Its original intent and core philosophy, similar to the co-housing movement in Northern Europe in the 1970s, is to help older persons establish solid social ties, thereby reducing loneliness in old age. Co-Housing can be defined as the realization of the elderly's needs for old age through the participation of the elderly in organizing and co-housing on the basis of specific geographical community housing, creating a community of old age where interests are related, mutual help is provided, and emotions are tied together.

The current situation of collective elderly care at home and abroad Co-housing is practiced differently in different countries. The development of Co- Housing is well established in Denmark. In 1972, the Sættedammen community became the first co-housing project in the world(Arrigoitia, 2021). The community consists of 50 families, each with their own private space and a large number of public facilities, and the management and decision-making of the community is done by the residents' self-governance. In the UK, as the traditional housing model is challenged, "OWCH (Older Women's Co-Housing)" was established in London, a co-housing community planned, designed and managed entirely by women (Beck, 2020). Members not only maintain their independence and autonomy, but also enjoy a close-knit community network, which not only solves the housing problems of this particular group, but also serves as an exemplary solution for older women to cope with aging.

China's "collective elderly care" model first appeared in 2017, when Mr. Zhu in Hangzhou rented out his family's villa and transformed it into a shared living space comprised of 10 like-minded seniors. These seniors socialize with each other in their daily lives, build deep bonds with each other, and take care of each other in their lives. But by relying only on internal organization and simple agreements, trivial matters such as life conflicts can still arise between members, while dealing with emergencies and medical care has gradually become a challenging issue to consider in collective elderly care .

Women and collective elderly care

With the trend of feminization of the aging population, suitable life solutions for aging women are available. In China, women often take on the role of caring for their families and maintaining family harmony. As women age, it is easier for them to establish deep emotional ties, provide emotional support and companionship to each other, and satisfy their social needs in a collective elderly care environment. In recent years, there has been a growing number of experiments and activities in which women collective elderly care in China. For example, Ms. Hu in Shandong Province is trying to explore a model for women to age in groups through the Women's Elderly Cohabitation Pilot Project. She set up a house in a small county in Shandong and gathered like-minded friends to live together, exploring the future of old age together and preparing for her later years.

Figure 1. Female elderly cohousing experiment.

At present, there are several problems in China's collective elderly care:

1. There is looseness in the collective elderly care.
2. Lack of support from external social forces.
3. Lack of mature and systematic service model.

Service value co-creation

What is value? Value is a relative concept, and in traditional economics, value was considered to be acquired through the exchange of services or goods. With the development of the market, the concept of value has been gradually extended to include services, creating a shift from a product-centered economy to a service- centered economy.(Ostrom，2010)

In the 19th century, Storch proposed that service providers and consumers work together to create service value. (Grönroos，2013)With scholars' research on value co-creation, two perspectives of value co-creation theories have been developed. The first perspective is the value co-creation model centered on user experience. The second perspective is the service-led logic of value co-creation, focusing on the shift from tangible to intangible resources. It emphasizes the shift of business focus from products to services, with consumer participation, interaction, self-service and experience as the core elements of value co-creation.

A typical example of value co-creation in a cohousing community is the New Ground project in the UK, which consists of 26 single elderly women. Its uniqueness lies in the participation of residents from the design and planning stages, and the community's emphasis on mutual assistance and collaboration in life. (Brenton， 2017) Autonomy and self-governance are the distinguishing features of the New Ground community.

Figure 2. "New Ground" cohousing community.

Value co-creation model of embracing ageing in place

Self-help, Mutual Help and Specialized Help

This study proposes a value co-creation model for elderly women, which is characterized by self-help, mutual assistance and specialized assistance. Self-help embodies autonomous life management mode and free space for independent development; mutual assistance embodies mutual love and care, communication and entertainment among groups; and specialized assistance embodies the provision of professional medical and health services and the demand for life care services. In self-help, mutual assistance and specialized assistance, elderly women are given full play to joint participation and creation of resources, creating a collective elderly care service model with elderly women as the core.

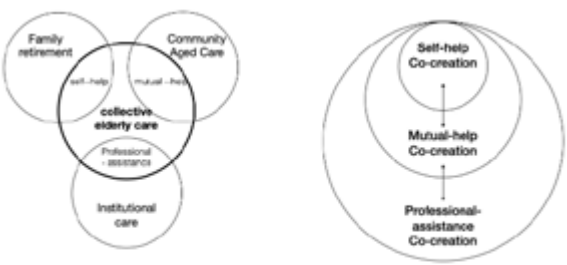

Figure 3. Characteristics of the collective elderly care model.

Value Co-creation Framework for Collective Elderly Care.

This research categorizes embracing old age into three levels: self-help co-creation, mutual aid co-creation and specialized aid co-creation. Self-help co-creation and mutual aid co-creation are reflected in older women's dominance and interaction in life, and the strengthening of older women's decision-making ability and social interaction. Specialized co-creation mainly consists of medical services, recreational services, care services and travel services. Through the integration of major social resources, community support and the joint participation of elderly women, an ecological environment of mutual collaboration, mutual trust and mutual benefit for the elderly is formed.

Figure 4. Value Co-Creation System for Older Women's collective elderly care.

Value co-creation process of collective elderly care

In the process of embracing the elderly, taking the interaction behavior of elderly women participating in the organization of embracing as a clue, the process of embracing the elderly service is divided into three core stages: the stage of organizing embracing the elderly, the stage of co-creation of embracing the elderly service, and the stage of sustaining embracing the elderly service. The process of value co-creation is further subdivided into embracing value consensus, embracing value creation, embracing value integration, embracing value transmission, embracing value recognition, and embracing value continuity. As shown in Figure 5.

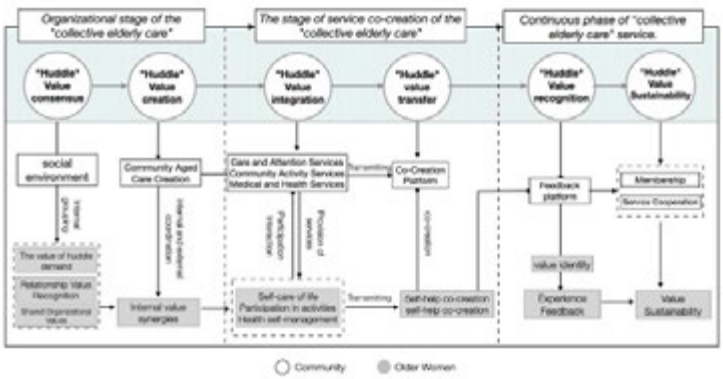

Figure 5. Value co-creation process of community huddle for the elderly.

Conclusions

Given the context of the feminization of the aging population, this paper applies the theory of service value co-creation to examine the current evolution of collective elderly care. It synthesizes the unique attributes and mechanisms of collective care for elderly women, promoting an amalgamation of self-help, mutual aid,

and specialized assistance. We propose a value co-creation model for collective elderly care, encompassing comprehensive medical, care, travel, and recreational services. This model advocates for the proactive involvement and innovation of elderly women. By fostering their active participation and creativity, we aim to enhance the elderly care service experience in emotional, leisurely, and health-related domains. This approach aspires to provide elderly women with a holistic care environment in their later years, transitioning them from a state of loneliness to one of trust and communal living.

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References and citations

Arrigoitia, M. F., & West, K. (2021). Interdependence, commitment, learning and love: the case of the United Kingdom's first older women's co-housing community. Ageing & Society, 41(7), 1673-1696.

Beck, A. F. (2020). What is co-housing? Developing a conceptual framework from the studies of Danish intergenerational co-housing. Housing, Theory and Society, 37(1), 40-64.

Brenton, M. (2017). Community building for old age: breaking new ground. The UK's first senior cohousing community, high barnet (Housing Learning and Improvement Case Study No. 139). Housing Learning and Improvement Network, London.

Grönroos, C., & Voima, P. (2013). Critical service logic: making sense of value creation and co-creation. Journal of the academy of marketing science, 41, 133- 150.

Ostrom, A. L., Bitner, M. J., Brown, S. W., Burkhard, K. A., Goul, M., Smith-Daniels, V., ... & Rabinovich, E. (2010). Moving forward and making a difference: research priorities for the science of service. Journal of service research, 13(1), 4-36.

Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. Journal of the Academy of marketing Science, 36, 1-10.

Designing for Health: A Clothing "Chan"(襜) in The Ancient Chinese Medical Prescription

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Abstract

In ancient China, "love" can be defined as a kind of care for the human body. This paper explains how traditional Chinese clothes were used to treat individual diseases and preserves human health from the perspective of traditional Chinese medicine culture. Traditional Chinese medicine texts recorded not only a large amount of materia medica (bencao 本草) used to treat diseases, but also the use of clothing for healing purposes. Medical practitioners adapted people's ordinary clothes and used it in the medical field to complement specific materia medica and assist in the treatment of diseases. This paper takes "Chan"(襜), a clothing used to treat kidney disease in the ancient Chinese prescription "Yu Bao Du" (玉抱肚), as a case study and explores the design and health care behind the transformation of ordinary clothing into medical clothing.

Keywords: Chan(襜); Yu Bao Du(玉抱肚); Traditional Chinese Medicine; Health Design.

The Textual Record of Chan in the Yu Bao Du

From the Song Dynasty to the Ming Dynasty, many medical books recorded a common prescription called Yu Bao Du. According to the medical text, the prescription of Yu Bao Du utilized specific clothes and fabrics to treat the coldness of the heart, abdomen, and kidneys. Traditional Chinese medical practitioners would combine various medicines such as needle powder(zhensha 针 砂), alum(baifan 白 矾), refined calomel(fenshuang 粉霜), sal ammoniac (naosha 硇砂), evodia fruit(wuzhuyu 吴茱萸), black pepper fruit(hujiao 胡椒), cnidium fruit (shechuangzi 蛇 床 子), monkshood mother root(chuanwu 川 乌), lesser galangal rhizome (gaoliangjiang 高 良 姜) and so on, adjusting the variety and dosage of the ingredients based on different body parts. The prepared medicines would be ground into powder, mixed with water, applied to parchment paper, and then secured to the body using different clothes. Even, the mix of ground medicines could be directly contained in clothes. When the medicinal effect diminished, the clothing and parchment would be removed, and a new medicated ointment would be applied, sprinkled with water, and fixed with clothes. This process would be repeated cyclically to treat diseases such as cold pain, chronic coldness, and weakness.

The prescription of Yu Bao Du not only recorded some regular fabrics, but also appeared popular ordinary clothes, such as Chan in the Song dynasty. For example, Puji Fang(普 济 方) of the Ming dynasty, citing the text from Deshengtang Fang(德生堂方) of the Yuan dynasty，stated,

This prescription could warm the Dantian(丹 田) of the body, fumigate the renal sac, and exhibited remarkable efficacy.

Various medicines, including monkshood mother root(chuanwu 川 乌), pricklyash peel(chuanjiao 川 椒), cumin(xiaohuixiang 小茴香), Cullen corylifolium(poguzhi 破故纸), trigonella foenum-graecum(huluba 葫芦巴),

cinnamon(guangui 官桂), galangal(liangjiang 良姜), flower of Chinese Small Iris(malinhua 马蔺花), Dahurian Angelica Root(baizhi 白芷), nardostachys rooty(gansong 甘松), dried ginger(ganjiang 干姜), evodia fruit(wuzhuyu 吴茱萸), szechwan chinaberry fruit(chuanlianzi 川楝子), seaweed(haizao 海藻), rosewood(qingmuxiang 青木香), frankincense(ruxiang 乳香), myrrh(moyao 没药)， half a tael each, and good-quality mugwort(haoai 好艾)，four taels, ground into powder and spread on Guo Du(name of traditional Chinese clothing 裹肚).
A thin silk fabric was used to make a lined clothing Guo Du. The front fabric of the Chan covered the navel, with a diagonally shaped cloth attached below to cover the male scrotum. It also had straps on the side to secure it at the back of the body. The lower end of the Chan could cover the waist and kidney area, with the fabric wrapping around the waist, not exceeding Guo Du in length. Both the front and back fabric of Chan were covered with cotton, into which the prepared medicinal powder was evenly infused, sprinkled with water, covered with parchment paper, and fixed. The cotton was inside, similar to how people wear cotton clothes. This type of clothing was commonly used to wrap and secure around the waist and abdomen, allowing the medicinal vapors to steam and nourish the scrotum, thereby exhibiting a miraculous effect."
From the descriptions in the prescription, we can determine that Chan(襜) refers to a type of clothing. So, what does this clothing look like?

What is Chan?

The word of Chan was defined in the early dictionary Er Ya(尔雅) as a layer of cloth that covered the front of the body. During the Song and Jin dynasties, a category of clothing known as "Er Chan"(二襜) and "San Chan"(三襜) became popular. Based on the historical document, Er Chan and San Chan were typically worn by etiquette guards or bestowed as gifts by Zhao-Song emperors to foreign monarchs and envoys.(Table 1) So, what was the form of Er Chan and San Chan? Based on archaeological excavations found in Song and Jin dynasty tombs, San Chan was composed of three pieces of fabric, which was tied around the abdomen with a long belt, hanging down to the knees, and wrapped around the underwear. If one of the fabric pieces was reduced, it would be called Er Chan. (Figures 1 and 2)

Table 1: The Records of 'Er Chan'(二 襜) and 'San Chan'(三 襜)in the Historical Materials of the Song Dynasty

San Chan(三襜)	Government officials of imperial carriage	引驾官二十七人，幞头，白狮子紫罗单衫，涂金银束带、紫罗单夹三襜。引驾官四十八人，幞头、绯罗单衫、金镀海捷腰带、紫罗表夹三襜、绯罗看带。	History of Song Dynasty 宋史
	Government officials of imperial carriage	引驾官共四十人，人员并幞子，都将各首先官幞头、紫罗夹三襜、红锦袄、银带。	Zhenghe wuli xinyi 政和五礼新仪
	Foreign envoys of Jin Dynasty	朝见，使衣八件：紫春罗夹公服、淡黄罗绵袄子、绣背子、勒帛、熟白小绫宽汗衫、宽夹袴、红罗软绣夹抱肚、三襜。 副使衣七件：紫春罗夹公服、淡黄罗绵袄子、勒帛、熟白小绫宽汗衫、宽夹袴、红罗软绣夹抱肚、三襜。 贺正旦，赐使衣六件：紫素罗夹公服、淡黄小绫勒帛、熟白小绫宽汗衫、宽夹袴、红罗软绣夹抱肚、三襜。 朝辞，使衣八件：紫春罗夹公服、熟白小绫宽汗衫、夹袜头袴、淡黄罗绵袄子、绣背子、勒帛、红罗软绣夹抱肚、三襜。 副使衣七件：紫春罗夹公服、熟白小绫宽汗衫、夹袜头袴、淡黄罗绵袄子、勒帛、红罗软绣夹抱肚、三襜。	Song huiyao jigao 宋会要辑稿
	Archons	岁时杂记：端五，赐从官已上，执政亲王，是日百官已上，赐公服、衬衫，大夫已上加袴，从官又加角绣裹肚，执政又加红绣裹肚、三襜。	Suishi guangji 岁时广记
	Emperor of Yi Dynasty in Vietanm	全衣一袭：紫罗夹公服一领，熟白小绫宽汗衫一领，熟白小绫勒帛一条，熟白大绫宽夹袴一腰，红罗夹绣三襜一条，抱肚一条，二十五两金镀银花腰带一条，五十两白成银腰带匣一具。	Shouxi Jushi Poems [illegible]溪居士集
	Emperor of Samboja kingdom	紫罗夹公服一领，小绫宽汗衫一领，勒帛一条，熟大绫宽夹袴一腰，红罗绣夹三襜一副。	Shouxi Jushi Poems [illegible]溪居士集

Figure 1: Golden embroidered silk gown with brown ground, depicting peonies and phoenixes, unearthed from the tomb of King Qi of the Jin Dynasty. Image source: Zhao Pingchun, Chi Benyi. (1998), A Study of Costumes Unearthed from the Tomb of King Qi of the Jin Dynasty, Beijing: Cultural Relics Publishing House.

Figure 2: Golden embroidered silk gown with moss green ground, depicting magnolia flowers, unearthed from the tomb of King Qi of the Jin Dynasty. Image source: Zhao Pingchun, Chi Benyi. (1998), A Study of Costumes Unearthed from the Tomb of King Qi of the Jin Dynasty, Beijing: Cultural Relics Publishing House.

The Medical Function and Reconstruction of Chan

As a category of daily clothing that was popular with male individuals during the Song Dynasty, Chan was incorporated into medical practices by Yuan and Ming medical practitioners. However, the Chan used in medical treatment, as mentioned in the prescription, slightly differed in its form from the Er Chan and San Chan in people's daily life. For example, the Chan recorded in Deshengtang Fang was designed specifically to treat male waist and kidney diseases, covering the waist, kidney area of the body and protecting the scrotum. The medicinal compounds were precisely prepared to be fixed with the Chan, allowing the medicinal vapors to fumigate the male's lower abdomen (dantian 丹田) and kidney area and providing warmth and nourishment. Therefore, the prescription of Yu Bao Du stated that the Chan could effectively alleviate pain and exhibited exceptional efficacy.

According to the historical documents mentioned in the Yuan Dynasty medical prescription Deshengtang Fang, with reference to unearthed from the tomb of the King of Qi of the Jin Dynasty burial clothing known as San Chan with golden embroidered silk gown with brown ground, depicting peonies and phoenixes, and San Chan with golden embroidered silk gown with moss green ground, depicting magnolia flowers, I have speculated on the structure of the medicinal clothing Chan.

Using modern technology, I have attempted to reconstruct the ancient Chan(襜) garment. The first step is to measure and draw clothing size maps. The clothing size chart is drawn with reference to the average male height of 165-170 centimeters. The front panel is 43 centimeters in length and 30 centimeters in width, the back panel is 41 centimeters in length and 30 centimeters in width, the back panel is 37.5 centimeters in length and 20 centimeters in width, the bottom sloping tip is 25 centimeters in length, and the strap is 56 centimeters in length. (Figures 3) The second step is to preparation of raw materials and tools for production. The silk fabrics used in the restoration are all made of modern silk like materials. In addition, according to the prescription, prepare 18 traditional Chinese herbal medicines, as well as leather paper, cotton, and sewing tools. The third step is to make a slightly tail covering the scrotum and sew the tie of the slightly tail. Make the front cover and sew the straps on

both sides. To increase the thickness of clothing that covers the body's waist and kidneys, a back lining has been added to cover the back waist and kidneys. Make the back end and sew the front end and back end, as well as the connection between the front end and the slightly tail end. The end step is to crush and grind Chinese herbal medicine. After mixing with water, it seeps into the cotton, covers it with thin paper, covers the affected area, and binds it with clothing to complete the restoration work. I have attempted to reconstruct the ancient Chan garment and try it on. (Figures 4, 5 and 6)

Conclusion

Through the reconstructed clothing artifacts, we can see how medical practitioners incorporated people's ordinary clothing into the traditional Chinese medical system. They modified ordinary clothing so that it was not only be used to cover human's body, but also to align with traditional medical theories for warming and nurturing the body and treating diseases. With the spread and popularity of medical prescriptions, the integration of clothing and traditional herbal medicine treatment gained acceptance and acclaim among medical practitioners. Overall, Chinese ancient clothing was rooted in a health design concept of caring for life. Physicians bestowed medical significance upon clothing, enabling them to serve as tools for treating illnesses guided by the medical concept of the times.

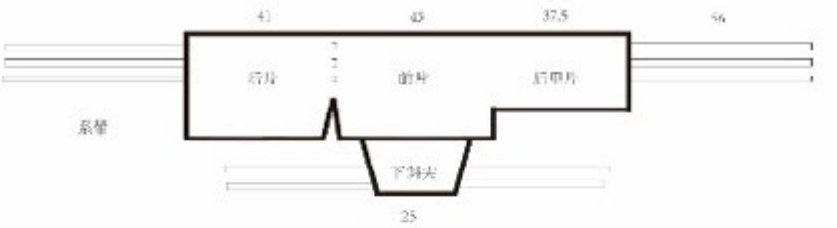

Figure 3: Drawn clothing size diagram.

Figure 4: Completing the reconstruction of the clothing

Figure 5: The effect of trying on the front.

Figure 6: The effect of trying on the back.

References

Luo Tianyi. (1963), Treasure of Health, Beijing: People's Health Publishing House.

Tuotuo et al. (1977), History of the Song Dynasty, Beijing: Zhonghua Book Company.

Wang Qiu. (2003), One Hundred Selected Recipes from the 'Shizhai' Collection, Shanghai: Shanghai Science and Technology Publishing House.

Zhu Su. (1959), Pu Ji Fang, Beijing: People's Health Publishing House.

Zhao Pingchun, Chi Benyi. (1998), A Study of Costumes Unearthed from the Tomb of King Qi of the Jin Dynasty, Beijing: Cultural Relics Publishing House.

The Art and life of Loving the Place You Live

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Abstract

The ideal environment that humans have been constantly pursuing through countless contradictions and conflicts since ancient times does not exist in the real world,And there are only utopias that have been built and failed one after another, but the pace of human pursuit of an ideal environment will never stop. Therefore,Therefore, although people with different geographical and cultural backgrounds interpret the world in different ways,"Topophilia" seems to be a kind of nature of human beings, and it is also a way for people to build living environments on the earth. Never-ending drive.And by citing the art of the place where love is located, it leads to the romance of collective heroism; The 'garden' where love is located is a way of life that allows for inner peace and forgiveness.'as it can help people realize their maximum potential.

Author keywords

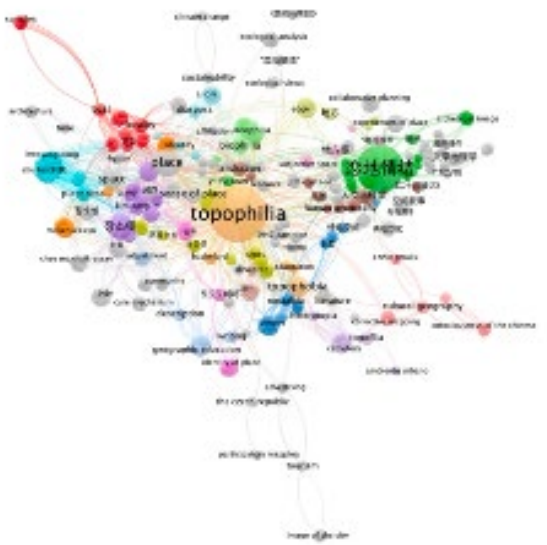
love; Art; Topophilia

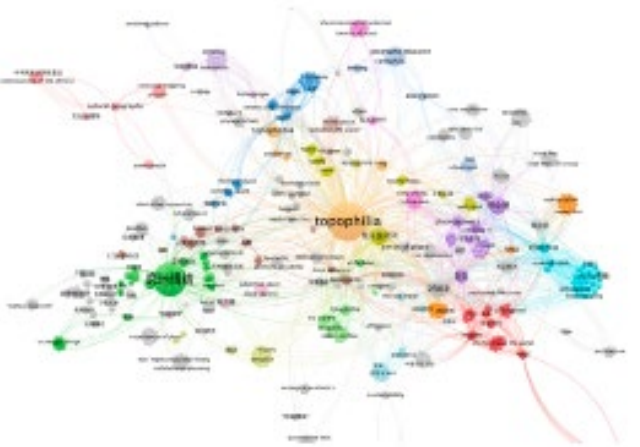
Introduction

We live in a time of such bizarre change today:after the COVID-19 pandemic,The recent drought has affected water shipping routes around the world,with long delays at the Panama Canal.At 13:00 on August 24,2023,the Fukushima Daiichi Nuclear Power Plant in Japan launched a plan to discharge nuclear contaminated water into the sea,with an estimated drainage period of 30 years · · ·Faced with this situation,how can we love our habitat? How to face our existing conflicts and difficulties? How can we strengthen cooperation?

As Mr. Duan said: "If an empire or a country is too big to evoke a feeling of land love, then the whole earth can, contrary to it. This is not impossible, because the earth is also A physical geographical unit with its own history....Maybe in the future, human loyalty will only point to two extremes, the homeland and the whole earth that remain in the deepest memory."

The"place"in the title of this article refers to the homeland left in the deep memory.At a small level,the homeland is the place where the physical body lives,and at the more divine level,it is the place where our spirit depends. The body's memory of love for land is very magical.Various groups pass on culture through physical practice,and the love of places carries the collective strength of generations.Memory,the family group has expanded from a blood community to a geographical community that lives here together.With common folk customs and living habits,"a fellow countryman sees a fellow countryman,with tears in his eyes",and then to a love community with a common belief and a common dream — the country.Besides the country,there is also the human community that awakens our love.Now we have a deeper understanding of the concept of"human community",we cherish the place we live more,we respect the equality of life more,people seem to forget love in the face of huge disasters,and love can indeed heal.So what should we do?





"The choices we make, or fail to make, today could result in breakdown or a breakthrough to a greener, better, safer future. The choice is ours to make. " — — ANTÓNIO GUTERRES, United Nations Secretary-General.
The author generates according to VOSviewer
A total of 84 Chinese literature articles about "TOPOPHILIA" were searched on CNKI during the period of 20 to 23, and a total of 150 English literature articles during the period of 12 to 21.Today, more and more disciplines are focusing on transdisciplinarity and collaboration, with psychology in particular playing an increasingly important role.The reason is obvious, because people are not completely subject to rational control, all science in the 21st century has shown a trend of social science.
The theme of this conference, "The interpretation of love," was inspired by a research project conducted by the Global Institute for Human Peace at the University of Wales of Trinity St. Davy, represented by Professor Shetto Qir and Professor Davy Cardman, the author consulted the official website and related information,In this Project, explore the ways in which Love has been expressed in the great philosophical and wisdom traditions of all time, including: Love in the Western Thought;Love in the Practice of Silence;Love in the Eastern Traditions.
The original text of Chapter 5 of Laozi's Tao Te Ching: The universe is unconscious; it regards everyone as insignificant. The Bible John 3:16 "16 For God so loved the world that he gave his one and only Son, that whoever believes in him shall not perish but have eternal life." Although God has a universal love for all, salvation comes only to those who believe in Jesus Christ's salvation, and the unbelievers are condemned. How to Love?God will not be eccentric, it is fair to all things, let them develop and die on their own. Between heaven and earth, everything is too small after all. Just like humans don't pay attention to ants.Whether it is the Bible or the Tao Te Ching, human beings are trying to"Love" as a belief to continue to live.

The Art of Loving the Place you live : A Romance of Collective Action or Collective Heroism

Gunpowder is one of the Four Great Inventions of the Chinese nation and the key to civilization. Cai Guo-qiang is an artist with a deep attachment to the place,Based on concepts of Eastern philosophy and contemporary social issues, Cai Guo-qiang often creates works of art in specific locations to respond to local culture and history and to establish a dialogue between the audience and the larger universe around them. His explosive art and installations transcend the two-dimensional plane and have the power to interact with society and nature.The

use of gunpowder in Cai's work carries deep meaning. The material, comprised of minerals that took hundreds of thousands of years to form, has a long lineage in Chinese history as an element of traditional Chinese medicine believed to help make one immortal.Cai rose from the ruins of the Chinese Cultural Revolution, so he is good at using explosions and other methods to think about the ability to destroy together. At the moment of witnessing the explosion, the gaze of the viewer also becomes an important part of the completion of the work.

All forms of collective memory embody attempts at meaning-making - efforts to integrate experience and provide a coherent foundation for individual and collective identities. However, different modes of collective memory have different meaning-making potentials.

He broke free from the constraints of the cultural divide between East and West and became the embodiment of cultural globalization. The BMoCA Museum is part of a series of social projects initiated by Cai in the 1990s, aimed at integrating art into the community. His inspiration comes from Joseph Boyce's philosophical ideas and the belief that 'everyone is an artist'. Continuing this spirit, he often creates large-scale projects within the community, inviting local artists and ordinary citizens to participate in order to further promote community healing, political unity, and stimulate reflection on humanity as an individual and a group. With the participation of the government and local artists, he transformed abandoned spaces (such as bunkers or old pottery warehouses) into museums. This focus on collective society can also be seen as a result of the influence on China's "cultural and political memory", yearning to "use the public sphere as a place for democratic empowerment art".

The life of Loving the Place you live:Lebanon's 'Garden of Forgiveness'

Mr. Duan in"Topophilia," said: The garden can reflect a particular view of the universe and treatment of the environment attitude. Chinese gardens developed as the opposite side of the city. Different from the square of the city, the garden has the lines and space of natural interest. Cities reflect the class of human society, while gardens express the randomness of nature. In the

garden, people give up the concept of social differences, can ignore the eyes of others, free meditation, and dialogue with nature.

The torment of love and war is eternal, and love Healing the Wounds of History.The "Garden of Forgiveness" in Lebanon is the work of Alexandra Asseily, a British Lebanese citizen and psychotherapist.Lebanon is located in the eastern end of the Mediterranean Sea, at the crossroads of invading civilizations, so far, the history of cultural exchange has given Lebanon a unique identity.Situated between archaeological sites and religious buildings in central Beirut, construction of the garden, which was suspended during the ongoing war, is surrounded by three cathedrals and mosques. All of US gathered here to worship for one thing, and that is Lebanon, where once-warring sects have found a moment of peace and reflection,A 'common place' of understanding and tolerance while emphasizing national unity.The garden of forgiveness will bear witness to a shared past and history.

In this case, we can find that the artificial landscape of "garden" has the same meaning in different contexts of the East and the West. A quiet and beautiful natural landscape can reflect the purity of the heart.

Image from https://www.gp b.com/garden of forgiveness

Conclusion

Even though people from different regional and cultural backgrounds have different modes of interpreting the world, the "Topophilia" contains a complex set of environmental experiences of the "Philia" mode, (In Greek philosophy, Philia is a form of love that encourages goodwill, friendship, and affection. it relies on shared values and common goals to maintain its strength. As a result, Philia love is often seen as one of the most important forms of love because it can help people achieve their highest potential.)which is reflected in the ideal spatial order. And then construct different places and places.

The ideal environment that human beings have been pursuing in countless contradictions and conflicts from ancient times to the present does not exist in the real world, but there are only utopias that have been continuously built and failed, but the pace of human pursuit of the ideal environment is forever. It will not stop, so the "land of love" seems to be a kind of human nature, and it is also an endless driving force for people to build a living environment on the earth.

Acknowledgments

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References and citations

[1] 王庆贺 & 王潇 .(2023). 身体记忆与实践 : 清水江中上游苗族刺绣文化基因的形成机制 . 中国非物质文化遗产 (04),82-88.

[2] 罗易扉 .(2023). 地方、记忆与艺术 : 回到地方场所与往昔的历史经验 . 清华大学学报 (哲学 社会科学版)(02),148-157+231. doi:10.13613/j.cnki.qhdz.003237.

[3] 刘苏 .(2017). 段义孚《恋地情结》理念论思想探析 . 人文地理 (03),44-52. doi:10.13959/j.issn.1003-2398.2017.03.006.

[4] 吴佩瑾 & 叶超 .(2023). 情景之间 : 段义孚的地方经验与书写艺术 . 地理科学进展 (06),1172- 1180.

[5] 任雪娇 & 李仲凡 .(2022). 荣格文艺心理学思想中的自然精神 . 陕西理工大学学报 (社会科 学版)(01),60-66.

[6] 高鑫 .(2023).《海的尽头是草原》: 地缘文化视域下共同体叙事的路径探寻 . 视听 (06),52- 55. doi:10.19395/j.cnki.1674-246x.2023.06.033.

[7] 陈诗凡 & 姜礼福 .(2021). 气候危机中的共同体崩溃——人类世小说《水刀》研究 . 文化与 传播 (01),43-48.

[8] Cumhuriyet Üniversitesi Fen Fakültesi Fen Bilimleri Dergisi (CFD), Methods and Techniques in Using Collective Memory in Urban Design: Achieving Social Sustainability in Urban Environments , No: 4 Özel Say⌧ (2015) ISSN: 1300-1949
[9] Adams, P. C., Hoelscher, S., & Till, K. E. (Eds.). (2001). Textures of Place: Exploring Humanist Geographies (NED-New edition). University of Minnesota Press. http://www.jstor.org/stable/10.5749/j.cttttg77
[10] Yi-Fu Tuan. (2019). Environment and Topophilia , Topophilia. (p150-151). Published by the Commercial Press:Zhicheng, Liu Su.
[11]Alexandra Asseily,BREAKING THE CYCLES OF VIOLENCE IN LEBANON – AND BEYOND,Published in 2007 By Guerrand-Hermès Foundation for Peace Publishing 199 Preston Road Brighton, East Sussex BN1 6AW Great Britain
[12] MEASURING PLACE ATTACHMENT, IDENTITY, AND MEMORY IN URBAN SPACES: CASE OF THE WALLED CITY OF LAHORE, PAKISTAN,ISSN 2029-7955 / eISSN 2029-7947,2021 Volume 45 Issue 2: 171–182,https://doi.org/10.3846/jau.2021.15183

References

O ' Connor, P. (2022). The unanchored past: Three modes of collective memory. Memory Studies, 15(4), 634–649. https://doi.org/10.1177/1750698019894694 @inproceedings{Tnnies2001CommunityAC， title={社区和公民社会}， 作者={Ferdinand T{\"o}nnies 和 Jos{\'e} Harris 和 Margaret Belser Hollis}， 年份={2001}， url={https: //api.semanticscholar.org/CorpusID:142095513}}
https://narrative-of-love.org/ https://caiguoqiang.com/projects/projects-2004/bmoc https://stirnetwork.wordpress.com/artists/guo-qiang-cai/ https://alchetron.com/Garden-of-Forgiveness https://davidcadmanatwork.com/thoughts/ https://www.theartstory.org/artist/cai-guo-qiang/ https://healingwoundsofhistory.com/approaches/

Exploring the Diverse Roles of Sound in Film: A Case Study of the Japanese Movie Liz and the Blue Bird

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Abstract

With the advancement of technology, the art of film and television has evolved into a comprehensive art form that combines the languages of both sight and sound. Film and television sound can be categorized into three main types: dialogue, sound effects, and music, and it holds significant value within the realm of visual arts. This article, based on the classification of forms of cinematic sound, analyzes the crucial roles played by sound in the world of film and television. Film and television sound possess three distinct capabilities: descriptive, lyrical, and monologue, all of which contribute to better character development and emotional depth. This article centers around the Japanese film Liz and the Blue Bird and discusses the interplay between film score and visuals. Liz and the Blue Bird employs music to convey the emotions between the characters, and the affectionate musical passages serve a narrative purpose.

keywords

Film Sound; Sound-Image Relationship; Emotion Shaping; Experimental Techniques.

The role of the interaction between sound effects and music in film and television works

Sound in film and television can create a three-dimensional environment, adding texture and depth to scenes. Skillful use of sound can enhance the spatial quality of the visuals, highlighting different meanings and subtexts within the film or TV show and further deepening the thematic impact. This is exemplified in the film Liz and the Blue Bird where the combination of sound effects and music has a surprising and impactful effect.

In the opening scene of the film, as the students walk through the school gate, the background music, performed on a prepared piano, produces a gentle rustling sound as the keys are softly touched. This immediately creates an atmosphere that captures the hazy morning mist, showcasing the composer's skillful use of sound effects and music to enhance the scene. Apart from the perfect use of timbre, the opening music Wind, Glass, Bluebird seamlessly complements the visuals, including all the sounds within the scene. Sounds like footsteps, flowing water, and door openings are all treated as part of the music, often integrated into the music as distinctive instruments. A significant portion of the environmental sounds even sync with the beat, blending seamlessly with the music to reflect the characters' dynamics and emotions, breathing life into the entire scene. The intermittent music at the beginning of the film doesn't follow a continuous melody, but it still manages to convey the inner emotions of the characters through the music — the calmness before their meeting and the subtle joy in their hearts after reuniting.

Towards the end of Liz and the Blue Bird the sound and music once again intersect seamlessly, creating a meaningful callback to the opening scene. In this instance, the echo of footsteps in the corridor, expertly designed to convey the sense of depth in the environment, blends harmoniously with the sounds of the piano and marimba. Notably, the footsteps themselves become an essential element of the percussion, resulting in a stunning combination. Blending visuals and music seamlessly allows the film to fully express its intended message and enhances the impact of both the imagery and the music. This integration strengthens the overall storytelling by giving the music a new layer of meaning through the visuals, creating a powerful synergy in the film.

The experimental use of sound and visuals in Liz and the Blue Bird.

Liz and the Blue Bird can be considered an experimental animation to some extent. The work features a rich variety of visual presentation techniques, including the use of fairy tale illustrations and watercolor printing methods. One of the most striking aspects that viewers can immediately notice is the significant contrast in the film's color palette. Compared to the high purity and bright colors of the illustrations in a fairy tale storybook, the film's real-world scenes are dominated by a significant amount of blue. The film primarily uses a blue-green color palette, effectively conveying the chilly atmosphere of early morning. Even the afternoon sunlight is not as vibrant and warm in these scenes. However, as the richly diverse scenes alternate, the music's emotional tone also changes. The bright and cheerful melodies from the storybook are juxtaposed with the quiet and somber sounds of reality. In Liz and the Blue Bird, the music's fluctuations perfectly complement the shifts in the visuals, creating a stunning and experimental audio-visual relationship that is both thought-provoking and filled with surprises.

The opening piece of music in the film, The Beginning of All Things is an adaptation of the third movement, Love Severed from the film's eponymous suite composed by 松田彬人 (Matsuda Akito). Compared to the intricate texture in the suite, the opening piece softens the intense sense of parting found in the original composition. When combined with the visuals, the audience is more immersed in the tranquility and stability of forest life depicted in a fairy tale picture book. In the overall music of the film, the music from the picture book fairy tale is light and cheerful, while the music from reality is blended with calmness, and at times, even a bit chilling. In this work, sound and the intended visuals are closely integrated, and in the expression of emotions, music, and cinematic images complement each other, forming a tight connection. Almost the entire film takes place within the school, and this seemingly monotonous setting could potentially lead to a stale narrative. However, the use of sound in this film not only brilliantly shapes the sense of space but also adapts the environment to the needs of the plot, at times isolating and confining, and at other times opening up to freedom.

From this, the following conclusions can be drawn about sound shaping the sense of space:

1. Recreating a realistic spatial environment, both within and outside the frame, enhances the screen's spatial capacity and credibility, immersing the audience in a world where scenes and imagery blend seamlessly. For instance, the use of sound transitions in a film can transport the audience with a single echoing basketball landing, instantly filling the space with a sense of openness. Background conversations and off-screen sounds complement the visuals, creating an integrated sensory experience. In scenes like a bustling classroom, varying sound levels from different angles and perspectives immerse the audience, making them feel present in the moment.

2. Creating a sense of a character's inner life, enhancing emotional atmosphere, and shaping character personas are all made possible through sound. Different spatial experiences can yield various artistic effects, forging distinct soundscapes that portray different characters' subjective emotions and psychological states. In the film, recurring scenes and dialogue are used with tone, duration, and intensity variations, allowing the audience to

perceive a breathing spatial dimension within them.

3. In the work, there are multiple instances where the camera focuses on Ying , but the audience hears the voices of classmates chatting and laughing in the classroom. This clever use of sound shapes Mizore's character (highlighting her sense of being out of place) and evokes different emotions in the audience.

In Liz and the Blue Bird, the music serves both lyrical and narrative purposes.

The music in the movie primarily serves to create background atmospheres, shape character personalities, and inner emotions, narrate the story, and make the plot more smooth and coherent. There are four chapters of music in total, titled Ordinary Days, A New Family, The End of Love and Flying to the Distance. The clever integration of music with the picture book elements weaves its way throughout the entire film, narrating the story with grace. Interestingly, the music plays a propulsive role in driving the movie's plot, guiding the development of the entire storyline. In this article, the author will analyze the music's exceptionally strong narrative function through the following points.

Firstly, music plays a crucial role in setting the atmospheric backdrop for the film, creating a specific mood or tone for a particular scene or the entire movie. It helps to establish the characteristics of time and space, thus enhancing the visual impact and emotional resonance of the scenes. This type of music doesn't merely replicate the visuals; instead, it intricately weaves a background ambiance that adds depth to the film's overall atmosphere. The film incorporates numerous elements of a fairy tale picture book, and the music plays a vital role in setting the atmosphere and enhancing the artistic appeal of the film. The sounds of the flute and oboe, ranging from light and lively to gentle and calm, contribute to the bright atmosphere of the entire picture book. Furthermore, when Ximei and Ying are walking together, even in situations with little or no dialogue, music can create an atmosphere within specific scenes of the film. In such cases, music intervenes from an auditory perspective, participating in the expression of the visual content of the scene. This further emphasizes the emotions of the characters within the frame and enhances the environmental atmosphere, ultimately deepening the visual impact.

Moreover, music can also shape the characters and their inner worlds. In the opening of Liz and the Blue Bird, the music accompanying the protagonist's entrance consists of single piano notes. When Ying is sitting alone on the stairs, these single notes create an atmosphere of inner tranquility, effectively shaping her character's quiet inner world. However, when Ximei enters the frame, the piano and marimba sounds, along with bird chirping, the rustling of leaves in the wind, and footsteps, all suddenly flood the scene. As Ximei approaches Ying, the melodic part of the piano performance joins in, followed by the marimba. Emphasizing Ximei's significance in Ying's world, the lively and joyful melody constantly conveys our protagonist's inner world. The moment Ying gets up to follow Ximei, a distinctive high-pitched single note is added to the melody, and at this point, the emotional rendering reaches its climax.

Furthermore, music in films can serve the purpose of connecting scenes and maintaining continuity. Sometimes, music acts like a ribbon, linking together scattered or disjointed shots. This is the cohesive role of music. Due to the limited time of a film, it's not always possible to extensively explain every brief shot, which is where music can play a vital role in bridging those gaps. And music, being non-spatial, connects these seemingly unrelated scenes, making them a cohesive whole. In the film, the tones of the flute and oboe complement the images of the girl and the bluebird in the picture book, creating a synergy of audio and visual language that becomes the primary driver of the plot.

Conclusion

In the film Liz and the Blue Bird, the author employs experimental techniques, using various visual storytelling methods and exceptionally nuanced music to take us on a sensory journey. The narrative technique of combining visuals and auditory elements complements each other, narrating the story of the two girls beautifully. The complexities of human relationships in real life, the estrangement that follows communication failures, and the challenges and anguish experienced in bridging that gap are all themes explored in the film. Just as in the duet between Ximei and Ying in the movie, it prompts us to consider how we can open up to others and overcome the challenges and difficulties that come with it. The entire film takes place within the confines of the school, with seemingly monotonous settings such as classrooms, hallways, and practice rooms. On the surface, this might appear limiting, but the film's use of sound not only enhances the spatial perception but also transforms the environment according to the needs of the plot, sometimes creating a sense of isolation and confinement, and at other times, openness and freedom.

Every corridor and room in the film possesses a serene and refined beauty, in stark contrast to the vibrant colors and lively music found in the world of fairy tales. Through subtle actions and gestures, the emotions of the characters are slowly revealed, and these moments are complemented by incidental sounds. Sound breathes life into the film, making it more vibrant and engaging. The composer used sounds from objects within the school as elements in the music, even recording sounds like touching walls or glass windows during their time in Kyoto. This approach was taken to create the most authentic effects in the music.

On the surface, Liz and the Blue Bird is a simple story, but that's also its most shining aspect. The author uses music and visuals to carve out profound emotions from this simplicity. We don't see the orchestra preparing for the competition; instead, we witness the story between the two girls. The final section of the movie suite, Flying to the Distance is the most emotional ending of all.

Reference

Lü, S., Pan, J., & Ren, Y. (2019). Research on Information Visualization Methods Based on Elderly Potted Plant Enthusiasts. Art Appreciation, 18, 71.

Zhang, L. (2017). Research on Information Visualization Design of Plants in the "Book of Songs". (Master's thesis). Xi'an Academy of Fine Arts.

Dawei Li,Lihong Xu,Chengxiang Tan,Erik D. Goodman,Daichang Fu,Longjiao Xin. Digitization and Visualization of Greenhouse Tomato Plants in Indoor Environments[J]. Sensors,2015,15(2).

Steven Braun.Data Visualization for Success:Interviews with 40 Experienced:Interviews with 40 Experienced Designers[M].Images Shenyang,2017

Johnson, S. (Author), & Xiong, T. (Translator). (Year). Death's End: How London's Great Plague Devastated a City and Shaped the World Today.Electronic Industry Press.

G.Robertson,S.K.Card and J.D.Mackinlay.The Cognitive Co-processor for Interactive User Interfaces.Proceedings of the ACM SIGGRAPH symposium on User interface software and technology,1989,Pages 10-18.

Zhang, W., & Cai, X. (2021). An Exploration of Information Visualization Design for Minnan Dialect Characters. Art World, 37(06), 149-158.

Li, S. (2019). Compendium of Materia Medica [M]. Beijing United Publishing Company.

Nigel Holmes .Wordless Diagrams[M].Bloomsbury USA.2005

Shen, F. (2018). An Analysis of Visual Elements in Information Visualization Design. Western Leather, 40(21), 95.

FU Jian-nan. The Application of Graphic Symbols in Graphic Design[J]. Business Herald, 2011(14): 265.

Yan. Discussion on the Application of Figurative Graphics in Logo Design[J]. Art and Technology, 2013 (6): 179.

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Unraveling the Healing Potential of Traditional Heritage and Childhood Scenarios — Using Narrative Public Art Installations as Healing Catalysts During Transformation Era

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Abstract

The intense competition and psychological distress brought on by the public health crisis emphasize the imperative for research on community emotional healing during the recovery and transformation phase. In this context, public art installations emerge as promising avenues with substantial therapeutic potential. This paper systematically analyzes the realistic bottleneck and development potential of emotional healing installations, then proposes five design strategies: blending into traditional context for community cohesion; nostalgia and emotional resonance through childhood gamescapes; modern presentation of traditional culture through multi-sensory integration; emphasizing community engagement and collaboration; embracing multiculturalism and facilitating inter-generational communication. Furthermore, this paper creates a prototype that promotes emotional well-being and envisions a more resilient, interconnected, and adaptable community capable of effectively facing complicated and dynamic social challenges during the transformation era.

Author keywords

Narrative public art installations; Community emotional healing; Childhood scenarios; Traditional heritage

Introduction

In contemporary society, intense competition and involution have led to widespread mental burdens on community residents (Gao et al., 2022). Moreover, the global public health crisis has presented unprecedented challenges, resulting in significant social upheaval and enduring impacts on individuals and communities. In comparison, the pandemic has primarily highlighted concerns about physical health, and the derived psychological problems are also severe (Wu & McGoogan, 2020). Many individuals have experienced various negative emotions, such as grief, anxiety, depression, and alienation, which might have long-term effects on mental well-being and social cohesion (Lam et al., 2009). The swift transformations in lifestyle, coupled with prolonged isolation, economic instability, and generalized grief, have contributed to an increasing number of community residents carrying heavy psychological burdens. Furthermore, communities have struggled to cope with fragmentation, mistrust, and collective trauma.

Under the pressure of fierce competition and the public health crisis, community rehabilitation and emotional

well-being emerge as vital factors in promoting individual and communal resilience, which involves fostering connections and rebuilding social bonds among community members (Cénat et al., 2021). Similarly, encouraging mutual understanding and support among community members cultivates attitudes of tolerance, compassion, and unity, enabling communities to confront adversities more effectively, adapt to changes, and proactively avert crisis escalation (Cheng et al., 2018).

Research on community emotional healing provides a valuable framework for understanding the complex interactions between individual emotions and community dynamics (Cleveland, 2014). During this period of recovery and transformation, the exploration of community emotional healing has gained heightened urgency, necessity, and practical significance. This paper integrates inspirations from arts, design, culture, medicine, sociology, and psychology, enhancing resilience and adaptability in challenging circumstances. Through an in-depth investigation into the origins of community emotional healing, the primary objective of this research is to furnish evidence-based design strategies that rejuvenate interpersonal relationships, restore collective cultural identity, and alleviate psychological afflictions. By fostering novel strengths, cohesion, and hope, this research seeks to empower communities to navigate through this transformative phase with resilience and optimism.

The community healing potential of public art installations

Residents in a suboptimal mental state live across various city locations. However, merely 10% of the population actively seeks psychological support, leaving approximately 90% of the residents without assistance despite facing diverse stressors (Hyland et al., 2020). The existing centralized healing hospitals or centers face difficulties reaching the "silent majority." Nevertheless, there are many leftover spaces dispersed in the city. Through the intervention of public art installations, those "ignoring areas "possess the potential to act as emotional healing catalysts. During periods characterized by recovery and transformation, these art installations may mitigate residents' psychological pressures and foster community cohesion. Furthermore, the concept of community healing through public art installations can be substantiated by the following points:

1.Creating Gathering Spaces: Public spaces are crucial in facilitating social interactions and community engagement, attracting individuals from diverse backgrounds to share their ideas and experiences (Han, 2016). Whether in the form of parks, squares, or designated art installations, these spaces encourage social networking, fostering connections among community members and enhancing social capital (Chen, 2012).

2.Encouraging Participation and Collaboration: The creation and maintenance of public installations often rely on community involvement and collaboration (Cheatle & Jackson, 2015). Community members can contribute ideas, artworks, or resources, nurturing a sense of ownership, deepening their engagement with the community, creating opportunities for socializing, and promoting connections between strangers (Philipp et al., 2015).

3.Cultivating Collective Memories: Public art installations hold the potential to create emotional responses and shared memories within communities (Ladino, 2019). As these installations become integral parts of the community's physical and cultural landscape, they serve as landmarks that trigger the recollection of past events. Community members develop a sense of shared identity and heritage through this collective memory, reinforcing their connections to other communities (Weijs-Perrée et al., 2020).

4.Promoting Cultural Diversity and Inclusivity: Public art installations that highlight various cultural elements or celebrate cultural diversity can foster cross-cultural understanding and inclusivity (Rau, 2022). These installations transcend social barriers by providing platforms for different cultural groups to express their heritage and narratives, promoting inclusivity among community residents and creating a more harmonious society(Lake et al., 2022).

In summary, public art installations show significant therapeutic potential by serving as healing catalysts in fostering community cohesion. By creating gathering spaces, encouraging participation and collaboration, cultivating collective memories, and promoting cultural diversity and inclusivity, public art installations could nurture a collective sense of hope, resilience, and communal healing awareness to create environments characterized by increased empathy, diversity, and emotional resilience.

Narrative design strategies for emotional healing public art installations

The central vision of narrative emotional healing public art installations is to help more individuals overcome feelings of isolation, thereby comfortably transitioning into the new normal life, which could be understood as how the environment influences individual emotions and social behavior. Based on the vision, this paper proposes three research questions:

1.How can public art installations possess narrative and inclusive adaptability in alleviating mental stress?

2.How can emotional healing installations attract natural and comfortable engagement from individuals during their daily lives?

3.How can public art installations transcend conventional aesthetic considerations, acting as touchpoints of communication and participation for diverse stakeholders, thereby catalyzing further social innovation?

In order to address these research questions, we conduct a comprehensive literature review to identify the existing constraints and untapped opportunities of public art installations. Subsequently, we derive five design strategies to illustrate the concepts more vividly.

Blending into Traditional Context for Community Cohesion

Designers can employ an anthropological approach to investigate representative cultural traditions, values, performances, rituals, and celebrations (Castro et al., 2010). Extracting emblematic patterns, colors, structures, interactive elements, and other elements from traditional culture, creatively integrating them into public art installations. This process aims to create a novel sensory experience that resonates with the community's collective memory, invoking positive emotions and fostering a sense of unity (Sun, 2012). Integrating traditional cultural elements into public art installations can serve as touchpoints for cultural traditions and historical narratives, allowing community members to reconnect with their cultural roots and revisit childhood memories associated with traditional customs. Furthermore, they can harmoniously blend with the surrounding environment and community spaces. Community engagement in familiar cultural activities can evoke nostalgia, cultivating community members' sense of unity and belonging.

Nostalgia and Emotional Resonance through Childhood Gamescapes

Designers can adopt psychological approaches to explore the emotional resonance of childhood gamescapes within the community. Through qualitative methods like in-depth interviews and observations, they can identify significant events, characters, and sensory details associated with joyful and comforting experiences during childhood games (Calik et al., 2022). By symbolically incorporating these elements into public art installations, designers can visually resonate with nostalgia, trigger emotional connections, provide a sense of familiarity, reduce the threshold for interacting with public art installations, and allow more passersby to engage comfortably.

Modern Presentation of Traditional Culture through Multi-Sensory Integration

Incorporating technology into therapeutic strategies has shown promising potential in expanding the scope and efficacy of treatments. Emerging technologies such as artificial intelligence, 3D printing, virtual reality, digital design, and interactive systems have transformed the conventional static approach of public art installations, making them more enriched and dynamic sensory experiences, fostering a sense of openness and creativity

(Baños et al., 2011). Fragrances, music, and environmental sounds could create a holistic and emotionally resonant experience (Born, 2013). Moreover, by capitalizing on multi-sensory stimulation, public installations can create immersive and experiential encounter for visitors, allowing them to establish deeper connections with installations.

Emphasizing Community Engagement and Collaboration

Fostering connections within the community is crucial for promoting emotional healing. Public art installations are effective platforms for community engagement, constructive discussions, and collaborative efforts, enabling individuals to come together, share their stories, and contribute to the creative process (Callahan, 2007). By encouraging social interactions and cooperation through community-based activities, public art installations help bridge the gap caused by prolonged isolation and allow community members, including children and adolescents, to express their unique perspectives, stories, and artistic expressions (Lake et al., 2022). This collaborative approach ensures that installations authentically reflect diverse viewpoints and memories within the community, strengthening emotional resonance while promoting the establishment of emotionally resilient communities.

Embracing Multiculturalism and Facilitating Inter-generational Communication

Public art installations promote multicultural appreciation and inter-generational communication, encouraging community members to recount their personal stories and associated emotions. These stories can act as sources of inspiration and emotional connections, fostering inter-generational communication that promotes emotional healing. Moreover, public art installations can become platforms for residents from different backgrounds to showcase their diverse cultures. By engaging in cultural exchanges and shared experiences, community members could cultivate empathy and establish profound emotional connections (Lee, 2004).

Prototype design of narrative emotional healing installations

Traditionally, centralized rehabilitation hospitals and parks have primarily provided community-based emotional therapy, relying on individuals to recognize their mental health challenges and actively seek assistance. Unfortunately, the majority of them struggle with intense psychological distress without seeking help (Hyland et al., 2020). To address this issue, this paper proposes public art installations as emotional catalysts within the community and discovers five design strategies focused on narrative emotional healing. As shown in Figure 1, we choose Chifeng Road as a prototype area for emotional therapy interventions. The healing interventions were placed in the leftover spaces to avoid interfering with residents' daily routines. By fostering a healthy mental state and creating a compassionate community atmosphere, these interventions have the potential to alleviate sporadic, extreme crises and encourage further social advancement.

Figure 1. The design team choose Chifeng Road as a prototype area for emotional therapy interventions. Source: the author.

Dragon Boat installation

The dragon boat installation is located at the central point of Chifeng Road, close to the bus stop on Miyun Road. The touchpoint features a large and captivating wall painting depicting a dynamic dragon boat race, celebrating the Dragon Boat Festival, one of the most recognized traditional Chinese festivals. The installation's color palette echoes the red graffiti on the side poles to blend with the street's existing ambiance harmoniously, creating a seamless fusion of tradition and modernity. Inspired by the dragon boat, the emotional healing installation artfully incorporates critical elements, albeit simplified, to ensure accessible and engaging experiences. The interactive method engages residents and tourists to stand aboard the boat with their feet staggered. Upon grasping the paddle attached to the bottom platform, the dragon boat will sway with residents' rhythmic body movements.

This emotionally evocative experience is an empowering and therapeutic activity, nurturing a sense of connection with traditional cultural heritage while fostering a collective feeling of joy and togetherness. The interactive play scenario facilitates social interactions among community members and visitors, contributing to developing a compassionate and harmonious community atmosphere. This installation represents a promising prototype for incorporating public art as a catalyst for emotional healing and community well-being.

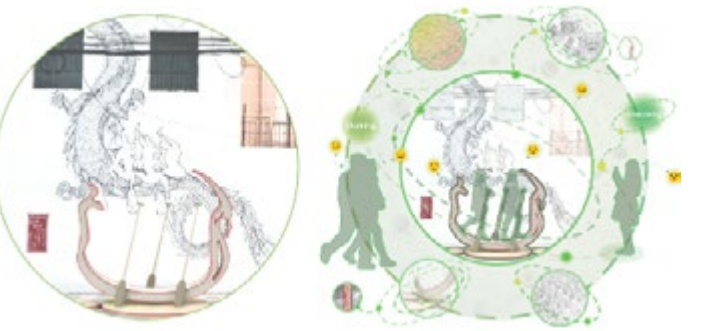

Figure 2. Dragon Boat installation. Source: the author.

Conclusion

During the period of recovery and transformation, integrating traditional culture and childhood game scenarios into public art installations demonstrates tremendous healing potential in fostering a cohesive community atmosphere. Resonating with traditional culture can evoke positive emotional experience. Additionally, incorporating symbols and themes from childhood games scenarios can deeply resonate with community members, promoting profound emotional healing and a deeper sense of community inclusiveness.

Moreover, narrative emotional healing public art installations could serve as effective facilitators of intergenerational communication, allowing community members to share emotions and memories, fostering empathy, mutual understanding, and cross-cultural appreciation to nurturing empathy, promoting emotional healing, and fostering a strong sense of unity among community members to face increasingly complex real-world challenges and potential future public health crises.

References

Baños, R. M., Guillen, V., Quero, S., García-Palacios, A., Alcaniz, M., & Botella, C. (2011). A virtual reality system for the treatment of stress-related disorders: A preliminary analysis of efficacy compared to a standard cognitive behavioral program. International Journal of Human-Computer Studies, 69(9), 602–613. https://doi.org/10.1016/j.ijhcs.2011.06.002

Born, G. (2013). Introduction-music, sound and space: Transformations of public and private experience. https://doi.org/10.1017/CBO9780511675850.001

Calik, A., Cakmak, B., Kapucu, S., & Inkaya, B. (2022). The effectiveness of serious games designed for infection

prevention and promotion of safe behaviors of senior nursing students during the COVID-19 pandemic. American Journal of Infection Control, 50(12), 1360–1367.

Callahan, K. (2007). Citizen participation: Models and methods. International Journal of Public Administration, 30(11), 1179–1196.

Castro, F. G., Barrera, M., & Holleran Steiker, L. K. (2010). Issues and Challenges in the Design of Culturally Adapted Evidence-Based Interventions. Annual Review of Clinical Psychology, 6(1), 213–239. https://doi.org/10.1146/annurev-clinpsy-033109-132032

Cénat, J. M., Blais-Rochette, C., Kokou-Kpolou, C. K., Noorishad, P.-G., Mukunzi, J. N., McIntee, S.-E., Dalexis, R. D., Goulet, M.-A., & Labelle, P. R. (2021). Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: A systematic review and meta-analysis. Psychiatry Research, 295, 113599.

Cheatle, A., & Jackson, S. J. (2015). Digital entanglements: Craft, computation and collaboration in fine art furniture production. Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing, 958–968.

Chen, A. Y.-C. (2012). Visual Melodies: Design and Evaluation of an Interactive Art Installation for Clinical Environments.

Cheng, J.-F., Chen, C.-Y., Lin, M.-C., & Huang, X.-Y. (2018). To explore the efficacy of community rehabilitation for facilitating daily function among patients with mental illness. Perspectives in Psychiatric Care, 54(4), 580–585. https://doi.org/10.1111/ppc.12283

Cleveland, A. C. (2014). Symbiosis between biophilic design and restorative healing environments: The impact on overall well-being of urban dwellers [PhD Thesis]. The Florida State University.

Gao, T., Tian, J., Zhang, X., & Zhou, H. (2022). Research on Urban Furniture Intervention to Foster Community Emotional Healing. In G. Bruyns & H. Wei (Eds.), [ ] With Design: Reinventing Design Modes (pp. 3097–3111). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-4472-7_200

Han, S. L. (2016). Improving mental wellbeing on college campuses through participatory art installation [PhD Thesis]. Massachusetts Institute of Technology.

Hyland, P., Shevlin, M., McBride, O., Murphy, J., Karatzias, T., Bentall, R. P., Martinez, A., & Vallières, F. (2020). Anxiety and depression in the Republic of Ireland during the COVID-19 pandemic. Acta Psychiatrica Scandinavica, 142(3), 249–256.

Ladino, J. K. (2019). Memorials matter: Emotion, environment and public memory at American historical sites. University of Nevada Press.

Lake, D., Marshall, D., Carducci, R., & Thurnes, T. (2022). The Power and Place Collaborative: Participatory Strategies for Scaling. Contexts – The Systemic Design Journal, 1. https://doi.org/10.58279/v1005

Lam, M. H.-B., Wing, Y.-K., Yu, M. W.-M., Leung, C.-M., Ma, R. C. W., Kong, A. P. S., So, W. Y., Fong, S. Y.-Y., & Lam, S.-P. (2009). Mental Morbidities and Chronic Fatigue in Severe Acute Respiratory Syndrome Survivors: Long-term Follow-up. Archives of Internal Medicine, 169(22), 2142–2147. https://doi.org/10.1001/archinternmed.2009.384

Lee, K.-P. (2004). Design Methods for Cross-Cultural Collaborative Design Project. DRS Biennial Conference Series. https://dl.designresearchsociety.org/drs-conference-papers/drs2004/researchpapers/128

Philipp, R., Gibbons, N., Thorne, P., Wiltshire, L., Burrough, J., & Easterby, J. (2015). Evaluation of a community arts installation event in support of public health. Perspectives in Public Health, 135(1), 43–48. https://doi.org/10.1177/1757913914548155

Rau, P.-L. P. (Ed.). (2022). Cross-Cultural Design. Interaction Design Across Cultures: 14th International Conference, CCD 2022, Held as Part of the 24th HCI International Conference, HCII 2022, Virtual Event, June 26 – July 1, 2022,

Proceedings, Part I (Vol. 13311). Springer International Publishing. https://doi.org/10.1007/978-3-031-06038-0
Sun, H. (2012). Cross-Cultural Technology Design: Creating Culture-Sensitive Technology for Local Users. Oxford University Press, USA.
Weijs-Perrée, M., Dane, G., & van den Berg, P. (2020). Analyzing the relationships between citizens' emotions and their momentary satisfaction in urban public spaces. Sustainability, 12(19), 7921. https://doi.org/10.3390/su12197921
Wu, Z., & McGoogan, J. M. (2020). Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. Jama, 323(13), 1239–1242. https://doi.org/10.1001/jama.2020.2648

Design Study on Constructing a Three-dimensional Slow Traffic Network Based on the Context of Urban Renewal

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Abstract

Urban regeneration is accelerating the development of high quality cities and building a high quality of life in cities, which is an inevitable necessity for the urbanisation process of Chinese society and also for sustainable development. Along with the deepening of China's urbanisation process, city streets and all parts of the city's travelling space have been transformed from being accessible to being comfortable and service-oriented. The purpose of urban renewal is to integrate social resources and services, and to build a people-centred, comfortable and green living space. The same goal applies to the transport system: a people-centred, healthy, comfortable and fast transport system is the need of the future. Among the many transport systems with the highest level of human participation in urban transport is the slow-moving road transport network. The pedestrian transport system is both a major part of the overall urban road transport system and the main method for ordinary citizens to deal with short-distance travel. The choice of public transport options for slow-moving trips can achieve the reduction of urban congestion, reduce pollution and create a safe and smooth urban environment. This paper begins by sorting out the developmental lineage of urbanisation and the theory and practice of urban renewal, and collating the characteristics of the future city in the context of urban renewal, so as to sort out the keywords for constructing future intelligent transport. It explores how the members of the society in the new era can self-define the slow-moving network in the future travelling, and the composition of the new slow-moving network under a variety of social relations. As well as how to build a three-dimensional new slow-moving network, which will lead to more interactive possibilities between people and transport, people and buildings, and buildings and transport, and also bring more modes of transport and lifestyles.

Author keywords

Slow traffic; shared space; transport system; urban renewal;

Introductory

With the advent of the smart city era, the demand for a higher level and quality of urban services, and the need for fine-grained intra-city spatial management is becoming more and more urgent. With the development and maturity of emerging technologies, the future of urban space is also changing: intelligence, energy efficiency and instant services are the keywords of the future urban space. In such a rapidly developing social context, how to balance the "fast" and "slow" in urban life, i.e., to balance the background of the rapidly developing technological era, and at the same time enable people to return to the essence of life. As times have changed, how have cities designed their streets throughout history to support a livable, human-centred living space? How should we shape our streets and curbs today to ensure that we realise smart transport travel scenarios tomorrow.

History and Practical Development of Urban Renewal Theory

Urbanisation is a complex social phenomenon influenced by many factors, such as population, economy, geography and culture. Cities have emerged with the emergence of human civilisation, and as the carrier of human civilisation, their own concepts have been enriched and become more and more complex in the course of history. The excavation of the historical city model is carried out from the two research meridians of ancient and modern, east and west, so as to explore and study the relationship between the city and the people, the city and the traffic space, and the city and the living space.

Cities are living organisms that gather human beings to live in an environment, and like real living organisms, cities have metabolisms and energy transformations. In the history of urban renewal in the world, a large number of theories and practices on building ideal cities have emerged from the agricultural era to the industrial era. A large number of ideal city theories are representative of the theory and practice of urban development process, such as traffic congestion and environmental degradation and other problems. In 1898, Sir Ebenezer Howard first put forward the concept of "idyllic city" in his book "The Idyllic City of Tomorrow". The main content of the theory is to combine the city and the countryside, so as to put forward a new way of thinking and solutions to the environmental degradation and speechlessness of the city. Since then, two experimental garden cities have been established based on this theory, which are still green and healthy communities today. The theory of "organic sprawl", represented by the Finnish scholar Ariel Saarinen, was first proposed in 1942 in his book "The City: Its Development, Decline and Future". It is an important theory related to urban agglomeration and dispersion based on the traffic and environmental problems caused by excessive urban concentration. In the early 1930's, the author of City of Lights, Corbusier, with Paris as the key object of observation, pointed out that "the fundamental malady of the modern city is the spatial logic of capitalism, characterised by the incentives of desire and the depletion of capital. It pulls people into an existence that is anti-freedom, anti-nature, and anti-equilibrium." The idea of Kouki City transformed the city with a new way of thinking about construction, envisioning a metropolis with high-rise buildings, a modern transport network and large green spaces to provide a sunny, modern living environment. It is now regarded by the architectural community as one of the five principles of modern architecture. Wright's Hiroko City Theory and Kisho Kurokawa's Symbiotic City Theory have had a profound impact on actual urban planning and urban space design.

Due to the rapid development of emerging technologies and the transformation of traditional concepts of urban space architecture, the "requirements" of human urbanisation, or the city itself, have begun to develop towards intelligence, digitisation, and interconnectivity. The construction of smart cities is a dynamic development process, which enriches the connotation of smart cities in the process of development. From the early definitions to the updated definitions year by year, it can be noticed that today's experience in the construction of smart cities adds to and deepens the understanding of the connotation of smart cities. Technology is no longer the core of smart cities, but the basic means of smart cities. The focus of smart cities has been upgraded from the technology of basic city operation systems to the recognition and perception of city residents. Nowadays, more and more research institutes are putting "people-centred" at the top of the whole framework of smart city modelling. At the same time, with the development of artificial intelligence, digital ovality and other emerging technologies, the construction of smart cities is not limited to the physical reality of the space, the virtual digital urban space is also an important part of the current and future development of the smart city, the dimensions of the smart city will be more broadened, but also to create the future of more behavioural activities, lifestyle, leisure, travel more possibilities.

The need for the development of "slow spaces" for urban life

The pace of urban development is changing rapidly, and in the process of promoting urbanisation, the high speed and high density of development and the level of human activity in this context have far exceeded the carrying capacity of the urban ecology. As a result, a series of urban problems and big city diseases have arisen, negatively affecting the psychological state and physical health of urban residents, and thus creating a negative feedback on urban space. How to carry out urban development in a healthy way requires balancing the fast and the slow in the city and focusing on the daily life space of the city, such as the space where daily activities such as commuting, leisure and shopping take place.

Nowadays, urban living space should pay more attention to the integration of resources and coordinated development within the "living circle", provide livable, comfortable and shared public spaces and communities, and balance the relationship between ecology and spatial development. According to existing research, the future living space should be an integrated system, focusing on eight aspects of innovation, including future education, future health, future architecture, future transport, future services, future neighbourhoods and low-carbon development. Firstly, build an ecological space where the city and nature coexist; configure intelligent public facilities to activate the vitality of the living space; optimise the urban transport system based on the demand for urban slow-moving space; cultivate green and low-carbon travelling modes and configure green and energy-saving transport means; and integrate spatial resources to create an open and shared space.

The Need for a People-Centred Slow-moving Transport Network in the Context of Urban Renewal

Urban renewal is not only a hardware transformation of old buildings and facilities, but also a renewal of software such as the ecological environment, which has a direct bearing on the health of residents and the safety and comfort of their lives.[1]The history of urban regeneration shows that the aim is to integrate social resources and services to create a comfortable and green living space that is people-centred. The same goal is applied to the transport system - to build a people-centred, healthy and fast transport system that is the need of the future.

1.Overview of urban slow-moving transport networks

Various types of slow walking and walking lanes, walking and cycling transport networks, roadside footpaths and non-motorised paths on major and minor arterial roads and side roads plus urban slow walking nodes such as urban core nodes, community nodes and cultural development points constitute the urban slow walking network.The slow traffic network in the context of the future smart city should meet the two aspects of travelling happiness and travelling as a service. Because the purpose of future travelling is not just to assist human beings to reach their destinations, but to pay more attention to the feelings of travellers and to continuously improve their confidence and happiness. Urban residents live in a three-dimensional space composed of urban roads and building facades, and the various elements in this spatial structure form a three-dimensional travelling place for the daily life of urban residents, which means that the future slow-moving network travelling scenario will be an accurate match with the spiritual needs of users.

2.Establishing the need for scenario flows in the slow-moving transport network

Human consciousness is highly scenario-based as well as real-time, and because of this, the core of consciousness of different scenarios naturally generates the flow of emotions in time and space through the different experiences of the participants. Therefore, there is no space in the essence of scene flow, on the contrary, it is through the connection of space full of emotions and atmosphere creation, realising a new concept of time and emotion. The future of the slow-moving network is to form a dynamic common body from time itself, space, and emotional activities, and then add the emotional atmosphere rendering to the space to form a personal scene flow. This will lead to a future of mobility that is based on the two aspects of mobility happiness and mobility-as-

a-service, with the unique colours of the participants.

3.Current Issues in Urban Slow-moving Transport Networks

3.1.Positioning is trivialised

Slow transport has become the most important way of short-distance travelling for human beings, as well as the most effective means of human leisure activities, throughout all the corners of the urban public space, but often occupies a smaller proportion in the process of urban public space construction and road resource allocation, and nowadays the space of the urban walking and cycling network has been more and more occupied by the space of the motor vehicle, and the natural environment of slow transport The natural environment for slow-moving traffic is also deteriorating.

3.2.Networks are segmented

In the context of new car-based urban planning and policies, the original safe and comfortable urban slow-moving transport network is gradually being fragmented and fragmented.

3.3.Space encroachment

Road planning, design and management have paid too much attention to and emphasised the traffic function, while neglecting the spatial function of the street, resulting in urban space being encroached upon by motor vehicle traffic, making the city lack a living public space.

3.4.Lack of character

The landscape of the majority of urban slow road is generally consistent, only because of the architectural design concept style is relatively single obsolete, the road structure is also more traditional single, the overall sense and sense of experience is not enough, so more often or consider a local environment of the overall design, and no mutual communication and integration, so the lack of overall consistency of space. And the greening arrangement in the space is more or less the same, lacking some spatial hierarchy.

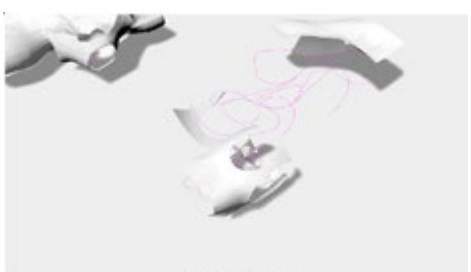
Optimising urban slow-moving transport networks based on urban slow-moving demand

1.Möbius Ring - The Blurring of Definitions Inside and Outside Public Space

"A Möbius ring is an expanding shape and its shape is maintained constant by distortion, expansion, contraction, or any deformation; it is a transformation from a plane to three dimensions." Such a concept makes me think about the slow travelling network in a new way, whether our roads can also complete the transformation from flat to three-dimensional, thus generating more usable space and making the activities of people in them more diversified as well as interesting. Another definition of the Möbius loop is the blurring of the inner and outer boundaries - although it is possible to say positive and negative for each part, it is not possible to distinguish positive from negative for the whole, and this kind of surface is a "unilateral surface" that has only one face. If one travels freely in such a two-dimensional world, one can go around the whole world without having to cross borders. Based on this concept, we discussed the design composition of the slow-moving space.

2.Generation of a three-dimensional urban slow-moving transport network

By extracting the linear data of the slow walking space in the urban area, based on the structure of Möbius ring, a new slow walking space is parametrically generated on the original space. The new slow walking network connects to the original building and creates a three-dimensional parameterised network based on the invisible space, in which people can participate more organically in the whole space.



author's own production

Conclusion

With the development of smart cities and the arrival of the era of

big epidemics, an unprecedented test has been put forward for public transport travelling. This paper focuses on the part of urban slow transport, which is not only an important mode of transport, but also a way of life, which can effectively relieve the pressure brought by the fast pace of the city as well as the current big city disease. Slow Mobility Network is a network structure made up of three parts: people, transport and buildings. Starting from the logical structural element of Möbius' ring, the distinction between internal and external structures in urban public space will be blurred, thus creating more possibilities for people's lifestyles. By depicting the grid structure of the original buildings in the study area, the parameterised building structure is generated to optimise the slow-moving space in the area. It also brings new thoughts on the layout and structure of the future slow-moving network.

References

[1] Pan Lin. The essence of urban renewal is to make people happier. The Learning Times 2021:1006(007).
[2] Jane Jacobs,Jin Hengshan. The Death and Life of Great American Cities[J]. Expo Books,2020(10):35.
[3] SUN Ting, LIU Hao. A review of research on the identification and planning of slow-moving environmental elements under the perspective of "behaviour-space" interaction[J]. Urban and rural planning,2021(03):111-117.
[4] Li Jun, Zhou Yongxian. Research on the development history and law of urbanisation in the world[J]. Jiangxi Building Materials,2015(08):61+67.History of Western Urban Development.
[5] Han. Multiple Imagery of Streets and Its Governance Mechanism - A Spatial Analysis Based on Street Types[J]. New Horizons,2018(01):64-71.
[6] Su Mi'e. Urban living space design strategy under the concept of slow city[C]//. Spatial Governance for High Quality Development - Proceedings of the Annual Conference on Urban Planning in China 2021 (07 Urban Design). ,2021:1003-1013.DOI:10.26914/c.cnkihy.2021.026581.
[7] Liu Bingqian. Research on Slow Walking Network in Beijing's Old Neighbourhoods in the Context of Shared Streets[C]//. Innovation Driven and Intelligent Development - Proceedings of the 2018 Annual Conference on Urban Transport Planning in China. [Publisher unknown],2018:13-27.
[8] Chen Han. Exploration of urban slow traffic[J]. Housing and Real Estate,2019(30):209-210.
[9] ZHAO Wei, ZHANG Yan. A preliminary study on the renewal strategy of urban street slow walking space--Taking three major arterial roads in Beijing as an example[J]. Art Dazhan,2020(09):129-131.
[10] Xu Buzheng, Architectural Science T000450, History of Western Urban Planning Thought. Liu Binjie, Wu Shulin, Yan Xiaohong, eds, China Book Yearbook, Hubei People's Publishing House, 2006, 599, Yearbook.

Research on the user experience elements of the future social kitchen in China from the perspective of affordance

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Abstract

the environment within the context of the kitchen system. Its primary objective is to analyze user experience components relevant to the development of the future Chinese social kitchen, envisioning the kitchen as a hub for social and cultural interactions, facilitating deeper connections among family and friends. To achieve this, the study adopts a comprehensive framework encompassing six Methodologically, it relies on sample recording and user interviews to identify operational challenges and user expectations during meal preparation activities, thus elucidating the experiential requirements of users within a social kitchen environment. Furthermore, the paper delves into the affordance design strategy for the forthcoming social kitchen, scrutinizing it through the perspectives of functionality, perception, physicality, cognition, emotion, and technology.

Author keywords

User experience; affordance; social kitchen

Introduction

Over time, the role of the kitchen in contemporary Chinese society has evolved beyond its culinary function. Notable advancements in kitchen functionality, usability, and human-computer interaction have occurred. As individuals satisfy their basic needs, they increasingly focus on the emotional and spiritual aspects of kitchen life. The kitchen has transformed into an interactive space, blending family activities, service experiences, and cultural heritage, leading to the concept of the 'social kitchen.'

The pandemic has prompted more people to engage in cooking, with post- 2022 reports indicating a preference for home gatherings during major holidays. Easy access to online resources has lowered the barrier to cooking, providing psychological satisfaction when sharing homemade dishes. However, group cooking during social gatherings requires consideration of diverse dietary preferences, eating habits, and culinary styles. Chinese cuisine's complexity demands careful pre-planning due to varying cooking techniques and hot dishes. Enhancing the service experience in domestic kitchens is now a design opportunity in the evolving social kitchen context, focusing on optimizing lifestyle factors.

This paper introduces the concept of 'affordance' from ecological psychology to explore user experience elements in Chinese kitchen design. Affordance, as coined by James J. Gibson (1979), refers to the attributes an environment offers an organism, facilitating their interaction with it. Checking the kitchen
experience through a affordance lens improves product utilization efficiency and overall satisfaction, creating an

enjoyable dining journey from preparation to post-meal.

The role of affordance in the user experience system

Donald Norman (1990) introduced the concept of 'affordance' to design in 'The Design of Everyday Things'. He used this concept to explain how products can inspire and guide user interactions based on user needs, emphasizing the importance of good product design in providing user insights. Building on Norman's work, Hartson (2003) expanded affordances into four categories: functional, cognitive, physical, and perceived. Functional affordance helps users complete specific tasks, while cognitive affordance aids in understanding product features. Perceived affordance involves design elements perceived through visual and auditory cues, and physical affordance aligns with users' physical characteristics and habits for successful actions.

In human-computer interaction, Vallverd (2018) introduced 'emotional affordance' to describe design features eliciting emotional satisfaction. Users can have emotional responses to certain product features. In communication studies, Leonardi (2011) sees affordance as technology's potential to impact daily life, considering the Internet's functions and technology-driven actions. In design, 'technology affordance' covers design features relying on technology, including innovative Internet interactions and advanced functionalities in high-tech products.

In the realm of user experience research, three fundamental aspects hold academic prominence: the user, the product, and the interactive environment. ISO 9241-210 provides an important definition, describing user experience as the response and result of the use or intended use of a product, system or service. The development of user experience is influenced by diverse factors, including user psychology and contextual elements, entailing inherent uncertainties. Drawing from Maslow's hierarchy of needs, Chen Wei (2011) introduced six elements and demand levels in user experience design. These encompass practical product functionality, sensory and perceived aspects, interactive expectations, emotional considerations, social aspects, and self- fulfillment desires. These demands reflect users' expectations regarding the environment and the product, highlighting their accessibility expectations. The affordance perspective aids in evaluating user experiential demands at different stages, facilitating the determination of element design priorities within the experiential process.

Figure 1. The six elements of user experience and affordance.

The contemporary social kitchen experience in China

In China, the kitchen serves as a dedicated space for culinary activities within households. It combines functions tailored to cooking habits and ergonomic principles, facilitating tasks like washing, chopping, cooking, and storage.

User behavior in the kitchen aligns with their lifestyle and dietary preferences. The complexity of kitchen spaces makes translating user needs accurately crucial to enhancing user experiences. The concept of the 'social kitchen' emphasizes emotional expression and self-fulfillment during cooking.

To assess the current experiential journey in the context of a social kitchen, this study employed an approach involving sample recording of behavior and family interviews. A total of 60 kitchen users from regions including Jiangsu, Zhejiang, Sichuan, Hunan, and Henan were interviewed. In addition, the kitchen activities of five urban users were tracked and recorded during a family gathering event involving eight people. The examination revealed that activities revolving around a Chinese-oriented dinner party in the kitchen primarily encompassed

menu planning, ingredient preparation, shopping, storage, preprocessing, cooking, setting, dining, tidying, and cleaning. Through a synthesis of subjective feedback and users' conscious or subconscious behaviors, we analyzed the pain points and aspirations of users while preparing meals for gatherings. These key findings notably include:

1. Preparation Challenges: Menu selection difficulties due to diverse dietary preferences; Last-minute ingredient sourcing; Misplaced items in storage.
2. Operation Issues: Congested preparation zones, limited workspace, and appliance errors; Difficulty distinguishing condiments.
3. Safety Concerns: Handling water and electrical appliances requires caution.
4. Time Management: Managing cooking efficiency and dish preparation order.
5. Emotions Aspects: Positive atmosphere with collaboration, loneliness, and stress when cooking alone; Willingness to seek food opinions and experiment.

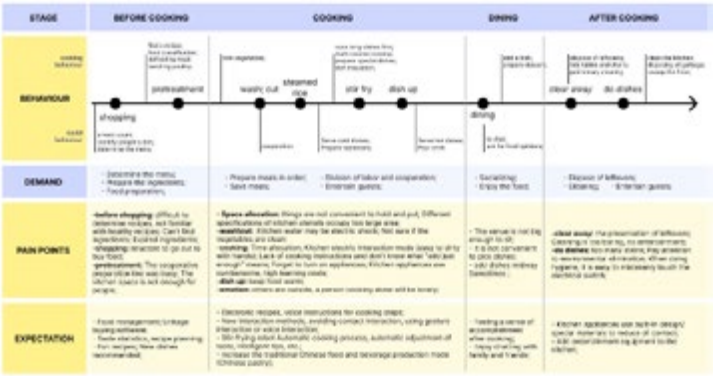

Figure 2. Social kitchen experience process and user expectations.

Strategies for affordances in the context of the social kitchen experience

Based on user surveys, we discern both pain points and anticipations. According to the affordance attribute and classification, the experience design

strategy of the kitchen system is analyzed according to the principle of affordance:

1. Diversified Functional Affordance: The kitchen, with its multifunctional nature, should offer users efficient, multifunctional products to save space and meet various needs (e.g., cooking, storage, and socializing).
2. Self-Selectable Multi-modal perception affordance: Implement voice reminders and body sensing to enhance the user experience by reducing neglect of prompts and increasing the fun of kitchen tasks.
3. Simplified Physical Affordance: Optimize ergonomics to provide users with suitable spaces, distances, and heights. Simplify operations to reduce complexity.
4. Standardized Cognitive Affordance: Establish industry-wide cognitive standards, including unified operations and recognizable icons, to reduce user learning costs and errors.
5.Emotional Affordance: Improve user satisfaction through user-centric designs and enhance relationships through cooperative kitchen activities.
6. Technological Affordance: Recent technological breakthroughs have introduced innovative features and interactions into kitchen spaces, such as low-sugar rice cookers and sleek range hoods. Furthermore, the integration of virtual reality technology has spurred diverse advancements in kitchen design.

Integrated physical, functional and cognitive affordance: kitchen layout and dimensioning for collaborative cooking

Compared with the traditional kitchen, the social kitchen shows higher versatility in function, and adopts a diversified open space configuration as a prominent design track in the future. Consequently, social kitchens must meticulously consider user preferences and aesthetic considerations when entertaining guests. At the same time, the kitchen space must be effectively constructed to mitigate potential clutter issues, which is especially important where multiple users are involved. For instance, the Chinese culinary tradition, which often adheres

to a specific sequence of operations: ingredient selection, vegetable washing, vegetable cutting, and the final cooking phase. The strategic placement of key appliances such as the refrigerator, sink, preparation area, and cooking station plays a pivotal role in ensuring operational efficiency, particularly within communal kitchen environments.

In addition, optimizing space utilization within the kitchen area is essential to prevent shrinkage.Based on anthropometric data, this suggests that Chinese adults typically have a shoulder width of about 400mm and a chest thickness of about 260mm, with 750mm across a sidewalk considered sufficient to facilitate the passage of two people. To enhance comfort and encourage interpersonal interaction while maneuvering with utensils, it is recommended that an aisle width of no less than 900mm be considered, as indicated by scholarly research (Li Junhua & Liu Fang, 2017).

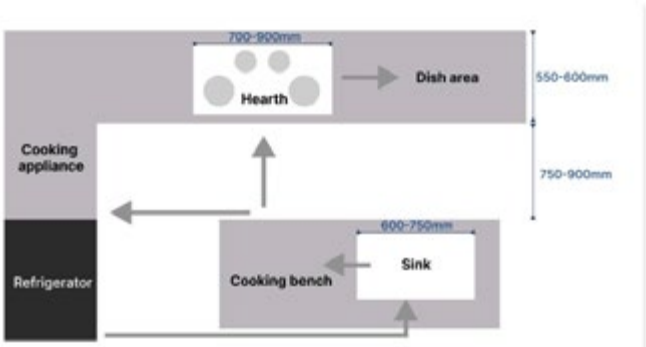

Figure 2. Kitchen activity path planning and size ergonomics.

Affordance breaks culinary constraints: enabling universal participation in cooking

Using the Internet of Things (IoT) technology, we can effectively alleviate the concerns associated with culinary preparations for social gatherings, thereby promoting wider participation in the culinary process. To this end, two key facets are emphasized:

Firstly, prior to the gathering, participants are encouraged to document their personal food preferences and meal plans. During the event itself, the organizer only needs to enter these personal preferences into the system, which, along with the existing kitchen appliances in the home, then generates automatic menu recommendations. This innovative approach serves to significantly mitigate the pre-event meal preparation anxieties experienced by all participants.

Secondly, the kitchen service system has the ability to provide comprehensive cooking recipes for selected dishes, accompanied by precise instructions on cooking duration and optimal equipment utilization. By imparting such valuable guidance, this system effectively reduces the learning curve inherent to culinary activities. Importantly, it democratizes the culinary experience, allowing even those with limited culinary expertise to actively participate and contribute their culinary skills. Ultimately, this multifaceted approach enhances the overall enjoyment and satisfaction levels of participants during their gatherings.

Emotional affordance as the core of the social kitchen: facilitating networking opportunities and enhancing self-fulfillment

The kitchen, as an integral component of a family living space, holds a pivotal role in fostering and solidifying emotional connections among individuals. In contrast to interactions between individuals and objects, interactions between people within the social kitchen evoked deeper emotional resonance within the participants. By harnessing kitchen activities as a conduit for communication, the social kitchen facilitates interpersonal engagement and reconstructs daily life scenarios. There are three key strategies employed to amplify the social and emotional dimensions of the kitchen space:

Firstly, enhancing the versatility of the kitchen space to accommodate non- culinary activities is paramount. This may involve incorporating a secluded office or study area in an open kitchen layout that promotes extended

family connection and interaction.
Secondly, establishing seamless connectivity and interaction between the kitchen system and other social devices augments the user experience. This
includes facilitating better communication with family and friends through kitchen-based devices (such as video conferencing or remote control functions) that can provide guidance and assistance during cooking activities.
Lastly, the implementation of a cooking proficiency progression curve, coupled with a system for visualizing a user's advancement in culinary skills, along with features such as content sharing and rewards, serves to heighten user engagement and a sense of accomplishment in the realm of cooking activities.

Conclusion

The kitchen has evolved into the multifunctional core of the home, catering to living, service and entertainment, and providing a diverse experience. The emergence of the social kitchen aligns with societal and lifestyle changes. Drawing from ecological psychology's affordance theory, we derive design strategies to enhance kitchen experiences across functional, perceived, physical, cognitive, emotional, and technological dimensions.
These strategies bolster the development of the social kitchen in three key areas: spatial layout, cooking engagement, and emotional enrichment. This approach emphasizes human-computer interaction, deepens the emotional connection between individuals, and promotes closer communication between people and the kitchen space. As a result, users enjoy an enhanced kitchen experience, leading to more harmonious social relationships.

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References

Gibson, J. J. (1979). The Ecological Approach to Visual Perception. Houghton- Mifflin.
Norman, D. A. (1990). The Design of Everyday Things. London: Currency.
Hartson, R. (2003). Cognitive, Physical, Sensory, and Functional Affordances in Interaction Design. Behaviour & Information Technology, 22(5), 315- 338.
Vallverdu, J., Trovato, G., & Jamone, L. (2018). Allocentric Emotional Affordances in HRI: the Multimodal Binding. Multimodal Technologies and Interaction, 2(4), 78.
Leonardi, P. M. (2011). When Flexible Routines Meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies. MIS Quarterly, 35(1), 147-168.
Chen, W. (2011). User Experience Design Elements and Their Application in
Product Design. doi:10.19554/j.cnki.1001-3563.2011.10.009.
Packaging Engineering, (10), 26-29+39.
Li, J., & Liu, F. (2017). Emotional Interaction Design Research of Future Kitchen Systems.Packaging Engineering, 38(24), 114-118.

Healing Rooted in Love: Discursive Design Healing with Intellectual Reflection as the Core

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Abstract

The marginalization of humanism caused by the dominant logic of technological society has resulted in numerous cultural traumas and intensified social alienation. Humanistic therapy based on practical philosophy can help us readdress fundamental questions about being human and leading a fulfilling life. Therefore, this article aims to build upon the foundation of humanistic therapy and utilize the intellectual power of love at its essence, which is essentially a spiritual force, to explore how design practice can address social healing issues. Love, whether self-love or love for the other, is first expressed as respect for wholeness in the initial stage. The second stage involves removing what is "alien" to restore wholeness. Healing is rooted in love. Discursive design, a healing practice that is "good for thinking," stimulates reflection through dialogue and can help explore the understanding of wholeness and the healing process. This approach may enable individuals to achieve self-healing or "self-rule," successfully overcoming all desires that obscure the "true self."

Author keywords

love; discursive design; alienation; healing.

Introduction

We have undoubtedly entered a stage of societal evolution dominated by technology, particularly emerging technologies. Disruptive technologies such as artificial intelligence, bio-genetic engineering, robotics, and FANG technologies (representing Facebook, Amazon, Netflix, and Google), among others, have deeply integrated with traditional society. This integration continuously shrinks the conventional physical and psychological spaces of every individual. The interactions between individuals, individuals and society, and individuals and the world manifest as a logic of technological "Ge-stell," thus leading us into a technosociety governed by technocracy. The technosociety, as a dominant social paradigm centered around a monoculture, has even eradicated the confrontation and tension between the "Two Cultures" (Snow, 1959), leading to the prevalence of cultural maladies such as cognitive regression, behavioral deficiencies, depression, and attention deficit disorders, as well as identity crises and a shift of consciousness from the real world to virtual spaces, known as technological traumas (Lou Marinoff, 2021). The marginalization of the humanities essentially causes the trauma of the technological society. Questions go to the heart of being human and living fulfilling lives. The underlying philosophical problems cannot be resolved by scientific, technical, or medical interventions, requiring solutions drawn from philosophy and the humanities. Therefore, this article explores humanistic therapies within the

design field, proposing Discursive Healing Design as an emerging design practice with intellectual influence and enlightening value, enabling design to be "good for thinking" and facilitating individuals' self-treatment or self-rule.

Humanistic Therapy in the Face of the Techno-Social Alienation

In today's era, we face a new form of alienation within a technological context, particularly under the influence of emerging technologies such as NBIC (Nanotechnology, Biotechnology, Information technology, and Cognitive science). This alienation is manifested as a sense of disconnection, estrangement, or separation between individuals and various aspects of their lives, such as their work, society, themselves, or even the products of their labor.

The concept of alienation has been explored from a more existential perspective by existentialist philosophers such as Jean-Paul Sartre and Albert Camus. They believed that when individuals feel disconnected from their authentic selves or confront the absurdity of existence, they experience a sense of estrangement. Existential alienation is often associated with meaninglessness, isolation, and a lack of purpose. These are issues that are prevalent in contemporary society.

Indeed, individuals are the sum of their social relationships, and discussions about individual issues are, in fact, manifestations of a social environment. Extending this to the field of social psychology, alienation refers to a sense of social isolation or detachment from one's social environment. It manifests as a feeling of not belonging, being out of sync with societal norms, or lacking social support. Represented by the Frankfurt School, including thinkers like Theodor Adorno and Max Horkheimer, critical theorists have linked this phenomenon to the dehumanizing effects of mass culture and consumerism. These vital theorists argue that modern society can lead to alienation as individuals become inundated by the commodification experience, losing their connection to authentic desires and values. Jurgen Habermas, on the other hand, explores ways to address alienation from the perspective of social interaction. He advocates for a return to social communication, focusing on the power of discourse to break through the "irreversible" social alienation. This is also the path advocated in this article.

Just as Lou Marinoff advocates, there is an emphasis on the importance of the humanities in addressing the cultural trauma within the technosociety (Marinoff, 2022). He suggests attempting to heal cultural traumas in the technosociety using humanities-based therapies grounded in practical philosophy.

Humanities Therapy was initially proposed by the Humanities Therapy Research Group (HTRG) at Kangwon National University in South Korea in 2007. Like the branch of psychotherapy called "humanistic psychology" (APA Dictionary of Psychology, n.d.) proposed by the American Psychological Association (APA), the primary distinction lies in the disciplinary foundations they draw upon. HTRG's definition succinctly captures the fundamental difference between humanities therapy and humanistic therapy: Humanities therapy is an interdisciplinary discipline that integrates humanistic values into therapeutic content from various related fields, both in theory and practice. It aims to prevent and treat diseases, thus promoting mental health and well-being of individuals, groups, and society by embodying humanistic spirit and employing interdisciplinary approaches. This approach underscores the role of the humanities in fostering mental health and well-being in individuals, communities, and society within the context of the technosociety and its associated cultural challenges.

Love and Healing Based on Wholeness

In other words, humanistic therapy is essentially an intellectually inspired healing strategy. Like Plato's view of healing, the concept of wholeness is central. All impediments to wholeness are "alien" factors that do not

belong to the human in which they have lodged themselves. This notion of the "alien" aligns with the context of "alienation" within the technological society mentioned earlier. Therefore, the process of healing for Plato is the removal of that which is alien to a person in the interest of restoring him to wholeness.

These two key concepts, as proposed by Professor Donald DeMarco in his article, revolve around the significance of love in two essential phases: "Love is an affirmation of the other, regarding the other in his wholeness. This affirmation rests on the recognition that a person's wholeness constitutes his original state, the state in which he is most himself.....the second phase of love is restoration. Here, love operates as the desire to help others return, as much as possible, to that original state of wholeness. Restoration implies the original state, which is the one that is affirmed."(DeMarco, 2010) Therefore, love has two phases: one is wholeness, and the other is restoration. Love can be manifested explicitly as respect for wholeness, whether in oneself or others. The healing process is then about removing what is "alien" to restore wholeness.

In the definition of healing, the emphasis on wholeness is also highlighted. The word "healing" in English comes from the Old English word "haelen," which means "wholeness." (Firth et al., 2015) It is generally understood that healing aims for health, and the World Health Organization (WHO) introduced the concept of health in its preamble in 1946 as a state of complete physical, mental, and social well-being (Stuckey & Nobel, 2010). In other words, health is a holistic balance of physical, mental, spiritual, and social aspects. Similarly, by resisting something alien, there is another essential key concept, which is harmony and balance.

Furthermore, in Plato's view of healing, it begins with cognitive changes in the mind; in other words, psychological, spiritual, and mental healing can lead to healing on different levels, such as physiological and even holistic healing. Healing is rooted in love because love desires the restoration of wholeness in the other, and this process of restoration places wholeness as a primary and fundamental condition. The core idea here is that cognitive and spiritual forces in the mind can influence physical reality. This is achievable, as seen in the standard medical practice of the "placebo effect." Moreover, "By becoming aware that our lives are a continual process of healing, we can learn to come to peace with any illness or injury that may manifest." This indicates that healing is an ongoing process in our lives.

For example, in the case of "Homeostasis sanatoris" (Martínez & Vela, 2019) see Figure 1, healing is achieved by developing meaning-oriented products that provoke reflection on illness, fostering healing from emotional and spiritual domains. Design serves as a tool and a medium of discourse. It inspires the audience or users to engage in discussion and introspection, reflecting on their relationship with disease and stress, to construct a positive narrative and thus alter cognition. This case is also considered an example of discursive design because it stimulates inner intellectual reflection in a way that promotes dialogue.

Figure 1. Homeostasis sanatoris.

Reflecting on the Connotation of Healing through Discursive Design

As an emerging design practice, discursive design (Tharp & Tharp, 2018; Zhang, 2021) takes abstract social discourse practices and makes them tangible, visual, and interactive. It facilitates the production of discourse as

an interactive mode, thereby promoting direct social interaction among people to bring existential experiences closer together. This, in turn, fosters intellectual exchange between individuals, leveraging the social and psychological support of others, ultimately leading to individual meaning reflection and exploration. It activates their inherent natural self- healing abilities to cope with the cultural traumas of the technosociety.

The reason why healing practices carried out with the principles and methods of discursive design can serve as a form of humanistic therapy lies in several factors. On the one hand, discursive design incorporates anthropological attention to the "lived social existence" of humans and an openness to "unconventional values." In other words, designers in digressive design aim to understand users and their needs within a holistic view of society. They also invite users to perceive objects beyond traditional forms and practicality. On the other hand, discursive design is a contemporary form of social design. As a design category focusing on objects' intellectual impact and enlightening value, it advocates that "design can be good for thinking" (rather than just serving material needs such as clothing, shelter, and food). Such designs can positively influence individual behavior, public discourse, professional practices, institutional policies, and the production of new knowledge. In theory, they become the catalysts for significant cultural transformations. Based on the fundamental positions of anthropology and material culture, sociology, and non- material design, discursive design considers design as an event that triggers observation and reflection. Through active public participation and discussion, it fosters dialogue and discourse, gradually constructing a public discourse on various societal, technological, cultural, and other topics.

"Dialogue is the fundamental path to acquiring knowledge; it is the practical foundation for establishing mutual value recognition among dialogue participants and engaging in social production labor. It is the real behavior that integrates thought and labor practices; it is the root cause of knowledge diversity, value multiplicity, and the diverse societal production needs." In conclusion, "This kind of philosophy dialogue that delves into the depths of the human mind and the corresponding philosophical therapy fundamentally alters the human psyche itself. Therefore, its essence is essentially self-treatment or 'self-rule.' It can successfully overcome all other desires that obscure the 'true self.'"(Luo & Tang, 2022)

Healing practices using discursive design may share some similarities with art therapy in form. Still, it extends the boundaries of art therapy and combines the strengths of talk and art therapy. Discursive design healing (Liu & Zhang, 2022) strongly emphasizes the importance of dialogue, with its aim being the individual's intellectual reflection, which, in the context of healing, translates to "self-rule."

Table 1. | Comparison of three forms of healing practices: talk therapy, art healing, and discursive design healing

	Healing Practice with Conversation as the Main Form	Healing Practice Using art Experience as a Medium	Healing Practice Using Discursive Design as a Method
Suitable Group	Those who	Those who take the	Those who do not

		actively seek medical treatment without language barriers	Initiative to seek medical treatment without limiting language expression	require medical treatment and do not limit language expression
Suitable Scene		Consulting room	art space	public or private space
Healing Modalities	**Expression**	talk	artistic creation	Objects as catalysts to inspire expression
	Perception	Listing	artistic cultivation	narrative stimulation
	Interaction	Have a conversation with a healer	Immerse yourself in art experiences and have a dialogue with healers through art experiences	Use objects to start conversations and promote communication, thereby activating self-healing power
Healing Strategies		Divert attention. Emotional expression and release. Reflection and sense-making.	Divert attention. Emotional expression and release. Reflection and sense-making. Self-care and self-support.	Divert attention. Emotional expression and release. Reflection and sense-making. Self-care and self-support. Social support and interpersonal interactions.

Healing practices using discursive design as an intervention method for social and emotional issues differ from primarily talk-based healing practices like talk therapy and distinguish themselves from art-based healing practices like art therapy. Talking is the most used therapeutic method in healing, and its effectiveness and utility in psychological healing are unquestionable. In talk therapy, the client's actions primarily involve speaking, listening, and engaging in communication, with the therapeutic
mechanism being rooted in expression, perception, and interaction. Art experiences as a medium expand

the scope of healing beyond verbal communication, allowing clients to use artistic creations to express their unconscious thoughts. Additionally, the inherent healing qualities of art experiences can activate the recipient's self- healing abilities. This approach broadens the audience base, eliminates temporal and spatial constraints, and reduces the need for the physical presence of professionals. However, the setting of art spaces and using art materials naturally exclude some individuals. Healing practices using discursive design may resemble art therapy in form, but they expand the boundaries of art therapy and combine the strengths of talk therapy and art therapy. The digressive design emphasizes the importance of dialogue, with its goal being the individual's intellectual reflection, which, in the context of healing, translates to "self-rule." (Luo & Tang, 2022)

As the group continues to expand, the healing space becomes more and more public; the form of expression tends to be substantial and concrete, the way of perception tends to be vague and blank, and the interactive method calls on more and more senses, and the scope is getting wider and wider; healing strategies are also on the rise. Social healing practice using discursive design as a method, through product, visual, display, and other material design, promoting communication through conversation ultimately points to non-material design intentions such as individual inner self-knowledge, reflection, and healing. What is initiated is a group-oriented, public, social healing practice that emphasizes ambiguity and joint construction.

Conclusion

The so-called discursive social design healing ultimately points to people's self- questioning and reflection, whether rejecting the anthropocentric position or exploring alternative paths. Although it is a healing design intervention for social integrity, the society here is more biased towards the social context, from which we can gain a clearer insight into the true intention of the design intervention. It does not mean designing a universal, accurate, and effective practical device, but as a social experiment to stimulate different groups to reflect on society and then reflect on themselves.

Acknowledgments

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References

DeMarco, D. (2010). Love and Healing. The Linacre Quarterly, 77(1), 43–52. https://doi.org/10.1179/002436310803888970

Dictionary.apa.org — APA Dictionary of Psychology. (2023). https://dictionary.apa.org/

Firth, K., Smith, K., Sakallaris, B. R., Bellanti, D. M., Crawford, C., & Avant, K. C. (2015). Healing, a Concept Analysis. Global Advances in Health and Medicine, 4(6), 44–50. https://doi.org/10.7453/gahmj.2015.056

Liu, Y., & Zhang, L. (2022). How Discursive Design Therapy is Possible: Theory and Strategy. In P.-L. P. Rau (Ed.), Cross-Cultural Design. Interaction Design Across Cultures (Vol. 13311, pp. 497–507). Springer International Publishing. https://doi.org/10.1007/978-3-031-06038-0_37

Longxiang, L., & Zihan, T. (2022). The Logical Way of Dialogic Philosophy Teaching and Its Therapeutic Effect. SCIENCE·ECONOMY·SOCIETY, 40(2), 57–66. https://doi.org/10.19946/j.issn.1006-2815.2022.02.005

Marinoff, L. (2012). Humanities Therapy: Restoring Well-Being in an Age of Culturally-Induced Illness. In Keynote

address, in Proceedings of the 11th International Conference on Philosophical Practice, Humanities Institute, Kangwon National University, 27-48.
Marinoff, L. (2022). Essays on Philosophy, Praxis and Culture: An Eclectic, Provocative and Prescient Collection. Anthem Press. https://doi.org/10.2307/j.ctv307fghh
Martínez, A. H., & Vela, S. D. F. (2019). Homeostasis sanatoris. A meaningfulness- driven product that stimulates physiological healing processes. The Design Journal, 22(sup1), 615–626. https://doi.org/10.1080/14606925.2019.1595442
Snow, C. P. (1959). Two cultures. Science, 130(3373), 419–419.
https://doi.org/10.1126/science.130.3373.419
Stuckey, H. L., & Nobel, J. (2010). The Connection Between Art, Healing, and Public Health: A Review of Current Literature. American Journal of Public Health, 100(2), 254–263. https://doi.org/10.2105/AJPH.2008.156497
Tharp, B. M., & Tharp, S. M. (2018). Discursive design: Critical, speculative, and alternative things. The MIT Press.
Zhang, L. (2021). How Discourse is Designed: Alternative Objects and Communication Ethics. Art and Design Research, 5, 64-70.

Genuine Love and Rational Love: An Exploration of the Practical Logic of AI in Painting Arte

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Abstract
With the continuous development and application of artificial intelligence(AI) technology, AI painting, as an emerging form of artistic expression, is continuously challenging the
traditional art field. Artists and viewers play crucial roles in the practice of AI painting art, mutually dependent and influencing each other. In AI artistic practice, artists require "genuine love," wherein by infusing sensibility and authenticity, they integrate their individual thoughts and emotions into the artwork to maintain their subjectivity. Viewers necessitate "rational love," implying the appreciation of AI-driven artworks with a rational and objective disposition. The coexistence of these two forms of love is essential for imbuing AI-generated painting art with genuine vitality.

Author keywords
Love; AI painting; practice logic; emotional authenticity; rational dialogue

In recent years, AI painting art has attracted widespread research interest and attention from the art community. Through the utilization of machine learning and deep learning algorithms, AI systems are capable of learning and imitating the painting styles and aesthetic concepts of human artists, ultimately generating realistic works of art. However, as the field of AI painting art continues to develop, some individuals have begun to question its impacts and repercussions. Some viewpoints suggest that AI painting art may lead to the marginalization of human artistic creation, undermine artists' creativity and uniqueness, and even encroach upon the artists' subjective position in the process of art creation. This paper aims to conduct research from the perspective of AI-generated painting art practice, delving into the significant role of "love" in the creation and appreciation of AI painting art.

Human-Centricity: The Practice Logic of AI Painting Art

Artistic practice encompasses two essential aspects: art creation and art appreciation. Art creation is the core of artistic practice, representing the process through which artists transform their inner thoughts and feelings into tangible artworks. Art appreciation involves the process by which audiences, listeners, or readers perceive, understand, and evaluate artworks to derive aesthetic enjoyment and intellectual inspiration. It encompasses sensory experiences, emotional resonance, and interpretive understanding of artworks.
In the context of AI painting art practice, artists employ AI tools to explore and present their understanding and feelings towards reality or abstract concepts. Audiences, based on their individual backgrounds, cultural experiences, and emotional states, express their own interpretations and insights regarding the artworks. The feedback from audiences can also stimulate reflection and inspiration for artists, prompting the continuous

evolution and development of artistic works and concepts. From the perspective of the practice logic of AI painting, the closed loop of logic actually involves multiple stakeholders: the original authors in the algorithm database, the designers of the AI system, the artists using AI tools, and the audiences appreciating AI painting works. In the era of weak artificial intelligence where AI itself lacks intentionality and free will, artists and audiences are the subjects of AI painting art practice, mutually dependent and influential, jointly leading the ecosystem of AI painting art.

In his book "Understanding Media," Marshall McLuhan wrote, "The 'content' of any medium is always another medium." In today's image-saturated era, the public is amazed by the productivity miracles of AI and enjoys the sensory stimulation brought about by image appropriation and replication. However, the essential nature of AI as an extension of human beings, as a medium, is often overlooked. Regarding how artists and audiences can maintain subject consciousness and self-discipline amidst the noisy technological torrent, the author proposes the principles of "genuine love" and "rational love."

Figure 1. Diagram of AI Painting Art Practice.

Genuine Love: The Artistic Subjectivity in AI Painting Art Practice

With the continuous popularity of AI painting tools such as Midjourney and Stable Diffusion, many creators have discovered that using these tools enables them to quickly generate complex and exquisite images with low entry barriers. However, this trend has led to uneven levels of proficiency among creators, and the majority of AI painting works suffer from severe homogenization, lacking artistic depth and quality. In order to avoid excessive reliance on AI painting tools, some artists have proposed effective methods, such as using AI painting techniques as auxiliary tools while combining traditional painting skills and methods to showcase their personal craftsmanship and artistic expression in their works. However, the author believes that if the approach merely involves additive techniques in the medium of painting, it may ultimately fall into the trap of form over content. If artists intend to embody their subjectivity in AI painting art practice, they must pursue an emotional authenticity from the inside out, termed as "genuine love."

To better understand the concept of "genuine love," we present two artworks here. The first artwork is "Family Portrait No. 1" (Figure 2) by contemporary Chinese artist Zhang Xiaogang, and the second artwork is an AI-generated painting (Figure 3) created by the author using the AI tool Midjourney with the theme of "family." Although these two artworks employ different tools, visual styles, and creation processes, they both depict a sense of unfamiliarity, loneliness, and estrangement within a family setting.

"Family Portrait No. 1" by Zhang Xiaogang, considered one of the most iconic works of contemporary Chinese art, originated from a family photograph of Zhang Xiaogang's own family, which triggered his contemplation on family and lineage. Beneath the calm, vacant, and startled expressions of the figures in the painting, their desires and passions seem suppressed within rigid uniforms and expressions. Zhang Xiaogang innovatively employed the style of contemporary popular art to depict the stylized portraits of the revolutionary era, endowing his works with distinct contemporary significance and provoking contemplation on family relationships and blood ties among countless Chinese individuals.

In contrast, the AI-generated artwork "Family" draws some inspiration from certain forms present in "Family

Portrait No. 1." However, the stiff composition evokes a sense of darkness, strangeness, and detachment. The mixture and fusion of Eastern and Western elements blur the cultural foundation of the artwork, ultimately presenting a peculiar and absurd visual experience that does not exhibit aesthetic competitiveness proportional to its technical advantages.

The philosopher Susan Sontag once wrote in "Regarding the Pain of Others": "What is presented by the artist is never the artist's true emotions, but rather the human emotions that the artist recognizes." In comparison to the works of human artist Zhang Xiaogang, the true limitation of AI systems lies in their lack of the complex life experiences and personal histories unique to humans. The essence of the phrase "all artistic creation originates from life" is not that all artistic creation should imitate life, but rather that it should follow the logic of life or the logic of humanity to construct artistic frameworks. "Genuine love" can be understood as a genuine experience or cognition acquired through perception, emotion, and intuition. It emphasizes subjective experience and personal feelings. Artists need "genuine love" in their AI painting practices because it can imbue their works with emotion, uniqueness, and expressiveness. While AI can generate accurate images or imitate existing art styles, a lack of emotional authenticity may make the works appear mechanical, soulless, and devoid of emotion. "Genuine love" also serves as a bridge for artists to establish connections and resonance with audiences. Audiences are often more drawn to works that can touch their emotions and evoke resonance within them. By infusing emotional authenticity, artists can establish deeper levels of interaction and dialogue with the audience.

Figure 2. Oil Painting "Family Portrait No. 1".

Figure 3. AI Artwork "Family".

Rational Love: The Role of the Audience as the Subject in AI Painting Art Practice

In the digital and globalized era, the significance of the audience in painting art practice has been increasingly emphasized, as they are no longer passive recipients but active participants and creators. In the past, audiences could only appreciate finished paintings by visiting galleries or art exhibitions. However, nowadays, people can access a wide range of painting artworks anytime and anywhere through artists' websites, social media platforms, or online galleries. Furthermore, the internet has demystified the artists themselves. Audiences can gain comprehensive understanding of an artist's life experiences, creative background, and artistic concepts by exploring their personal profiles, interviews, articles, and videos. This deeper understanding facilitates a more profound interpretation of the artistic significance conveyed by the artworks.

However, on the flip side, the proliferation of audiovisual elements in the internet age has significantly increased the threshold for audience satisfaction. With the continuous bombardment of visual stimuli, audiences have become desensitized, constantly seeking more, exquisite, and stimulating visual contents. When expressing their aesthetic preferences through comments, likes, and collections, audiences tend to be subjective and impulsive. In this context, the popularity of AI painting is understandable: creators utilize AI tools to produce a large volume of paintings that cater to the mass aesthetic taste. Under the influence of the high efficiency, high quality, and viral dissemination of AI painting on the internet, audiences may develop a "fanatical" mentality, manifested by an excessive obsession with AI painting and a dismissive attitude toward traditional painting.

As one of the subjects in AI painting art practice, the rationality and restraint of the audience are essential prerequisites for establishing an effective dialogue mechanism for AI painting art. I refer to this principle as "rational love."

When engaging in AI painting art practice, the audience upholds the principle of "rational love." This means that when appreciating AI paintings, the audience should avoid blind conformity and emotional evaluations, and approach AI artworks with a rational mindset for thinking, discussing, and evaluating. Firstly, the audience should maintain an open- minded attitude. The emergence of AI painting has brought about significant transformations in the art world, with different creative processes and aesthetic styles compared to traditional human painting. Therefore, the audience needs to keep an open mind, refraining from simply comparing or belittling AI painting in relation to traditional painting. Instead, the audience should strive to understand and appreciate the unique beauty and creativity presented by AI painting, discovering and experiencing the new allure of art.

"Rational love" does not seek to impose various restrictions on the audience's practices in order to bring them back to the one-sided worship of the "aura" surrounding art. Due to the low barrier to entry in AI painting, the author actually expects more audience members to personally engage in AI painting creation, transitioning from the role of spectators to creators. Only in this way can the audience gain a better understanding of the workings of AI algorithms, the selection of datasets, the application of training methods, and the details of the generation process. This deeper understanding helps the audience recognize the artist's agency in AI creation, thereby fostering greater respect for the artist's creative intentions and labor achievements, rather than one-sidedly viewing AI technology as a replacement for artists or artists as opportunists.

In summary, through "rational love," the audience can discern AI paintings that genuinely possess creativity and aesthetic value with more enriched and objective evaluation dimensions. This, in turn, fosters a virtuous cycle within the ecosystem of AI painting art practice.

Conclusion

As the real subject behind AI painting, we should continuously surpass the limitations imposed by technology and overcome the potential backlash of technology on humanity. From the perspective of artistic practice, artists utilizing AI in their creations should prioritize their emotional experiences and spiritual aspirations as the core of their expression. They should refine and process the content to reveal certain inherent essences and patterns of social life. Similarly, audiences should approach the appreciation of AI painting with rationality and restraint as the foundation. When facing the impact of AI painting, we should confront our living environment and current situation, exploring how to imbue AI-generated artistic creations with unique aesthetic value through the lens of "love," thereby uncovering more profound and splendid realms within the domain of aesthetics.

References

[1]Liu Xinlu.(2019).Artistic Reflection on Artificial Intelligence Digital Painting..(eds.)Procee dings of 2019 International Conference on Education,Economics,Humanities and Social S ciences(ICEEHSS 2019)(pp.444-447). Clausius Scientific Press,Canada.

[2]Cunjun Zhang,Kehua Lei,Jia Jia... & Zhiyuan Hu.(2018).AI Painting..(eds.)Multimedia(p p.)..

[3]Ziran Luo.(2023).The Modernity of Artificial Intelligence Painting..(eds.)2023 Internation al Economics, Management, Education and Social Sciences Conference(pp.).Clausius Sci entific Press.

[4]Jeanine DeFalco & Andrew Hampton(2022).The Frontlines of Artificial Intelligence Ethic s:Machines Like Us?. Taylor and Francis.

[5]John N. Hooker & Tae Wan N. Kim.(2018).Toward Non-Intuition-Based Machine and Ar tificial Intelligence

Ethics..(eds.)AI, Ethics, and Society(pp.)..
[6]Antonio Daniele & Yi-Zhe Song.(2019).AI + Art = Human..(eds.)AI, Ethics, and Society (pp.)..
[7]Christopher Andrews.(2019).An Embodied Approach to AI Art Collaboration..(eds.)Crea tivity and Cognition(pp.)..
[8]Sun, Y., Yang, C. H., Lyu, Y., & Lin, R. (2022). From Pigments to Pixels: A Comparison of Human and AI Painting. Applied Sciences, 12(8), 3724.
[9]Chiarella, S. G., Torromino, G., Gagliardi, D. M., Rossi, D., Babiloni, F., & Cartocci, G. (2022). Investigating the negative bias towards artificial intelligence: Effects of prior assign ment of AI-authorship on the aesthetic appreciation of abstract paintings. Computers in Hu man Behavior, 137, 107406.
[10]Zhang, C., Lei, K., Jia, J., Ma, Y., & Hu, Z. (2018, October). AI Painting: an aesthetic painting generation system. In Proceedings of the 26th ACM international conference on Multimedia (pp. 1231-1233).
[11]Kompa, B., Hakim, J. B., Palepu, A., Kompa, K. G., Smith, M., Bain, P. A., ... & Beam, A. L. (2022). Artificial intelligence based on machine learning in pharmacovigilance: a scoping review. Drug Safety, 45(5), 477-491.
[12]Mocanu, D. M. (2022). Gradient Legal Personhood for AI Systems—Painting Continental Legal Shapes Made to Fit Analytical Molds. Frontiers in Robotics and AI, 8, 788179.

Healing as a mode of reconstruction: The use of virtual reality to engage stakeholders

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Abstract

The reconstruction of a neighbourhood or city after a natural disaster or conflict is not an easy topic. These times are often painful for the people involved and, when it happens, there are always plenty of issues to consider. We look at this problem through the lens of architecture as healing. Architecture is a slow process which requires planning, negotiation, builders, materials, and permissions. In this paper, we argue that virtual reality can be used as a means of planning and discussing preferable spaces for this type of situation. It can be used as a democratic tool to envisage solutions common to city planners, designers, and dwellers, and as a window to the future. In order to do this, we look at existing reconstruction solutions and create a space to help with healing in the aftermath of disaster. Using speculation as a method, we look at a 'shelter' as a place to maintain the community and reconnect neighbourhoods; a space to recomfort the dwellers through basic services and green spaces.

Author keywords

Architecture; virtual reality; reconstruction; healing

Introduction

Much care is put into the construction of any house and, once a person or family has moved in, it becomes their duty to care for it. When a catastrophe occurs, whether natural or human, there is little that can be done to protect the people. In this paper, we look at those architects who have foreseen these issues and join them in thinking of the role of architecture in terms of healing. Usually, architects undertake reconstruction by studying the past (Bullock, 2002) or interviewing the survivors of conflicts, as ways to empirically study the destruction of buildings (Azzouz, 2019). In our research we use case studies and movies. The former allows us to understand what is currently possible in terms of materials, and the latter helps us focus on specific issues. Movies have been used to problematize the post-occupancy of new constructions (Penz, 2018), which is little studied in architecture. Anyone who has never experienced a disaster, cannot be expected to foresee the solutions taken by the people in that situation. Movies are not perfect, as they depend on the director or writer's ability to properly research, but they can give us situated issues that we are able to use for discourse.

The first part of our research is pragmatic, as we look at the issue as a human experience combined with an architectural one. Michael Benedikt (2020), for example, reminds us that space and architecture have more than a I-IT relation, or instrumental relation. Following the work of the philosopher Martin Buber, he introduces an I-THOU

relation, in which the construction is not only aesthetic but also enhances the human relation and, in our case, the healing of its inhabitants.

In the second part, we look at virtual reality as a means of creating a speculative-pragmatic experience. This unique perspective is suggested by the work of Isabelle Stengers, from whom we learn that the study of the future needs to be applied with the consequences in mind: 'What might their aim be? What are their effects?' (Debaise & Stengers, 2016). We attempt to solve an issue of the future with the intention of finding a preferable solution, and as a way of letting planners and dwellers collaborate and discuss these solutions. Design is, in a sense, always about planning the future, but the necessity of care needs to overcome the instrumentalization of design. Virtual reality can immerse us in a space and, while it is not the final space, it is nearly as strong as the real space. It is an opportunity to get into the environment and open the conversation.

Background

Rather than using a real site, we create a model site, which is a composite of multiple sites. It is a mixed space composed of low and high-rise buildings, offices and factories, social housing, and a commercial district (Figure 1). We choose this space for its ability to create discourse on the theme of reconstruction.

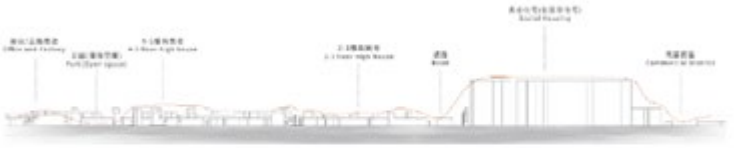

Figure 1. Mixed space composed of low and high-rise buildings, offices and factories, social housing, and a commercial district

We look at movies and documentaries about the destruction of cities during the various wars of the 20th Century. The first which made an impact on us is Twenty-four-hour love affair [Hiroshima, Mon Amour] (1959), which is set not long after the dropping of the bomb, and features a conversation between a French actress and Japanese architect. In the beginning, he repeats: 'You have seen nothing in Hiroshima, nothing' (Resnais & Duras, 1959), while she replies that she did see the hospital and the museum. But he is insistent. He tells her that she saw nothing. To us, as the audience, this is a reminder that we have not seen the war and, no matter how many museums, books, or films we look at, we cannot have experienced its reality. This is a position of humility that we accept. Like all wars or crises, but particularly this one, it is a good reminder that for those not personally affected it is impossible to comprehend the suffering. The character of the architect is willing to share his experience of the events, and shows his ability to think about the time after the war in terms of reconstructing and healing the city rather than mourning. We are not sure whether this is a professional deformation, but it becomes a necessity as time passes.

The other drama we look at is The Defeated (2020), a TV series about Berlin after the war which shows that reconstruction doesn't happen quickly. The heroes of the series are mostly women, which reminds us that the first post-war casualties are women. The men have disappeared or are prisoners, and the women need to find shelter from the invaders, often in places that are very dangerous, such as the heroine's flat which looks normal in one room but has a hole in the other (Figure 3). Structurally speaking, it is not safe but the memories it

Figure 2. *The Defeated (2020):* The heroine's lives in an apartment with a hole instead of a window.

Case Studies

The reconstruction of cities is not a very popular field. We are interested in the work of two architectural studios. The first is Reparametrize Studio, the main ethos of which is that reconstruction is not always a case of re-developing but re-coding and re-generation. The studio's founder, Ziwar Al Nouri, says he want to 'use this disaster as a positive opportunity to bring better life for the future citizens' (Harrouk, 2023). The use of high-tech methods, such as 3D scanning, help them develop streets holistically, rather than dealing with one building at a time. The focus on sustainability in this sort of case is very welcome, even if the temporary living arrangements remain. We wish there were a stronger relation with the past, in one way or another, so people would not feel completely detached from their roots. That said, the use of a platform to see the city from above, the use of shadows to keep the street cool, and the mix between the old and the new are interesting ideas.

The architecture office WZMH, on the other hand, has developed a modular system to save partially destroyed structures; the 'SpeedStac'. In the situation depicted in The Defeated (2020), people find it difficult to leave their homes, even if they are structurally compromised. We appreciate the focus on materials that try to keep both the building and the social fabric alive, even if reconstruction of the building is likely to be necessary in the future. This idea is much more pragmatic, ready to use, with a specific use case in the khrushchyovka, a typical concrete house found in Russia and Ukraine, where the load bearing is in the façade.

Figure 3. The SpeedStac in use in Ukraine (courtesy of WZMH Architects)

Fill in the gaps

One issue we see with the random destruction of an area, is the gaps it leaves between buildings which

are partially or completely destroyed (Cano, 2022; Mårlind, 2020). Gaps are urban phenomena, where buildings are abandoned or destroyed, such as cracks in buildings after bomb attacks or holes in the ground after buildings collapse. These features often mean that it is time to leave the house but, as Anouk Sugar (2020) says: 'Losing your house, leaving it behind, whether by force or by choice, is much more than just leaving behind a structure made of concrete'. A home, like that depicted in The Defeated (2020), is 'infused with our daily actions, our thoughts, and our memories' (Sugar, 2020). Thus, leaving a house is not living in a structure, even if there is danger attached to it.

Figure 4. A visual interpretation of the war (image by Liu Ling-Chun)

Survive-rebuild-heal

We use architecture to mend the gaps created by war. These gaps inevitably needed to be stitched together with some form of structural filler (WZMH) or bridges that reconfigure the city (Reparametrize Studio). While we think these two solutions would be beneficial, we focus on shelters. Used during war, they provide protection from the elements but, after the war, they serve as links for rebuilding the community while the cleaning and reconstruction take place. Once a space is safer, we propose transforming the shelter from a place of survival to a space of healing. The organization of the future city is restructured in the context of urban development.

Individual-settlement-collective

While gaps are visible on houses, they are also present in the social fabric of the city. We see the city in ecological terms. Any crisis is an event that puts pressure on a system which is not ready for that kind of change. The distance between the shelters should allow movement within the city, to help people regroup with their families and friends. The shelter is not only a space but a chain to reconnect the elements of society. In this approach, we reflect the work of Bruno Latour (2005), for whom an object is not an object on its own, but a material relation that helps maintain society. This perspective is important for architects, as it shows the necessity of building a network which allows the safe passage of people through the city. Cellular proliferation, by establishing interconnected dwellings and linking lives, eliminates the distance between individuals. When it is safe to come back, as suggested by Reparametrize Studio, houses connect to each other by platforms and roofs, and activities connect each space, bringing people closer together by increasing the interactions between them.

Architecture as healing space

In addition to renovating buildings, we must also deal with the uncertainties and fears in people's hearts about the post-war future. But, what kinds of places can truly bring people together? We create a prototype of a healing space by introducing nature as a spiritual element of urban space. Like a jungle, it can act as a barrier, creating camouflage on the surface and protecting the humans that reside within it. Additionally, it serves as a nurturing ground for the rebirth of both nature and human life. Reconstruction is 'a chance for radical change' (Bullock, 2002). Nature not only fills gaps, but also isolates people from the turmoil of reconstruction, simultaneously reconfiguring spaces. These spaces are reminiscent of voids in a forest, riversides or ponds which are treated as breathing spaces for animals and serve as healing sanctuaries for post-war residents.

According to Jennifer Beggs (2015), a researcher working on the use of architecture for healing, natural environments help 'distance people from stressors or reduce sensory stimuli'. Greenery is used to bring a feeling of peace and healing for people, for those suffering from trauma, in addition to providing a comfortable living environment. The spread of greenery brings vitality to a damaged city, not as a patch but as a radical change redefining our relationship with nature for the future.

Design development

In this project, we redefine the shelter not as protection during a crisis but as a community-scale model which includes public spaces, shared kitchens, community activity areas, and a park, with the goal of healing a community. Existing roofs, walls, and structures are used as basic supports for new shelters, and become key points for rapid regeneration. Modular living units overlap, and each group has a platform extending to connect to the public space or another group. Walls separate spaces and roofs serve as parts of a standable platform. Sky bridges (Reparametrize Studio) play the role of connection, eliminating the distance between the private and the public. We set bridges to connect to parks, where healing spaces are, so that people can walk into the artificial forest by the sidewalk, just like a lush pathway. Treehouses are intertwined among the trees, and people can move among them. They serve as places to provide life and sustenance, while also being spaces for spiritual reflection, communication, and play.

During the design development phase, we explore spatial relationships and how to reduce stress and anxiety among the population. Beggs (2015) points out that an ideal healing space requires natural light, soft colours, access to open space, and visual connections to plants and wildlife, so we use natural additives to create spaces. Healing does not just occur in a specific area, but extends to the whole community. We create permeability between buildings and spaces, aiming to bring about interaction between public and private domains. Nature is close to the residents' life, so the concepts of rural living, food symbiosis, and self-sufficiency are integrated into the urban green spaces established by post-war community shelters.

Figure 7. Section of the shelter (image by Liu Ling-Chun)

Virtual Reality

From the moment we put a headset on, the immersive reality becomes the new reality. Virtuality can be an event of the past that we have idealized and made virtual (Shield, 2002) but also an image indiscernible from reality (Deleuze, 1994). Once we moved from the planning and making of a model into the experience of the space, we made some changes to stairs that were too long and other spaces that were difficult to reach. What looks good on a plan does not necessarily make sense once time is involved. Once the movement was smoother in the space,

we added furniture and basic household items, then added interaction so doors could be opened, for

example. While the representation we used was not photorealistic, we added some elements of nature which moved with the wind to give the viewer a feeling of the real world. After making sure the model corresponded to our design, we moved in into the shelter to test how the spaces connected. We take a feminist perspective on virtual reality as a technoscience. Lucy Suchman (2006), for example, approaches technology by focusing on the situatedness of a scene. It is not only the details of the interaction, the quality of the image or the general representation of the new reality, but the performativity of the model and the fact that it invites people to discuss and engage in debate about the priorities of post-war reconstruction. We discard the instrumentalization of the model, which would see options appear as the user explores the space. The conversation, as we conceive it, would happen between sessions, and the designer is responsible of the interpretation of these conversations and the implementation of changes.

Figure 7. The shelter space in Unity (image by Liu Ling-Chun)

Conclusion

The reconstruction of the city is a serious topic with humane, economical, and long-term effects. Our attempt to immerse ourselves by looking at films allowed us to get a sense of the situations people face. It raised some specific issues and presented situations as starting points (the hole instead of a window, for example). We are aware, however, that we are not looking at the whole picture. With the war in Ukraine and current world instability, we engage in this crucial debate with much caution. We are not dealing with the same level of destruction as London (1940-1945), Hiroshima (1945), or Berlin (1945), which caused so much homelessness in these cities. Through our case studies, we look for ways to amend existing building, such as in Aleppo (2016) where reconstruction was first aid repair. However, healing forces us to reflect on the future of cities and their inhabitants in terms of habitability and the relation with nature. Our project is to combine structural and social

damage, using a shelter, to maintain the structure of houses while maintaining the social fabric of the city, by allowing people to gather and have a place to slowly regenerate basic services.

Acknowledgments

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References

Ammar, A. (2019). A tale of a Syrian city at war, City, 23(1), pp.107-122. https://doi.org/10.1080/13604813.2019.1575605

Beggs, J. (2015). Healing Through Architecture [unpublished doctoral dissertation]. University of Waterloo. http://hdl.handle.net/10012/9591

Benedikt, M. (2020). Architecture Beyond Experience. Applied Research & Design.

Bullock, N. (2002). Building the Post-War World: Modern Architecture and Reconstruction in Britain. Routledge.

Cano, P. (2022, September 20). WZMH Develops Modular System to Save Partially or Fully Destroyed Structures. ArchDaily. https://www.archdaily.com/989207/wzmh-develops-modular- system-to-save-partially-or-fully-destroyed-structures

Debaise, D. & Stengers, I. (2016). L'Insistance des Possibles. Pour un Pragmatisme Spéculatif [The Insistence of Possibilities: Toward Speculative Pragmatism]. Multitudes, 2016/4 (65), pp. 82- 89.

Deleuze, G. (1994). Difference and Repetition. Bloomsbury.

Harrouk, C. (2020, February 4). Reparametrize Studio and Digital Architects Re-Code Post War Syria. Archdaily. https://www.archdaily.com/933147/reparametrize-studio-and-digital- architects-re-code-post-war-syria

Latour, B. (2005). Reassembling the social: An introduction to actor-network theory. Oxford University.

Mårlind, M. [Director, Writer] (2020). The Defeated: First Trick [TV Serie]]. Tandem Productions and Bron Studios.

Penz, F. (2017). Cinematic Aided Design: An Everyday Life Approach to Architecture. Routledge. Resnais, A. [Director] & Duras, M. [Writer] (1959). Hiroshima Mon Amour [Twenty-four-hour love affair]. Argos Films, Como Films, Daiei. Shields, R. (2002). The Virtual. Routledge.

Suchman, L. (2006). Human-Machine Reconfigurations: Plans and Situated Actions (2nd ed., Learning in Doing: Social, Cognitive and Computational Perspectives). Cambridge University Press. https://doi.org/10.1017/CBO9780511808418

Sugar, A. (2020). Perdre la maison: Essai sur l'art et le deuil de l'espace habité [Losing the Home: Essay on Art and the Grief of Inhabited Space]. Varia.

A life cycle study on the HPP Event booth of cosmetics products in the context of circular economy

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Abstract

POP-UP is a business model emerging nowadays. Due to its features of low rent, high revenue, and innovativeness, it has received more attention and emphasis from enterprises and brands. This study takes the product life cycle and field research as the methodology and uses system design as guiding principles to research and dialogue on the operation process of HPP (a type of pop-up) for an internationally renowned aroma and chemical brand. By disassembling the components and materials of a typical HPP, sustainable design opportunity points are identified, and the possibility of internal and external reuse of some of the components of a single HPP is proposed to extend the life cycle of the materials involved. However, design challenges still remain, such as brands' focus on intellectual property protection and significant cost investment in the future. The results of this study have a certain reference value for environmental protection and sustainable development in the Pop-Up industry, contributing to the joint shaping of a more harmonious and cohesive society.

Author keywords

Circular Economy, HPP Event Booth, Pop up Sustainable Design, Product Life Cycle, Fashion Brand

Introduction

The Internet's growth and online shopping's popularity have transformed traditional retail, prompting brands to enhance offline experiences. Flash stores, a short-term business model, have become a key method to engage young consumers. In China, the POP-UP industry surpassed $80 billion in turnover by 2020, with about 9.6 million flash mob landings. [1]

A POP-UP, or provisional activity, involves renting a small space for a short period to quickly captivate consumers with a product or service. Notably, 65% of POP-UPs in China last less than 10 days . [2]

This approach offers significant benefits. POP-UP rents are typically 30% to 40% lower than traditional retail, with sales exceeding traditional stores by 20% to 30% [3]. They prove cost-effective in attracting foot traffic and driving sales [2]. In the Chinese market, POP-UPs compete favorably with IP-based exhibitions in customer attraction and

revenue contribution, outperforming general catering, fast fashion, and cinemas in customer engagement [2].

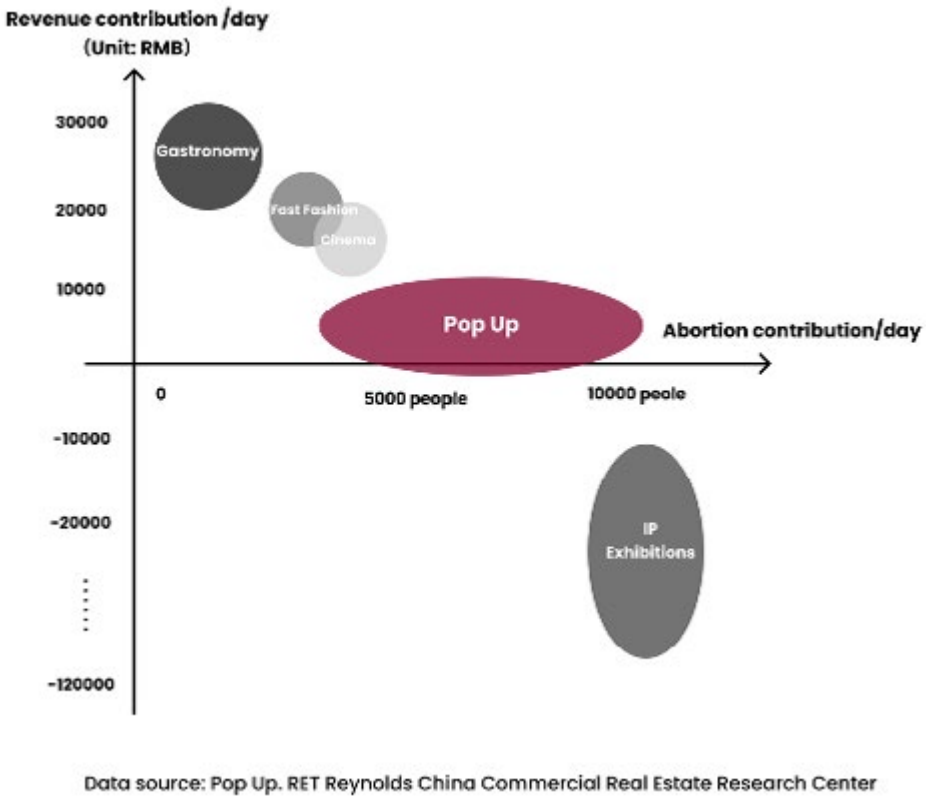


Figure 1. Gathering performance of pop ups and other shopping center formats presented

While these commercial efforts create value, their short duration, distinct themes, and diverse locations pose environmental and sustainability challenges. This study collaborated with a major international fragrance brand, Brand D. Extensive field research was carried out on Brand D's HPP Event Booth and processing facility. In the context of Brand D, HPP (High Profile Promotion) pop-ups typically last 2-4 weeks, occurring numerous times each year and often featuring an artistically crafted beauty flash mob booth. The research team performed a product lifecycle analysis on the materials used in constructing a typical HPP event booth for Brand D. The aim was to uncover design insights and potential enhancements.

Literature review

Using the Opportunity Map tool to identify various paths to infuse sustainable practices into society. As social responsibility and awareness rise, more entities are embracing sustainable thinking. Taking a holistic approach to sustainable optimization, beyond individual design elements, provides a broader outlook. Forward-thinking, eco-conscious brands are increasingly adopting this strategy. Seizing this chance, this study systematically analyzes HPP event booths, envisioning sustainable optimization. The goal is to empower brands to incorporate sustainability tools while pursuing commercial goals, collectively promoting a balanced and sustainable society.

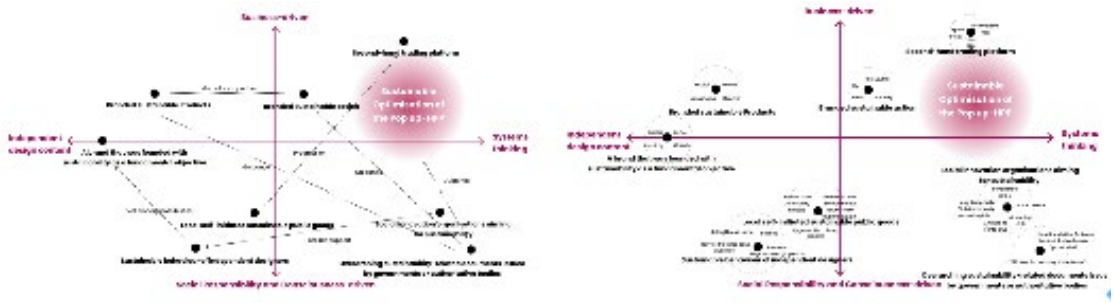


Figure 2、3. Opportunity Map of sustainable action

Methods

This study is a pragmatic exploration grounded in real-world situations, allowing for first hand insights and on-site research data. Employing a blend of quantitative and qualitative research techniques, including sustainable design methodologies like product life cycle assessment and eco-design checklist, along with design research methods. Focusing on a specific scenario's HPP booth, the research team scrutinizes its features, components, and life cycle as an individual product. This analysis is then contextualized within the broader product life cycle to holistically propose sustainable design strategies.

1.Sustainable Green Design Methodology [4]

1).Life Cycle Assessment (LCA)

The methodological framework of this study is LCA, a quantitative methodology that collects and analyzes data to quantify the environmental impacts of a product or system throughout its life cycle, including resource consumption, energy use, and waste generation.

2).Eco-Design Checklist

Using eco-design checklist and listing the impacts of each part of the HPP stand in relation to the environment and its associated impacts.

3).Product Life Cycle (PLC)

In this Research, the environmental friendliness of HPP booths can be analyzed from a life cycle perspective at each stage of the life cycle, from source, production and processing, product use, recycling, disposal and reclamation.

2.Designing research methods

1).Field Research

The research team mainly used Non-participant Observation (NPO) to go to the booth production factory to conduct field research on the production process and actual situation.

2).User Research

The research team mainly used the Expert Interview method to interview the brand managers and the frontline staff of the manufacturer, aiming to understand the multi-perspective process in the whole process scenario of the production, processing and putting into use of HPP. [5]

3).System Diagram Analysis

Analyzing material and financial flows among stakeholders reveals their relationships and the key factors influencing decisions throughout the HPP lifecycle. In order to display system structure and components, which can present relationships and connections more clearly.

Case study of Brand D

1. Streamlining the HPP Process

Following three in-person field surveys and direct engagement with Brand D, our research team gained insights into the organizational process of an HPP. As the Chinese representative of Brand D, the overall process involves the following steps:

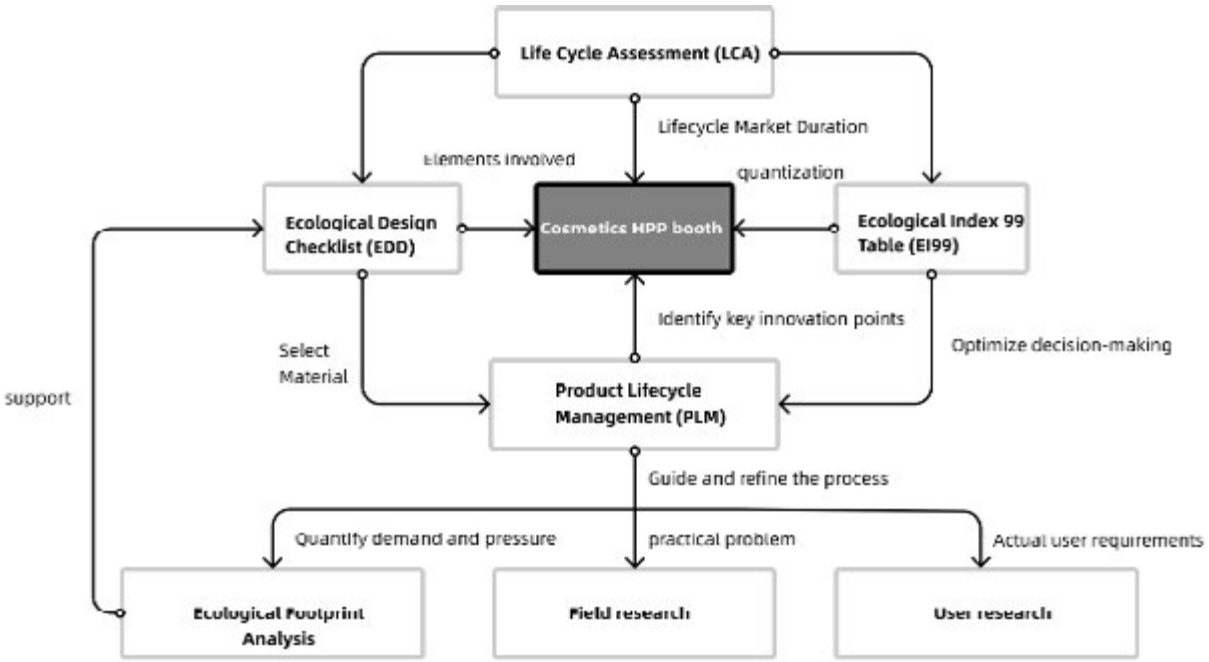


Figure 4. Field Research Methods

1). Receipt of Design Guidelines:

The subsidiary first receives design guidelines from the parent company, encompassing the event theme, duration, and design concepts for the HPP Event. The branding department in China utilizes this as a blueprint to create the booth design tailored for China.

2).Feedback and approval of specific programs in China

The design team in China will return the design plan to the parent company for approval, then start docking with the cooperating factories for on-site production.

3).Cooperative factory building HPP event booth

The construction comprises pre-build and final assembly stages. The factory initially completes the entire HPP build within its premises, validates the outcome, disassembles the components, and transports them to the site for final assembly.

4).Event site

Brand D's HPP event will mainly carry out themed displays and experiential makeup trials, and set up a series of interactive sessions with consumers.

5).Booth Dismantling and scrapping

When the HPP activity is over, the whole booth will enter the dismantling stage. The dismantled material parts will first be kept in the factory for a period of time. During this process, the factory will organize and provide a

scrap opinion feedback to D Brand. If an order is received from the brand to scrap, the factory will contact a scrap company to scrap the remaining materials.

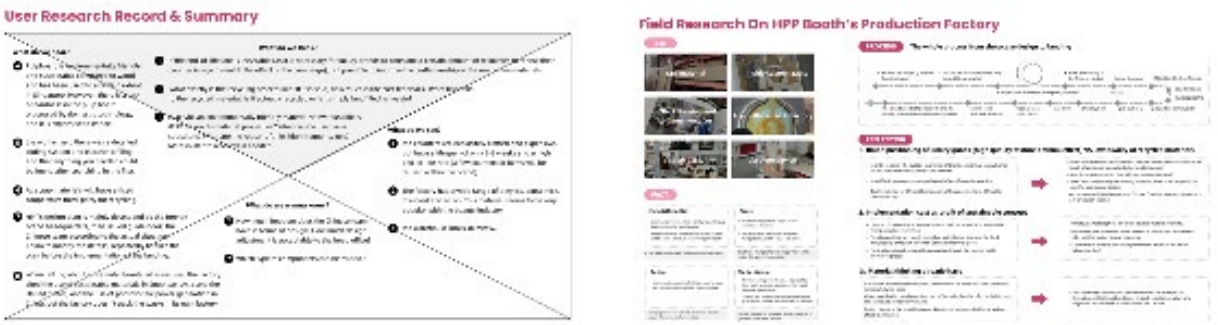


Figure 5、6. Brand D warehouse and factory field research records

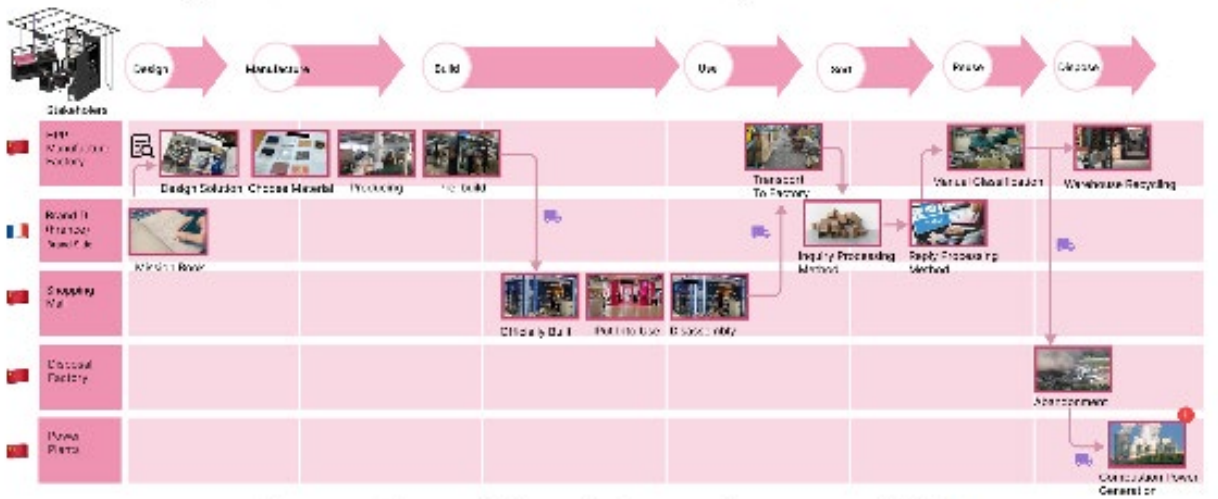


Figure 7. Current life cycle interaction system of HPP

2.HPP Material Research and Classification

To pinpoint design improvement areas, the research team further examined the materials employed in Brand D's HPP. Collaborating closely with the brand, and identified the most common components, materials, and furniture used in a standard D Brand HPP space. These were classified into three categories: rarely recycled, broken down and recycled until they lose functionality, and typically reused. Upon quantifying these categories, the research observed that Brand D presently directly recycles only 14-34% of the materials. Approximately 20% of the materials exit the recycling process at the conclusion of an event lasting about 2-4 weeks.

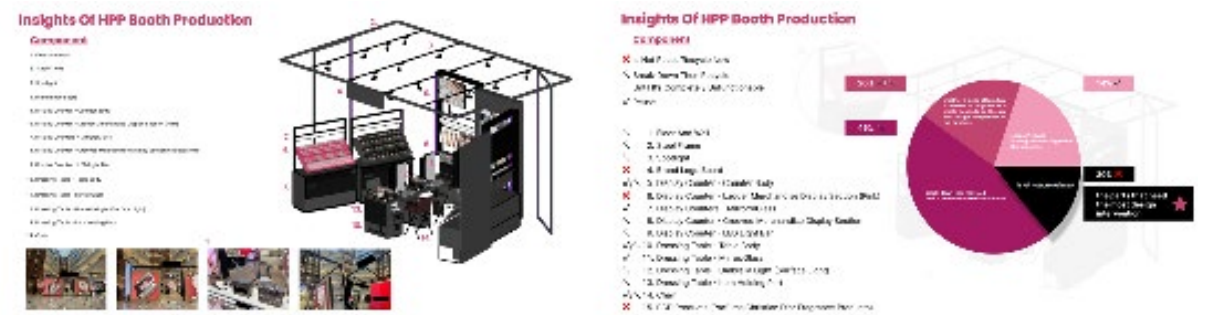
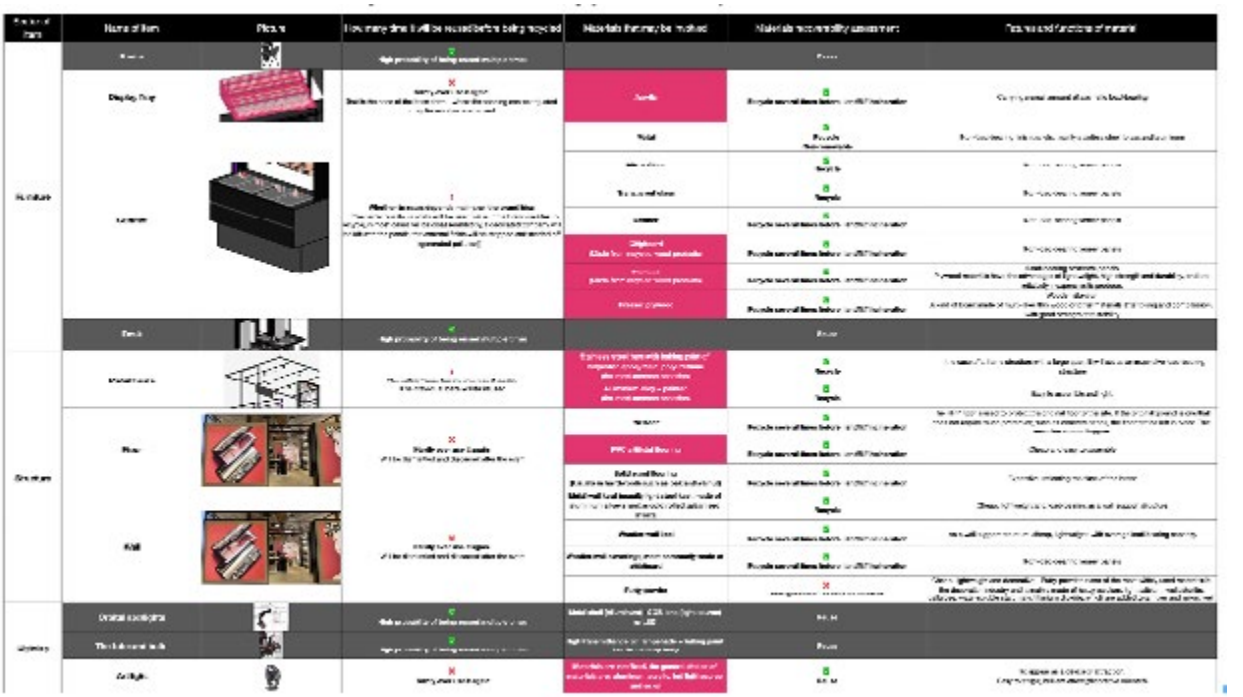


Figure 8、9. Sorting out the required building blocks for a typical HPP for brand D

3.HPP Furniture Split and Component LCA Sorting

The research team further disassembled this items and sorted out the use, characteristics, production process, recycling process, and end-of-life process of the materials that may be used as well as the most commonly used for each type of component.



Brand D's traditional HPP mainly consists of furniture, structures, and lighting. Among these, chairs, desks, light fixtures, and unit frames are the most likely to be reused many times. They are not strongly related to the theme of a single event and offer a high degree of freedom for combination. For example, if an HPP uses a large frame composed of unit frames or steel bars welded together, there is a high probability that the frame will be disassembled at the end of the event and reassembled according to the required size for the next event. This indicates that modularization remains highly effective as a sustainable solution.

On the other hand, display trays, wall coverings, flooring, and art fixtures have a high likelihood of being dismantled and discarded after a single event. This is because they need customization to match the campaign's theme, and the customized content usually includes the brand's message and logo. However, most of the materials used in these items can be recycled. In order to protect intellectual property rights, brands have sacrificed the recycling of materials to some extent.

Cabinets are the most complex HPP components in terms of carrying functions, and they involve a wide variety of materials such as metal, glass, leather, chipboard, plywood, and press plywood. The extensive range of materials allows for subjective selection, which means materials with a high recycling efficiency can be chosen. However, Brand D sometimes foregoes the use of highly recyclable materials to achieve higher quality and perfect results. The team discovered that the decision to reuse cabinets primarily depends on the brand's choice. However, during field research at the factory, the team did not see the cabinets in the warehouse, suggesting a low probability of their reuse.

Findings

The study revealed that Brand D had initiated sustainability integration across the entire HPP process, intending to reuse related consumables. However, challenges surfaced:

1.Balancing Luxury Brand Image with Recycled Materials:

Brand D strives for a high-level texture and visual appeal consistent with its brand image, making it difficult to ensure the same with recycled materials.

2.Incentive Gap for Material Recycling:

Presently, the high cost associated with material recycling deters both factories and brands from vigorous enforcement. Partner factories, despite executing brand programs, lack significant involvement in the execution process.

3.Aligning with Sustainable Values:

Brands desire visible sustainability initiatives, yet mere material recycling poses a risk to brand texture without adequately reflecting sustainability commitment. This diminishes incentives for both brands and factories to act.

And, by analyzing the organizational form, operation cycle, processed component materials, and recycling methods of Brand D's HPP, the research team concluded that the following design opportunity points exist in the entire process of HPP, from design to processing, production, and recycling:

1. Recycle some of the components for internal reuse within the brand, or categorize the parts into a registry and reintegrate them into the next HPP production process.
2. Recycling of some components for reuse outside the brand, thereby developing a second-hand market and extending the life of the material.
3. Obtain proper maintenance and repair instructions digitally and authorize the local company to repair the product itself.
4. Redesign and enhance member connectors.

Conclusions

To summarize, a POP-UP is a business tool that adapts to the current business environment and can generate significant revenue for brands. However, its short duration, distinct theme, and irregular venues have led to issues such as a short life cycle of materials and wastage of resources. Through field research and an analysis of the typical HPP erection and dismantling process of Brand D, the research team proposes the possibility of internal and external reuse of some components of a single HPP to prolong the lifecycle of related materials. However, there are still various design challenges in this process, such as the brand's need to prioritize the protection of intellectual property rights and the increased cost of intelligent warehouse management. This study can provide advice and guidance to environmentally conscious and socially responsible brands in their POP UP decision-making and design, contributing to shaping a more harmonious and cohesive society.

Acknowledgement

We would like to thank prof. Paola Trapani for implementing the research tools, and the researcher Ning Jin, Yating Ren, Yilin Li, Zinning Zhou and Benyu Hu, for their contributions to the initial discussions and materials collecting. We would also like to thank Brand D for sharing their materials and providing the opportunities for field research.

References

Huajing Industrial Research Institute (2022), China Flash Stores Industry Market Panoramic Assessment and Development Strategy Planning Report in 2022-2027. (In Chinese)
Realest Talents (2022), Chinese Pop-Up Research Report. (In Chinese)
Cushman, Wakefield (2015), The Popularity of Pop-Up Shops.
Hu Fei, Zhong Haijing (2020), Environmental Design Methods and Their Multidimensional Analysis, Packaging Engineering, 41:04, 20-33, DOI:10.19554/j.cnki.1001-3563.2020.04.003.
Yan Jiu (2002), The Use of Interviewing Methods in Social Science Sesearch, The Beijing Federation of Trade Unions College Journal, 17:02, 44-50. (In Chinese)

Research on the Construction of Public Space in Northwest Sichuan Based on the Spirit of Place - - Taking Jiangyou Qinglinkou Ancient Town as an Example

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Abstract

In the context of the irreversible progress of human society towards post-industrial civilization, the number of traditional villages as ' living fossils'and'gene banks'of China 's agricultural civilization has plummeted on the one hand, and on the other hand, the remains are precious and become the material and cultural foundation for rural revitalization and maintenance of nostalgia. Among them, the village public space characterized by social public services has attracted much attention. It is not only an important activity space for villagers ' collective activities, carrying the collective memory of several generations, but also an epitome and carrier of regional culture. With the transformation of the main social contradictions in the new era, the rural revitalization strategy has promoted the rapid development of rural construction and cultural tourism, leading to the gradual change of rural public space structure. The existing public space neighborhood relationship is indifferent, the trad 中 anal public space ecological environment is degraded, the new public space tends to assimilate and the village local culture declines. Therefore, in order to better promote the development of ancient towns, it is necessary to further study the ancient towns in northwest Sichuan. This paper introduces the theory of place spirit and takes the second batch of Qinglinkou Village in Jiangyou City, which is included in the list of Chinese traditional villages, as an example. The current situation of the site is investigated on the spot and the pain points are analyzed, and then the construction mode of' starting, carrying, transforming and merging'is put forward to be demonstrated in practice, and the activation power and internal demand of Qinglinkou ancient town are explored through the phenomenon. In order to provide a reference for the traditional ancient town to continue the existing style while inheriting the spirit of the place behind it in the protection and revival.

Author keywords

Public space; Spirit of place; Qinglinkou Ancient Town

Introduction

Since ancient times, there has been a proverb that says, "It is better to be attached to a twist of soil in one's hometown than to love ten thousand taels of gold in another hometown." The localization of Chinese society and the inheritance of the hometown have resulted in the deep affection for the "well-being" of the land that is embedded in our veins. With the "rise of global culture" brought about by the integration of global science and technology, information, and economy, and

the acceleration of China's "urbanization" and the deepening of the "construction of new countryside", the lack of comprehensive planning, improper protection, and hasty development of the land has led to a serious shortage of land. Due to the lack of overall planning, improper protection, and the rush for quick success and instant profits, people enjoy the comfort and conven ience of life brou ght about by high-speed develo pment, but at t he same time also cause the gradual loss of the village's own local style, wh ich leads to a grow ing lack of social collective memory built in the village's publ ic space. As an important place for villagers'l ife and cul t ural exchanges, public space can be created to improve the quality of t he landsca pe and the function of use, enhance the interaction and commun ication between villagers, and promo te the social develo pment and cul turalinher itance of the village.

Synthesis of research

The world as a whole is made up of concre te and abst ract phenomena, with com plex and cont rad ictory relationsh ips between t hem. When some phenomena interact with each ot her and form a specific situation, we can unders tand it as a "place". Place is a kind of spirit, emotion and memo ry "con tainer", has a special identity. The Norwegian arch itect Norber t Schultz put forward t he "spirit of place" is generated by the fusion of the inner sub 丿 ecti ve will space and the ob 丿 ecti ve existence space of human beings. (Norber g-Schulz, 2010) In order to bett er grasp t he spirit of place in t he rural publ ic space creation from theory to practice of t he evolu tion of the process t hrou gh t he CNKI and Web of Science database to export t he data in the past 20 years for visual ization and analysis {Figure 1), and interpretation. In t he last five years, research in this field has shown a t rend of rapid grow t h, especially in 2016 and 2020. With t he help of CiteSpace software to visual ize and analyze t he aspects of clustering mapping and knowled ge graph of research keywords the field of landsca pe design and landsca pe arch itecture has paid more attention to the theory of spirit of place. The t rend of publ ications in recent years shows that the Spirit of Place Theo ry is stil l a popular topic that att racts a lot of att ention and is expected to continue to att ract wide interest in the future.

Figure 1. Comparison of the amount of domestic and international literature on spirituality of place

const ruction of public infrast ructure and t he upgrading of the human environmen t. Combine rural environmen tal management with indust rial econom y, engineering const ruction and village improvemen t. With t he conti nuous const ruction of digital virtual public space, through the Internet and other technolo gies, st rengthen publ icity and mob ilize enthusiasm, so that "protection" is integrated into life.

Publ ic Space Crea ti on Prac tic es in Qingl inkou An cien t Town under t he Pers pec ti ve of t he Spi r it of Place

Proj ect Overv iew

The project is located in t he northwest edge of Sichuan Basin. It is known as the "First Ancient

Town in Northwest Sichuan" and is an ancient village where mul tip le cultures coexist. There are

Figure 2. Analysis of the concept of spirit of place

Figure 3. Problems and contradictions in the current state of public space

Translating Sense of Place with Slices of Time: Experience from Miyazaki, Japan

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Abstract

The advancement of society has resulted in a cultural and geographical homogeneity known as "placelessness." To counteract this trend, conventional efforts often concentrate on functional strategies and effective branding. This paper, however, proposes a novel approach to combat this phenomenon by highlighting the role of self-expression in reinforcing a sense of place. Drawing inspiration from a collaboration between Musashino Art University and Miyazaki's forest industry, we explore how self-expression contributes to a stronger sense of place. Students engaged with the environment, using various media to capture their experiences. This act of "translating experience" not only deepened their engagement but also facilitated the development of a genuine sense of place. The strong emotion, rooted in preserving experiences, can be interpreted as an expression of love for a place. Beyond traditional photography theories, all forms of self-expression, contribute to a sense of place by conveying authentic attitudes and connections.

In a society overshadowed by uniformity, we argue that by encouraging individuals to translate their experiences into various forms, a more authentic representation of places can emerge. This approach offers a promising avenue to reestablish a sense of place, construct our narrative of love for a place, and counter the dominant influence of placelessness, contributing to a more meaningful and diverse spatial experience for this transitioning society.

Author keywords

placelessness; sense of place; theories of photography; self-expression; translating experience

Introduction

Globalization, the process of transformation in the spatial organization of social relations and transactions, has brought rapid urbanization, commercialism, and mass communication that lead to a state of cultural and geographical uniformity (Freestone & Liu, n.d.; Held et al., 2002; Relph, 1976). Relph describes this uniformity as "placelessness", "the weakening of distinct and diverse experiences and identities of places" and states that the characteristics are being diminished in the waves of modernization (Relph, 1976).

Flooded by the standardized values from mass communication, we, in this post-industrial society, are losing our sense of place. The definition of sense of place varies. Sense of place comes with an authentic attitude to

place, "a direct and genuine experience of the entire complex of the identity of places" without the influences of mass fashion, values, and social conventions (Relph, 1976). An inauthentic attitude to place means "involving no awareness of the deep and symbolic significances of places and no appreciation of their identities" (Relph, 1976); it is a convenient attitude, heavily influenced by widely uncritically accepted values or aesthetic fashion that leads to a diminished
sense of place. Both authenticity and inauthenticity are valid attitudes toward everyday life. The important subject is, as inauthenticity becomes the more prevailing attitude, a deep-felt authentic relationship with a place will be even less possible to gain. There are efforts shown to retrieve or create place identity and sense of place in different areas, mainly those related to urban planning and marketing. The importance of being locally anchored and capturing the social context of place identity has been emphasized in Place Identity, Participation, and Planning (Hague & Jenkins, 2004). The concept of place branding emerges as a strategy to manage place identity, emphasizing the idea of a sense of place and residents' consciousness. Some articles point out the possible utilizations of place branding as a spatial planning instrument to enhance engagement and build place identity (Bonakdar & Audirac, 2020; Oliveira, 2015; Van Assche et al., 2020). Nevertheless, the concept of place is also widely discussed in Japan, from the idea of "regional gene" (Goto, 2000) to a recent academic focus on place branding along with the regional revitalization strategy(Wakabayashi, 2014). Also, a design practice called "Qingtian Form" in China has gained considerable attention as a design model focusing on local ethics and lifestyles (Qu, 2019).

The above academic interests come from a spatial planning and business strategy angle, which can be considered as "techniques" which is functional efficiency oriented (Relph, 1976). Besides searching for the efficient design to establish placeness, this paper will emphasize self-expression and propose, from a perspective of photography for discussing, a new angle to discuss a possible expression of love towards a place. We will first present our observations about self-expression being an expression of love and a sense of place based on the experience from a University-Industry collaboration program between Musashino Art University (MAU) and the forest industry of Miyazaki. In the subsequent section, by referencing theories of photography, we will define the self-expression observed in MAU-Miyazaki program as an act of translating experiences and expression of love. Then we will further elaborate on how translating experience can represent and communicate the sense of place. Lastly, this article will discuss and conclude the translation of experience as an expression of love and evoke new discussions about placelessness and the attitude toward place.

Experience from Miyazaki: self-expression and sense of place

Miyazaki, one of the cities with high quality cedar wood in Japan, is facing challenges relating to sustainable developments and an aging workforce. Aiming to introduce new perspectives to the industry, Miyazaki forestry agency, NGO, forestry businesses, and MAU collaborate and design a program, which provides the students with the chance to connect with the environment and industry and to share their findings with the locals and others. During the program, 6 undergraduate students from MAU spent a month in the mountain area of Miyazaki to visit, explore, and communicate with the residents. The students are
encouraged to indulge themselves and record their experiences through picture taking. At the same time, other forms of media are also welcome besides photographs. During the 1 month's stay in Miyazaki, around 150

Figure 1. Student-produced magazine

pictures with captions are being recorded as results of "Photo Observation". Besides pictures, the students also record their experiences and thoughts in various forms, including writing, voice recording, and drawings. Many undocumented photos of their daily lives were shared in the conversation from an online chatgroup of the program.

As a result, based on the collected records of experiences the students have self-produced a magazine called Travelling through the Forest (Figure 1). From the magazine, we notice that the students gradually develop a sense of awareness towards the environment of Miyazaki and themselves.

Some students do not only describe the identity of place in their individual columns but also express a certain aspect of their own identity relating to Miyazaki. For example, Student S and Student A both have written dairies along with images, with their own words and photographs to express some genuine feelings toward the place and people of Miyazaki. By putting it into words, S says that the diary becomes a tool for him to have a better recognition of his feelings at the time. Furthermore, some other students express their emotional interpretation of the environment and the people of Miyazaki, instead of showing their identity their sense of place leans more toward the identity of place. For example, Student C connects with the local craftsmen and has recorded the conversations with multiple craftsmen with writings, recordings, and photographs. Student M has taken a route toward self-expression of the sound and the voice of Miyazaki and started a radio show focusing on the conversations with the local community to introduce a side of Miyazaki which only she has experienced. Lastly, the students' act of self-expression can be understood as an expression of love, a deep-felt emotion. Self-expression does not only enhance their engagement with the place but also helps them to develop a sense of place. Thus, we argue that what the students have achieved in the program as the "translation of experience" which will be further elaborated on the rest of the paper based on theories of photography.

Translating experience: a photography perspective

Pieces of world

The idea of translating experience is mentioned in various works of literatures on photography. To further elaborate on the idea of translating experiences, this section will first begin with a brief background of photography and then discuss the action of producing photographs. The invention of photography dates to the 19th century, and, in the early days, its existence is once viewed as black art which mirrors god's creation with manmade instruments. To produce photographs with an instrument is once sacrilegious, and the way photographs have reflected our reality is still particularly intriguing. Benjamin once commented that the photographs of French photographer Eugene Atget "suck aura out of reality", which can be interpreted as photography can capture the "strange weave of space and time"(Benjamin, 2005). In other words, photograph represents of a specific moment in a specific space. Years after Benjamin, Susan Sontag has described photographs as pieces of the world, the "miniatures of reality that anyone can make or acquire (Sontag, 2005)." Therefore, photographs with the quality of transience and reproducibility, are pieces of "momentary copies" of the original world produced.

Translating experience: a melancholy

We use the camera as the arm of our consciousness to translate our experience into images (Sontag, 2005). Our experience instantly becomes immortal then the specific moment is sliced out from the experienced reality. Every capture becomes the past when the shutter is pressed, thus, every photograph carries a pathos of the melancholy toward the time past. This kind of deep-felt emotion comes with every photograph, the translated experience, especially the old photographs because of the greater "loss of time". The moment we decide to "translate" our experience and produce a "copy" of the present, we are doing it with a notion of keeping the

moment or an unwillingness of accepting the current to end. Sontag describes, "to take a photograph is to participate in another person's (or thing's) mortality (Sontag, 2005)." With photography, we attempt to preserve, like conducting taxidermy, and to create immortality or "death", which correspond Roland Barthe's idea of "flat death" (Barthes, 1982). There is a deep emotion, an urge or longing in this death creating action, or even aggression. Meanwhile, this attempt to stop time and to create immortality represents a deep-felt feeling which could be considered as love.

The focus is on the act of "photography"—a mode of translating experiences. Based on the above interpretation from a photography aspect, every record they made is a piece of Miyazaki which represents a certain connection they have at a certain moment. What they have done is not simply just taking pictures or writing notes. The students are consciously and unconsciously translating their experiences into photographs and other different forms throughout the program, and such media activism enables them to construct an authentic image of Miyazaki from their perspective with less influence from the mass value.

Translation of sense of place: a slice of time beyond photography

With technological development and digitalization, especially the emergence of digital personal devices like smartphones, similar qualities of consistency and immediacy do not only exist in photographs. Photography, intertwining with other mediums, comes with a message of mirroring the world and "transcends the pictorial by capturing the inner gestures and postures of both body and mind" (McLuhan, 1994). From a more post-modern lens, we will broaden the discussion beyond the boundary of imagery to further elaborate on the representation of a sense of place. The product can be generalized as a slice of time, "a piece of translated experience"; and the act of producing such translation will be a broader sense of media practice in time and space.

Based on the experience from the Miyazaki Program, the translation of experience is a translation of a sense of place. According to Casey we as "humans are ineluctably place bound, we are placeling and our very perceptual apparatus, our sensing body, reflects the kinds of places we inhabit", thus we are in a dynamic relationship with a place and are constantly experiencing the surrounding environment (Casey, 1997). Based on Relph's definition, a sense of place is an authentic attitude that be understood as a genuine experience. The essential to have a sense of place is "experiencing". As what Feld has pointed out, "When place is sensed, senses are placed; as places make sense, sense make place. (Feld & Basso, 1996)" Any translation of experience can be a fragment of our authentic experience, a kind of self-expression of one's sense of place. To enhance placeness, a place needs to make sense with our authentic attitude and a deep-felt emotion called love. Like what we have observed in the Miyazaki program, translating experiences through a preferable media or instrument, consistent "copies" of our experience, attitude and love are produced. With these kinds of "slices of time", the copies of our experiences, it becomes possible for us to share and communicate our sense of place, and an authentic relationship with place could become easier to gain while facing the dominant placelessness phenomenon.

Discussion and Conclusion

From the Miyazaki program, we have seen how the participating students expressed their love and feelings by translating their experiences into different forms of copies of realities. We have also noticed the gradual formation of their own narrative of love toward Miyazaki, consisting of their own identity, sense of place, and the place identity. We conclude that self-expression, especially the translation of experience, is important to establishing placeness. As we are facing dominant inauthentic representations, we argue that more authentic representations of a place will be needed for constructing a locality.

By referencing theories of photography, we introduce the experience from the University-Industry collaboration

program to discuss how a sense of place can be represented and communicated with the translation of experience. Every record of reality is a piece of the world, and each piece created through translating our experience should be considered as a reflection of our attitude toward the environment. Even though the translated experiences can be both authentic and inauthentic, such self-expressive action give voice to the less dominant authentic attitude and encourage a more authentic relationship with the place while facing the dominant placelessness phenomenon. As the idea of place has become increasingly important in post-modern society, continuous exploration of how our attitude and sense of place can be represented will be crucial for us to navigate ourselves in the placeless phenomenon and transitioning society.

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References and citations

Benjamin, W. (2005). Little History of Photography. In M. W. Jennings, H. Eiland, & G. Smith (Eds.), & R. Livingstone (Trans.), Selected writings. 2,2: Vol. 2, part 2, 1931-1934 (1. Harvard Univ. Pr. paperback ed, pp. 507–530). Belknap Press of Harvard Univ. Press.

Bonakdar, A., & Audirac, I. (2020). City Branding and the Link to Urban Planning: Theories, Practices, and Challenges. Journal of Planning Literature, 35(2), 147–160. https://doi.org/10.1177/0885412219878879

Casey, E. S. (1997). How to Get from Space to Place in a Fairly Short Stretch of Time: Phenomenological Prolegomena. In S. Feld & K. H. Basso (Eds.), Senses of Place (pp. 13–47). School of American Research Press.

Feld, S., & Basso, K. H. (Eds.). (1996). Senses of place (1st ed). School of American Research Press ; Distributed by the University of Washington Press.

Freestone, R., & Liu, E. (2016). Place and Placelessness Revisited. Routledge.

Goto H. (2000, January 14). Nihon no KukudoKeikaku to Machidukuri[National Land Planning and Urban Development in Japan]. The 2000 Symposium Industrial Park Planning and Development. Japanese National Planning and Community Planning, Taipei,Taiwan.

Hague, C., & Jenkins, P. (2004). Place Identity, Participation and Planning (1st ed.). Routledge. https://doi.org/10.4324/9780203646755

Held, D., McGrew, A. G., Goldblatt, D., & Perraton, J. (Eds.). (2002). Global transformations: Politics, economics and culture. Stanford Univ. Press.

McLuhan, M. (1994). Understanding media: The extensions of man (1st MIT Press ed). MIT Press.

Oliveira, E. (2015). Place branding as a strategic spatial planning instrument. Place Branding and Public Diplomacy, 11(1), 18–33. https://doi.org/10.1057/pb.2014.12

Qu, Y. (2019). Qingtian Form: A Kind of Local Ethics and Design Practice Based on the Reconstruction of Life Style. ZhuangShi, 12.

Relph, E. (1976). Place and placelessness. Sage.

Sontag, S. (2005). On Photography. RosettaBooks LLC.

Van Assche, K., Beunen, R., & Oliveira, E. (2020). Spatial planning and place branding: Rethinking relations and synergies. European Planning Studies, 28(7), 1274–1290. https://doi.org/10.1080/09654313.2019.1701289

Wakabayashi, H. (2014). Chiiki Brand Identity Sakutei Ni Kansuru — Kousatsu[A Study on the Formulation of Local Brand Identity]. Japan Marketing Journal, 34(1), 109–126. https://doi.org/10.7222/marketing.2014.033

Smart Material Inspired Emotional Design based on Biosignal Measurement

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Objective: The main objective of this paper is to establish a general and structured quantitative emotional interaction design method and integrate it closely with smart materials to facilitate emotional interactive product design. By utilizing smart materials, human emotions can be effectively connected with design elements, enhancing product innovation, user-friendliness, and intelligence, while empowering product designers to fully exploit the potential of smart materials in emotional interactive product design. Method: The paper adopts an "empirical validation method". It refines the new method framework based on the traditional double diamond theory and verifies the effectiveness and feasibility through actual design practices. Results: Under this method's guidance, an interactive product design practice based on smart materials was conducted, successfully creating an emotionally relevant interactive product, employing smart materials' transparency changes as a key medium, achieving an organic fusion of emotions and design elements. Conclusion: The research concludes that combining smart materials with emotional interaction design offers significant advantages and promising prospects. Implementation of this method is expected to unlock more possibilities for emotional interactive product design and further drive the development of smart materials in the design field.

CCS CONCEPTS • Human-centered computing • Interaction design • Interaction design process and methods
Keywords: Smart Material, Emotional Design, Emotional Engineering, Intelligent Product Design, biological Measurement

1 INTRODUCTION

As society progresses and consumer demands change, there's a growing emphasis on addressing users' emotional needs in design, alongside function and form. Emotional design is now pivotal for enhancing user satisfaction and product competitiveness. Traditional methods rely on qualitative analysis and subjective measures like surveys, which are influenced by personal feelings. To improve accuracy, we need to quantify user emotions through affective computing. Smart materials, capable of sensing and adapting, offer significant potential, especially in emotional design. This paper aims to establish a structured method for emotionally driven smart material design, linking human emotions with design elements through smart materials and creating a more controlled product interaction experience.

1.1 Quantified Emotional Design Methodology

Currently, most research focuses on obtaining multimodal emotional biosignals for design but lacks overarching design guidelines. These biosignals are mainly used in product feedback collection and interactive product

design. While feedback collection methods are well-developed, interactive product design methods need further attention. Scholars like Hongyu Guan [1] explored enhancing user emotional experiences in intelligent building design through EEG. Liu & Wang [2] revealed true emotional design preferences for car styling. Others, such as Zhu Yue [3], used eye-tracking to study cultural characteristics of Liao Dynasty ceramics for design reference.

In human-computer interaction design, some scholars, like Aftab [4], incorporated multimodal emotional biosignals for driver intent recognition. Calandra et al. [5] developed a panoramic artwork system adjusting content based on user interest inferred from pupil size. Tomo et al. [6] created a puppet theatre robot with musical emotion recognition. Rosello [7] designed a wearable device presenting heart rate signals visually. Kosmyna & Maes [8] used AttentivU to perceive brain activity and enable human-computer interaction.

In emotional design, there's a need for quantified methods; current research primarily focuses on emotion measurement and recognition. Kansei engineering models the relationship between design elements and perception, but a structured emotional design method linking quantified emotion with product design remains elusive.

1.2 Smart Materials in Emotional Design

Smart materials, which can be altered by factors like stress, temperature, or electric fields, find applications in various fields: construction for damage detection, medicine for controlled drug release, fashion for altering perceptions, and automotive for interior temperature control.

However, despite their widespread use, smart materials remain underexplored in design, particularly in affective design. Existing efforts are mostly conceptual. Initiatives like "ICS_Materials" by the MADEC Research Center at Politecnico di Milano explore the synergy of design, materials, and interaction. "UltraSurfaces" [11], for instance, detect sensory changes and facilitate data exchange through remote manipulation, offering potential applications in healthcare. Additionally, "Material Driven Design" [12], unlike traditional market-centric design, emphasizes transitioning between material properties and visual representation.

A significant gap exists in applying smart materials to affective design, despite their potential to infuse products and environments with personalization and emotional resonance. Establishing a smart material-driven approach to emotional design is imperative.

1.3 The Main Content of This Paper

This paper refines the theory of quantitative emotional interaction design by analyzing existing methods. It integrates smart material research into design for emotional interactive products. The paper consists of four parts: introduction, method framework creation, practical application, and conclusion.Firstly, it identifies challenges in traditional emotion design methods, highlights smart materials' potential, and reviews existing research gaps.Secondly, it creates a framework for emotion-driven intelligent product design inspired by smart materials, refining it with design practices and traditional methods.Next, it conducts an interactive product design using this framework, utilizing energized nebulized membranes as smart materials to measure electrodermal activity signals. Finally, it summarizes results, discusses research advantages and future prospects in the field.

2 THE FRAMEWORK OF THE DESIGN METHOD

According to the current research achievements in the field of emotion quantification and the design process and methods commonly used in daily life (Double Diamond Model) [13, 14], this paper proposes an emotion-driven intelligent product design method inspired by smart materials. It serves as a thinking model for designers engaged in emotional design, assisting them in creating user-centric designs based on emotions. This

structured method divides the entire design process into four stages:

Stage One: User Emotion Research

This stage consists of two parts. The first part involves divergent exploration and investigation, collecting extensive user emotional information, and engaging in divergent thinking to explore and study the essence of the problem. In- depth research is conducted using primary and secondary data to understand user characteristics, the current state of the product, how users use the product, and their attitudes toward it. User emotional needs are analyzed from this information, and the target emotions to be studied are clarified. The second part involves a more in-depth and specific study of the identified target emotions to achieve emotion quantification. Subjective and objective measurement methods are used to conduct emotional measurements of target users in both physiological and psychological aspects. This yields emotional data and numerical signals related to user emotions and identifies the emotional characteristics of users.

Stage Two: Smart Materials Research

In this stage, smart materials act as the driving element to inspire innovative emotional design. Designers conduct in- depth research on smart materials, progressively deducing and analyzing the changes in product states. The specific steps of this research are as follows: First, analyze the three properties of smart materials, namely natural properties, functional properties, and social properties, to gain a general understanding of possible applications of smart materials. Secondly, delving into the response characteristics of smart materials that change with external adjustments, with user emotional characteristics as inputs and changes in product states as outputs, to clarify the interaction between smart materials and human emotions. Lastly, selecting suitable smart materials based on the physical and chemical forms, geometric shapes, strength properties, and extensive properties of the materials.

Stage Three: Emotion Feature - Product State - Smart Material Attribute Model Construction

In this stage, starting from the user's emotional characteristics, the intersection of the human-computer interaction, i.e., the human-machine interaction model is sought to guide designers' design thinking and achieve the corresponding transformation from emotional features to product states and smart material attributes. This mapping model is based on Donald A. Norman's three-level theory of emotional design and proposes a rough correspondence between emotional features and product states, and smart material attributes: The instinctive level corresponds to immediate emotional effects achieved through sensory stimulation, which is related to design elements such as the product's form, color, material, and corresponds to the natural attributes of smart materials, such as weight, hardness, transparency, etc. The behavioral level corresponds to the user's experience of using the product and is closely related to the product's functionality, performance, and usability, corresponding to the functional attributes of smart materials, such as visibility and other functional changes. The reflective level corresponds to the user's feelings about the product's meaning, including self-image, social status, etc. It reflects whether users can obtain care, social recognition, and cultural, informational, and utilitarian aspects from the product, corresponding to the social attributes of smart materials, which can evoke emotional responses or memories from users.

Stage Four: Emotion Design Research

This stage is the actual design phase and is also divided into two parts. The first part is based on the previous deductive results and involves exploring potential solutions. This part is the divergent stage of generating numerous idea proposals and conducting preliminary evaluations of feasibility from both functional aspects (mainly referring to the model deduced in stage two) and the form (appearance) of the product. The second part involves determining the final solution and the ultimate realization of the product. All potential solutions are analyzed and verified one by one, and the most suitable ones are chosen. Product prototypes are created,

tested, and iterated, continuously improving and optimizing, eliminating unreasonable idea proposals, and finally outputting the most suitable design.

3 APPLIED CASES

3.1 Research on User Emotion

This section aims to collect, measure and analyze users' emotional information to obtain the final target group and its specific user emotional characteristics.

First, 10 couples were surveyed through questionnaires and interviews. Through a large number of crowd surveys, it was finally determined that the emotions of people in the process of receiving gifts - seeing the packaging - unpacking and seeing the specific contents will be the research object of this design.

This study then measured the target emotions of people receiving gifts - seeing the packaging - unpacking in both physiological and psychological aspects. The user's data changes in this process are measured through the Arduino skin sensor.

Finally, the emotional characteristics of the user during the process of receiving the gift - seeing the packaging - unpacking were obtained as calm - slightly happy - moderately happy - strong happy.

3.2 Research on smart material liquid crystal film

3.2.1 Properties of liquid crystal film

The smart material used in this study is a film of liquid crystals, a substance between liquids and crystals. It has the following properties:

(1) Natural attributes

The natural properties of the liquid crystal film include refractive properties, nematic alignment, electrochromic properties, and current control properties.

(2) Functional attributes

The functional attributes of liquid crystal film include energy saving, transparency-atomization conversion, fast response, etc.

(3) Social attributes

The social attributes of liquid crystal films are first mainly reflected in applications in information technology and communications, education, medical fields and conference rooms, such as display screens, electrified atomized glass windows, etc.

3.2.2 Interaction mode of liquid crystal film

By controlling the presence or absence of current through changes in human skin electricity data, the liquid crystal film exhibits transparent-atomization effects at different frequencies and realizes the interaction between people and liquid crystal film materials.

3.3 Emotional features-product status-intelligent material attribute model construction

Visceral level – immediate emotional effects. After comparing various characteristics of transparent materials on the market, acrylic material was finally selected as the material for this design.

Behavioral layer - the feeling of using the product. This product is made up of six acrylic panels. One of the panels is pasted with a smart material—switchable film. They are easily spliced together and can be disassembled at any time, in line with the product's ease of use

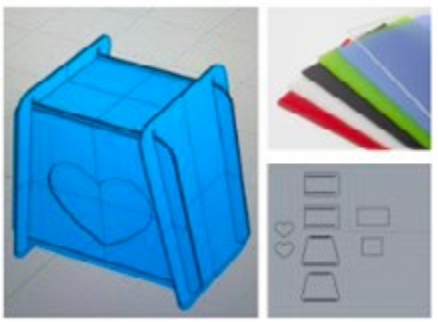

Figure 1: Modeling of acrylic gift box in Rhino software and acrylic sheet in many colors.

principle.

Reflective layer - the feeling of the meaning of the product. Users gain care and social recognition through the splicing construction of the product and its dimming film conversion function.

3.4 Research on Emotional Design

After the previous derivation, this experiment decided to focus on the design of the acrylic smart dimming gift box.

3.4.1 Potential solutions for products

Appearance design solutions

This product is made of six acrylic sheets spliced together, and is designed in a trapezoid shape for stability.

Arduino designed solution

The solution is to not change the original switch control of the dimming film, but directly connect the switch to the servo, connect the servo and the skin sensor to the Arduino UNO development board, and write code, which can also realize the user's emotional control of the dimming film changes.

3.4.2 Feasibility assessment of the solution

After the construction is completed, it has a certain degree of stability and can carry small items such as perfume, books, postcards, cosmetics, etc. And its upper plate can be removed at any time for easy access. The steering gear can successfully control the switch and achieve interactive effects.

Figure 2: Keyshot rendering and physical finished product.

3.4.3 Verification Solution and Final Design

The design connects the blade fan of the servo to the switch. The servo drives the switch to rotate 50 degrees in a circular motion to realize the opening and closing of the switch controlled by Arduino.

Then connect the galvanic sensor to the Arduino Uno development board and write code to complete the final design. The user wears a skin electrode sensor when using it, so that the user's emotional changes when receiving a gift, that is, the skin electrode data changes, control the atomization-transparent interactive reaction of the dimming film, and realize the visualization of emotions. When it detects that the user's mood is extremely high, it will remain in transparent mode, and the user can fully observe the situation in the gift box.

Figure 3: Servo control switch mode, code writing and different forms of products stimulated by different signals.

Using Heartbeat can increase the fun of people giving gifts, allowing love to be transmitted between people through it, visualizing expressing love and receiving love, and realizing the narrative of love.

4 CONCLUSION

This article proposes a general and structured method for the emotionally driven design of smart materials. The main focus of this research is to integrate smart materials into the process of quantified emotional design,

linking human emotions with design elements such as form, color, and texture through smart materials as a medium. This approach

After the construction is completed, it has a certain degree of stability and can carry small items such as perfume, books, postcards, cosmetics, etc. And its upper plate can be removed at any time for easy access. The steering gear can successfully control the switch and achieve interactive effects.

addresses the shortcomings in previous design studies regarding the consideration of smart materials and the lack of consideration for user emotions and experiences when applying smart materials. As a result, the outputs are more innovative, user-friendly, and intelligent.

Further exploration and research are still in need in the future. Next step, we will conduct research from the following aspects: First, we will improve the method model and steps, to more deeply depict the mapping relationship between user emotions - smart materials - product states. Secondly, we will make a deeper exploration of the application level of this method and put it into practice in the real design process to enrich its application scenarios. In addition, we will collaborate with researchers and practitioners in related fields for interdisciplinary exchange and cooperation.

REFERENCES

[1] Hongyu Guan, Songtao Hu, Mingli Lu, Mengyuan He, Xiaoxia Zhang, Guodan Liu, Analysis of human electroencephalogram features in different indoor environments, Building and Environment, Volume 186, 2020, 107328, ISSN 0360-1323, https://doi.org/10.1016/j.buildenv.2020.107328.

[2] Liu, C., Wang, Z.: A Method of Requirement Acquisition for Emotional Design of Automobile Styling Based on Kansei Engineering and Online Comments — Taking the Design of Automobile Front Face as an Example (基于感性工学和在线评论的汽车造型情感设计需求获取方法——以汽 车前脸的设计为例). Journal of Anhui Polytechnic University. 37 (1), 62–70 (2022). doi: 10.3969/j.issn.2095-0977.2022.01.009

[3] Zhu Yue,Teng Cheng-lein, Study on Culture Image Meme of Liao Dynasty Ceramics by Psychological and Physiological Measurement(基于心理与生 理测量的辽瓷文化意象基因研究)[J]. Journal of Computer-Aided Design & Computer Graphics, 2020, 32(07):1183-1191.

[4] Aftab, Abdul Rafey. (2019). Multimodal Driver Interaction with Gesture, Gaze and Speech. 487-492. 10.1145/3340555.3356093.

[5] Calandra, D.M., Mauro, D.D., Cutugno, F., & Martino, S.D. (2016). Navigating Wall-sized Displays with the Gaze: a Proposal for Cultural Heritage. AVI*CH.

[6] T. P. Tomo, G. Enriquez and S. Hashimoto, "Indonesian puppet theater robot with gamelan music emotion recognition," 2015 IEEE International Conference on Robotics and Biomimetics (ROBIO), Zhuhai, China, 2015, pp. 1177-1182, doi: 10.1109/ROBIO.2015.7418931.

[7] Rosello, O.: HeartBit. MIT Media Lab. https://www.media.mit.edu/projects/heartbit/%20overview/

[8] Kosmyna, N., Maes, P.: AttentivU: An EEG-Based Closed-Loop Biofeedback System for Real-Time Monitoring and Improvement of Engagement for Personalized Learning. Sensors. 19 (23), 5200 (2019). doi:10.3390/s19235200

[9] W.-G. Drossel, H. Kunze, A. Bucht, L. Weisheit, K. Pagel, Smart3 – Smart Materials for Smart Applications, Procedia CIRP, Volume 36, 2015, Pages 211- 216, ISSN 2212-8271, https://doi.org/10.1016/j.procir.2015.01.055.

[10] Marinella Ferrara, Liu Qiang, Designing with Smart Materials in the Internet of Things Age(物联网时代的智能材料设计)[J]. ZHUANGSHI, 2020(01):12-16. DOI:10.16272/j.cnki.cn11-1392/j.2020.01.005.

[11] Ferrara, M., Pasetti, C. (2020). UltraSurfaces: A New Material Design Vision. In: Ahram, T., Karwowski, W., Vergnano, A., Leali, F., Taiar, R. (eds) Intelligent Human Systems Integration 2020. IHSI 2020. Advances in

Intelligent Systems and Computing, vol 1131. Springer, Cham. https://doi.org/10.1007/978-3-030-39512-4_139
[12] Karana, E., Barati, B., Rognoli, V., & Zeeuw van der Laan, A. 2015 Aug 30. Material Driven Design (MDD): A Method to Design for Material Experiences. International Journal of Design [Online] 9:2. Available: http://www.ijdesign.org/index.php/IJDesign/article/view/1965
[13] Council, D.: Eleven Lessons: Managing Design in Eleven Global Companies, Desk Research Report. Engineering. (2007).
[14] Best, K.: Design Management: Managing Design Strategy, Process and Implementation. AVA publishing, Los Angeles (2006).

Research on the renewal design of public space in marine villages based on symbiotic thought— Taking the fishing platoon of Xunzhou Village, Raoping County, eastern Canton as an example

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Abstract

contradictions of human-land conflicts in the process of modernization and industrialization have become increasingly prominent. As a maritime ethnic group born by the sea, the fishing rafts in Xunzhou Village(Chaozhou city) have both retained and inherited in the succession of the times. This paper takes the symbiosis thought as the theoretical support and the rural construction of harmonious and beautiful countryside as the macro planning background. By analyzing the application value of symbiosis thought in the renewal design of beautiful countryside in the new era. It demonstrates the rationality and feasibility of the coordination and coexistence of production, life and ecology in the new rural society. Interpret the expression of love in rural renewal design from the perspective of humanistic feelings.

Author Keywords

Symbiotic thought ; Harmonious and beautiful countryside ; Integration of culture and tourism ; Space update

Introduction

" National Rural Revitalization Strategic Plan (2018-2022) " clearly proposes to " develop rural tourism and characteristic industries, and form a benign mutual promotion mechanism between characteristic resource protection and village development. " (Huo，2023) Chinese traditional rural settlements not only have rich natural resources, but also contain profound cultural lifelines. In the post-epidemic era, a wave of industrial adjustment has been set off, and production technology has ushered in transformation and change. Some aborigines engaged in traditional breeding have left their homes and flowed into cities. The contradiction between tradition and modernity, between human and nature is further highlighted. In the process of modern urbanization, the traditional settlement landscape is bound to be impacted by urban cultural factors and rapid economic development. The traditional regional characteristics and cultural characteristics are constantly stripped and lost, and the protective planning of rural settlement landscape is imminent. (Fan， 2011) Past practice and governance experience have proved that rural governance plays an important role in national prosperity, economic development and social stability. Improving the rural living environment is the only way for China 's coordinated development in the new era.(Li，2022) To sum up，coordinate the relationship between the main levels in the rural environment to establish an interdependent and a sustainable mutually

beneficial and a harmonious symbiotic relationship,moreover realize the regional connective symbiosis and cultural dynamic symbiosis of various elements in rural public space. Establishing a channel for dialogue between human and nature, tradition and modernity, updating the traditional rural public space from the perspective of symbiosis. Promote the realization of economic and cultural industries and multiple interactions with culture to awake the common emotional carrier of ' nostalgia love ' between rovers and rural areas.In this way，it would realize the better harmonious coexistence between human and nature in the future.

Research and application of symbiosis thought in rural planning and design at present stage

2.1 Concept elaboration and research status of symbiosis thought

The conception of ' symbiosis ' originated from biology, which refers to the combination and interest relationship between two or more organisms due to their survival needs. Since modern times, with the continuous development of symbiosis thought, this thought has been widely used in many fields such as urban planning.(Li et al，2023)Kisho Kurokawa, a scholar in the field of architecture and urban planning in Japan, believes that the 21st century is an era from mechanical rules to life principles. In regions with great cultural differences, localities are diverse and interpenetrated with each other. (Kurokawa，2011) Similarly, the idea of symbiosis is also widely used in the field of design research. To a certain extent, it emphasizes the interconnection, interdependence, co-existence and common prosperity between different elements, and plays an important role in the update of public space. In the Research and application of symbiosis thought in rural planning and design at present stage context of the development strategy of building a maritime power in the new era, it is undoubtedly a key issue to deal with the contradiction between the exploitation and utilization of marine resources and the protection of marine cultural diversity. The protection of the marine environment depends on the common consciousness of all mankind, and the expansion of human living space depends on the marine environment. It can be seen that the two have formed an interdependent and co-evolutionary relationship to a certain extent. Therefore, it is feasible to study the spatial settlement relationship of marine rural areas with the core of symbiosis thought.

2.2 Research objectives of rural settlement planning based on symbiosis theory at present stage

Figure 1, 2 .The local photograph of Xunzhou Village.（photography by author）

The construction of rural ecological civilization is a macro-control strategic goal of the country at the rural level since the beginning of the 21 st century, and it is a key factor to promote sustainable development. Since the construction goal of " beautiful countryside " was first proposed in 2013, it has taken the restoration of rural ecological environment as the keynote, and the protection and inheritance of rural culture as the starting point ; focus on the improvement of the overall rural environment. On this basis, the concept of "

harmonious and beautiful countryside " proposed in the No.1 Central Document in 2023 further emphasizes the benign interaction between people, industry and nature in the countryside on the basis of environmental beautification, forming a de-subjectivity model. (Zhang，2023) In order to realize the new concept of sustainable harmonious coexistence between human and nature, tradition and modernity in the rural carrier. It is concluded that in the context of a new round of rural revitalization, the sustainable design concept of symbiotic thought will play a more prominent role.

The author chooses Xunzhou village, Raoping county marine fishing row space as the research object.Combined with this case, the marine environment, marine fishing row residential buildings, marine village aborigines and visiting tourists are the most basic symbiotic units ; the reciprocal symbiosis model should be selected for the design of fishing row settlement space. The unique marine natural environment and human environment in the Tuolin Bay area where the flood island village is located have created a symbiotic environment of people-fishing row space-ocean.

Analysis of the current situation:Xunzhou village, Raoping county marine fishing row space

Figure 3,4 .Case spatial location image（Author self-made）

Advantages : 1, the advantage of spatial location is becoming more and more obvious. 2,Chaozhou city, a famous national historical and cultural tourism city(Guangdong province，China), as the base to promote the development of related rural infrastructure construction.

Disadvantage:1,The original state and similar models are difficult to form a distinct cultural promotion brand. 2,The commercialization process is too fast, and the original features are seriously damaged.3, The building is in disrepair for a long time, and the safety hazards are prominent.

Development opportunities : 1, the intensity of investment financing has been continuously strengthened. 2.Ecological governance policy gradually improved. The pollution control of mariculture has achieved remarkable results. Challenges : 1, in the post-epidemic era, it is difficult for various rural economic industries to recover from the downturn. 2.Villagers have a serious rejection of foreign new things to transform, but the implementation process is cumbersome and it is difficult to reach a unified opinion.

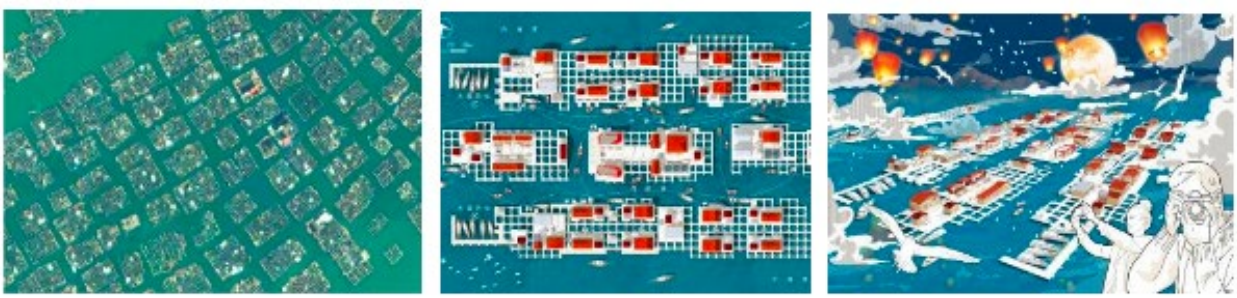

Figure.5,6,7 satellite plane image，Overall design presentation（Author self-made）

From region to culture-space update design strategy

4.1Regional symbiotic space update strategy

People and the sea are in a mutually beneficial symbiotic relationship in a certain space carrier. The ocean is not only a source of income for fishermen, but also an excellent choice for outdoor classrooms to carry out outdoor research.

The Maritime Museum is divided into two exhibition areas. The first part shows the popular science knowledge and specimen display related to marine life and marine environmental protection ; the second part shows the Canton regional culture and art works. Combined with the special environment of sea location, it is more dynamic and creative.

Build a characteristic underwater snorkeling research base. In the periphery of the middle module of the fishing row community, there is a de-area for snorkeling in the planning area of the safe non-channel sea area. In the summer of each year, under the guidance of professional safety officers, young students are guided by professional diving equipment to carry out underwater snorkeling research and exploration, and explore the new space utilization with underwater as the third dimension. Combined with the special geographical conditions of the location, a new marine field teaching platform base is created. Through the safe interaction between man and nature, the natural symbiosis mode of safety, interest and education is achieved.

Figure.8,9 The images of Regional symbiosis strategy（Author self-made）

4.2 Cultural symbiosis space update strategy

The original village fishing row building layout is scattered, and the internal facilities are dilapidated in a single form, which greatly reduces people 's willingness to go sightseeing and recreation. The intervention of artistic means is the most intuitive way to enhance the overall visual sensory style of the fishing village and enrich the cultural and spiritual life of the crowd.

1.Spatial art awakening. It aims to design and transform the external form and planning spatial pattern of building facade and infrastructure by artistic means.

The color visual elements and the way of artistic painting expression are integrated into the fishing row building, and the layout of artistic installations enhances the overall interest and appreciation of the space. 2.Sensory art awakening. It aims to increase people 's travel experience from the three main senses of vision, hearing and taste by artistic means. With the visual art of beautiful sea sightseeing scenery, the beautiful piano concerto is accompanied by the auditory art of the light beat of the waves, and the taste art of tasting delicious sea food awakens the deep vitality.

3.Cultural and artistic awakening. Art and cultural festivals such as dance art performances, photography art salon exhibitions and painting art activities are held regularly in public spaces. Improve the infiltration of art and culture .

Figure10-13 The image of cultural symbiosis strategy（Author self-made）

Conclusion

Nowadays, the relationship between urban and rural areas has entered a new stage with the rapid development of social productivity, and the valuable regional culture of local villages is gradually fading out of people 's sight. Rural revitalization is a century-old plan. Based on previous studies, dealing with the rural symbiotic relationship is an interdisciplinary and far-reaching problem involving multiple fields. It is the responsibility of generations of children to coordinate the relationship between mankind and landscape to create a harmonious and sustainable green ecological development mechanism, inherit and care for the culture of the rural ethnic groups, finally retain the common memory of the homesickness to wake up the diverse people base on love.

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References

Huo Jun. (2023).Study on the classification and activation of memory places in traditional tourism villages-Taking Mingyuewan Ancient Village in Suzhou as an example. Decoration (02), 127-129.doi : 10.16272 / j.cnki.cn11-1392 / j.2023.02.006.

Kurokawa Kisho. Urban Revolution : From Public Ownership to Common Ownership [M]. Xu Suning, Lv Fei, Translation. Beijing : China Construction Industry Press, 2011 : 84-90.

Zhang Xi & Yang Dongjiang. (2023). From ' rural beautification ' to ' harmonious and beautiful countryside ' - the connotation change, construction path and value analysis of ' beautiful countryside ' in the new era. Art

design research (03), 69-74.
Li Jinchun & Lv Kefei. (2023). Research on the Design of Gannan Sangke Grassland Chalet Homestay from the Perspective of Symbiosis. Design Art Research (01), 52-56.
Li Xinyi. (2022). The application of ' symbiosis ' theory in rural environmental landscape design (master 's degree thesis, Beijing Jiaotong University).https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202302&filename=1022819284.nh
Fan & Zhang (2011).Competition-symbiosis : Research on the Development Path of Lingnan Traditional Settlement Landscape.Southern Architecture (03), 33-35.

Research on Image Style and Emotion Expression in Maalbeek

Li Lutong

Introduction

Maalbeek, the short film first came out in Montreal New Film Festival in October 7th, 2020, is an experimental documentary animation. Ismaël Joffroy Chandoutis, the director of this film, processed image with unique stylized method. By recording and delivering reappearance to a terrorist attack occurs at Brussel in March 22nd,2016, he led the audience to a journey of retrieving calamitous memory with the narration of Sabine, who was a survivor from this disaster and suffering memory loss after the attack. This film shows the awful aftermath of terrorism and painful memory of the victim by real-life narration and scenery reappearance, in order to provide truth of the disaster and draw audience's sympathy.

In summary, this paper means to analyze the technique of art expression in graphics, including shot scheduling, color application and the render method called "point clouds" in the director's word. In this way, the unique image style of this film should be revealed. On the base of that, this paper will research on the method in emotion expression along with analyzing the emotion contained in the film in order to get a overall understanding.

Graphic Art and Image Style

1. Visual Language

1.1 Shot Scheduling

To start with, as a documentary film, this film holds a major task of real-life event reappearance and showing the real-world scene. As a consequence, the majority of shots about real-world scenes are prime lens so that the real situation of the event could be delivered to audience and the documentary of this film is able to be seen. Besides prime lens, zooming out is also utilized in some cuts. On the one hand, the scenes shot in the real environment were compressed into two- dimensional space from three-dimensional space. With zooming out, the scenes are restored with the sense of space. On the other hand, in cuts relate to Sabine's memory, zooming out represents to travel through the thoughts. For instance, there is a cut in which subway entry, windows of train and unidentified abstract portraits appear in turn and finally blend into Sabine's face. These cuts mean the victim sails through her shattered memory while suffering amnesia. And zooming out here draws the audience into the emotion of the victim to raise the audience's sympathy.

2.2 color

In spite of documentary, this film is an experimental animation with strong personal style. As a consequence, colors in the film are allowed to be edited. So, the analyzation on colors is divided into two parts. First, there are relatively realistic colors. Although stylized methods are introduced in the film's making process, some cuts in the film stay with the primary colors of real-life scenes as they were shot in real world. As the subway entry and Sabine's home, the relatively realistic colors weaken the impact of emotion but focus on scenes' reappearance. The other part of colors are rearranged colors on the base of real-world colors. And this kind of colors strengthen the emotional tendency of cuts. For instance, in a down-looking scene along the escalator in the subway, black holds most of the screen while bloody red appears on the walls beneath. The powerful contrast here presents strong visual stimulation but "peacefully" shows the miserable situation after explosion. In this way, the

audience are shocked by uneasiness and panic.

2. Picture Texture

As mentioned before, this film is an experimental image work with stylized method, one of them is the render method which is called "point clouds" by the director. In the interview "Ismael Joffroy Chandoutis, Talent de la fête de court métrage 2021", when the director is asked with the technique used in filming, he mentioned "point clouds". The filming team first take photos of the real scene, then process them into scattered points without linking to each other and make it a three- dimensional pre-presentation. Finally, it looks like stipple in painting. Due to there are no connection between the coloured points, the visual effect presents some sense of blur and brokenness, which brings the unique picture texture to the film. It is like a delicate frosted glass and the things behind can barely be seen. However, the texture conforms to the theme of memory-retrieving with the victim.

3. Image Style

The render method "point clouds" mentioned previously brings the film its unique picture texture, with other elements of graphics, the image style of this film comes along. The transformation from real-world scene to stylized experimental images endows the film with a kind of realistic abstraction. The terrorist attack occurs in real life is definitely realistic while the victim's emotion is pretty abstract. So in this film, after recording real-world scenes the director chooses to combine them with the emotion of victim and visualize the emotion to the surface of reality. After this, the images are completed.

Also, the director himself is pretty capable of the combination of virtuality and reality, which could be seen in another film of his called SWATTED. In SWATTED, virtual network world covers above the reality as three-dimensional wireframe sequences and blends into event in reality. But in Maalbeek, things happen in the real world are transformed to optic illusions on the screen. At that time, virtuality and reality collapse and merge into each other. Beyond that vague boundary, Sabine, the victim's inner world with shattered memory is revealed.

In conclusion, the director's understanding and utilization to both technology and art create the unique image style of this film. The line between virtuality and reality is blurred. On this basis, the emotion contained in the film is able to be expressed in a more abundance shape.

From Picture Representation to Emotion Expression

In the second chapter of this paper, analyzation about the stylized picture representation is delivered, which contains shot scheduling, color application and the unique picture texture thanks to the "point clouds" render method. On this basis, Maalbeek represents distinct image style. As a consequence, by the support of these element in picture representation, this film focuses on the emotion of the victim in the attack and express with the carrier of memory.

1. Emotional Basis from Reality

The source of inspiration of this film comes from the real event, which allows the emotion inside able to be traced. On October 22nd, 2016, there is a serial explosion occur in Brussel. One of the sites suffered was the Maalbeek subway station near the EU headquarter in Brussel. Due to the explosion, at least 20 were dead with another 106 wounded. Facing terrorist attack as this, it is natural that emotions like shock, anger and sorrow hit people. And all these bad emotions contributed to emotional undertone of this film. On the base of that, the director made his way to get in touch with a survivor in the event named Sabine. She was involved in the tragical event during a daily routine. Considering her experience, her narration was taken as a clue of the film. After explosion, Sabine found herself wake up lying on hospital bed with her hair shaved and without no memory about the attack. The enormous shock of terrorist attack triggered the self-protection in her brain, so

she kept her life together with the cost of memory loss. However, she's still trying hard recovering her memory for the damage in emotion couldn't be undone by memory loss. So, with the memory-retrieving's road, Sabine tries to face the truth to truly remove her pain. And for the film, the director chooses to show the audience this process so that the audience are allowed to stand by Sabine together.

2. Emotion Expression Based on Picture Representation

As mentioned previously, Maalbeek stands on the emotional basis of real event and using stylized method of representation to show the audience the event and victim's emotion by helping the victim to retrieve her memory. In this section, analyzation on the connection between picture representation and emotion expression in this film will be presented.

Firstly, as expounded before in the section about shots, zooming out in the film usually means a dive into thoughts. In a series of cuts which are referred to in previous sections, through several scenes and different elements, Sabine's face comes out from some broken abstract portraits found underground. Out of these shots, it seems like the memory preserved in Sabine's mind is buried by the wrecks after explosion deep inside her brain. This approach of expression claims the dilemma that Sabine was in: she was actually there and damaged, but with no memory about that left. Although the amnesia separated the damage from her mind, it cannot claim the absence of that terrible tragedy. Secondly, in the aspect of colours and picture texture, it is the peculiarity of animation allows the film to deliver emotion by colours and the unique picture texture contributed by "point clouds" visualized emotion expression in the graphics. For instance, there comes the same cut mentioned previously. Due to the effect of "point clouds", Sabine's face is somehow "blurred". At that time, her situation equals to the audience in some way. She lost a part of the memory about the catastrophe, so her cognition about the event was blurred. The director stated it as "an event we all know but her". In this way, the audience's cognition differs from hers. However, when Sabine's image was processed "blurred" by stylized methods in the film, chances are that the audience are able to follow her in some perspective. On that basis, the audience are allowed to follow Sabine's narration and thoughts with less obstacles and increase sympathy with her.

In conclusion, benefit from the stylized expressing method, Maalbeek deliver the emotion inside visualized to the audience. From simply documentary to stylized animation, events in reality blend into the victim's inner world. And relying on shots scheduling and unique rendering method, the barrier stands between Sabine and the audience vanishes little by little. In the memory-retrieving road, the audience are able to have deeper feelings about the event through Sabine's sight.

Peroration

Maalbeek shares the same personal style with other films of Ismaël Joffroy Chandoutis. The very director is pretty good at the combination of virtuality and reality, then present visually by technological methods. This film comes from one corner of the notorious 3.22 Brussel terrorist attack. It starts from an individual sight and shows a victim's inner world with stylized expressing method. Amazingly, the director managed to draw the audience in, so that the audience learn about the victim's dilemma and catch sympathy with her. Through the analyzation on the film's picture representation, it is able to take a glimpse at the director's personal style and find out the emotion expression in the film eventually. Meanwhile, it is worth learning and appreciating with the director's talent in understanding and utilizing to technology and art.

Constructing Child-Friendly Recreational Spaces: A Social Innovation Perspective

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Abstract

Addressing the complex social issues faced by children is key to achieving child-friendliness. Social innovation offers a new perspective for designing child-friendly recreational areas in modern cities. Currently, recreational space design in China prioritizes the physical environment while overlooking child participation and agency. Through analysis of the iSTART "Infinite Creator" urban co-creation project, this study summarizes the project's profound insights in engaging children as co-creators, using games to convey positive values, and enabling co-creation through diverse stakeholder collaboration. It outlines models and strategies for constructing child-friendly recreational spaces from a social innovation perspective, aiming to empower children and build a sustainable, loving future, while providing references for developing child-friendly spaces.

Author keywords

child-friendly recreational spaces; social innovation; urban co-creation; child participation

Introduction

Climate change, cultural bias, economic divides, and rapid AI advances require design, art, and education to proactively adapt, reorganize, and redefine values. This global challenge is shared by art and design fields. Amid social reform, socially-innovative design has emerged to promote equity, aid disadvantaged groups, and enable sustainable development goals (SDGs). This new approach provides practical solutions to pressing societal issues and drives change. The Child Friendly Cities Initiative (CFCI) states: "Children's well-being indicates the health of our environment, democracy, and governance." However, many urban spaces overlook child participation, though the Child Friendly Cities Initiative recognizes children's wellbeing reflects societal health. While actively developing child-friendly cities, issues affecting youth in China persist, their voices unheard. This study on child-friendly recreational spaces explores integrating social design innovations to create caring areas, driven by a "people first" ethos. With creativity underestimated and rights overlooked, children should partake as co-creators. Pursuing child welfare and spotlighting youth participation shows the meaning of this socially-innovative approach. By engaging children and enabling cross-sector cooperation, it aims to build inclusive, sustainable futures.

Social Innovation Propels Child-Friendly Recreational Space Design

Child-friendly recreational spaces are vital components of child-friendly cities, meeting children's play and leisure needs (Chen et al., 2022). Having industrialized earlier, Western countries became aware of urbanization's

tensions with child development sooner, amassing extensive research on children's play spaces. China's early work focused on residential and public play areas. Since the 1990s, domestic scholarship has increasingly examined children's recreational spaces as standalone research subjects.

Research on child-friendly recreational areas traces back to the Child Friendly Cities Initiative (CFCI) formally introduced by UNICEF and UN-Habitat in 1996. This groundbreaking program catalyzed worldwide child-friendly environment building, guiding nations to champion and implement child welfare policies. China is actively developing child-friendly play spaces with Chinese characteristics. The 14th Five-Year Plan marked this as a major national project for the first time in 2021 (The Central People's Government of the People's Republic of China, 2021a). "Guiding Opinions on Promoting the Construction of Child-Friendly Cities" issued that year signified the comprehensive rollout of this effort (The Central People's Government of the People's Republic of China, 2021b). "Design Guidelines for the Construction of Child-Friendly Urban Spaces" jointly issued by the National Development and Reform Commission and other relevant bodies in 2022 delineated specific requirements (The Central People's Government of the People's Republic of China, 2022).

The concept of social innovation emerged in 1972 when Victor J. Papanek raised "designer" and "social responsibility" issues in Design for the Real World (Li et al., 2023). The-Young- Foundation defines social innovation as activities and services developed by social organizations to meet social needs (Geoff Mulgan et al., 2007). Thinker Ezio Manzini views it as a process where diverse stakeholders generate new solutions by directly addressing problems (Gong, 2017). China held the inaugural International Conference on Social Innovation in 2006, commencing domestic exploration.

Since the 21st century, social innovation and design have become increasingly intertwined. Design aimed at transforming society can be termed "social innovation design" (Xu & Bao, 2023). Manzini delineates this as "all activities professional design can implement to activate, sustain, and steer society toward sustainability" (Ezio Manzini, 2015). Thus, social innovation design refers to design activities under a social innovation lens. It is a breakthrough process of innovating for societal change and the most vital component of innovation efforts.

However, much urban children's recreational space building remains limited to physical design, overlooking child participation. As a new approach to address challenges beyond conventional models, social innovation design can facilitate child participation in developing play spaces. Children transform from passive subjects of "designing for children" to active co- creation participants, becoming decision-makers, partners, and enablers in socially innovative design.

The iSTRAT "Infinite Creator" Urban Co-creation Project Embodies Social Innovation

The 2023 International Children's Day "Infinite Creator" urban co-creation project by iSTRAT and Chengdu SKP holistically integrated social innovation into event and space design, generating positive impacts (Figure 1). Transforming

from a museum exhibit into public space experience, it extended SKP venue and garden design to shape child-friendly scenes. Over 100 families participated in vibrant artistic co-creation across SKP Garden (Figure 2). Blending landscape and interactive games cultivated a collaborative ethos, forming interconnected co-creative communities with children at the heart and adults as

Figure 1. "Infinite Creator" Urban Co-creation Project Activity Site

"super sidekicks". By enabling child cooperation and conveying games' developmental value, the project pursued child welfare goals. This innovative collaboration highlighted children's immense creativity while revealing inspirational insights.

Figure 2. Children and Families Communicating and Collaborating

Children as Co-Creators Partaking in Social Projects

Wordsworth believed, "The child is the father of the man." Though metaphorical, this signifies the disruptive evolution in adult-child relations - children's imagination, creativity, and verve should not be underestimated. The "infinite" in "Infinite Creator" aims to transcend limited public perceptions of children and stress participatory agency. Gameplay concepts and inspirations all originated from iSTRAT's little artists. Children partook in event planning and game design, articulating their understanding and envisioning of family through artworks, dissolving inter- family boundaries and establishing a greater clan. At the event, adults' authoritative status was nearly dissolved, shifting from "leaders" to children's "co-creative partners," while children transformed from "receivers" to "participating subjects." This shift not only spotlighted children's creativity but also yielded positive ripples on project and societal levels. As co-creative agents, children actively experienced and exerted innovative thinking, awakening society's novel comprehension of child participation through the creativity and vitality they conveyed.

Games as Co-Creative Bridges Conveying Positive Values

iSTART recognizes family relationships and education as particularly vital. Presently, disconnects persist across child, family, school, and community spheres that necessitate innovative approaches for a natural reorganization. Games have played a crucial role in facilitating post- pandemic bonds among children, families, and society. "Infinite Creator" spotlights games' impacts on children's self-awareness, relationships, socialization, and learning. Using games as a conduit between children and creativity, it explores the boundless potential of constructing "games within homes" and "rebuilding homes within games" through playful and artistic practices. Games are not just amusement for children, but also interactive, participatory co- creative experiences generating meaningful engagement. The event conveyed games' positive values. Children are not merely participants, but also creators, designers, and experiencers. They play a subjective role in games with their decisions and opinions fully respected and integrated into the design. Through creating and experiencing games, children develop abilities, a spirit of cooperation and innovation, and stronger bonds to family and society in their self-actualization.

Diverse Stakeholder Collaboration in Co-Creation Bridges Diversity

Engaging diverse stakeholders is integral to implementing social innovation design. Their cooperation is vital for tackling societal challenges and enabling sustainability. For the "Infinite Creator" event, iSTART recruited globally online for stakeholders to co-create the "Infinite Games Family," spanning urban partners, children, families, designer-artist teams, volunteers, etc., to build game environments bridging disparate groups. This transcended interpersonal and familial divides, crossing age, background and other boundaries to foster child-group exchange. With roles as observers, co-creators, documenters, disseminators, assistants, and more, these diverse stakeholders leveraged their varied lenses and expertise to enhance inclusivity, expand participation, and amplify impact and sustainability, forming a shared-goal community propelling urban co-creation and child-friendly recreational space building.

Models for Constructing Child-Friendly Recreational Spaces through a Social Innovation Perspective

The "Infinite Creator" event spotlighted children's tremendous co-creative potential and the positive impacts of their creativity and vigor. This case underscores children's participatory subjectivity in social projects, while relaying an important message: As professional design practice targeting societal change, social innovation design can drive breakthrough solutions to children's challenges through collaborative processes, constructing child-centric strategies. Building on this transformative innovation archetype and actualizing design efforts, this paper summarizes models for developing child-friendly recreational areas via social innovation.

Transforming Site, Place, and Scene in Children's Recreational Areas

To resonate, relying solely on artificial creations falls short; the dynamism of site, place spirit, and scene-setting must be activated, integrating content and site (Lin & Wang, 2022). China's urban growth overlooks child-family-community relationships, fashioning amusement park environments. The "Infinite Creator" event initially entered public space, transforming original site plans into child-friendly scenes through ingenious design. Children's spaces should engage families, assist city-building, and furnish co-creative experiences. Incorporating creative elements can resonate, making vibrant spaces that resonate emotionally and culturally with children, families, and society (Figure 3).

Figure 3. Transformation of Child-friendly Recreational Spaces, Venues and Scenes

Games as Co-Creative Bridges

Game research pioneer Johan Huizinga declared in Homo Ludens: "From the very beginning, the great prototypical activities penetrating human society have been suffused with play." Games hold multilayered developmental value as children construct knowledge and community through engagement. They furnish a "field" enabling connection (Zhang et al., 2021). iSTART spotlights children's play power, expanding its community

around co-creating games with kids. Alongside "Infinite Creator," iSTART has incubated projects witnessing play power through a child's lens. As child-friendly development advances in China, games increasingly stimulate imagination and nurture cooperation and creativity as co-creative conduits. Avoiding instrumentalization and actualizing games' subtle educational value is a responsibility needing clarification in children's recreational space design.

Cooperating to Shape Communal Society

Cooperation catalyzes systemic change and communal societies (Manzini, 2018). Social innovation design essentially transforms societal structures through collaboration actualizing child-friendly values. Initiatives like "Infinite Creator" and iSTART systematically nurture child- community interactions, striving to build an open ecosystem supporting children's art and education. This establishes the basis for long-term initiatives and collectives united by shared aspirations. Such communities include iSTART's Family Art Museum Project, Museum-School Partnership, and Rural Teacher Art Literacy Development endeavors. Through such cooperation, children and diverse sectors can jointly address issues, unlocking possibilities for youth and injecting hope into future cities. As an iSTART curator stated: "What we do now represents the future, because children are the future." (Figure 4)

Figure 4. iSTART Cooperation Project

Design Strategies for Child-Friendly Recreational Spaces from a Social Innovation Perspective

The child-friendly recreational space design model under social innovation empowers children as active participants, fully unleashing their creativity and initiative through co-creative scenes and gameplay. However, the objective needs for constructing child-friendly recreational spaces demand even higher spatial design strategies. By exploring three key strategies - site shaping, place making, and scene creation, this article aims to build more inclusive, creative, interactive and sustainable recreational spaces, promoting children's active participation in society and their holistic development.

Site Shaping

The site is the foundation and origin of any design, an objectively existing space (Lin & Wang, 2022). The "Unlimited Creator" activity is sited at SKP Chengdu. Its multidimensional, interconnected, open-air design catalyzes the event at a tangible level. As an "eco-park + world- class shopping district", SKP integrates high-end retail, arts and entertainment, creating a multifunctional urban space. Strategically located, it interconnects with the surroundings, practicing TOD development principles to boost commercial viability via public transit. Ultimately, its openness accommodates unforeseen activities and diversified experiences.

Urban site shaping should focus on multidimensionality, interconnectedness and openness in design.

Multidimensionality means the site coordinates diverse dimensions like physical, social, economic and cultural. With all dimensions developed in harmony, the site evolves into an independent physical space with distinct functions. Next, interconnectedness requires integrating the site with the urban context and surroundings to form an interconnected system and become part of the greater urban fabric. Finally, openness endows the site with higher adaptability for varied interactions, energizing the space. While invigorating the urban landscape, these principles also benefit child-friendly recreational spaces.

Place Making

According to Norberg-Schulz, a "place" is formed by various concrete elements like textures, colors, and shapes, creating an atmosphere known as "genius loci." Design transforms a site into a meaningful place with its unique spirit (Norberg-Schulz, 1980). SKP Garden embodies this through its blend of "multimodal transport + green ecology + high-end business" and artistic"Brocade Weaving of Shu," aligning with sustainable urban planning. It becomes an ideal setting for the "Unlimited Creator" activity.

Placemaking extends beyond the physical site to create experiences. It involves merging the site with human emotions. This enhances functionality and resonates with children, connecting them to the city and forming a wider social ecosystem. Child-friendly recreational spaces should prioritize systemic, artistic, and sustainable designs. By merging human creation with nature, highlighting the genius loci, and crafting innovative, inclusive spaces, a new world of possibilities emerges.

Scene Creation

After refining site traits and crafting a meaningful place, the next phase involves integrating people into it. Scenes blend site and place, forging evocative landscapes (Lin & Wang, 2022). Organizing people and spaces, "Unlimited Creator" nurtures an experiential "third space" and gameplay connecting communities, fostering a cooperative society with shared goals.

Scene creation is vital in child-friendly recreational space design, focusing on spiritual and experiential aspects. Manzini summarizes social innovation practices enabling urban and project sustainability into three design principles-commons, enabling platforms and collaborative services (Manzini, 2018). Scene creation adheres to these principles, curating landscapes, enhancing resonance, fostering connections, and collaboratively generating value. The "Unlimited Creator" showcases a shift towards child-centric co-creation in urban planning, driven by social innovation for addressing children's social challenges.

Conclusion

The "Unlimited Creator" project, centered around children's play energy, provides crucial guidance for crafting child-friendly recreational spaces with a social innovation approach. In an evolving society, involving children as co-creators in communal endeavors with diverse stakeholders can drive child-friendly transformations. These spaces should embody the essence of "love". When children and stakeholders collaborate within a shared-value social collective, more initiatives will emerge to address children's social challenges, yielding lasting societal change and developmental possibilities.

Acknowledgments

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References

Chen, X., He, X., Cheng, L., & Wang, T. (2022). Children's recreational space planning and construction in high-

density cities. Planners, 38(06), 131–137. https://doi.org/10.3969/j.issn.1006-0022.2022.06.018
Ezio Manzini. (2015). Design, when everybody designs: An introduction to design for social innovation. Mit Press, Cop.
Geoff Mulgan, Tucker, S., Ali, R., Sanders, B., & University of Oxford. Skoll Centre For Social Entrepreneurship. (2007). Social innovation: what it is, why it matters and how it can be accelerated. Young Foundation.
Gong, M. (2017). Service design towards social innovation: The exploration in JU DESIS Lab. Creation and Design, 02, 100–104. https://doi.org/10.3969/J.ISSN.1674-4187.2017.02.017
Li, Y., Li, J., & Gong, M. (2023). Gong Miaosen: The fundamental concept of social design is "Keen Care." Design, 36(08), 42–47. https://doi.org/10.20055/j.cnki.1003-0069.000763
Lin, Q., & Wang, X. (2022). Archetype, place, and experience. Chinese Landscape Architecture, 38(05), 6–13. https://doi.org/10.19775/j.cla.2022.05.0006
Manzini, E. (2018). The making of the collaborative city: Social innovation and design for city making. ZHUANGSHI, 05, 12–14. https://doi.org/10.16272/j.cnki.cn11-1392/j.2018.05.002.
Norberg-Schulz, C. (1980). Genius loci: Towards a phenomenology of architecture. Academy Editions.
The Central People's Government of the People's Republic of China. (2021a, March 13). Outline of the 14th Five-Year Plan (2021-2025) for National Economic and Social Development and Vision 2035 of the People's Republic of China. Www.gov.cn. https://www.gov.cn/xinwen/2021- 03/13/content_5592681.htm
The Central People's Government of the People's Republic of China. (2021b, October 21). Guiding Opinions on Promoting the Construction of Child-Friendly Cities. Www.gov.cn. https://www.gov.cn/zhengce/zhengceku/2021-10/21/content_5643976.htm
The Central People's Government of the People's Republic of China. (2022, December 4). "The Guidelines for Child-Friendly Urban Space Construction (Trial)" issued by the National Development and Reform Commission, the Ministry of Housing and Urban-Rural Development, and the Office of the State Council's Committee for Women and Children. Www.gov.cn. https://www.gov.cn/xinwen/2022-12/04/content_5730111.htm
Xu, Z., & Bao, Y. (2023). Research on design development trends from the perspective of social innovation. Packaging Engineering, 1–16. https://kns.cnki.net/kcms2/detail/50.1094.TB.20230619.1718.008.html
Zhang, X., Sha, Y., & Yu, H. (2021). Learning by playing: The return of educational value of games. Contemporary Education Sciences, 05, 10–15. https://doi.org/10.3969/j.issn.1672- 2221.2021.05.003

Sense of Value: Thinking about the Stance of Design through "Community Engagement"

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Abstract
In contemporary social life, design leaves more space for public participation, and the arrival of the experience economy marks the maturity of the transition from traditional "designer design" to "participatory design", and shows that design is gradually focusing on the satisfaction of individual needs and the realization of values. The continuous development of public participation is of psrofound significance and is an effective way to create a sustainable future of "love" through the humanization of design.
Starting from the theoretical background of "community participation", this paper discusses the practical scenarios of brand community user participation in brand design, and examines the value of community user participation in brand design practice and the position of design intervention.

Author keywords
brand community; community engagement; design stance; design value

The Dissolution and Reconstruction of Traditional Design Power Discourse
Eliminate
Design always needs to keep up with the characteristics of the times, understand the real social context and consumption context of the moment, and actively respond to the future shape of social development. In the Internet era, traditional technical means and philosophical concepts are gradually dissolved under the impact of digitization. In the information society, all people are faced with more open information and controllable production technology, and it becomes easier for the public to participate in design. At the same time, the traditional philosophical concepts of thought have been broken, people's pursuit of individuality and emancipation has never been higher, and the technical conditions for design oriented to the needs of individual consumers have tended to mature. In such a new context of reconstruction, the traditional design discourse has been dissolved and reconstructed, and the rise of user participation in design has led to a trend of democratization of design activities.
Zhao Chao(2007) reveals in Authorititave Speech Deconstructed Design that the real design situation is that "designers first see the user's behavior, and then infer the user's needs; in this microscopic system, the user's behavior is the cause and the needs are the effect." This has led to a long history of people's needs being guided by products that have already been designed, and the absence of user needs has also led to an inversion of the power and center of design, hence the dissolution of the traditional designer power discourse as a call for collective action. Reconstruct
With big data, artificial intelligence, deep learning and other emerging technologies are widely used in design,

people's daily life style, social interaction and the way to receive information has changed dramatically, design is also facing new situations and problems,

revolutionary design is to change the way of thinking about ordinary design problems, and the rise of community participatory design can empower the design of the right to discourse construction, the community is the integration of services for brand design, Communities are the best vehicle for brand design to integrate service, visual, aesthetic and functionality, and in such a more fluid framework of power, participants begin to construct their own spatial discourse on products. Helen Armstrong(2011), in Participate: Designing with User-generated Content thinks that, "Instead of handing a client an artifact, designers for a new era can provide users with tools they can master." Graphic designers tend to deliver "fixed" outcomes to their clients, for example, they create a logo, an application, etc. They create fixed outcomes. And participatory design can break down these fixed deliverables and replace them with more open- ended solutions.

Community-based design participatory practices

Brand Building and Communication

Under the trend of self-media, new cultural contexts are constantly generated, which also bring the extension, precision, stylization and circling needs of users and brand image dissemination, and the shaping and dissemination of brand image has become a process in which designers, users, and dissemination contexts are jointly involved, specifically in strategy design, image establishment, and fissure upgrading, and each link can be practiced and completed by the users and the brand together. Brand consumers are no longer held hostage by the traditional unidirectional information dissemination model, but instead participate in the construction of the overall information environment with the help of new digital means and platforms, and act as participants in the design.

In 2020, Converse partnered with TikTok, calling on participants to use Converse shoes as a "creative canvas" to make their own unique shoes, in order to gain the opportunity to learn from influential creatives, in addition to online and offline linkage, penetrating into the user's life scenarios, and the brand later launched a series of product-oriented In-Feed ads to attract potential consumers with products that are infused with a lot of personal involvement, bringing excellent conversion results. Later, the brand launched a series of product-oriented In-Feed ads, which attracted potential consumers with products created by the public and infused with a lot of personal color. In this design context, every aspect of the brand's construction and communication is permeated by the user's personal needs and values.

The dynamic emblem design for the 2028 Los Angeles Olympics invites people from all walks of life to co-create part of the visual image based on each person's unique identity and story. The ever-changing emblem shows the multifaceted value of the city's branding, and the participants gather under the theme of the Olympics to show their love for the city, and the emblem also lets the community feel the vitality that the Olympics has injected into the city and the glamour of the future Olympics. It can be seen that the brand image as a symbol of information communication is being constructed by the community and the brand, and this systematic design process, which relies on the combination of social and cultural contexts and individual ways of thinking, truly expresses the collective emotions, and extends the value of the brand by binding the community's life in depth.

Design Management and Orientation

The reconstruction of the design rights discourse with community participation needs to follow the overall principles and optimize the design expression, and this process also requires certain restrictions on the resources and permissions available to the participants. If users can actively create value for the brand, it will also be easier to recognize the significance of the brand. Meanwhile, the design strategy should guide the community to more perspectives of design interactions through support services(Figure1) , encourage the exchange of creative ideas,

and co-create a unique brand culture.

The design method of community participation does not have a strict design process, it emphasizes the brand's inclusion and identification with the public and society. Nowadays, we are in the era of social transformation to a sustainable society, and the realization of the brand's value relies on the joint influence of the quality of life and the social construction, therefore, the challenges faced by the design are not a single issue, but a result of the joint action of society, culture, politics and economy. What is needed in the transition is a design-led creative thinking. Therefore the form of community and brand building driven through participatory design can simultaneously enhance the public's awareness of social responsibility and cultural identity.

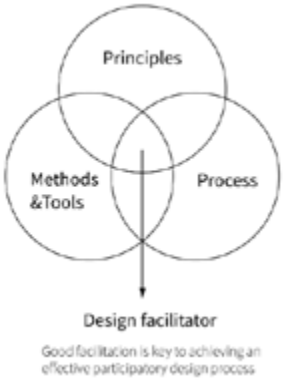


Figure1. The key areas of Good participatory design

Exploring the value of community participation in brand design

Building User Experience Together

The composition of participatory design behaviors mainly stems from the progress of productivity, the demand for self-realization and the need for innovative design. The development of information technology provides tools and media for the public to participate in design, and makes the communication between users and brands more direct, so that users can participate in the design before brand promotion, and enhances the adaptability and "rights" of users in the brand system. The value of this "right" is most directly embodied in the user experience, through the application of design principles based on psychology and sociology, the brand is incorporated into the experience, the "experience" as the object of design, and the persuasive participatory behavior explores the user's behavior and motivation, giving the user a deeper understanding of the brand. The persuasive participation behavior explores the user's behavior and motivation, and gives the user a deeper brand experience and brand awareness(Figure2). In the process of participation, people communicate with the brand face-to-face, experience a series of brand-related events, and accumulate material and emotional personalized feelings, thus influencing people's consumption, life, and culture.

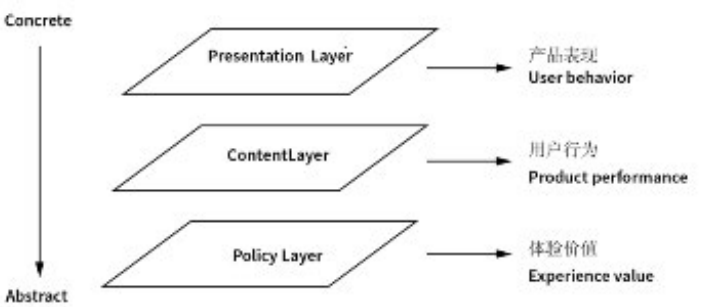
Katja Battarbee et al. put forward the concept of "Co-experience", which means that in the context of living in a social setting, an individual's experience will be enhanced by interaction with other people. In the social context, the individual's experience will change with the interaction with others, and the experience of brand community not only creates a differentiated personalized experience, but also makes the user to participate in the interactive process of value creation and cultural significance beneficial to the brand(Figure3).

Figure2

The progression of experience

Figure3

Experience design elements



Towards decentralization

Under the phenomenon of "atomization", contemporary people's individuality based on personal values and expressions of desire come to the fore. Under the phenomenon of "atomization", contemporary people's desire to express their individuality based on personal values is highlighted, and the bottom-up trend represented by crowdfunding and sharing, starting with the open-source movement, has demonstrated a strong vitality, making the power of design show a differentiated situation, and invariably dissolving the dominant discourse of the expert design. The practice of community participation strengthens people's access to and control of resources, and their right to express themselves through their own unique visual language. The resulting community with more diversified value propositions also reflects the underlying logic of "self-manufacturing as the driving force and decentralization as the form".

The members of the brand community have a mutually inclusive relationship with the brand, and the establishment of the community is a kind of collection, a new ecosystem, where not only the brand pays attention to its own development and products, but also the consumers are the main body that maintains the integrity and innovativeness of the brand and the products. It embodies the sentiment of design in eco-ethics. Thus, this more automatic and positive way of intervention and interaction will also greatly stimulate the enthusiasm of consumers, and help to enhance the depth, height and breadth of the brand.

Conclusion

Participatory design as a co-creative behavior, everyone in the community for the brand discussion and innovation, are to promote the brand development process, at the same time, the community of individuals, the role of their own reflection on the core needs of the brand to respond to the brand, will naturally form part of the brand construction process of practice.

In order to attract and retain community members, valuable content and form of security is needed to meet the demand for experience or sentiment beyond the product demand, community participation in the design behavior effectively contributes to the consumer's personal philosophy and brand value linked, users will consciously look for the brand to build a community, and through the brand to highlight their own values and lifestyles.

Through community participation in design, the empty commercial consumption is cured, so that participation becomes a creed, and everyone is a designer. Participants will analyze, reconstruct, and extend the possibilities of design by reflecting on their own roles and value standards, have the right to design while understanding more about the responsibility of design, and realize the significance of design in the life of contemporary society.

References

Zang C.[赵 超]. (2007). Authorititave Speech Deconstructed Design —— Contemporary Industrial Design Re-examined with a Philosophical Perspective of Deconstructionism . ZHUANGSHI(6), 3. DOI:10.16272/j.cnki.cn11-1392/j.2007.06.033

Tang S,He R K[唐 啸 , 何 人 可]. (2017). The Social Innovation Research: A Concept of Participatory Desgin Perspective . Art and Design, (6), 29-30.

Joseph-Armstrong, H. (2011). Participate: Designing with User-generated Content;[a Design Guide to Co-creation]. Princeton Architectural Press.

Xing X Y.[辛 向 阳]. (2019). From User Experience to Experience Design. Packaging engineering, 40(8), 60-67. DOI:10.19554/j.cnki.1001-3563.2019.08.010

Muniz Jr, A. M., & O'guinn, T. C. (2001). Brand community. Journal of consumer research, 27(4), 412-432.

Zomerdijk, L. G., & Voss, C. A. (2010). Service design for experience-centric services. Journal of service research, 13(1), 67-82.
Cen Z Y,Bao Y X[陈 姿 羽 , 鲍 懿 喜].(2023).Brand community service design study under the experience economy. Design(01),76-78. doi:10.20055/j.cnki.1003-0069.000398.

Visual Design Practice Exploration of Dazu Rock Carvings with Glitch Art in the Context of Cultural Heritage Crisis and Opportunity

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Abstract

This paper is grounded in the context of the "crisis and opportunity" of cultural heritage, analyzing the crisis and opportunities of Dazu Rock Carvings cultural heritage in Chongqing. It explores new visual possibilities at the intersection of tradition and contemporary digital imagery through the practice of glitch art and visual design applied to Dazu Rock Carvings. The design practice primarily involves the fusion of real photography and digital pseudos, creating chaotic and intermingled visual effects, the integration of modern print fonts' order and disruption, generating a sense of imperfect visual beauty, and the use of conventional and rebellious materials to achieve personalized visual aesthetics in the design of Dazu Rock Carvings visual posters. This design practice aims to explore how to seize the opportunity of new-era technology to protect and inherit traditional culture in the context of the gradual decline and weakening influence of traditional culture.

Author keywords

Dazu Rock Carvings; Glitch Art; Crisis and Opportunity; Visual Design

Introduction

Background and Significance of Research

Crisis and Opportunity of Dazu Rock Carvings Cultural Heritage

Analysis of the Crisis

The preservation and inheritance of cultural heritage are significant challenges and opportunities in the field of global culture today. With the acceleration of globalization and urbanization, people are pursuing modernization while facing crises in cultural diversity and heritage preservation. Therefore, the protection and inheritance of cultural heritage have become hot topics of global concern. Dazu Rock Carvings, located in Dazu District of Chongqing are now a UNESCO World Heritage Site and one of the Eight Great Caves of the world. Dazu Rock Carvings are a vital cultural heritage in China and the only UNESCO World Heritage Site in Chongqing, with cultural value comparable to China's famous Four Major Grottoes. However, compared to these grottoes, Dazu Rock Carvings still have a long way to go in terms of influence, and there are significant preservation issues. The crisis in cultural heritage preservation primarily stems from natural disasters, warfare, and human-made damage. Furthermore, the crisis in cultural heritage inheritance mainly arises from the impact of modernization and urbanization. In peace time, people's lifestyles, values, and aesthetics have undergone significant changes. Therefore, how to inherit and develop traditional culture in modern society is a major challenge in cultural

heritage inheritance. From the perspective of designers, it is worth exploring how to proactively adapt, restructure, and define values in response to challenges, opportunities, and crises.

Analysis of Opportunities

The development opportunities for Dazu Rock Carvings cultural heritage include: First, global, national, and societal attention. Second, government support in policies and funding. Third, the increasing cultural heritage protection awareness of the public. With the coordinated promotion of cultural heritage protection and cultural heritage tourism by the national and Chongqing municipal governments, Dazu Rock Carvings have continuously received protection and development.

The emergence of new design forms provides new visual effects and methods to meet the aesthetic concerns of modern people. Currently, there is limited cultural and creative design content related to Dazu Rock Carvings, with most exhibits in the Dazu Rock Carvings Art Museum consisting of individual rock carvings and historical image materials. Therefore, there is significant space for promotional design.

Significance of Design Practice

Exploring new visual possibilities at the intersection of tradition and contemporary digital imagery through the practice of glitch art and visual design applied to Dazu Rock Carvings.

Strengthening protection, deepening connotations, and activating the utilization of Dazu Rock Carvings to tell the story of the carvings actively.

Develop related cultural and creative products for tourism, expanding social influence of cultural heritages.

Current Problems

The current main problems with Dazu Rock Carvings in Chongqing are preservation crises and cognitive crises.

Lack of widespread awareness of Dazu Rock Carvings: Compared to China's four major grotto art, Dazu Rock Carvings suffer from insufficient recognition. While there is a certain level of recognition among Dazu Rock Carvings specialists and local residents, it is lacking among people from other regions and the wider society. This is partly due to its relatively remote location and insufficient efforts in heritage preservation and promotion. Therefore, it is essential to conduct publicity and design work from a marketing perspective.

The need to propagate the artistic value and traditional spirit of Dazu Rock Carvings: Dazu Rock Carvings embody core philosophical ideals such as kindness, charity, filial piety, righteousness, and integrity, representing the essence of traditional Chinese culture in grotto art.

Lack of fashionable and popular visual forms: Cultural heritage tourism creative products that align with popular and mass aesthetics can better meet the demands of market promotion and expand influence.

Research Objectives

Explore the cultural attributes of Dazu Rock Carvings in Chongqing, attempting to express cultural qualities in design works through the use of glitch art, creating new visual effects to expand awareness and cognition. glitch art, as an emerging art form reshaped by the youth in the Internet age, has distinct characteristics of contemporary and strong visual expressiveness. Practicing glitch art in the context of Dazu Rock Carvings allows us to glimpse the impact of rapid development in the digital information age on social structure and the human psyche.

Attempt to expand the space for promotional design by updating Dazu Rock Carvings' cultural tourism manuals and cultural creative product designs.

Research Framework/Conceptual Framework

The research framework or conceptual framework is shown in the following figure. The research explores glitch art transformation design practices in the context of the "crisis and opportunity" of cultural heritage, using a hybrid approach of glitch art. Figure 1 illustrates the research framework for design practice.

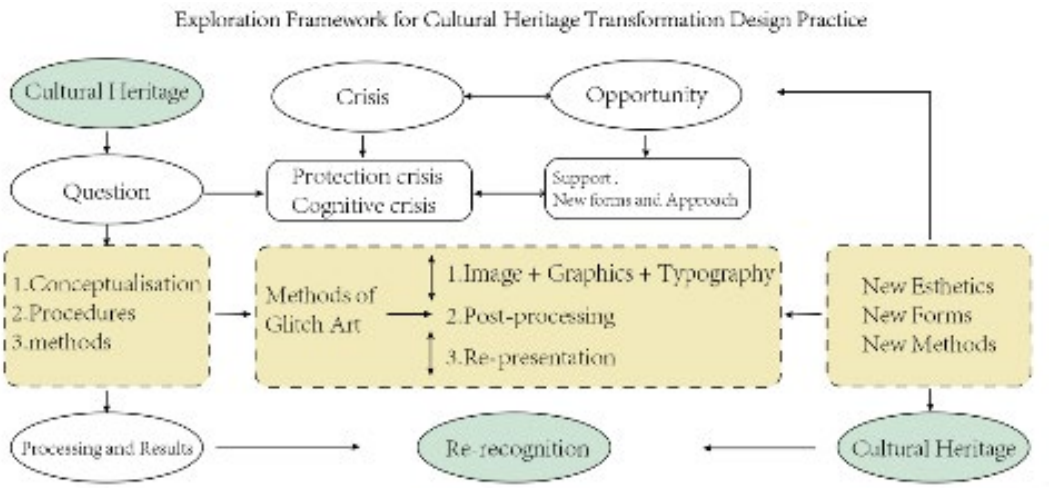

Figure 1. Exploration Framework for Cultural Heritage Transformation Design Practice.

REVIEWS OF LITERATURE

Glitch Art

Glitch art, as a concept rooted in the digital age, can be traced back to the emergence of "glitch art." Glitch art refers to the intentional use of digital or analog errors to create art. It can be seen as the product of both technological and cultural factors. It encompasses a wide range of art forms, including visual art, music, and literature. Glitch art is a subcategory of glitch art, focusing specifically on the aesthetic use of glitch or errors in visual imagery.

Dazu Rock Carvings

Dazu Rock Carvings are a UNESCO World Heritage Site located in Dazu District, Chongqing, China. They are a collection of religious rock carvings that date back to the Tang and Song dynasties, with additional carvings from the Ming and Qing dynasties. The carvings depict Buddhist, Taoist, and Confucian themes and are known for their artistic quality and cultural significance.

METHODOLOGY

Research Design

The research design for this study is practice-based research, which involves the creation of visual design works that apply glitch art techniques to Dazu Rock Carvings. This design practice aims to explore new visual possibilities for representing cultural heritage and promoting awareness and appreciation of Dazu Rock Carvings.

Data Collection

Data collection for this study involves gathering information about Dazu Rock Carvings, glitch art techniques, and relevant visual design principles. Primary data sources include visits to Dazu Rock Carvings, interviewing with experts in cultural heritage preservation and visual design and the creation of glitch art-inspired visual design works.

Data Analysis

Data analysis in this study includes the evaluation of the visual design works created through the practice of glitch art. The analysis will assess how effectively glitch art techniques can be applied to Dazu Rock Carvings to enhance their cultural significance and engage contemporary audiences.

DESIGN PRACTICE

Visual Design Process

The visual design process involves several stages, including research and concept development, design creation, and evaluation. The research and concept development stage includes gathering information about Dazu Rock Carvings, glitch art techniques, and cultural heritage promotion. The design creation stage involves applying glitch art techniques to Dazu Rock Carvings imagery to create visual design works. The evaluation stage assesses the effectiveness of the design works in promoting awareness and appreciation of Dazu Rock Carvings.

Application of glitch Art to Dazu Rock Carvings

The application of glitch art to Dazu Rock Carvings involves the intentional introduction of digital glitch or errors into the visual representation of the carvings. This can include distortions, glitches, and other visual disruptions that create a contemporary and visually engaging aesthetic.Figure 2 Thousand-hand Guanyin.

Visual Design Works

Several visual design works will be created as part of this design practice. These works will include promotional materials such as posters, brochures, and digital media that apply glitch art techniques to Dazu Rock Carvings imagery.Figure 3 Dazu stone carving glitch art poster group.

RESULTS AND DISCUSSION

Figure 2: Thousands Hands Guanyin **Figure 3：** Dazu stone carving glitch art poster group

Evaluation of Visual Design Works

The evaluation of visual design works will assess their effectiveness in promoting awareness and appreciation of Dazu Rock Carvings. This will include feedback from experts in cultural heritage preservation and visual design,

as well as responses from the general public.

Discussion of Findings

The discussion of findings will explore how glitch art techniques can be used to enhance the representation of cultural heritage sites like Dazu Rock Carvings. It will also consider the broader implications of this design practice for the preservation and promotion of cultural heritage.

CONCLUSION

Summary of Research

This paper explores the "crisis and opportunity" of cultural heritage in the context of Dazu Rock Carvings in Chongqing. It applies glitch art techniques to create visual design works that aim to promote awareness and appreciation of Dazu Rock Carvings.

Contributions and Implications

The contributions of this research include:

The application of glitch art to cultural heritage promotion, offering a novel approach to engage contemporary audiences.

The creation of visual design works that expand the visual possibilities for representing Dazu Rock Carvings and similar heritage sites.

Future Research

Future research in this area could explore the application of glitch art to other cultural heritage sites and assess its effectiveness in different cultural contexts. Additionally, further studies could investigate the long-term impact of glitch art-inspired visual design on heritage site preservation and visitor engagement.

References

Deng Xinghang. (2019).Study on the Image of Bashu Guanyin in Tang and Song Dynasties (Ph.D. Dissertation, southeast university). https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDLAST2022&filename=1021579265.nh

Gu Zheng. History of World Photography, Zhejiang Photographic Publishing House: 202007.203.

Hu Nan, Gou shuangxiao. Exploration of Filial Culture Images in Dazu Rock Carvings. Art, 2021 (8) : 138-139. The DOI: 10.13864 / j.carol carroll nki cn11-1311 / j. 006477.

Li Shaobin.(2016). Visual Elements of the Wheel of Life in Dazu Rock CarvingsAnalysis of the visual elements of six cyclic graphs in Dazu stone carvings. Journal of Zhejiang Shuren University (Humanities and Social Sciences) (03),56-58. doi:CNKI:SUN:ZJSR.0.2016-03-013.

Li Xiankui, Guo Xuan, Chen Wei et al. Dazu Stone Carvings and Ancient Buildings . Chongqing University Press: Illustrated Historical Materials of Ancient Buildings in Southwest China, 201503.286.

Long Hong, Wang Lingjuan.. On Outstanding and Delicate Decorative Character of the Design World of Dazu Rock Carving. Journal of zhejiang vocational college of art (02) 83-91. The doi: 10.15965 / j.carol carroll nki zjys. 2008.02.017.

Lv Sijia. Social aesthetic education under the perspective of heritage activation research . Sichuan fine arts institute, 2021. The DOI: 10.27344 /cnki. GSCMC. 2021.000182.

Peng Liyuan. Aesthetic research on the sculpture art of Baodingshan carved in Dazu Stone. Journal of Luliang University (06),67-69. doi:CNKI:SUN:LLXK.0.2019-06-022.

Tian jun. (2014). Dazu grottoes statues of digital protection (a master's degree thesis essay, from Chongqing normal university). https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD201501&filename=1014357779.

nh

Wei Xiuyu. Visual Arts Language Teaching in Contemporary Cultural Context. Northwest Art (01),57-60. doi:10.13772/j.cnki.61-1042/j.2018.01.044.

Love-driven craft sustainability in rural areas: A comparative study in Chongming, China and Fife, Scotland

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Abstract

This paper presents qualitative comparative research between China and Scotland exploring the relationship between craft sustainability and the forms of love that drive rural craft practice in this post-pandemic era. This research aims to (a) compare strategies utilised in the sustainable development of rural craft practice under different cultural contexts, (b) provide a holistic understanding of the forms of expression of love in a rural craft setting, and (c) demonstrate the importance of craft sustainability in rural areas to achieve the United Nations (UN) Sustainable Development Goals (SDGs). Love can be the driver behind practising craft and forming local communities of craft; at same time, craft practice can express different forms of love. In this context, love-driven craft practice is led by two types of love: self-love and connected-love. To achieve an in-depth examination, this study employs a multi-sited rapid ethnography methodology to investigate the significance of people doing craft activities in two creative rural areas – Chongming (China) and Fife (Scotland). Case study, semi-structured interview, questionnaire and participant observation methods have been selected to give a holistic view of the sustainability of love-driven craft practice in rural areas. The long-term goal is to focus on insights into the importance of love in future sustainable development of craft practice. This could stimulate the creative economy, reinforce respect for local culture, and support social well-being.

Author keywords

Love-driven; rural craft practice; sustainability; multi-sited rapid ethnography; China and Scotland.

Introduction

Craft practice can play a vital role in addressing the issue of sustainability. This has been demonstrated in a range of studies (Ferraro et al., 2012; Luckman & Thomas, 2018; Marchand, 2017), all of which argue that crafts can contribute to the economy, culture, and environment. Craft practice, including local production, small and micro-scale enterprise, locality and recyclable source materials, and equality in the work environment, has become an alternative approach to mass or large-scale manufacturing to respond to present-day challenges. These include slow-growth economic sectors, worsening climate change, and increasing human well-being issues (Chen, 2022; Gudowska, 2020; Pollanen, 2015; Zhan, et al., 2017). In this uncertain situation, craft practice has had an increasingly strong relationship with love. In this paper, two types of love have been emphasised. First, there is 'self-love' for individual crafting. For instance, craft-making allows people to practice self-love through self-realisation and self-expression, improving their long-term quality of life and reducing risk to their well-being. Second, connected-love is evoked when a group or personal craft activities structure a connection between nature, community, and society. It can contribute to forming friendly communication between humanity and real-

world, as well as promote building local resilience.

However, research on craft and sustainability has been primarily urban-centred (Hunter, 2018; Lowery et al., 2020). This focus underestimates the value of rural craft practice in forging a sustainable future. Moreover, authenticity is a characteristic of rural crafts because rural-based craftspeople live close to nature, and the objects are made by hand for everyday life use (Barbara,1998; Bendix, 1997; Charles, 1991). Exploration of design's contribution to craft sustainability research currently concentrates on the benefits of design interventions, such as new products, packaging, and marketing. This emphasis leads to ignoring the rural-based craftspeople's need to realise sustainable development and demonstrates a lack of respect for local culture and craft knowledge in the collaboration process between designers and makers (Buchert et al., 2017; Zhan, et al., 2017). Additionally, to date, there has been little consideration that rural-based craftspeople unconsciously infuse love into their craft practice (Bozkurt & Lara Cohen, 2019). Therefore, this research discusses what available sustainable approaches for achieving craft sustainability in rural area through love-driven craft practice.

Methodology

To gain a holistic understanding of love-driven craft sustainability in different cultural, economic and environmental contexts, the multi-sited rapid ethnography methodology (Marcus, 1995; Saukko, 2003) has been selected for this study within the framework of qualitative comparative research. In this case, archival research and literature review methods have been utilised to capture secondary data, which allow a comprehensive insight into how diverse cultural contexts and governmental policies impact craft sustainability and rural development differently.

In keeping with multi-sited rapid ethnography methodology, a case study method (Yin, 2014) was adopted to investigate two creative rural regions - Chongming in China and Fife in Scotland (see Figure 1). This research draws a comparison between the craft sustainability of two regions for the first time in an academic case study. Chongming is a world-class ecological island with a long history of local crafts (Yuan, et al., 2003). Fife is a culturally active rural region with various craft activities, craft groups, and organisations. In this area, craft-related activities have played an important role in driving local development since the mid-twentieth century. Today, although increasing globalisation and mass-scale manufacturing have brought some challenges to local craft sustainability, such as the lack of young people to inherit traditional crafts and related education support, they still use their own way of expressing love through their craft practice.

The selection criteria of participants in semi-structured interviews and participant observations was 1) to include professional craftspeople and hobbyists who were based in Chongming (China) or Fife (Scotland), 2) participants working in craft-related organisations that run projects inspired by the concept of sustainability, and 3) experts in sustainability and the field of crafts. Semi-structured interviews were carried out with fifteen participants in Chongming and ten participants in Fife, which helped to better understand the current situation of local craft sustainability and the forms of love interwoven with practicing their craft. To receive complete and accurate information to assist in accomplishing the above purpose, the participants were asked to fill in a short questionnaire to gather craft-related personal details before the interview began. Participant observations were conducted with local micro-craft studios in Chongming and Fife. This provided rich context to compare differences and similarities in love-driven craft sustainability in rural areas.

Initial finding

Figure 1. Fife, Scotland and Chongming, China: Locations of the two representative regions in above mentioned comparative case studies (Source: Wikipedia).

This section offers an overview of the current situation of craft sustainability in Chongming and Fife. The aim is to illustrate how their craft practice constitutes expressions of love in terms of self-love and connected-love.

The relationship of rural-based craftspeople and their craft practice to forms of love in Chongming
In the past ten years, rapid development of tourism has attracted an increasing number of people interested in traditional crafts to Chongming, resulting in the emergence of craft studios such as Cotton Tree Flower's Bloom, and the development of local catering and accommodation, all of which have contributed to the local economy and culture in this world-class ecological island.
The fieldwork found that most of the traditional craftspeople are residents who learned their craft skills from their families, such as mothers passing on their handloom weaving skills to their daughters. Self-love was present among the personal satisfaction in craft passed down from generation to generation. Still, it also emerged to bring people together through connected-love for others to experience craft and connectedness.

One interviewee Rongyao Song is a local craft amateur of textile and micro-scale enterpriser. In 2013, she registered a craft social organisation called Cotton Tree Flower's Bloom in Chongming. In the beginning, self-love drove the way she conducted individual crafting, such as making a phone bag by using local material rather than consuming mass-manufacturing products, enabling her to feel self-expression and happiness in the making process. In the long term, she hopes to be a more meaningful influence in the community, including spreading local culture and supporting marginalised people be bring people together to experience craft activities. Thus, she decided to leave her job as an accountant working for the Chongming government, and devoted herself to

running a social organisation full-time in 2018. The social organisation offers craft experience workshops for craft enthusiasts. For example, they taught people how to make a unique bag from Chongming cotton fabric in the workshop. Also, they organised non-profit craft training programmes for local housewives and disabled people, which supported them in improve personal value and livelihood. It has expressed the connected-love through involving local people in craft practice and providing job opportunities for vulnerable people.

Another interviewee, the master bamboo weaver Jiuren Shi, aged seventy-four, learned his crafts from his older sister. He still uses natural local materials for production, even though he did not realise doing so can positively contribute to the environment. He said he faced the most challenges in selling products and securing young successors to his craft. However, he still insists on practicing his craft to make objects for everyday use because he can feel personal value from the process of transforming materials into meaningful objects.

The relationship of rural-based craftspeople and their craft practice to forms of love in Fife
Fife includes several rural communities with creative industries, such as Pittenweem, Cupar, and St Andrews, where many craft-related organisations and studios, such as Fife Contemporary Arts and Crafts (FCAC), Open Studio North Fife, and East Neuk Fife, are located. In recent years, this area has attracted an increasing number of artists and craftspeople who come to the beautiful countryside to set up their studios and restart their lives in an idyllic setting (National Records of Scotland, 2022). Through my field trips, I found that community self-organisation is the main impetus behind booming craft industries. However, these craft-related self-organisations are limited to their places of origin, which means that their works are scattered across different communities. Pittenweem Community Craft Project was established by six retired local women who are craft hobbyists with self-taught craft skills. They enjoy making and sharing things without needing external rewards such as income. Every year in August, this group will sell their handmade items for charity during the Pittenweem Arts Festival. Since 2009, it has donated over £29,000 to local charities, including East Neuk Community Trust, the Pittenweem Community Library, and the local branch of national cancer charities. They described their craft-making as a habit and claimed they practice craft because they want to feel part of social networks and show their life experience. In this context, the two types of love have been put into practice by promoting the craft economy and personal well-being.

The textile craft artist Bun Mitchell uses locally sourced natural coloured wool and dyes from plant material. She is a member of the Open Studio North Fife. Each year in May, she opens her studio for visitors to see the craft-making process and offer an in-person experience to understand her craft knowledge. Her practice concerns the relationship between the environment and materials; she is passionate about exploring ways to extract colours from natural materials. She says, 'I lay the leaves on the fabric and then steam or boil it. It is about the chemistry between the chemicals in the plants and the container in which you boil it.' To ensure the textile production's close connection to local culture is done in an environmentally responsible and ethical way, she attends lots of courses on sustainability, the technology and techniques of natural dyeing, and creative industries. The craft artist's connected-love is shown through using local plant materials to make the connection between nature and objects, as well as an open studio for others to experience craft.

Discussion and conclusion

The analysis of primary data collected from Chongming and Fife indicates that although Chongming and Fife are both culturally active rural areas, their current development situations show the influence of different social

and cultural backgrounds on craft sustainability and the craftspeople's forms of expression of love. First, Chinese craftspeople traditionally learn their craft skills and knowledge from older generations and family members. In contrast, Scotland's craftspeople are more used to learning craft skills and knowledge via online resources and by attending courses. Second, in China, craft sector sustainable development relies on the top-down approach. For instance, Rongyao Song described her new craft-related career would not have been possible without the government's support, which included land transfer and collaboration projects. Conversely, in Scotland, the bottom-top system effectively promotes the sustainability of rural craft sectors. For example, there are many community-based self-organised organisations to boost the local economy and creative culture in Fife. Third, Scottish craft artists, like Bun Mitchell, have more awareness in seeking connections between nature and craft-making. Chinese craftspeople often unconsciously incorporate the idea of sustainability into their craft-making process. However, craft practice in the two rural regions is driven by two forms of love (self-love and connected-love) because of human beings' common needs, including self-realisation, self-expression, meaningful life, and interaction with others.

This comparative research explores the two forms of love through the rural craft practice within a sustainability context. Multi-sited rapid ethnography methodology has been employed to elaborate on the differences and similarities of love-driven craft sustainability in rural areas, which can reach a holistic understanding of the narrative of love in craft sectors. The analysis has shown that rural craft sustainability and love have a strong relationship, especially regarding self-love and connected-love. Thus, combining these two types of love could enable long-term sustainable development in craft sectors and support the implementation of UN SDGs. Nevertheless, future work will consider the appropriate strategy for transforming the sustainability challenges for rural-based craftspeople.

References

Ahmad, S., Wong, K. Y., Tseng, M. L., & Wong, W. P. (2018). Sustainable product design and development: A review of tools, applications and research prospects. Conservation and Recycling, 132, 49–61. https://doi.org/10.1016/j.resconrec.2018.01.020

Bozkurt, & Lara Cohen, R. (2019). Repair work as good work: Craft and love in classic car restoration training. Human Relations (New York), 72(6), 1105–1128. https://doi.org/10.1177/0018726718786552

Buchert, T., Halstenberg, F. A., Bonvoisin, J., Lindow, K., & Stark, R. (2017). Target-driven selection and scheduling of methods for sustainable product development. Journal of Cleaner Production, 161, 403–421. https://doi.org/10.1016/j.jclepro.2017.05.067

Chen, C. W. (2022). Approaching sustainable development goals: Inspirations from the Arts and Crafts movement to reshape production and consumption patterns. Sustainable Development, 30(6), 1671–1681. https://doi.org/10.1002/sd.2334

Ferraro, E., White, R., Cox, E., Bebbington, J., & Wilson, S. (2012). Craft and sustainable development: Reflections on Scottish craft and pathways to sustainability. Craft + Design Enquiry, 3. https://doi.org/10.22459/CDE.03.2011.06

Gudowska, B. (2020). Arts and crafts and UN sustainable development goals. International Journal of New Economics and Social Sciences, 11(1), 277–288. https://doi.org/10.5604/01.3001.0014.3547

Handwerker W. (2001). Quick ethnography: a guide to rapid multi-method research. Lanham, MD: Almira Press.

Hunter. L. (2018) House of Lords Rural Economy Committee Report. Creative Rural Industries Consortium.

Lowery, B., Dagevos, J., Chuenpagdee, R., & Vodden, K. (2020). Storytelling for sustainable development in rural

communities: An alternative approach. Sustainable Development, 28(6), 1813–1826. https://doi.org/10.1002/sd.2124

Luckman, S & Thomas, N. (Eds.). (2019). Craft economies. Bloomsbury. https://doi.org/10.5040/9781474259576

Marcus, G. E. (1995). Ethnography in/of the world system: The emergence of multi-sited ethnography. Annual Review of Anthropology, 24(1), 95–117. https://doi.org/10.1146/annurev.an.24.100195.000523

Panneels, I. (2023). The quintuple bottom line: A framework for place-based sustainable enterprise in the craft industry. Sustainability (Basel, Switzerland), 15(4), 3791–. https://doi.org/10.3390/su15043791

Phillipson, J., Gorton, M., Turner, R., Shucksmith, M., Aitken-McDermott, K., Areal, F., ... Shortall, S. (2020). The COVID-19 pandemic and its implications for rural economies. Sustainability, 12(10), 3973– . https://doi.org/10.3390/SU12103973

Pollanen. (2015). Elements of crafts that enhance well-being: Textile craft makers' descriptions of their leisure activity. Journal of Leisure Research, 47(1), 58–78. https://doi.org/10.1080/00222216.2015.11950351

Sandhu, J. S. et al. (2007). Serial hanging out: Rapid ethnographic needs assessment in rural settings. In Human-Computer Interaction. Interaction Design and Usability. [Online]. Berlin, Heidelberg: Springer Berlin Heidelberg, 614–623.

Saukko, P. (2003). Doing research in cultural studies: An introduction to classical and new methodological approaches. Sage. https://doi.org/10.4135/9781849209021

United Nations. (2022) The 17 Sustainable Development Goals. https://sdgs.un.org/goals (Accessed: 10 August 2022).

Yin, R. K. (2014). Case study research: Design and methods (5th ed.). Sage.

Yuan, W., James, P., Hodgson, K., Hutchinson, S., & Shi, C. (2003) Development of sustainability indicators by communities in China: A case study of Chongming County, Shanghai. Journal of Environmental Management, 68(3), 253–261. https://doi.org/10.1016/S0301-4797(03)00063-X

Zhan, X., Walker, S., Hernandez-Pardo, R., & Evans, M. (2017). Craft and sustainability: Potential for design intervention in crafts in the Yangtze River Delta, China. The Design Journal, 20(sup 1), S2919–S2934. https://doi.org/10.1080/14606925.2017.1352802

Artistic Expression Of Body Language In VR Dance Therapy

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Abstract

The development of new media technology provides a broader vision for dance art, dance performance gradually began to combine with virtual reality (Virtual Reality, VR) to create. Dance therapy is an integrated process of psychotherapy through dance movements to promote the interaction between individual emotion and physiological behavior. With the rapid development of VR technology, the body language and emotional expression in traditional dance therapy are difficult to meet people's further exploration of body perception. With its unique interaction, interest and experience, VR technology can provide a variety of means of expression and multi-dimensional perceptual expansion for dance therapy, can fundamentally change the way of physical and mental communication in dance therapy, convey richer emotions, and make the expression of body language more audiovisual impact and appeal.

Based on the theories and methods of body language analysis commonly used in dance therapy, this paper explores the artistic way of physical and mental communication in dance therapy, and combines the expression characteristics of individual, space and time in body language in VR, and makes a research on the artistic creation of VR dance therapy. Finally, through the design practice, I build a natural interaction method for VR dance therapy in the aspects of individual reconstruction and group therapy, which helps more and more individuals to express themselves more deeply and truly. The close combination of dance therapy and VR makes the artistic expression of its body language more abundant.

Author keywords

VR; Dance Therapy; Body Language.

Introduction

In the present day, dance therapy is gradually being widely used in the field of therapeutic rehabilitation. Based on this background, VR dance-related applications are also appearing more and more in people's vision, but the research on the application of the combination of the two is still relatively small. The popularity of dance therapy in our country is relatively low, a large part of the reason is that there are few dance therapists in our country, but VR applications are more innovative, attractive and interesting than traditional treatment modalities both in terms of dissemination and in terms of immersion in the therapeutic environment, which will make people more willing to experience dance therapy. Existing VR dance works are more for presenting cool performance effects, and do not have more in- depth research on individuals and their movements and spaces, but there are also some interesting interactive experiences as well as body language presentation forms that can be combined with dance therapy. The emergence of VR dance therapy will be an inevitable trend in the development of digital art.

Dance is an important part of dance therapy, which itself blends art and science and is an interdisciplinary

approach: it combines therapeutic approaches to the body, movement, dance and psychology (Levy,1988). Using movement as the medium of dance therapy can break the limitations of language and help individuals express themselves more deeply and truthfully. The way of presenting body language in VR dance application makes the expression of movement more like, and it can create visual, creative, and interesting forms of movement expression, and with the assistance of multiple motion capture technologies, it can restore the body movements of the experiencer in the virtual world and create a virtual- real world communication bridge between the virtual and real worlds. In VR, the virtualized
body as the carrier of the experiencer's movement in virtual space and time, its presentation form has diversified characteristics. The audiovisualization elements combined with motion and static can intervene in the body language expression of the experiencer in the virtual space-time exploration, and through triggering creative movements, express the experiencer's self-emotions, and further strengthen the integration of self and social cognition to achieve the purpose of dance therapy in VR.
The large number of work cases of VR dance application (Kyan et al., 2015) is enough to provide support for the technical and artistic creation of dance therapy combined with VR. In the process of creative research, it is necessary to combine the characteristics of dance therapy, so that the creation of virtual individuals, the construction of space, and the change of time assist the experiencer to better obtain emotional cognition from body language.

Dance therapy

Concepts of Dance Therapy

The concept of Dance/Movement Therapy DMT has evolved iteratively over time, culminating in "the American Dance Therapy Association, which was founded to formalize dance therapy as a psychotherapeutic approach." (Chodorow,1991) The Association defined dance therapy in 1972 as "the process of using movement in psychotherapy and facilitating the integration of an individual's emotions and physiology." Dance therapy uses body language as a bridge to break through the limitations of speech to help the experiencer become more emotionally and physiologically integrated. Dance therapy is defined as "the process of using movement in psychotherapy and promoting the emotional and physical integration of the individual." (Levy,1988) Dance therapy uses body language as a bridge to break through the limitations of speech and help the experiencer gain a deeper understanding of his or her own inner world. Movement-mediated "dance therapy offers an alternative approach to the systematic study of understanding the development of human behavior and emotions (Chace et al.,1993)."

Dynamic Representation of Body Language in Dance Therapy

Non-verbal dynamic action symbols

Non-verbal symbols include both visual and auditory systems. Humans communicate information in three ways: sound, color patterns, and movement. Sound includes language and music, color patterns include words and paintings, and movement is non-verbal information symbols. Among them, movement is the most difficult to be imitated, and different people making the same movement will produce different emotional experiences due to factors such as strength and amplitude (Wu Jianxiu, 2017). Human movement has a similar function with words and language or even expresses more than them.

Laban Movement Analysis

Laban Movement Analysis (LMA) is abbreviated as LMA. There are four basic elements in Laban Movement Structure Description Analysis (Guest, 2013): Body - the specific part of the body that is in motion; (which body parts are used in the movement, which part of the body triggers the movement); Space - the specific direction,

level, distance, or degree of movement; (how the body occupies space in a movement, the spatial structure of human movement); Shape - the internal and external changes in movement; Effort - How is the action launched, what is its internal drive and intent.

The Evolution of Dance Forms in Dance Therapy

Dance therapy has been gradually developing into an art form in its long history. Magurandam's survey on the prospects for the development of dance therapy in "Analysis of the Current Situation of Dance Therapy in China's Education and Training" shows that "those who believe that dance therapy can be used in the field of education are in the first place, 79.2% in the field of health care, 75.4% in the field of art, 63.3% in the field of physical education, and others account for 10.9% (Magurandam, 2019) ". So dance therapy used in the field of art is a big trend.

Dance therapy tends to be artistic provides multiple avenues of body language expression and communication. Some researchers see artistry on the one hand as having a psychoanalytic model of therapy. In this mode, art becomes a potential non-verbal communication medium, assisting the individual to maintain the balance between the inner and outer worlds, and to express his emotions through some associations and interpretations of his creations; on the other hand, it is believed that activities of an artistic nature have a therapeutic function in themselves, and that they can improve the individual's observation of things through artistic expression, which is conducive to self-knowledge and self-growth, and to achieve the purification of the emotions (HaoQi, 2005).

Dance therapy combined with VR art creation

Digital technology, with its unique interactive, fun and experiential nature (Vialle et al.,2022), can provide diverse means of expression and multi-dimensional expansion of perception in the performing arts (Jürgens et al.,2020). It can fundamentally change the way the mind and body communicate in the language of movement, conveying a richer emotional content within. Dance therapy is a psychotherapeutic process that facilitates the integration of the interaction between an individual's emotional and physical behaviour through dance movement. So the fascination of body language reaches new heights in the dance therapy process. So I created a VR installation: 'Bodyreath' to appreciate and understand the body language of people with autism. Let me describe my process of making it below.

Introduction to the overall idea

Pre-research

a. Questionnaire survey. The main purpose of creating the work is to achieve therapeutic effects on autistic people through VR dance therapy, and to allow the public to experience and understand the characteristics behind their behaviour by appreciating their VR body language during the dance therapy process.

Before creating the piece, I did a questionnaire survey to collect people's knowledge about autism and their views on people with autism (Figure 1a). The survey showed that most people were still a little bit aware of this group, but the least number of people were more aware. Although the majority of people who knew a little bit about the group, there were still a lot of incorrect and bigoted views when looking at what they had to say about people with autism.

b . **Figure 1.** (a) Level of understanding of people with autism. (b) Motion capture experiments.

Observation Notes. In order to understand more about the autistic community, I made a field trip to a charity that cares for autistic people and used observation notes during my year-long stay with them to summarise some of their characteristics: stereotypical behaviour, sudden mood changes, failure to follow instructions, obsessive-compulsive disorder, hyperactivity, etc.

c. VR Experiment. In order to find out how autistic people accept VR, I conducted a survey experiment on the use of VR devices by autistic people. A total of 14 autistic people experienced it, of which only two were more reluctant to wear VR devices and three enjoyed experiencing virtual scenes very much. The results of the experiment show that most autistic people are receptive to VR as a new way of interaction and viewing.

d. Motion capture experiments. I captured the dance movements of people with autism (Figure 1b) and the movements of the dance teacher using the Noriton device, recorded a

database of their movements and played the artistic effect of the author's designed avatars on the monitor in real time, so that they could watch the designed avatars while dancing to increase the fun.

Design solutions

My work, Bodyreath, is a VR installation that allows the viewer to appreciate the innocence of autistic people from a different perspective and to understand them in an artistic way. The work is divided into two main parts - 'outside' and 'inside'. "The "outside" is a collection of four artistic effects based on the personality and behavioural characteristics of autistic people, and uses motion capture equipment to capture the movements of the teachers and students in real time. The "inside" is a VR application based on the four characteristics of the "outside", through the appreciation of their dance movements, to experience the characteristics of each "outside" avatar. The four main categories of their characteristics are: stereotypical behaviour, star children, emotional instability and 'transparent' people.

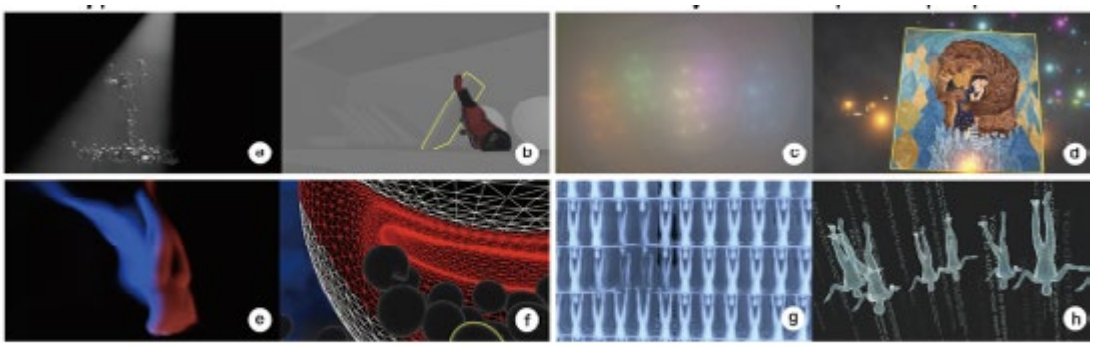

Figure 2. "Stereotyped Behavior". (a) The virtual avatar. (b) The VR scenario, "Children from the Stars". (c) The virtual avatar. (d) The VR scenario, "Emotional Instability". (e) The virtual avatar. (f) Th VR scenario, "Invisibility". (g) The virtual avatar. (h) The VR scenario.

Four main categories of characteristic performance design (Figure 2). - the first characteristic: stereotypical behaviour. Expression of their experience of monotonous, repetitive behaviour. In the process of drawing, some autistic people always like to draw circles, they have a special love for circles; the second characteristic: star children. They are called children of the stars, shining brightly but far away from us, yet their own world is very colourful and when you approach each star, you will appreciate their rich world; the third characteristic: emotional instability. Their emotions are unstable, sometimes good and sometimes bad, mostly without much warning, and it is difficult to convey other people's emotions to them, so our emotions may be grey for them, with little emotional representation, and the feedback they make may only hover between good and bad. The red and blue smoke effect wants to show that autistic people have difficulty breaking through in their own monotonous emotions, always being "wrapped up" and wanting to break free but unable to do so; the fourth characteristic: the transparent person. People with autism may be "transparent" to most people, our world is devoid of them, and many people do not know or understand them, in their world, we may also be transparent.

Conclusion

At present, the research and development of VR dance application is moving towards a mature stage, but the research on combining body language in dance therapy is relatively little, and it is found that part of the technical support and artistic expression in VR dance can be used in dance therapy. Therefore, this paper investigates the artistic expression of body language in VR dance therapy.

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References

Chodorow, J. (1991). Dance therapy and depth psychology: The moving imagination. Psychology Press.

Levy, F. J. (1988). Dance/Movement Therapy. A Healing Art. AAHPERD Publications, PO Box 704, Waldorf, MD 20601.

Chace, M., Sandel, S. L., Chaiklin, S., & Lohn, A. (1993). Foundations of dancemovement therapy: the life and work of Marian Chace. Marian Chace Memorial Fund of the American Dance Therapy Association.

Guest, A. H. (2013). Labanotation: the system of analyzing and recording movement. Routledge.

Wu Jianxiu. (2017). Body language analysis and application in dance training.

Magurandam. (2019). Analysis of the current status of dance therapy in education and training in China. Art Education, 19(06), 90-91.

HaoQi. (2005). Dance Therapy: From Body to mind. Medicine and philosophy, 26(3), 61-62.

Kyan, M., Sun, G., Li, H., Zhong, L., Muneesawang, P., Dong, N., ... & Guan, L. (2015). An approach to ballet dance training through ms kinect and visualization in a cave virtual reality environment. ACM Transactions on Intelligent Systems and Technology (TIST), 6(2), 1-37.

Vialle, M., Alaoui, S. F., Skouras, M., Vilvanathan, V., Schwartz, E., & Ronfard, R. (2022, June). Visualizing Isadora Duncan's movements qualities. In Proceedings of the 14th Conference on Creativity and Cognition (pp. 196-207).

Jürgens, S., Fernandes, C., & Kuffner, R. (2020). Experiencing choreographed 4D visuals in a VR dance installation. Performance Research, 25(4), 94-97.

Organon Type of a Narrative of Love:Inspirations for the Study of Eastern Care Design

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Abstract

The research project "A Narrative of Love: the Perspective of Traditional Chinese Culture" originated in 2019 and was conducted by the Enlightenment Institution(China), led by Professor Li Yufeng of the China Central Academy of Fine Arts. This research project explores "A Narrative of Love"from the perspective of Chinese traditional culture under the commission of the "Narratives of Love: Towards Healing, Transformation and Transcendence" commissioned by David Cadman and Sherto Gill. "Organon Type of a Narrative of Love"is one of the sub-products of this research project.

As a practical guide, "Organon Type of a Narrative of Love" introduces Eastern care design values with the aim of integrating 'love' into the entire design process. This study examines the methods of tool construction in the book and its multidimensional interpretation of love, reflecting on the significance of establishing Eastern care design thinking. It provides valuable perspectives to the field of design studies and provides valuable insights for cross-cultural research and design practices in a global context.

Author keywords

Organon Type of a Narrative of Love;Chinese Traditional Culture;Eastern Care Design;Design Thinking;Methods of Design Studies.

Introduction

The research methodology for"A Narrative of Love"comprises three main components: literature review, data collection, and organon development. This study

primarily centers on the concept of love within Confucian and Taoist theories, supplemented by interpretations of related literature and a collection of over 300 folk proverbs to enrich Chinese cultural elements.

The literature review forms the foundation, involving a comprehensive exploration of multifaceted questions, inspiring thought patterns and strategic tools. Findings are presented in a series of thematic reports, including one main report and five sub- reports. This paper focuses on Sub-report Five: "Organon Type of a Narrative of Love," providing a condensed summary.

The research focuses on the following questions:

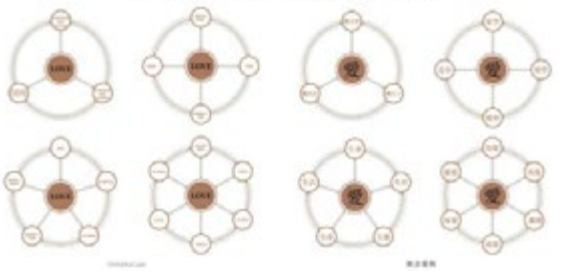
As a participant in the "A Narrative of Love: the Perspective of Traditional Chinese Culture" research project, this initiative has prompted my contemplation on Eastern care design. Through extensive literature review and research, it becomes evident that care design is a research direction that has yet to be definitively defined.

However, it is undeniably essential to base Eastern care design on our profound studies of Chinese traditional culture.

The Overview of "Organon Type of a Narrative of Love"

On the basis of literature review and the integration of questions, we try to select and combine a series of concept groups with love as the starting point, and construct these concept groups in a mode of thinking logic through linear logic, hoping to develop diverse thinking modes on this basis, which including Conceptual logic, Mandala organon, and A Matrix of entanglement.

Table 1. The Conceptual logic modes



Three thinking modes

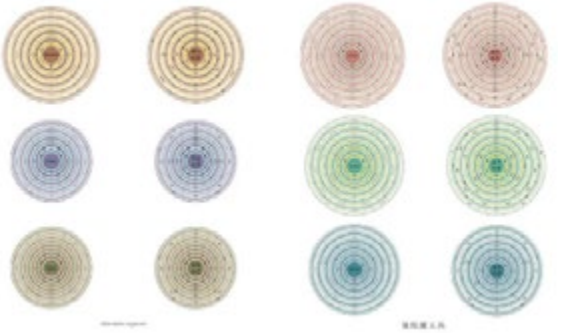
Conceptual logic

Concept is a thinking form that reflects the essential properties of things and their molecules. It is an abstract and differentiated definition.Conceptual logic is an orderly system to refine concepts and their rationalizations.

Reflection: Love undergoes semantic adjustments and variations when placed in different contexts. The associative nature of conceptual terms prompts us to reconsider the meaning of love within specific domains, while also establishing logical connections among related words. Consider this as a foundational model for your design. If the central word within this framework were replaced with terms like 'self-interest' or other relatively self-centered vocabulary, how would it impact the design outcomes?

The charm of design lies in the ideas it embodies; it must engage with both business and technology(Liu,2019). Dr. Zhu Songchun, Director of the Beijing General Artificial Intelligence Research Institute, delivered speeches on "Empowering Humanities through AI Research: Insights from Chinese Philosophy." (2023)He stressed the importance of revisiting human nature, humanities, and civilization, drawing from Eastern Chinese philosophical concepts to guide intelligent societal governance and explore Chinese wisdom.

Table 2. The Mandala organon modes



Mandala organon

Mandala perhaps is the most "intelligent" graphic symbol system in "nature" and "culture".There are some universal characteristics of eternal meaning in the mandala figure and its derivation mechanism, which are summarized as centrality, systematicness, logicality and adaptability.

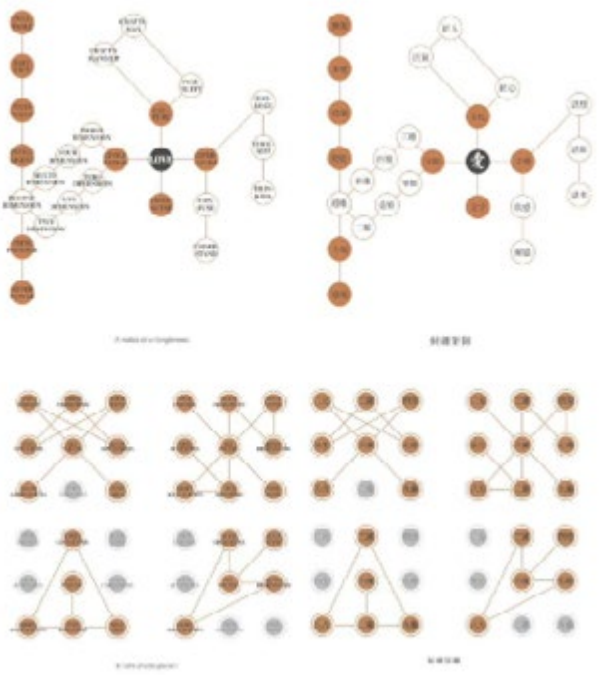
Reflection: In the design process, we often stress the "User-Centered" concept(Norman and Draper,1986). This concept emphasizes users' roles and needs in human-computer interaction, greatly benefiting our user experience research. However, Eastern ideas of love often highlight a comprehensive "love." In the vast context of the universe and time, humanity's existence is minuscule. This prompts us to rethink, considering today's challenges, that design should not solely revolve around humans. Instead, it should encompass a broader scope for contemplation, fostering extensive discussions on the relationship between humans and the future. The

FAST, located in Pingtang County, Guizhou Province, China, is a single-dish radio telescope and the world's largest of its kind. According to Chief Engineer Mr. Nan Rendong(Yang,2023), the construction of the "FAST" is not driven by economic interests but rather originates from the innate human drive for creativity and the desire for exploration.

A Matrix of entanglement

We believe that the world is intrinsically connected.The quantum entanglement phenomenon presented by quantum physics is to some extent in syncretism with the principle of connection of all things contained in the Chinese classical Yi theory.

Table 3. The Matrix of entanglement modes



Reflection: The Book of Changes is a vital component of ancient Chinese philosophy, encompassing reflections on various aspects such as nature, human life, morality,and more. Through the study of I Ching individuals can delve into profound philosophical inquiries, including concepts like change, balance, and human nature, thereby gaining a deeper understanding of life and the universe.

Physicist Carlo Rovelli released a groundbreaking book titled "Helgoland"(2020). This book doesn't merely explain quantum theory; it endeavors to construct the entire world's ontology based on quantum ideas. It offers a relational interpretation, asserting that objects don't exist continuously; they are the sum of their interactions, which occur discretely. Professor Qin Jingyan highlighted quantum thinking as a vital driver of innovative design(2019).

The Insights into Eastern Care Design Research

Through research on "Organon Type of a Narrative of Love," two key features of the book's tools are evident: the creative amalgamation of love's constituent elements and the innovative progression and refinement of tool methods. Combining these three models creates a celestial map of Chinese cultural interpretations. This study offers four insights for Eastern Care Design in design motivation, system, patterns, and applications, aligning with the Morphological Diagram of Love Interpretation Tools for understanding.

Table 4. Matrix of a Narrative of Love

What is Love? — The Motivation for Constructing Love (Care)
Love is difficult to encapsulate in a single word. In Chinese traditional culture, it is abstracted as a spirit, a perpetual pursuit of "truth, goodness, and beauty." Taking love as the motivation and starting point of design empowers design actions, processes, and outcomes.
What to Love? — Establishing a Design System of Dynamic Equilibrium
Love for individuals, love for family, love for communities, love for the nation, love for the world, love for nature... Each form of love has its unique system, and the future of design is to explore its direction and establish its system. Utilizing dynamic thinking to consider unknown uncertainties and create dynamic equilibrium within this system.
How Many Paths Does Love Have? — Expanding Multi-Vectored Design Patterns Love is a zero vector，it inherently lacks direction yet can lead to anywhere. Don't confine your design to a single answer; let the modes of thought lead in all directions.
Love is Eternal! — Assessing the Sustainability of Design Applications
The unknown is also eternal. In this era of rapid technological advancement, civilizations can easily become fragmented. Chinese wisdom emphasizes the concept of 'long-term.' Design has a starting point, and it has phased endpoints, but it should not have a final endpoint. It should establish sustainable applications and heritage, allowing design to possess enduring vitality.

Conclusion

In this study, we re-examine the inspirations embedded in Chinese traditional culture regarding 'love' and contemplate how to construct a design methodology of love through "Organon Type of a Narrative of Love". The entire process explores the significance of establishing Eastern Care Design as a core design value, while also aiming to uncover specific paths and seek insights.

Acknowledgments

It is an honor to have been a participant in the "A Narrative of Love: the Perspective of Traditional Chinese Culture"project, and I am grateful for the opportunity to share and interpret this research outcome. I extend my thanks to Mr. David Cadman and Ms. Sherto Gill for initiating the project, to Professor Li Yufeng for providing me with the opportunity to engage in the project's research and learning, and to all the partners who participated in and supported this endeavor.

References

Special Note:The entire images in this article and the introduction to the project's content are excerpted from the outcomes of the"A Narrative of Love: the Perspective of Traditional Chinese Culture"project. I have been involved in the project's research, the development of the toolkit, and the creation of the images. It is important to note that as of now, the project's outcomes have not been published or publicly released.

Liu,G.Z.(2019).Design is the coordinator to take into account the interests of all parties.Design(CHINA),2019,32(02):67-68.

Beijing General Artificial Intelligence Research Institute.The 5th ACM Turing Conference in China.https://mp.weixin.qq.com/s/JYyCI49hDV3KalPButaoRg

Fan, L., Xu, M., Cao, Z., Zhu, Y., & Zhu, S.-C. (2022). Artificial Social Intelligence: A comparative and holistic view. CAAI Artificial Intelligence Research, 1(2), 144–160. doi:10.26599/air.2022.9150010

Norman, D. A., & Draper, S. W. (1986). User Centered System Design. doi:10.1201/b15703
Yang,J.F.(2023). Look up at the stars with the "FAST in China".People's Daily Overseas Edition(CHINA),2023-07-11(005).DOI:10.28656/n.cnki.nrmrh.2023.002246.
Rovelli, C. (2020). Helgoland. Milano: Adelphi.
Rovelli, C., Segre, E., & Carnell, S. (2022). There are places in the world where rules are less important than kindness and other thoughts on physics, philosophy and the world. New York: Riverhead Books.
Qin,J.Y.(2019).The impact of quantum thinking on artificial intelligence and innovative design.Design(CHINA),2019,32(24):81-82.

Design and grief: the loss and connection of love

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Abstract
In recent years, the world's population's mortality rate has increased yearly. However, the rapid pace of modern life has led to a very short time for bereaved people to mourn and rebuild their lives. This phenomenon has caused severe and long-term psychological problems and mental disorders among bereaved people, urgently needing the attention of all walks of life. Based on traditional Chinese bioethics, this research analyzes the theories and models related to bereaved persons in the academic community, takes the cognitive- behavioral model as the theoretical basis, and design as the intervention method. Qualitative research is used to conduct user interviews and analysis from the cognitive, emotional, and behavioral levels of bereaved persons, gain insight into the relationship between the bereaved's grief response and its coping methods, and combine design practice cases to investigate the design preferences of the target population, in order to explore the design model for bereaved grief counseling and form an effective design strategy, which provides theoretical basis and reference value for relevant designers to carry out design practice work for bereaved persons, and help more bereaved individuals rebuild themselves to adapt to the new life after the departure of the deceased.

Author keywords
Bereaved; Grief Counseling; Design; The Cognitive-Behavioral Model; Emotional Connection.

Introduction

The death of a loved one is one of the most painful experiences in human life, and it is also a universal experience that everyone cannot escape. In recent years, facing the continuous accumulation of bereavement incidents caused by the development of aging societies around the world and the inability to complete the relevant mourning procedures caused by the epidemic infection (Wallace, Wladkowski, Gibson, & White, 2020), most bereaved people usually adopt an attitude of forbearance and self-digestion and devote themselves to work or study after the funeral is quickly completed. The mourning time and opportunities have been significantly reduced. The vital way and medium to maintain connection with the deceased have been lost (Xu, He, & Wang, 2020), which has triggered a more robust and unexpected grief response of bereaved people, manifested as emotional, physical, behavioral, cognitive, social function, and other aspects of stress response (Breen & O'Connor, 2007), and even as a result, leading to new deaths (M. Stroebe, Schut, & W. Stroebe, 2007).

For the world, death is not eternal, but oblivion is. People who have passed away need to leave materialized memories for relatives and friends to mourn. With the rapid development of contemporary science and technology in medicine, the adaptation after bereavement is not limited to expressing sad emotions and

thoughts but also includes the adaptation and recovery of the bereaved to new life. The academic community began to think critically about how to treat the dying life and enhance the happiness of life after bereavement. The strategic research related to the design discipline has the characteristics of comfort, connection, and commemoration (Moules, 1998), which can provide bereaved people with bioethical grief counseling design practices and help them establish a bridge of communication with the deceased in order to adjust their emotions and return to social life faster.

Due to the differences in grief culture, funeral and mourning customs around the world, based on the context of traditional Chinese bioethics, this article analyzes the research status of bereaved people and grief counseling in the academic community, understands the psychological characteristics and coping methods of bereaved people, and combines existing grief counseling design case studies and user research for bereaved people. Design as an intervention method, reconstruct a design model for grief counseling for bereaved people, and explore design strategies in line with traditional Chinese bioethics to guide the design practices of grief counseling for bereaved people.

Grief Counseling: Escaping the Grief of Bereavement

Losing a loved one is a journey of spiritual reconstruction, usually accompanied by emotional pain and cognitive reconstruction. The academic research on bereaved people has a history of nearly a hundred years. Among them, grief counseling (GC) originated from the medical field of hospice care, covering philosophy, ethics, psychology, and other fields (Medicine et al., 2004). In 1917, Freud proposed in the classic monograph "Sadness and Melancholy" that the bereaved should be psychologically gradually separated from the deceased, and the grieving process should be completed by expressing sad emotions. Psychologists widely accepted this view for the next half-century, and grief counseling was thus defined as assisting bereaved people to adapt to loss, produce normal grief within a reasonable time, and start their lives again (Cui, Li, & Zhao, 2017).

With the impact of natural disasters and the epidemic around the world, grief counseling, as an essential part of the bereaved person's transition from experiencing grief to adapting to grief, has gradually attracted the attention and attention of the whole society, and its research results have become more affluent and more prosperous. Some scholars have successively conducted exploratory research on the nature of grief counseling, morbid grief patterns, and treatment methods (Currier, Irish, Neimeyer, & Foster, 2015), and proposed grief counseling intervention methods such as empty chair technology, role-playing, safe deposit box technology, box court therapy, life review method, and ritual activities (O. Qi & S. J. Qi, 2018), and through related cases, it has been proved that grief counseling can effectively help bereaved people improve their adaptability to a new life. By combing through the relevant research status quo, this study corresponds to the five-stage theory of grief, counseling steps, and counseling principles of bereaved persons, and summarizes the overall grief counseling process, as shown in Figure 1.

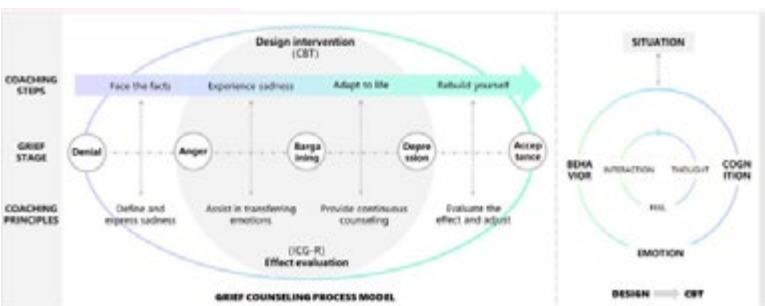

Figure 1. Grief counseling process and design intervention cognitive-behavioral model.

Due to different factors such as the time, cause, and type of bereavement, the psychological experience of the bereaved is also different. Hence, the research on the design strategy of grief counseling still needs to be completed. As an effective short-term psychotherapy method, cognitive-behavioral model has a wealth of practical case studies in the field of grief counseling, but as a whole, it pays more attention to the professionalism of the process, lacks emotion and uniqueness, and fails to give sufficient humanistic care to the long-term nostalgia required by the bereaved. There is room for improvement to allow the design to step in and optimize. As a discipline that combines innovation and subjectivity, as well as reflection and discussion on one's own choices, design can help the bereaved people express grief, psychologically accept the separation from the loss of objects, and have the function of re-evaluating the value of life and psychological self-healing (Wang, 2019). Therefore, this study uses design as an intervention method to intervene in cognitive-behavioral model. As shown in Figure 1, the three design levels of feeling, thought, and interaction correspond to the three elements of emotion, cognition, and behavior in the original cognitive-behavioral model to promote designers to improve the existing grief counseling intervention methods, make them more emotionally caring and interactive, and help bereaved people complete the grief recovery stage through their strength and reawaken their love of life.

Design practice: Exploration about Healing

Related studies have shown that bereaved people usually have the psychological need to communicate when facing the death of their loved ones. However, the existing funeral rituals and grief counseling processes cannot meet the emotional release of bereaved people. With the continuous cross-integration between design science and psychology in the 21st century, designers have begun to think about the demise of life and bereavement, and related emerging design practices have also produced an unprecedented surge. For example, iconic exhibitions such as the 2013 "Design for Death" International Challenge and the 2020 Dutch Cube Design Museum "Re/Design Death" have been held one after another, which have become a milestone in design practice for bereaved people and have influenced it to this day. Designers from different countries, different cultural backgrounds, and beliefs around the world, through their different understandings and expressions of death and bereavement, have conducted design-level discussions on particular groups, such as bereaved people, looking for more emotional and sustainable design practices.

This study mainly screened the design cases for bereaved people from 2013 to 2022 and compared them to the four steps of grief counseling, "Facing the Facts, Experiencing Grief, Adapting to Life, and Rebuilding the Self." According to the four types of funeral ceremony design, assisted mourning design, daily life design, and shared future design, 44 cases were finally categorized to explore the specific design methods used for special groups such as bereaved people. International design cases for bereaved people mainly focus on experiencing grief and adapting to life. Designers usually design from the perspective of mourning and remembrance, using the interconnection and compensatory nature of human senses, design interventions on the five aspects of bereavement: sight, sound, touch, smell, and taste, and design more interactive activities to help the bereaved people actively cope with the grief after the death of relatives and friends, to adapt to daily life gradually. The relevant cases and their corresponding sensory intervention methods and color use characteristics are shown in Figure 2.

Figure 2. Case study of related design for bereaved persons.

The sensory design of sight and touch has led to practical research for bereaved people.

However, at present, the academic community is gradually solving the problem of ignoring other sensory modes, advocating the study of user experience based on smell, taste, sound, and even expressive physical interaction. Therefore, designers can sample the environment and choose the subjective imprint of life experience as the design carrier. By optimizing the relevant design models in the field of psychology, combining a variety of facts, symbols, internalization, and imagination connections, designers can provide bereaved people with a more emotional design plan to help them establish an emotional connection between the past and the present, better remember the loved one, relieve the sadness in their hearts, and obtain a intense, real and important interactive experience.

User Research: The Lost Stretches

With the accumulation of human social life experience, funeral rituals, as an essential life ritual, have gradually become an important cultural complex in community activities, covering physical objects, beliefs, psychology, ethics, morality, art, and other aspects (Gao, 2020). Modern psychological research has shown that funeral rituals in the context of traditional Chinese culture are formulated based on the diverse grief emotions of bereaved people (Zheng, Liu, & Shi, 2016). They contain traditional bioethical ideas that pay attention to emotions, situations, and practice. They play an essential role in guiding bereaved people to rebuild themselves (Zeng, 2021). They can construct the boundaries of funeral rituals and create an atmosphere through costumes, music, and artifacts to help designers create an interactive experience relationship that connects past experience and future life according to the situational characteristics of different objects so that abstract emotions can be visualized to a certain extent, and a bridge of communication can be built between the souls of the living and the deceased (Liu, Zhai, & Shi, 2013) to help the bereaved perceive their cognitive, emotional, and behavioral needs while increasing people's true sense of death and sense of control over life, which has the effect of resolving and soothing grief (Chen, 2015).

In today's era, different cultures and concepts of death have different taboos and rituals. Therefore, this research is mainly based on the background of traditional Chinese bioethics and sacrificial rituals. From March 2023 to April 2023, bereaved individuals who have experienced the death of relatives and friends in different regions of China were selected. Braun and Clarke's thematic analysis method was used to qualitatively analyze the interview text (Braun & Clarke, 2006), and the inventory of complicated grief-revised (ICG-R) in the field of psychology was combined to understand the emotional state and related life events of the bereaved people, so as to explore their coping styles in three aspects: emotion, cognition and behavior during the period of bereavement. Finally, through coding and analysis, it can be found that bereavement reactions such as sadness, regret and nostalgia usually run through the interview process. The relationship among the main causes of grief expression, consequences and coping styles is shown in Table 1.

Table 1. The causes, consequences and coping methods of bereavement.

Causes of grief	Grief reaction	Causing behavior	Consequence
Dying pain	Sad	Cry	Talk to each other
Deep feelings	Resist	In a trance	Bow down to incense
Unable to accompany	Depressed	Insomnia and dreams	Keep a diary, exercise
Family loses cohesion	Anger	Doubt	Fixed holiday sacrifice
Bad attitude	Blame yourself	Regret and guilt	Make up for others
Accidental death	Shocked	Deliberately avoid	Cherish collectible items

At the same time, this study surveyed user preferences for related design cases. It can be learned that when facing the complex emotional memory of bereavement, different periods, different groups of people, and different individuals behave differently. In the traditional era, people rarely express their sadness publicly, and their emotional expression is usually restrained and personal. In the era of new media, as people's attitudes towards death have changed, emotions have gradually become open, participatory, and shared, and bereaved people have begun to look forward to maintaining a longer-term emotional contact between people and the dead (Shao, 2022).

Design strategy: A Loving Way to Connect

The grief response of the bereaved has the characteristics of phased and universal. This study is based on the design intervention cognitive-behavioral model proposed in the previous stage. It analyzes bereaved people's grief response and coping methods from three aspects: cognition, emotion, and behavior, as shown in Figure 3.

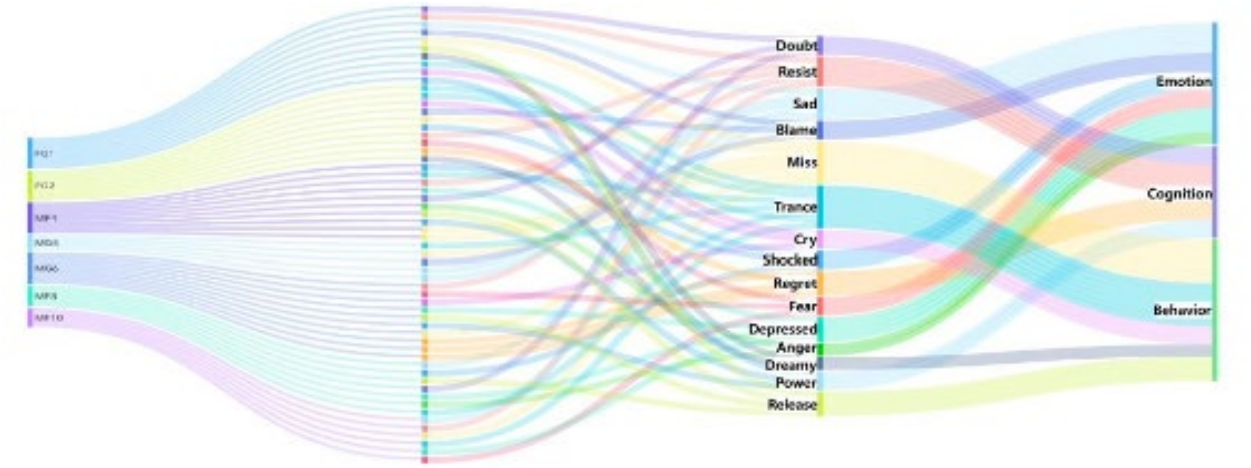

Figure 3. Insight results of user research on grief response.

It can be learned that in terms of cognitive response, most bereaved people fail to see the last side of the deceased, resulting in strong regrets and guilt, and will escape from things related to the deceased, while bereaved people who have made promises to the deceased will use this as motivation to accomplish something. Regarding emotional response, regardless of whether the bereaved person is mentally prepared, the moment they receive the news of the bereavement, they will show a huge psychological impact, and related memories will quickly emerge in their minds. They feel a sudden lack in life, leading to low mood and a loss as to what to do. Regarding behavioral response, bereaved people usually express their nostalgia for the dead by writing letters, reviewing photos, sweeping tombs for incense, and producing comforting psychological emotions.

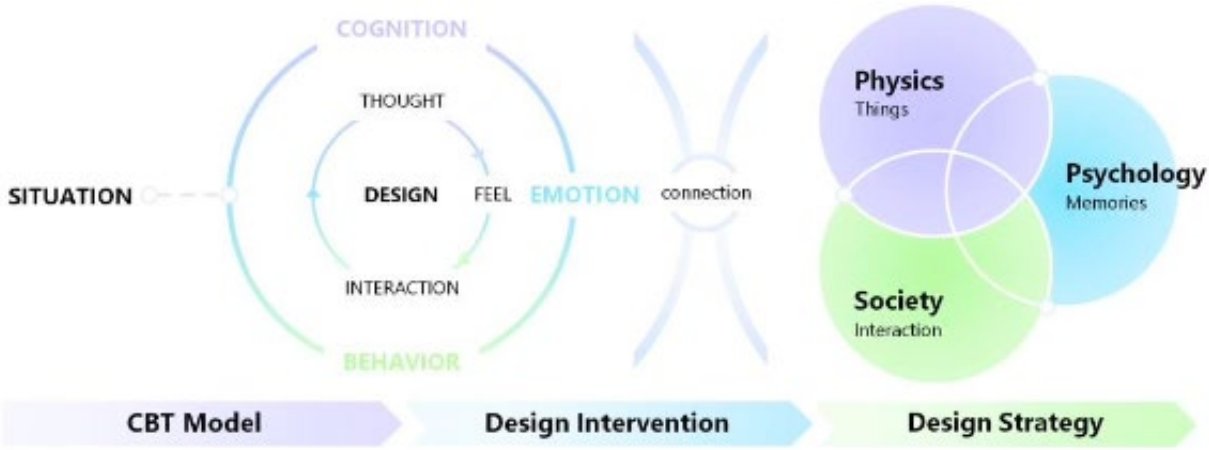

Figure 4. A design model for grief counseling for bereaved persons.

In summary, the main reason for the grief response of the bereaved and their coping methods lies in the degree of association between the bereaved and the deceased. The way of connection mainly includes the psychological level of memories, the physical level of things, and the social level of interaction. The interactive method of emotional design possessed by the design discipline intervenes in the thinking of the bereaved's grief response to help them face the facts during the bereavement, rebuild themselves, and maintain a positive nostalgia for the dead. Therefore, this study is based on the overall process framework of grief counseling for bereaved persons, combined with traditional Chinese bioethics and the survey results of user design case preferences, to optimize the method for designing a cognitive- behavioral model of intervention and re-improve the design model for bereaved persons, as shown in Figure 4, and from the physical, psychological and social levels, propose a design practice strategy for bereaved persons, that is, respect cultural background sensitivity and find transitional objects of memory; construct multi-dimensional perceptual information and set low-frequency emotional expressions; create interactive ritual experiences and divide the outer limits of participation.

The death of the deceased and the end of grief do not mean oblivion, but in different ways to resettle the deceased in the hearts of the bereaved people (Klass, 1997). Studies have shown that helping the bereaved people to feel a sense of the surviving experience of the deceased still is the key to maintaining a connection with the dead (Costello & Kendrick, 2000). Design can trigger memories of the bereaved and become an effective way to convey emotions. Through the above six design strategies, designers should be aware of cultural and religious differences when facing emotionally sensitive users, adopt reasonable emotional management methods, and provide them with corresponding emotional support. By dividing the boundaries between the bereaved and other participants, help the bereaved find shared memories or experiences with the deceased and use different sensory characteristics such as sight, touch, sound, and smell to choose symbolic forms and materials familiar in life for design, such as creating a memory box or planting flowers and trees, or creating an interactive ceremony with a multi-dimensional sensory experience, such as farewell ceremonies, like tea parties, concerts or photography and other activities, so that the bereaved can evoke more profound memories based on daily cognitive experience, and establish an emotional connection with the deceased in spirit and life, and express their grief and remembrance of the deceased. It is worth noting that in the design practice for the bereaved, achievability is as essential as restriction. Therefore, designers need to set an achievable goal to make them realize that grief is a limited process that requires time transition, and in this way, limit the time and

frequency of bereavement and encourage them to rebuild their lives positively and healthily.

Conclusion

For every bereaved person, the death of every deceased person is an indescribable loss. As a discipline that combines innovation and subjectivity, as well as reflection and discussion on one's own choices, design has the characteristics of interdisciplinary, practical, interactive, and participatory. It can be used as a design strategy to deal with the emotional collapse and community collapse caused by the death of a loved one (Yin, Li, Lu, & Zhang, 2021). By intervening in a certain process of personal or joint bereavement, combined with the design of formal objects, another imaginary world is established for the dead. It becomes a space of consciousness that the living can feel, helping the bereaved to gradually psychologically accept the fact that their loved ones have left and re-establish a common connection with the dead, which has become a traditional good strategy for bereaved individuals to heal their grief.

Based on the context of traditional Chinese bioethics, this research analyzes the relevant theories and models of bereaved persons in the academic community, combines design practice cases to conduct research, and uses design as an intervention method to intervene in the cognitive-behavioral model of psychology, reconstructs the design and application model for bereaved persons, and looks for connections that meet the cognitive, emotional, and behavioral characteristics of bereaved persons through qualitative research, corresponding to the physical, psychological, and social levels of bereaved persons, in order to form a design strategy for the practical application of bereaved persons, provide reference suggestions and theoretical support for related design practices, and help more bereaved individuals relieve the emotional pressure of nowhere to be placed, and provide a way for the living to communicate with the dead and re-establish an emotional connection with them throughout their lives.

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References

Wallace, C. L., Wladkowski, S. P., Gibson, A., & White, P. (2020). Grief during the COVID-19 pandemic: considerations for palliative care providers. Journal of Pain and Symptom Management, 60(1), e70-e76.

Xu, J., He L., & Wang, J. P.(2020). Characteristics of the grief response of bereaved persons in the context of the new crown pneumonia epidemic and suggestions for grief consultation. Chinese Journal of Mental Health, 34(04), 382-386.

Breen, L. J., & O'Connor, M. (2007). The fundamental paradox in the grief literature: A critical reflection. OMEGA-Journal of Death and Dying, 55(3), 199-218.

Stroebe, M., Schut, H., & Stroebe, W. (2007). Health outcomes of bereavement. The Lancet, 370(9603), 1960-1973.

Moules, N. J. (1998). Legitimizing grief: Challenging beliefs that constrain. Journal of Family Nursing, 4(2), 142-166.

Medicine, H. P., Care, C. T. A. P., Association, H. P. N., Partnership, L. A., & Organization, H. P. C. (2004). National consensus project for quality palliative care: clinical practice guidelines for quality palliative care, executive summary. Journal of Palliative Medicine, 7(5), 611- 627.

Cui, F. F., Li, Q. F., & Zhao, M. N. (2017). Research progress of grief counseling at home and abroad. Chinese Journal of Nursing Education, 14(11), 872-876.

Currier, J. M., Irish, J. E. F., Neimeyer, R. A., & Foster, J. D. (2015). Attachment, continuing bonds, and complicated grief following violent loss: testing a moderated model. Death Studies, 39(4), 201-210.
Qi, O., & Qi, S. J. (2018). Application of empty chair technology in grief counseling. China Social Work, (24), 49.
Wang, Z. J. (2019). The comfort of sadness with chinese characteristics-the perspective of traditional funeral rituals and customs. Chinese Medical Humanities, 5(11), 13-17.
Gao, T. T. (2020). The art of "paper tie" in folk funeral culture. Cultural Creation of the Present and Ancient Times, (16), 73-74.
Zheng, Y. R., Liu, W., & Shi, L. (2016). The role of funeral rituals in the grief reactions of the bereaved. Chinese Journal of Clinical Psychology, 24(04), 695-701.
Zeng, Y. X. (2021). Research on bioethics education for students in middle school ideological and political courses. Hunan Institute of Technology.
Liu, W., Zhai, Y. J., & Shi, L. (2013). A preliminary study on the concept of death and funeral rituals in modern China and their impact on the bereaved. Psychology and Innovation Ability Improvement-Proceedings of the 16th National Psychology Academic Conference.
Chen, L. Y. (2015). An experimental discussion on the social function of traditional funeral rituals in our country. Chizi (upper middle), (06), 127.
Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77-101.
Shao, L. H. (2022). The construction and reproduction of collective memory-based on the research of Leslie Cheung's mourning ceremony. Tianjin Normal University.
Klass, D. (1997). The deceased child in the psychic and social worlds of bereaved parents during the resolution of grief. Death Studies, 21(2), 147-176.
Costello, J., & Kendrick, K. (2000). Grief and older people: the making or breaking of emotional bonds following partner loss in later life. Journal of Advanced Nursing, 32(6), 1374-1382.
Yin, K. L., Li, H., Lu, L., & Zhang, J. J. (2021). The psychological mechanism of collective rituals after loss: from individual control to group identity. Chinese Journal of Clinical Psychology, 29(6), 1317-1322.

Holistic design in eco-village: Framework，local practice and implications

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Abstract

Eco-villages are intentional communities that strive for social, economic, and ecological sustainability. This article focuses on the holistic design of eco-village by summarizing the elements based on the insights of scholars and global experiences. Using Zhonghong village in Shanghai as a case study, it explores the practical implementation of holistic design through grassroots sustainable initiatives. Additionally, the article proposes local reconstruction strategies to enhance the adaptability of eco-village in rural areas of China. The aim is to provide a reference model for rural revitalization in Chinese context. It also highlights the theme of Cumulus conference—the eco-village as a demonstration of a sustainable community development model rooted in love for the earth and human-beings.

Author keywords

Integrated design; eco-village; sustainability; rural revitalization

Introduction

Human settlements are facing numerous challenges, including food insecurity, air pollution, biodiversity loss, climate change, and fragmented communities. To address these issues, several solutions have been proposed and implemented, aiming to improve living conditions. Among many initiatives, eco-village is seen as an ecological paradigm that would recognize human-ecosystem interdependence and an example for grass-root level sustainability that has practical implications (Singh,Keitsch & Shrestha, 2019).

Historical development of Eco-village

In the early 1980s, the first eco-village appeared in Europe, based on the new phenomenon of cooperative living and characterized by the promotion of environmentally and socially sustainable development.The Gaia Foundation, established in Denmark in 1987, played a significant role in supporting research and practical implementation of eco-villages and sustainable societies. In 1991, Robert Gilman and Diane Gilman published a groundbreaking study called "Ecovillages and Sustainable Communities," which provided a comprehensive overview of successful eco-village communities across the globe and marked a milestone in formalizing the eco-village concept.

The year 1995 saw the establishment of the Global Ecovillage Network (GEN) during a conference held at the Findhorn eco-village in Scotland. This event brought together eco-villages from different parts of the world, fostering collaboration and knowledge exchange. The efforts of these eco-villages gained recognition in 1998 when they were selected as the United Nations' "Top 100 Best Practices." Today, GEN lists over 1000 local eco-

village projects and networks worldwide, including approximately 130 in Europe.

The concept of eco-village has shed light on the human aspect of sustainability, but it is an area that has not been thoroughly examined, as noted by Kasper (2008). In 2012, Wagner conducted an extensive review of existing research on eco-villages, which greatly contributed to the understanding of this subject at that time. However, given the constant evolution of eco-village, there is still a need for further research to stay up to date in this field.

A framework of holistic design in eco-village

An eco-village is a conscious, traditional or urban community that consciously designs its own path through a locally owned, participatory process that aims to address the regeneration of the eco-village principle in its four dimensions: social, cultural, ecological, and economic, and to form a holistic system design. It was a consensus that the three dimensions (social, economic and ecological) composed the pillar model of sustainability. However, several authors indicate that a comprehensive understanding, methods and tools on how the dimensions relate to each other in the pillar model of sustainability are absent (Singh, Keitsch, Shrestha, 2019).

This paper presents a framework for the holistic design of an eco-village, which is based on the research of three scholars (Gilman, 2015; Jackson & Svensson, 2002; Dawson, 2006) as well as EDE courses. The framework aims to provide clarity on the various elements involved in an eco-village. One key aspect highlighted in this framework is the concept of "Worldview." It is recognized as an underlying pattern within a culture that may not always be explicitly expressed, but significantly influences the relationships between the economy, society, and ecology. It is important to note that each eco-village is unique to its locality, implying that not all the elements listed within the framework need to be fulfilled. Rather, it is crucial to assess the efforts made towards each element and understand why certain elements may not have been addressed.

Figure 1. a design framework of eco-village

A case study in Shanghai, China

The concept of Eco-villages is a worldwide network that encompasses various local initiatives. Each local Eco-village possesses unique attributes shaped by its specific circumstances. In this research, the author focused on a case study of an Eco-village located in the bustling metropolis of Shanghai, China. The study spanned from January to August 2023 and utilized participatory observations and in-depth interviews. Through analyzing the data gathered from fieldwork and interviews, this paper sought to elucidate the functioning of this emerging Eco-village, particularly its integrated design approach, and investigated the potential implications for rural revitalization in China.

General information

Zhonghong Village, also known as Jinshan Peasant Painting Village, is located in the northern part of Fengjing Town, Jinshan District in Shanghai. This village is renowned as the birthplace of Chinese peasant painting. Covering an expansive area of 5.88 square kilometers, Zhonghong Village is home to over 1,000 families, with a population of approximately 4,200 individuals.

Figure 2. location of Zhonghong village

Mr. Li, one of the primary founders of Cloud Valley Farm in Zhonghong Village, embarked on his permaculture practices in 2013. Initially, he started with a mere half-acre of land, which has progressively expanded over the course of ten years to an impressive 130 acres. Within this sprawling expanse, a significant portion of around 70 acres is dedicated to the cultivation of rice. Another 20 acres are reserved for the nurturing of various fruits, leaving the rest of the land to be utilized for growing vegetables.

The remarkable development and growth of Cloud Valley Farm has not only transformed the landscape but also attracted new residents to the eco-village in nearly three years. Approximately 20 individuals now call this sustainable community their home. These new villagers bring with them diverse professional backgrounds, adding depth and variety to the collective expertise woven into the fabric of Cloud Valley Farm.

Ecological dimension

The Zhonghong Village adopts the principles of permaculture, fully considering the relationship between people, agriculture, and the environment. It is divided into five areas according to the level of human intervention: Zone 1 is the vegetable garden area, which realizes ecological planting at the doorstep to meet daily vegetable needs; Zone 2 is the food forest area, where over a hundred economic crops such as persimmons, figs, kiwis, and bananas are grown, and a large amount of enzymes are produced as fertilizer for the crops; Zone 3 is the rice field area, where old seeds are used and natural farming methods are employed; The fourth zone is the economic plantation zone, but it is rather rare. Zone 5 is the forest area, which serves as an important ecological barrier to protect water systems and restore the forest ecosystem.

The construction in the new village also adheres to the principle of low environmental impact. By renovating a public living room with less than 20,000 yuan through second-hand recycling, it becomes one of the gathering places for eco-villagers. A zero waste center has been established within the community for storing and circulating second-hand recycled items, reducing waste generation.

Economic Dimension

Figure 3. permaculture zones

Figure 4.Low-Impact architect

Figure 5. Zero-waste center

The interview found that villagers in the eco-village have a basic consensus on "moderate livelihood". Currently, the livelihood of new villagers mainly relies on external work, while internally, the main sources of income include CSA membership prepayment system, open days, markets, training, and study tours. New villagers are also expanding their ideas for economic balance, but they will not blindly develop too quickly.

Social dimension

Eco-village residents often have various celebratory activities, internal discussions, and collective learning, but it is not mandatory for all new villagers to join. Experienced mentors from outside are also invited to provide training in conflict resolution, nonviolent communication, U-theory, and other aspects to enhance community cohesion. External promotion and public education are also included. There are regular open days every month, and a Tomato Brand Festival was established in July. The eco-village also maintains a certain level of communication with the international network GEN.

Figure 6. Inner training

Figure 7. Tomato festival

Figure 8. Education program

Discussion

Zhonghong Ecovillage was initiated by a minority group as an ecological experiment, aiming to restore land and ecology through permaculture and improve the relationship between humans, land, and food. Therefore, it is an eco-village that prioritizes ecological dimension. Attracted by common values, a community gradually formed and actions in social and economic dimensions started to intensify. From this perspective, community building and sustainable economic development may be a challenge in the future.

Secondly, in comparison to the ecological framework, currently Chunhong Ecovillage adopts the three core principles of permaculture - "Care for the Earth, Care for People, Fair Share" as its overall values. Incremental ecological actions have been taken in the ecological, economic, and social dimensions. However, due to constraints posed by land and economic policies, practices such as regenerative planning, renewable energy, and community currency strategies have not been implemented.

Thirdly, as Yue (2016) pointed out in her article, mature consensus communities after the 1990s are no longer limited to remote rural areas geographically. They have started to expand into cities and suburbs, shortening the physical distance to mainstream society. Based on the existing system and social foundations, they extensively unite with diverse entities such as governments and social organizations. As an eco-village located in the suburbs, Zhonghong eco-village does not isolate itself from the mainstream but actively establishes connections with the outside world, collaborating with multiple entities such as schools, cultural tourism, and rural revitalization offices to promote its sustainable culture and ideas.

Conclusion

The ultimate object of ecological design is the human mind. Suburban eco-villages has significant practical significance for rural revitalization in China. In contrast to eco-village projects that solely focus on ecological engineering construction, Zhonghong Eco-village emphasizes the integration of economic, ecological, and social benefits, as well as the interactions between them, becoming a small-scale but significant model of sustainable living.

Acknowledgement

This project is support by Shanghai Summit Discipline in Design. We thank all the new village members to accept the interview and offer their experiences and insights.

References

Wagner, F. (2012). Ecovillage Research Review. RCC Perspectives, 8, 81–94. http://www.jstor.org/stable/26240436

Singh, B. , Keitsch, M. M. , & Shrestha, M. . (2019). Scaling up sustainability: concepts and practices of the ecovillage approach. Sustainable Development, 27(2).

Catton, W.R. Jr. and Dunlap, R.E. . 1978. Environmental sociology: A new paradigm. The American Sociologist 13, 41-49.

Kasper, D. V. S. . (2008). Redefining community in the ecovillage. Human Ecology Review, 15(1), 12-24.

Gilman, R. (2015). The Eco-Village Challenge. In Context: Living Together, Sustainable Community Development. Context Institute.http://www.context.org/iclib/ic29/gilman1/

Jackson, H., & Svensson, K. (2002a). Ecovillage living: Restoring the Earth and her people. Dartington: Green Books.

Dawson, J. (2006). Ecovillages: New frontiers for sustainability. Totnes: Green Books.

Multifaceted Care:
The Integration of Art and Technology in Contemporary Exhibition Design

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Abstract

The field of exhibition design has undergone a lengthy transformation, during which "The Integration of Art and Technology" has emerged as a key catalyst for the transformation and innovation of exhibitions. Together with the contemporary concept of "Multifaceted Concern", these elements collectively formed the theoretical paradigm and shift in thinking on exhibition design. This paper aims to break the limitations of the single professional perspective and disciplinary field, employing an open-minded approach of cross-disciplinary integration for analysis and interpretation. Starting from the development history of exhibition methods, it seeks to summarize the humanistic characteristics of exhibition design in the information age. Additionally, it endeavors to propose how, within the context of art-science fusion, to attach importance to "humanity" and interpret "love" in spatial exhibition design.

Author keywords

The Integration of Art and Technology; Exhibition Design; Multifaceted Concern

Introduction

Art and technology represent two distinct forms of human civilization. From a macro perspective, there has always been an inseparable connection between them. Throughout history, the relationship between art and technology can be described in three stages: coexistence, independent development, and integration, symbolizing a linear progression. On a micro level, art and technology complement each other, possessing both independence and unity. In the histories of art, both Eastern and Western, every period of artistic reform and development has been closely linked to innovations and advancements in technology. Technology provides the technical and theoretical foundations for the development of art, while the unique creativity of art has inspired technological advancements, see Figure 1. The continuous integration and development of the artistry of technology and the technicalization of art have promoted the continuous progress of human civilization.

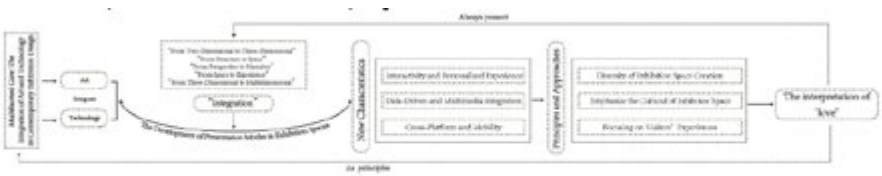

Figure 1. Research framework for the integration of art and technology in contemporary exhibition design

The Development of Display Methods in Exhibition Space

In the early 20th century, movements like Constructivism and Suprematism had a profound impact on traditional art, prompting numerous artists to embark on new experiments and explorations in presentation methods. With the arrival of the Information Age in the 1960s, the emphasis in exhibition design began to shift towards mediums of information dissemination and experiential elements. This transformation is not only a consequence of the collaborative synergy between art and technology but also represents a prevailing trend in the current development of exhibition design.

From Two-Dimensional to Three-Dimensional

The enlightenment of modern exhibition design traces back to the early 20th century when artists redefined the relationship between space and art. In 1923, Russian artist Malevich introduced the concept of "spatialization" of abstract painting and the "three-dimensionality" of abstract symbols during an exhibition in Berlin. This innovative step enriched two-dimensional painting into three-dimensional space. As a result, the exhibition space itself became an artwork, blurring the boundaries between exhibition design and artistic creation. Exhibition design was no longer solely a service for large museums and art galleries but also emerged as a significant medium for artists' self-expression.

From Structure to Space

The structuralism of the early 20th century had a profound impact on exhibition design, leading to the emergence of new presentation forms. In 1924, Austrian architect Kisler, influenced by structuralism, pioneered the enduring "L&T" exhibition system. This system consists of freely combinable and detachable display racks, which can be adjusted according to the audience's needs, thereby presenting different combinations. Unlike the previous "Salon-style" exhibition methods, artworks attached to the display framework could now be separated from its space, bringing artworks into the space and time of the audience.

From Perspective to Narrative

As a visually-based design discipline, the concept of "perspective," introduced by Herbert in 1930, played a significant role in advancing modern exhibition design. His approach to design was not about shaping a timeless ideal space but rather creating a hypothetical space: designing and organizing space by considering who would visit and how they would visit. In his designs, the "flow lines of the designed individual" began to emerge as an essential component in spatial exhibition design. This linear spatial composition structure laid the groundwork for the development of narrative exhibition spaces in the future.

From Space to Experience

In the 1958 Brussels World Expo, the Dutch company Philips commissioned Corbusier to design its corporate pavilion, which became an exemplary model of integrated architecture and exhibition design. This design emphasized the visitor's experience and exploration within the building. The space served primarily as a fundamental enclosure, and the visitor's experience in the space was not solely derived from the spatial design itself but more from the impact of light, shadow, digital imagery, and music within the space. This type of space, which uses architectural space as its core medium and incorporates dynamic media and installations as its primary display elements, profoundly influenced the development of experiential exhibition spaces.

From Three-Dimensional to Multidimensional

From conceptual ideas in the 1960s to practical applications today, artificial intelligence has gone through three waves of development and gradually advanced towards the cognitive intelligence stage. Artificial intelligence, as one of the digital technologies with significant application potential, possesses characteristics such as intelligence, connectivity, real-time capability, and visualization, providing effective technological support for exhibition design. In recent years, the integration of artificial intelligence and innovative design has become a hot

research topic, particularly in aiding the design and development of exhibition services and cultural products. Artificial intelligence, combined with innovative design, not only enhances the multidimensionality of exhibition spaces but also enables deep interaction with visitors.

New Characteristics of Exhibition Design

The fusion of art and technology is a reflection of the new characteristics in contemporary exhibition design, a domain of knowledge within which traditional boundaries are being pushed beyond what was previously conceivable. It requires extensive support from a multitude of related disciplines such as communication studies, computer science, psychology, materials science, information technology and interactive technology. As a result, contemporary exhibition design is currently undergoing a transformation catalyzed by the fusion of art and technology. This transformation provides new and multidimensional avenues for the interpretation of "love". The following aspects will explore the connection between the interpretation of "love" and the new characteristics of exhibition design, see Figure 2.

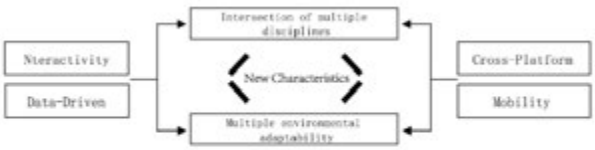

Figure 2. New characteristics of exhibition design

Interactivity and Personalized Experience

Leveraging advanced data analytics and artificial intelligence technologies, such as sensors and AR/VR, places a greater emphasis on interactivity and personalized experiences in exhibition design. Under the theme of "love interpretation", interactivity extends beyond the mere exchange of information; it encompasses the exchange of emotions and values. Through interaction with elements within the exhibition space, visitors can delve deeper into understanding the various meanings of "love", it can be familial, friendship, romantic love, or a broader love for society, culture, nature, and the universe. Personalized experiences can manifest as tailored content and pathways based on the individual interests and needs of each visitor. For instance, some individuals may be more interested in family and familial love, while others may prioritize social justice or the harmonious relationship between humans and nature. Through personalized exhibitions, visitors can explore and understand "love" from the angles that matter most to them.

Data-Driven and Multimedia Integration

The principles of data-driven design can be applied to precisely determine which exhibition elements or pieces of information resonate most with visitors, thus enabling more effective communication of the "love interpretation" theme. For example, through the analysis of visitor behavior and feedback data, exhibition organizers can gain insights into which presentation methods are most emotionally evocative or which stories or information are most likely to trigger empathy and action from the public. With the support of multimedia technology, particularly in visual, auditory, and tactile sensory elements, exhibition design becomes a comprehensive sensory experience that bridges the realms of art and technology. Under the "love interpretation" theme, this implies that visitors can experience and feel "love" through various sensory pathways. For instance, immersive audio and visual effects allow visitors to intuitively experience the power and beauty of love, leading to an emotional and cognitive resonance.

Cross-Platform and Mobility

Cross-platform technology and mobile internet connectivity have liberated spatial exhibitions from physical constraints. Under the "love interpretation" theme, this cross-platform nature offers more channels for expression and dissemination. Visitors can engage in exhibition interaction and discussions through mobile apps or social media platforms at any time and from any location, thus widening the understanding and dissemination of "love"

to a broader and more diverse audience.

Principles and Approaches of Art and Technology Integration in Exhibition Design

As a multidimensional and cross-cultural emotional experience, "Love Interpretation" provides a profound social and cultural background for spatial exhibition design. In this context, contemporary exhibition space does not only refer to architectural space in the traditional sense, but is a spatial relationship created by materialization (space, material, installation, technology), dematerialization (art, culture, history, symbol) , people (participants and makers) and all of this three parts is connected by experience (behaviour, awareness, emotion, sense, mind, reaction). Secondly, due to the development of the information age, the connection between art and technology in contemporary spatial exhibition design is getting closer, which leads to the participants' requirements for materialization and dematerialization experience also increasing, the audience is no longer a passive information receiver, but a direct participant in the display activities and an information exporter. This has formed a development trend of linking and driving the materialization, dematerialization and human aspects in spatial display design. Thirdly, contemporary spatial exhibition design is no longer a linear display of exhibits, but a link between materialization and experience, dematerialization and experience, people and experience. Contemporary spatial exhibition design is the process by which designers achieve 'intangible experiences' through' material means', lets the audience through its body, behaviour, emotion and so on to produce direct or indirect feelings, to exhibition space or exhibits to have a deep memory, then realize the effective transmission of display information. Therefore, the materialization display space is only a carrier for carrying dematerialization art and culture, while exploring and guiding new ways of cultural and artistic interpretation and viewing experience is the kernel of spatial exhibition design (Figure 3). Based on this, given the development trend of integration of arts and sciences in contemporary spatial exhibition design, centring on the essence of spatial exhibition design"information transmission", some reasonable development principles and ways are proposed here.

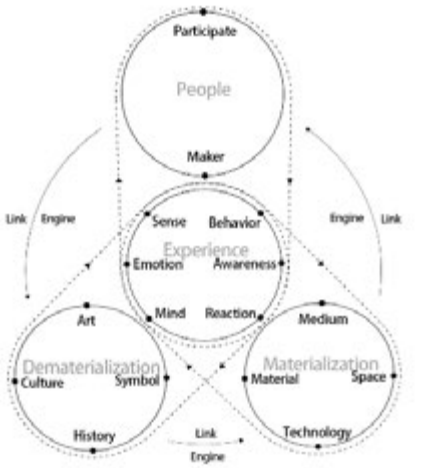

Figure 3. The relationship between art and technology

Diversity of Exhibition Space Creation

For a long time, the most important function of exhibition space has been to serve as a container for exhibits and provide a place for visitors to view the exhibition, people also think that exhibits and space should maintain relative autonomy. Until Eisenman , Perry and other architects proposed that the exhibits should get rid of the negative relationship with the building in the past, actively intervene in the exhibition space to form an interactive concept of the overall art. This has changed the field characteristics of traditional spatial exhibition design, subverted the presentation of artwork in the display space, and deconstructed the attributes of traditional display space "without expression" and neutral display background, especially when the content of the exhibits involves the experimental exploration of "space", the exhibits often influence the spatial qualities of the container and reshape the spirit of the place of the exhibition space, thus providing the audience with a special spatial experience. Through this kind of mutual intervention between the exhibits and the exhibition space, the exhibits and the exhibition space show a certain degree of ambiguity, the visitors can fully experience the content of the exhibits.

Emphasize the Cultural of Exhibition Space

"Culture" is an important direction for the development of exhibition design. An innovative and novel exhibition space work with an outstanding personality and various forms may give the audience a perfect visual feeling. However, if the object is left aside, only the creation of space, modelling and other formal elements, but not from the display object, the objective environment of the exhibition place (mainly refers to the geographical, human factors) of the "cultural" and other fundamental issues to start a rational analysis, so that constructed from the design of the exhibition space from the perspective of the basic ideas are not complete. The exhibition space without "cultural" interpretation can not give the viewers a strong resonance and long-lasting psychological imprint. Therefore, in the development of contemporary exhibition design, designers should adopt a design attitude of rational thinking, practical research, searching for the roots and start from the expression elements of "culture" to build a multi-dimensional display space that conforms to the display subject's regional characteristics, humanistic environment, history and culture.

Focus on Visitor Experience

Under the background of experience economy, the main purpose of design tends to satisfy people's self-realization needs and emotional needs more and more. Contemporary spatial exhibition design in the process of its development, needs to fully consider the psychological and emotional experience of the "information receiver", the audience into the space narrative content for overall consideration, to create a narrative plot with emotional resonance, redefine the role of the audience in the art display space, so that the audience from the cognitive level to actively participate in the understanding of the significance of the display content. It is possible to let the audience from the cognitive level actively participate in the understanding of the significance of the display content. In addition, it is also necessary to build a unified spatial context with the help of various new technologies, new materials and new ideas. Reverse positioning of the degree of experiential experience in the exhibition space by presetting and grasping the emotional scale of the audience. As a result, the audience is included in the narrative experience of the exhibition space, follows the transformation of the spatial narrative clues, and becomes a participant in promoting the development of the plot from a bystander.

Conclusion

In the context of the development of interdisciplinary fusion of art and technology in the information age, contemporary exhibition design is continuously expanding and refreshing itself in terms of spatial forms and presentation methods. It is steadily progressing towards a comprehensive and multifaceted concern discipline. As the relationship between art and technology becomes increasingly intertwined, various aspects such as the audience, exhibition venues, exhibition content and communication methods are also trending towards multidimensional presentations. This vividly demonstrates the diverse interpretations of "love" by contemporary exhibition design in the new era. Furthermore, through interdisciplinary collaboration, art and technology are constantly merging and innovating, which will contribute to propelling exhibition design to a higher level, meeting the ever-changing needs of communities and adapting to societal transformations.

References

Cantor, G. (2012). Science, Providence, and Progress at the Great Exhibition. Isis, 103(3), 439–459. https://doi.org/10.1086/667968

Fleming, M. (2021). Embodied ephemeralities: Methodologies and historiographies for investigating the display and spatialization of science and technology in the twentieth century. History of science, 59(2), 197-219. https://doi.org/10.1177/0073275319858528

Hesseldahl, K.,McGinley, C., & Monk, G. (2018). Using Design Thinking to Develop New Methods of Inclusive

Exhibition Making. Studies in health technology and informatics, 256, 151-160. https://doi.org/
Mura, M. D. (2009). Re : Focus Design Display Design in Museums: Towards an Integrative Approach: The Potential of Science and Technology Museums. Journal of Design History, 22(3), 259–270. http://www.jstor.org/stable/40301450
Zoran, A., Valjakka, S. O., Chan, B., Brosh, A., Gordon, R., Friedman, Y., Marshall, J., Bunnell, K., Jorgensen, T., Arte, F., Hope, S., Schmitt, P., Buechley, L., Qi, J., & Jacobs, J. (2015). Hybrid Craft: Showcase of Physical and Digital Integration of Design and Craft Skills. Leonardo, 48(4), 384–398. http://www.jstor.org/stable/43833040

A Narrative of Love -- The Wisdom of love in Chinese Traditional Folk Culture

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Abstract

In folk proverbs of love, we can see traditional folk customs, ways of thinking, and survival wisdom. In folk proverbs, we can see different or the same judgement of motivation, idea, concept, principle, standard, element, strategy, and variety. To see people's choice of the azimuth, orientation, methodology, proposal of the development of things, compared with today's life, gives us a lot of enlightenment, and also enlightens us to think more about the value of the present and the future...

This paper finds out the wisdom of love in People's Daily life from Chinese folk proverbs. This paper will present the understanding, narrative and practice of love in folk culture in six levels (Love of individual, Love of family, Love of ethnic group, Love of national, world love and nature love). From the ideas of people's life, to the designs of daily necessities, to those wisdom lifestyle adapted to local conditions. The folk wisdom presents The root of Tao is concise.

The paper illustrates the love of following the natural order through wisdom cases of folk beliefs, lifestyles, and production methods. This love of folk wisdom can lead us TOWARDS HEALING, TRANSFORMATION AND TRANSCENDENCE in the small moments of our everyday lives.

As the saying goes, "one local nature will raise one kind of person." Different geographical environments nurture different ways of living, cultivate different humanistic temperaments, and produce different ideological cultures. The Yellow River and the Yangtze River have nurtured Chinese unique characters, literature,
culture and civilization, and they have continuously passed on common sense, knowledge and wisdom of love from generation to generation.

However, in China with a vast territory, the natural environment varies greatly from north to south and west to east. A richer and more detailed experience of China's love cannot be separated from the observation of the people's production and daily life in the public society. Elite culture is the soul of national culture, social people's life is the flesh and blood of national culture, and the folk scenario are the real source of sociology and anthropology. Because folk proverbs are spread in oral language, they directly and truly reflect the people's real life and values. With their brief and concise forms and rich and varied content, folk proverbs convey love in the form of spoken language and affect people's hearts.

Author keywords

Folk，Folk proverb，Love，Lifestyle，Wisdom·.

1. Love of individual

1.1 What is the motivation for personal love?

" 人不为己，天诛地灭 (rén bù wéi jǐ,tiān zhū dì miè)" ，This means that If people do not self-cultivation, will not be

accepted by world. The Confucian culture emphasizes "cultivating oneself for resting people" into such a popular proverb that awakens and inspires people to cultivate themselves and achieve the realm of life with erudition, discernment, deliberation, scrutiny, and diligent practice.

The individual is the smallest unit of human society. When the motivation of each smallest unit is lost, where does the whole human race go? The personal part of the folk proverb begins with this proverb, which gives us an answer: The universal pursuit of personal love is not only to cultivate one's own body but also to serve the world. This proverb reflects the fundamental motivation of personal love, the pursuit of cultural, social and other values of life, is for self-improvement of personal love. This proverb reflects the fundamental motivation of personal love: to achieve self- improvement of self-love and to make contributions for the country and the people through the pursuit of cultural, social and other values of life.

1.2 How to achieve noble personal love?

How do individuals love? How to cultivate one's perfect love? There are 20 Confucian characters which indicate the requirements of perfect personality. They are: Ren(Benevolence),Yi(righteousness),Li(propriety),Zhi(knowedg ean,wisdom),Xin(integrit y),Wen(gentle),Liang(kind),Gong(respect),Jian(simplicity),Rang(comity),Zhong(loyalty), Xiao(obedient),Yong(bravety),Gong(justice),Lian(incorruptness),Ti(united brothers and sisters),Jie(thrift),Shu(f orgiveness),Qin(hardwork),Qian(modesty). "One loses by pride and gains by modesty" tell us modernity makes progress; "Hard-working Making up for Clumsiness, diligence reduce desire." reminds us that diligence helps us to build good habits and make up for our shortcomings. We recognize the importance of character formation from the proverb "Benevolence and integrity is far more valuable than gold.". We know never lose our sincerity because of the proverb "faith will move mountains." There are abundant and specific practical guidance in folk proverbs.

These Suggestions can be applied to all aspects of personal health, mind and life. In terms of culture and education:1. If you can't judge yourself correctly and don't have the right qualities, how can you teach others? 2.Never too old to learn. people from the three division martial arts high. 3. carry out training in the coldest and the hottest parts of the year. These proverbs tell us that learning should start from self, with the qualities of persistence, diligence, and humility; The health aspect: 1. Disease comes from the mouth and cold comes from the feet. 2. The way to keep in good health, relax your eyebrows and smiles. 3. No desire to be at ease, not full is medicine. Health is a matter of mind as well as body. Take care of your body and mind, and health will last. In business economics: 1. Gentlemen love fortune, in a proper way. The society aspect: 1.A friend in need is a friend indeed! 2.Kindness and patience are the two virtues of being human. 3. The grace of dripping water should be reciprocated by a gushing spring. 3.Kind words make people warm, cold words make people cold, etc.

Folk proverbs are always reminded in life like this, which is the subtle education and influence of folk beings. Although time and space are changing, the proverbial personal love has important implications for the present and even the future.

1.3 How to explore the future value of the love of indivual?

" 人貴有自知之明 (rén gùi yǒu zì zhī míng)", This means that the wisest and most valuable thing is to know yourself clearly. To explore human nature for Heaven and Earth, to secure life and fortune for the people, to continue learning for past sages, to establish peace for all future generations. The future of rational love starts with the individual, and the value influences far and wide...

How to achieve self-understanding of subject and object?

How to integrate self-worth with cultural, social, ecological, economic, political, and technological values?

How to find the azimuth of oneself, the orientation and methodology of personal love in the cognition of the things you doing, want to do, can do, should do, and must not do, so as to realize the symbiosis of multiple values

among individuals, families, ethnic groups, countries, the world, and nature?

1.4 Love of individual in Folk Design (Example)

Image 1: 'Only I Know Contentment' Excuse Money, sourced from Baidu Images.

Image 2: Illustration of 'Only I Know Contentment' from 'Beautiful Chinese Characters,' edited by the Han Sheng Editorial Office in Taiwan.

The coins with the inscription " 唯 吾 知 足 " (meaning "I know contentment") are said to have appeared during two different periods, the Han Dynasty and the Qing Dynasty. The specific historical evidence is unclear. On the obverse side of the coin, there are four characters, " 隹、 五、 矢、 止 ," which share a common " 口 " (mouth)in the center, forming the phrase " 唯 吾 知 足 ," which is why they are also known as "Borrowed Mouth Coins."

A common saying among the people goes, " 知足常樂，必有余福 " which means "Contentment brings lasting happiness, and there will be extra blessings." Understanding contentment, avoiding excessive pursuit in all matters, is the key to long-term physical and mental well-being. By inscribing the phrase " 唯 吾 知 足 " on coins, the intention is to remind those chasing after wealth to find a sense of balance and peace. Striking a balance between material and spiritual aspects is a requirement for a harmonious life.

2. Love of family

2.1 What is the Chinese perspective on family love?

" 家和万事兴 (jiā hé wàn shì xīng)", The meaning of this sentence is that harmony in the family is the basis for success in any undertaking. Since the Xia dynasty more than 4,000 years ago, China has been the concept of the integration of family and country. The concept of "country" in China is accompanied by "family", so the word combination of "country" in China is composed of two characters: " family " and "country", which shows the importance Chinese people attach to family. Chinese people believe that the family is the basic unit of the country, the harmony and happiness of the small family is the foundation of the prosperity of a large country, the home is the harbor of the soul, the spiritual source, folk proverbs and idioms have influenced thousands of family life in the family order, family virtues, family responsibilities and other aspects.

2.2 How to establish the concept of harmonious good family love?

Practical and spiritual guidance can be found on family education, family relations, family virtues, family wealth, and the relations between family and country, etc.

The aspect of relationship of family members: 1. When the child is away, the mother will pray. 2. Filial piety is first in kind actions. 3.The elder brother is like the father, the elder sister-in-law like the mother. 4.Brothers united, father and son as one, will be able to create wealth. 5.The children can take care of themselves when they grow up, so the parents don't have to work too hard for the future of their offspring. These principles prompt us to further build a more comprehensive group of members who respect each other, care about each other and work together for a better future. Family education: 1. The son of a scholar is familiar with pen and ink, the child of a carpenter can play with axes and chisels, and the son of a soldier knows his sword and spear. 2. A man is taught in his youth, horses are trained from they are foals. These proverbs teach parents to value family education. Some proverbs tell us the family virtues, for instance "The host is gracious and hospitable, so the guests will come more

often". They even help to establish the concept of family economy: 1. Families have a stable and sustainable source of career income and savings will not break down even in difficulties. Fengshui of family space: 1. All the water fell into the courtyard (Water represents money, when it's rain, the eaves around the yard will rain into the yard.). 2. The house faces south, peace of mind. The relations between families and countries: 1. work hard for our country and be thrifty in our home. 2.Can't run a good family, can't run a good country.

At the family level, many proverbs provide us with cultural, economical, ecological, political, social and technological references.

2.3 How to explore the unknown variables of family love?

In traditional society, blood relationship is the basis for the establishment of family existence. With changes in the structure of social relations, personal development needs and status, the definition of family units is also changing, such as families with individuals and pets as units, and close friends as units. Families, etc., various forms of family organizations that break through blood ties have emerged, and the basic social units above the individual have undergone structural changes. Such changes are closely related to the evolution of human spirit and values. We have to face many of the diversified variables facing the future...

What challenges are we facing at the level of family love?

As the role of family ties fades, what will be the impact on future human group patterns?

What kind of organization will become the base unit for the future community of common destiny for the love of all mankind?

How to build a new family value concept in the future?

2.4 Love of family in folk Design (Example)

The patchwork clothing known as "Baijia Yi" or "Hundred Families' Clothing" is a Chinese folk tradition for blessing children. "Baijia Yi" is made by piecing together scraps of fabric gathered from neighbors, friends, and loved ones. It carries the symbolic meaning of "wearing the clothes of a hundred families, receiving the blessings of a hundred families." This practice is also a daily handicraft in traditional Chinese culture, known as "Chinese women's handiwork." With a mother's loving hands, the thread weaves through the small patches of fabric, tightly binding a mother's care to her child's clothing. This tradition has endured through time, and with the passage of years, this love has become an art form for mothers.

Image 3: Chinese Children's 'Baijia Yi' (Hundred Families' Clothing), taken from 'Chinese Needlework - The Art of Mothers,' edited by the Han Sheng Editorial Office.

3. Love of ethnic group

3.1 How to understand the love of ethnic group in China?

Human beings are social animals, we can't live alone without group, and individuals are fragile and helpless, while the group organization and unity force can often achieve the effect of 1+1>2, which is one of the important characteristics that distinguish human beings from other organisms. We can achieve the cooperative operation with high density and high complexity. The globalization of trade, the factory of the world, and other concepts are

based on the emergence and development of groups.

The Chinese civilization is beautiful but different among different ethnic groups, and each of the 56 ethnic groups has its own characteristics (personality, customs). In such a vast area of China, a harmonious community of love between ethnic groups has been established. In traditional Chinese culture, the concept of ethnic group is a cultural and social group based on blood relationship and clan expansion. In modern society, there are abundant forms of social groups which are still united by the culture and civilization of this long history. The folk is an important place to gather the strength of the group and coordinate the group relationship. There are many folk proverbs widely spread in the daily life of the group love among the Chinese folk.

3.2 How do Chinese people develop strategies for love between different ethnic groups?

The ethnic group relationship of people's life involves such factors as clan relationship, neighborhood relationship, group cooperation and regional customs. For tradition Here is "We should worship our ancestors reverently, never forget history.", it encourages us that Remain true to our original aspiration and keep our mission firmly in mind. Some show the importance of the relationship among ethnic groups: 1. With unity of heart, mount Tai can be removed. 2. A close neighbor is better than a relative far away. 3. There is a good sister-in-law in the village, all the girls learn from her. Some prove to us the meaning and value of unity: 1. Where there are many people, there is always a general. 2. Unity can create wealth，even can turn dirt into gold . 3.Talent is sure to be found among the crowd. Wisdom can be found by gather. "I'd rather give the hungry a bite of rice than the rich a liter of rice." Tells about the need to care for the disadvantaged. "Without the wood on both sides of the car, the car cannot be loaded with more things and will become weak. Without lips, teeth will feel cold." Once the resources and interests of others are excessively invaded, the self-Consolation will also be affected; Emphasizes the mutual care relationship in the group relationship. "Birds can fly with the phoenix and fly far, one will be more noble to be accompanied by virtuous ". It shows that the influence of the group on the individual must be associated with the group with noble and good character. "Even if the business cannot be done, benevolence and righteousness are still there." It shows that benevolence and righteousness are the most important in group relations, and we should cherish the mutual care of long-term friendship; We can also find the works of the emperor that have been passed down and used among the people, for instance, The figure of "Yi Tuan He Qi" is a meticulous figure painting by Zhu Jianshen, the emperor of Chenghua. The work is intended to explain the Chinese doctrine of the mean: the local concept of harmony in which Confucianism, Taoism and Buddhism coexist peacefully. This spirit of harmony has been introduced into the folk wisdom, which has led to the saying "Yi Tuan He Qi, Bai Wu Jin Ji "---- everything harmony, nothing taboo, advocating the spirit of harmony. There are also related to collective activities in folk local customs, Rural gatherings have different themes and various forms, such as flower fairs, incense fairs, temple fairs, etc., but the ultimate purpose is to promote physical and mental exchanges among the people, and related proverbs are spread: 1. If two people are into a conflict and not happy, persuade them to join the walk on a leash. 2. Taiping drum pray for world peace, while playing while singing while dancing It reflects the simple wisdom of the folk unity in ethnic group.

3.3 How do ethnic groups' love create future value together?

In the traditional proverbs awaken the complex interdependence between our groups. More and more nations, ethnic groups and organizations tend to diversify group types in the world. In the growing future ethnic relationship network, how to establish compatible cultural, economical, political, social, ecological, technological models to harmonize the relationship between groups, individuals and groups is a major issue for the future development of mankind.

Must the formation of different groups depend on different ideologies?

How to coordinate different values among different groups?

How to spread and practice the right value of love among groups effectively?

3.4 Love of ethnic group in Folk Design (Example)

During traditional holidays such as New Year's Eve and the Lantern Festival, people spontaneously organize "Dragon Lantern Festivals" in their communities. Local residents come together to "perform with dragon lanterns." The performance of the dragon lantern involves flexible variations in choreography, and it can only be danced well when people unite as one. There is a proverb passed down among the folk: "Dancing the dragon with one heart." During festive moments, people set aside the hustle and bustle of their livelihoods and the worries of gains and losses. This is a wise design of love within the community, fostering unity and togetherness.

Image 4: Yang Zhenlong Lantern, taken from 'Illustrated Dictionary of Beijing Intangible Cultural Heritage.

4. Love of Nation

4.1 What is the origin of national love?

"Every country originates from the clan" -- Observation On The Chinese Nation In History write by Liang Qichao. " referring to China, the related concepts in people's mind are the Chinese nation, the descendants of the Chinese people, the Chinese civilization, the Yellow River civilization, the Yangtze river civilization and so on. China is a community of Shared future that connects the natural environment with human culture and history and is the origin of culture and civilization.

Folk proverbs provide people with a secular perspective on the love of the state: the view of how an individual loves the state, the class system, the capacity of government, the duties of officials; They start from the Angle of common sense but achieve the evaluation and analysis of wisdom level, perspective of the way of running a country, and a government. All of these views and concepts are derived from the cultural and spiritual heritage behind the national symbol...

4.2 How to analyze the patriotic principles of the people?

From the folk perspective, the love of the country is a concise and clear expression, which is not like the logical discussion of scholars. People's views on the love of the country involve emperors, leaders, officials, generals, soldiers, national laws, people... Folk Proverbs's content of the love of the country is not much but covered these aspects. The love of the country in the folk proverb has the love of the people for the country and the hometown, the choice of loyalty and filial piety, the sacrifice of life and righteousness, the expectation of a wise ruler, and the desire to check and balance power.

From the personal point of view, there is a strong feeling of home and country in the love of the state. When he was young, he traveled far away, and when he got older, he fell back to the roots. The root is the root of culture and blood, is the home country; In the process of personal ability training, one should put one's family before one's country, and "run the family before one's country". When interests conflict, one should put one's country before one's country, we will find proverbs like 1. "Everyone is responsible for the rise and fall of the world". 2. One should uphold his country's interest with his life, he should not do things just to pursue his personal gains and he should not be evade responsibilities for fear of personal loss. Some proverbs emphasis on the rule of law: 1. If a prince violates the law, he must be punished like an ordinary person. 2. The country has a uniform law, even in the face of danger will not perish. Here also are lot suggestions of military: 1. Better to devise a plan than to employ more weapons. 2. Better abandon a thousand armies than an inch of land. "Cherish the wealth, cherish

the people", which is remind economic policy. This section gives many interesting descriptions in economic, political, cultural, social, military and other aspects.

4.3 How does the country achieve a balance between spiritual happiness and material happiness?

How to explore and reconstruct the strategic principles of national democracy? How to determine the comprehensive indicator system for the development of a happy country? Nowadays, international economic development and military strength have become important and obvious indicators to measure a country's hardware capabilities, but are economic standards and military development the fundamental and all of a happy country? The truth strategy of national love means a sustainable and higher pattern of national political, economic, cultural, scientific, ecological, and social value development strategies guided by a healthy and rational national concept. We must face the reconstruction of the value of national love... How to understand the concept of "state" from the perspective of love?

What adjustments need to be made in national values to center on the love of the world and nature?

How does the country achieve a balance between spiritual happiness and material happiness?

4.4 Love of nation in folk Design (Example)

Shadow puppetry is an ancient traditional art form in China. Historical records indicate that shadow puppetry originated during the Warring States period, thrived during the Han Dynasty, and reached its peak during the Song Dynasty. In 2011, Chinese shadow puppetry was included in the "Representative List of the Intangible Cultural Heritage of Humanity," making it the 29th item on China's list of intangible cultural heritage.

Although shadow puppetry stages are small, they encompass an infinite world. With just a single puppeteer and simple shadow puppet props, one can summon armies and narrate the passage of five millennia.

Traditional shadow puppetry scripts include titles like "Three Battles of Lü Bu," "The Chu-Han Contention," "Loyal and Brave Hearts," and "Judge Bao's Cases." Most of these stories revolve around themes of loyalty to the ruler and the country, upholding justice, and exploring familial relationships. Shadow puppetry combines education with entertainment, vividly portraying historical knowledge and cultural values through its performances. The love for one's homeland and patriotic spirit have been passed down through generations in such a folk theater.

Image 5: Wang Tianwen's Shadow Puppetry Work "Mu Guiying" (Source: The Paper News, Reporter: Lu Linhan, September 2, 2021, 08:23)

5. Love of world

5.1 How to understand the universal love in the civilian world?

"Better to be dog in peace time, not a person in war", a word said yearning for world peace and harmony. The idea of the love of the world is that there is no self, no family, no ethnicity, no country, the thought cognition and the behavior practice all achieve benevolence. Describe the world life maintains its own unique characteristics, but can coexist in harmony, and then ask different individuals, families, ethnic groups, countries how to love the world? And how does the world love individuals, families, ethnic groups and countries? The arrangement and reconciliation of various relationships is the only way to realize the vision of harmonious love in the world.

5.2 How to explore the love strategy for common prosperity in the world?

Although there are only a few entries in the part of the folk proverbs, the book of folk proverbs shows that it is the integration of individuals, families, ethnic groups and countries that makes the world love. Eight proverbs simply and clearly express that kind, sincere, rational, compassionate, hero, peace is essential. The proverb "Man proposes, God disposes." play the role linking the preceding and the following, never forget that human love can never be separated from nature.

5.3 How to establish the value concept of world love?

In the relevant concepts about the love of the world (class/stratum, production/life, fairness, competition, order, development), Then we consider how individuals, families, ethnic groups, and countries in the different background of different culture, economy, politics, society, ecology, and technology can love the world together? Is class flatness a necessary condition for the love of world?

5.4 word of nation in folk Design (Example)

" 六合同春 (Liu He Tong Chun)" WeiFang Yangjiabu woodcut prints is a folk art that cleverly uses homophones. It takes the sound of " 鹿 " (lù, deer) to represent the sound of " 陆 " (lù, land) and the sound of " 鹤 " (hè, crane) to represent the sound of " 合 " (hé, together). " 陸合 " (lùhé) means " 六合 " (liùhé), which includes the heavens, the earth, and the four directions. The symbolism of " 春 " (chūn, spring) is represented by flowers, pine trees, and camellia trees, among others. When these images are combined, they create the auspicious pattern of " 六 合 同 春 ," which signifies that spring exists everywhere, all things are harmonious, and prosperity abounds.

Image 6: "六合同春Liu He Tong Chun" WeiFang Yangjiabu Woodcut Prints.

6. Love of nature

6.1 What is the motivation of folk love for nature?

Nature loves life and treats life well. How does life love nature? Such thinking reveals that life itself is nature. We are part of nature, no matter how the history changes the individual, family, ethnic group, country, world all are a part of nature. The love of six levels love themselves, love each other, and love the true, the good, and the beautiful of nature are necessary for the great harmony. Can it be understood that the love of nature starts and ends with being?

Because of the close relationship between production and life and agriculture, Chinese people pay more attention to observe, adapt to and utilize nature, and make corresponding adjustments to production and life with the changes of nature.

6.2 How to deal with the infinite changes of nature's love?

There are full summaries of the laws of natural climate, observations of animals, descriptions of geographical environments. People act as responds to natural changes. The laws of natural climate like 1. Spring rain is as dear as oil. 2. A fall of seasonable snow gives promise of a fruitful year. 3. No fire, no fertilizer. With the strong intervention of human industrialization in the improvement of agricultural production capacity, people have gradually changed from actively adapting to nature to actively transforming nature, but it has also brought more unpredictable changes, which requires us to further respond. In the past, people emphasized cooperation with nature in agricultural production, for example: 1. Hill more trees, equal to repair reservoirs; On rainy days it can drink, on dry days it will vomit. 2. A man would rather climb a dangerous mountain than cross a dangerous river. 3. We should grow 2000 square kilometers of cotton and 2000 square kilometers of rice, sunny day is good to cotton,

rainy day is good to rice. The love of nature part involves all aspects of food, clothing, and shelter:1. Radish and ginger keep away from doctor. 2. Cold wind and sunshine make the body strong. 3. Perfect house have beautiful water and quite wind. 4. Fly kites with the east wind in spring. "Harmony of Six directions and celebrate spring coming together", "ten thousand blessings like endless clouds", in such an overall blessing proverb to feel the love of harmony between man and nature.

6.3 How to establish the future space-time view of natural love?

People change with nature, nature is the same, the two influence each other, there is a proverb said, "thirty years east, thirty years west, good luck turns." What is eternal behind this transformation? The folk people have never regarded themselves and nature as two. The natural ecology in the folk culture is an important reference, Nature is the source of all the harvest of the private economy (agricultural production) and the guide to productive activities. Even politics and military affairs cannot delay the natural time of farming.

Folk nature emphasizes the season, nature has the attribute of time, time is reflected in the climate, environment, biological and other entities of material space changes. Folk life lessons is in the fields, The time and space of the field is seamless.

How to expand the use of natural virtual space to protect the natural ecology of physical space?

When nature seeks balance, are plagues and agricultural disasters also is love?

If natural ecology is regarded as an important indicator of value development, what will happen to the development motivation of culture, economy, politics, society, science and technology?

6.4 Love of nature in folk design (Example)

The proverb goes, "Having mountains at the back and facing water brings joy to the heart; carrying hidden benefits and embracing sunlight is top-notch Feng Shui." Before selecting a location for a settlement, it's essential to observe and analyze the surrounding mountains, bodies of water, air currents, vegetation, and other factors to find a geographically favorable Feng Shui environment. The ideal model is to have a mountain at your back, with protection on the left and right, and an open area in front with a circular flow of water and roads. The mountain at the back blocks the dry, cold northern winds and welcomes the humid, warm southern winds and sunlight, providing a sense of security. The flowing water in front, in a lower area, ensures a reliable water supply and facilitates transportation without the risk of flooding. In modern planning, it's also crucial to consider the overall relationship between the natural environment and humans, cleverly use environmental elements, integrate the harmony between nature and humanity, and achieve maximum natural and cultural efficiency at the lowest cost.

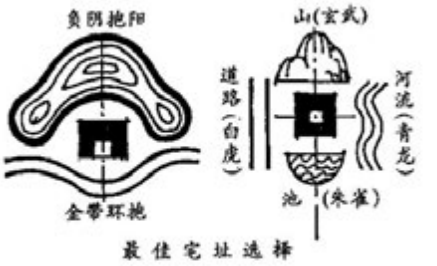

Image 7: Feng Shui Diagram for Selecting Residential Locations

6.References

[1] [China] Xinhua Proverb Dictionary[M]. Beijing:The Commercial Press，2015. [2][China]Xinhua Idiom Dictionary[M].Beijing:The Commercial Press，2015. [3][China] Xinhua Allegorical dictionary[M].Beijing:The Commercial Press，2015.

[4][China] Echo Editorial Office.Mei Zai Han Zi[M].Shanghai:Shanghai Story Cultural Media Co., Ltd., Shanghai Literature and Art Publishing Group，2012

[5][China] Echo Editorial Office.Zhong Guo Nv Gong —— the art of mother[M].Beijing:Peking University Press，2006

[6][China] Yongsong Huang.The Sutra of a Hundred Parables on Health[R].Beijing: 2018No press

Control Relationships and Emotional narrative-Speculative Design Practice Utilizing Historical Data

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Abstract
Cultural differences are a significant concern in Speculative Design when implemented in various cultural contexts. Researchers have developed a Backward Speculative Design approach tailored to the characteristics of Chinese culture, aiming to provide a design paradigm that leverages the rich historical and cultural heritage from a country for Speculative Design.
This study is a design practice that utilizes Backward Speculative Design as a research methodology. Drawing inspiration from the historical event of ' 垂 帘 听 政 ' (Reign Behind a Curtain- Empress Dowager Cixi's regency), the researcher has designed a set of artifacts to recreate subjective imaginings of this historical event. This paper elaborates on the relationship between the project and the historical event, as well as the methodology employed in constructing the work. It describes how the design practice uses Chinese historical culture for scenario building, storytelling, and the establishment of the audience's engagement, thereby elucidating the emotions and control dynamics within parent-child relationships. Throughout the research, the author discusses how Backward Speculative Design can more effectively harness traditional Chinese history and culture for speculative and imaginative purposes, catering to the Chinese cultural context and achieve the motivation of Speculative design.

keywords: Backward Speculation, Speculative Design, Chinese culture, Design Practice, Backward Speculative Design

Introduction

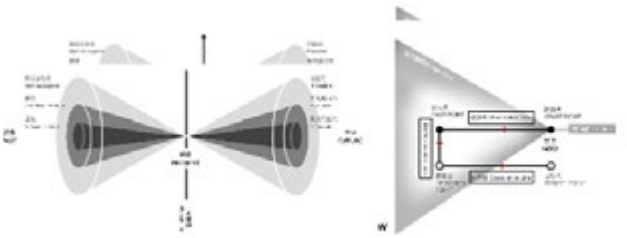
Speculative Design serves as a design methodology that utilizes storytelling and speculation to create potential future scenarios and explore their implications. Narrative and emotional expression are pivotal tools for designers within the realm of Speculative Design. By harnessing these techniques, designers can craft more engaging and impactful experiences, thereby inspiring individuals to envision novel possibilities for the future and take actions toward positive change.
Speculative Design can be applied to explore the futures of intimate relationships and upcoming technologies (Kaur et al., 2022). Furthermore, it can be employed to promote sustainable behavioral patterns that emphasize social welfare (Ray & Mizuno, 2021). However, the speculative blueprints or narrative substitutes in Speculative Design often draw upon the cultural foundations of the audience. Consequently, Speculative Design artifacts from the interaction between their use and the behavior of users, thereby contributing to the evolution of culture (Sara, 2019; Hohendanner et al., 2023). Design professionals, as agents of public imagination, play a crucial role in shaping public narratives regarding social-technical relationships (Hohendanner et al., 2023). Cultural

differences represent a significant challenge for Speculative Design when implemented in diverse cultural environments. Researchers have developed Backward Speculative Design approaches that are tailored to the unique characteristics of Chinese culture. The aim is to provide a design paradigm that better leverages China's rich historical and cultural heritage for Speculative Design.

This study endeavors to engage in a specific design practice that involves the use of Chinese historical culture for scenario fabrication, storytelling, and the construction of the audience's relationship within it. The research question centers on how Backward Speculative Design can more effectively utilize ancient Chinese historical culture for speculative and fictional purposes, catering to audiences within the local cultural context. Simultaneously, in the context of concrete design practice, it seeks to elucidate how emotions and control are reflected, provoking design challenges markedly distinct from our everyday lives and sparking dialogues and debates about our current state.

Research methods and processes

By employing the Backward Speculative Design method, which builds upon traditional Speculative Design, researchers provide a more systematic elucidation of how historical data can be integrated into the design process (Tseng, 2022). Building upon the design trajectory of Backward Speculative Design (Tseng, 2022), this study situates its historical focal point during the reign of Empress Dowager Cixi in the Qing Dynasty. Leveraging the dynamics of familial relationships and power control during Cixi's regency, the study engages in speculative future scenario building.



In accordance with historical records from the Southern Song Dynasty, as documented by Fan Ye in the "Book of the Later Han": "Throughout history, even during the challenging period of a young monarch's reign, royal families often faced rebellions. Invariably, governance was entrusted to accomplished statesmen who sought loyalty and competence. There has been no precedent for the exclusive delegation of power to a woman, nor the relinquishment of significant authority. It was only during the reign of Empress Dowager Qin Mǐ, who took the reins of governance, that Chancellor Zhěnwàng achieved prominence, and the nation prospered."

However, the earliest documented instance of " 垂 帘 听 政 " (lit. "Reign Behind a Curtain") originates from the Song Dynasty, specifically in Wang Ou's "A Brief Account of the Eastern Capital," where it is mentioned: "Emperor Yīngzōng fell severely ill, and the Empress Dowager assumed governance behind the curtain." "Reign Behind a Curtain" represents a form of governance in ancient China during the imperial era. Typically, it refers to the reigning queen or empress, or the empress dowager, taking control of state affairs, hence the term of "Reign Behind a Curtain." Such a mode of governance was also observed in other countries, including Japan and Korea. Notably, this form of political maneuvering finds its most famous historical exemplar in Empress Dowager Cixi of the Qing Dynasty, who governed alongside Emperor Guangxu.

Within the courtly environment of Empress Dowager Cixi and Emperor Guangxu, a dynamic of control and being controlled was established. In essence, Emperor Guangxu surrendered his authority and decision-making power within this environment. Two distinct identity markers are evident within this relationship. First, there is the nominal mother-son relationship between Empress Dowager Cixi and Emperor Guangxu, though this relationship played a crucial role in the emergence of "Reign Behind a Curtain." Second, there is the prerequisite for the transfer of power, namely, the political authority held by Emperor Guangxu. This authority, and the control and

decision-making capacity it conveyed, was relinquished or transferred to Empress Dowager Cixi.

When this perspective is applied to modern society, it becomes apparent that the existence of familial relationships remains largely unchanged, bringing with them subtle status distinctions. In family environments, children typically experience a degree of parental control. While the formidable royal authority of the past no longer exists in contemporary society, the stark transfer of power can still be represented through economic means. Fei (1939) once defined the " 大 家 庭 " (lit. "big family") as a group of relatives who share common property, maintain a joint budget, and collaborate through labor specialization to pursue communal living (Fei, 1939). More specifically, the intricate web of obligations between parents and children centers around the actual transfer of food and money, which can extend to other facets of social action (Stafford, C. 2000). By reimagining the process of monetary transfer, the researchers attempt to underscore the heightened and extreme nature of power transfer that is often subdued in the representation of modern society. The roots of this desire for control and the ensuing power struggle continue to be grounded in the emotions between family members, though it cannot be ascertained whether these emotions are necessarily positive.

Design practice- The Love Behind

The foundational structure of "The Love Behind" comprises two terminal devices and a portable digital information carrier (circular coin). These two devices are placed in the home and the consumption environment(cash register in store), respectively. The home device serves both charging and information exchange functions. In a typical usage scenario, the controlled side (e.g., the children) obtains their daily "pocket coin" from the home device before leaving the house. The "pocket coin" is loaded with the identity information of the controller (e.g., the parent or the breadwinner of the family), along with currency. The children carry this "coin" with them for their daily consumption.

Fig.3. Image of "The Love Behind"

In the consumption environment, the consumption terminal (cash register) consists of an information reader and a price display screen. The cash register identifies the identity information and spending preferences restrictions associated with each "coin." Based on this identity information, the cash register displays special prices for the controlled side(children). The operational logic is as follows: if the controller(parent) has a preference for a particular purchase, the cash register will display an extremely low price, making the purchase highly suggestive. The actual price difference for the item will be compensated by the controller(parent) in the background. Conversely, if the controller(parent) strongly opposes a specific item and does not wish the controlled side(children) to acquire it, the cash register may display an exorbitant price, surpassing the purchasing capacity of the "coin" (e.g., a prohibitively high price of RMB 26000 for a particular fruit when the controlled side(children) has a coin with only RMB 10).

The controlling side and the home-based terminal device communicate through a mobile app, recording the controlling side(parent)'s daily expectations and consumption preferences for the controlled side(children). These preferences data may indirectly relate to the controlling side(parent)'s emotions, principled considerations, peer influence, and personal desires for power on that particular day. Decision-making is often influenced by multiple factors, whether it's Empress Dowager Cixi making significant state decisions or ordinary individuals making choices on various matters. Each morning, before heading out, the controlled side(children) retrieves the coin. The total amount of money on the coin can vary daily based on the controlling side(parent)'s expectations. For

instance, the controlled side(children) may be allowed to spend RMB 2000 today, or only RM B20. The researchers deliberately eliminated the convenience of displaying real prices, ensuring that the controlled side(children) remains unaware of the daily spending limit, creating an extreme sense of control and maintaining the illusion of continuous wealth, similar to that of an emperor.

The only visible indicator of the coin's value is found on the relative scale displayed on the coin dispenser's dashboard when the coin is retrieved. This indicator leads to psychological fluctuations in the controlled side(children) due to the high or low value, thereby influencing their purchasing behavior for the day. Without the display of the coin's value, the controlled side(children), while making daily spending decisions, does not need to consider how much remains or how much they should spend. This saves a considerable amount of decision-making time, leaving only the outcome of "can buy" or "cannot buy," ultimately serving the controlling side(parent)'s objectives.

Discussion and conclusions

In this project "The Love Behind", a virtual scenario is constructed through the artifacts, forming two interconnected threads: the transfer of control and the emotional conflicts arising from this control transfer. In this project, the researchers attempt to interpret love as a transformation of control within parent-child relationships and use this control dynamic to stimulate discussions among the audience regarding contemporary parent-child relationships and the desire for control.

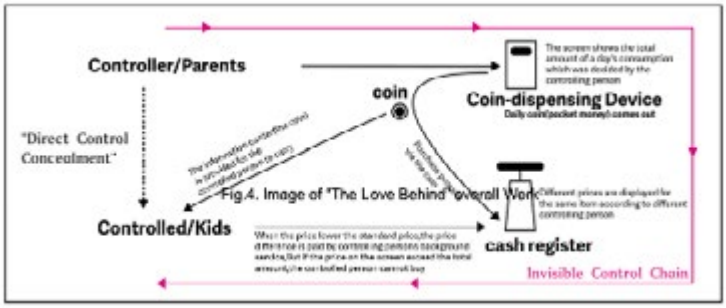


Fig.4. Image of "The Love Behind" overall Work

In the specific design practice, through the interaction scenario between the product and the consumer, the price display on the consumption terminal sometimes lacks practical consumption significance. However, it strongly suggests preferences to the consumer (in this case, the controlled side) based on the type of item to be purchased. The consumer appears to be endowed with clear preferences to alleviate the symptoms of consumption overload (McShane BB 2018), but these preferences are forcibly imposed. The price also reflects the emotional response of the controller(parent), such as their feelings of dislike, anxiety, anger, joy, persuasion, and more towards a particular event on that day. This is the only insight the controlled side(children) has into the controller(parent)'s psychological state concerning decision-making. The consumer receives two basic options in this process: "can buy" or "cannot buy," and the control of these options lies within the special identity information of the "coin," which belongs to the "controller." Through the consumption terminal, the transfer of control is enacted.

Parental social control (SC) in the form of societal influence, akin to a form of regulatory influence, is employed by parents to influence a child's behavior (Lewis & Butterfield, 2005). Parents may use social control to shape their child's behavior, for example, by establishing rules and expectations for their child's conduct and imposing consequences for non-compliance (Shek & Law, 2015). This type of control can effectively promote positive behavior, but if the child feels pressured or coerced to act in a certain way, it may also lead to conflict. It also involves parental self-regulation, as parents' self-regulation skills can affect their ability to exercise social control effectively. Parents with good inhibitory control and effective emotion regulation strategies are more likely to engage in sensitive and responsive behaviors with their children, promoting positive behavior and reducing the need for control (Shaffer & Obradovi, 2017).

In the researcher's design practice, this form of control is transferred to a completely implicit mode of expression, where control is input and expressed through data transfer between devices. This hidden control is used to develop a narrative that allows the audience to break away from projecting themselves onto the roles of Cixi and Guangxu. Instead, it encourages them to view the narrative of " 垂帘听政 " (Reign Behind a Curtain) from a neutral perspective. However, the emotional response and expression of control are intentionally made dramatic to elicit emotional fluctuations in the audience. Users experience an intense result after a process filled with uncertainty, intensifying the emotional stimulus. Regarding the expression of control and the emotions it triggers, the audience is free to speculate various extreme situations, stimulating their thinking once they step into the role.

From the perspective of the controlled(children) and the controller(parent), it is evident that, after relinquishing the decision-making power, the controlled side may gain additional free time, but over time, they may also lose their judgment and face uncontrollable consequences. This project "The Love Behind" does not aim to determine whether being controlled is good or bad or to predict specific outcomes. It does not seek to glorify the controller(parent)'s position. Instead, it extracts the essence of the " 垂 帘 听 政 " (Reign Behind a Curtain) relationship, allowing the audience to disengage from projecting their own emotions onto Cixi and Guangxu and reexamining the narrative of "Reign Behind a Curtain" from a neutral standpoint. The experience of the audience, whether it feels light-hearted or fearful, may vary, leading to different perspectives on the historical material. Additionally, the core of this work- "The Love Behind" lies in its connection to contemporary social issues. By bridging modern life into the relationship between Guangxu and Cixi, the project allows the audience to directly relate to the subconscious or inner attitudes that Guangxu might have had at the time. It corresponds to existing family phenomena and relationship dynamics in contemporary society, sparking discussions among Asian children regarding their upbringing and control under their parents. This relationship dynamic, starting with parent-child relationships, has the potential to apply to various relationships involving control and being controlled, whether in the family, emotional relationships, or workplaces. The controlled side often hovers within the framework of established perceptions, but by relinquishing decision-making power, they may also become beneficiaries, a fact often overlooked. This "Reign Behind a Curtain" of "The Love Behind" leaves the outcome open, allowing the audience to become aware of their pre-existing frames and reevaluate them through the object, gaining new definitions of value.

By employing the Backward Speculative Design approach, the researchers delve into historical materials and reimagine the possibilities of traditional culture as they intersect with contemporary societal issues. Anthropologists interested in "tradition" or "late imperial" societies have long debated the necessity of examining kinship relationships as mutable rather than fixed "things" outside of history, especially when influenced by the Marxist trends of the time. "The Love Behind" is an attempt to intervene in ancient China's complex social composition, particularly the centrality of blood relationships, by using historical events like " 垂帘听政 " ("Reign Behind a Curtain") (Santos et al. 2006). It bridges the temporal gap and presents certain commonalities between Chinese traditions and the modern westernized world. The intersection of the public and the familial is one important direction in fully understanding Chinese kinship, politics, economics, orthodoxy, and resistance in contemporary contexts (Silbergeld and D. Ching 2013).

reference

Charles Stafford，Separation and Reunion in Modern China，Cambridge：Cambridge University Press，2000.

Hohendanner, M., Ullstein, C., Buchmeier, Y., & Grossklags, J. (2023). Exploring the Reflective Space of AI Narratives Through Speculative Design in Japan and Germany. Proceedings of the 2023 ACM Conference on Information Technology for Social Good.

Hsiao-T'ung Fei. (1939). Peasant life in China: a field study of country life in the Yangtze Valley. G. Routledge and Sons, Limited.LONDON AND HENLEY. P27

Kaur, J., Devgon, R., Goel, S., Singh, A., Monteiro, K., & Singh, A. (2022). Future of Intimate Artefacts: A Speculative Design Investigation. Proceedings of the 13th Indian Conference on Human-Computer Interaction.

Lewis, M. A., & Butterfield, R. M. (2005). Antecedents and Reactions to Health-Related Social Control. Personality and Social Psychology Bulletin, 31(3), 416–427. https://doi.org/10.1177/0146167204271600

McShane BB, Böckenholt U: Multilevel multivariate metaanalysis with application to choice overload. Psychometrika 2018, 83:255–271, https://doi.org/10.1007/s11336-017-9571-z.

M. Bloch, Marxism and Anthropology (Oxford: Oxford University Press, 1983).

Ray, L., & Mizuno, D. (2021). Designing for Narrative Influence:: Speculative Storytelling for Social Good in Times of Public Health and Climate Crises. Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems.

Santos, Gonçalo Duro Dos. 2006. "The Anthropology of Chinese Kinship. A Critical Overview." European Journal of East Asian Studies 5 (2): 275–333. https://doi.org/10.1163/157006106778869298.

Sara, S. (2019). Audience Matters: Participatory Exploration of Speculative Design and Chinese Wedding Culture Interaction.

Shek, D., & Law, M. (2015). Assessment of parent-child subsystem qualities in Chinese adolescents : behavioral control, psychological control and parent-child relational qualities. International journal of child health and human development, 8, 207.

Shaffer, A., & Obradovi, J. (2017). Unique contributions of emotion regulation and executive functions in predicting the quality of parent-child interaction behaviors. Journal of family psychology : JFP : journal of the Division of Family Psychology of the American PsychologicalAssociation (Division43), 31(2), 150–159. https://doi.org/10.1037/fam0000269

Silbergeld and D. Ching (eds)，2013, The Family Model in Chinese Art and Culture ，Princeton University Press

Stafford, C. . (2000). Chinese patriliny and the cycles of yang and laiwang. journal of the american society for horticultural science.

Yi-Wen, Tseng. (2022). Speculating Backwards: How is Speculative Design Transferred into East Asia? In the Journal of the Asian Conference of Design History and Theory (Vol. 4, pp. 20-29). The ACDHT 2021 OSAKA Executive Committee.

Yi-Wen, Tseng.(2022).On the poetic boundary of the past: Speculating backwards toward multiple histories through Speculative Design(Doctoral thesis, China Academy of Art).https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDLAST2023&filename=1022711598.nh

Traversing the Mist of Growing-up: Design as a Reflective Process for Self-Healing

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Abstract

In professional practice, designers are usually required to consider a generalized client profile in design process. Driven by this conception, conventional design pedagogy often emphasizes the importance of design rationale for its persuasiveness in winning clients. If taking a reflexive orientation, however, design rationale could also probe one's memory and form a coherent story for oneself. In other words, design could be regarded as a narrative-seeking process that has healing and transformative effects.

This idea was experimented in a four-week design class named "Traversing the Mist of Growing- up", in which students were asked to recall their personal struggles during childhood and worked out self-healing pathways through design. To show how reflexive narratives could be actualized in design works, the paper introduces two project examples, each tackling with a typical growing-up problem and creating products and diagrams as final outcomes. Responses from each group were collected after the course, which proved the design pedagogy to be effective in deepening the students' understanding of themselves. As a whole, the design class functions as a pilot project that calls for more of its kind to be implemented in the future.

Author keywords

design pedagogy, self-narrative, diagram design, reflective process, healing, well-being, self- articulation

Introduction

Growing up in an age of rapid technology iteration and economic development, the post-2000s generation in China faces unprecedented challenges in their lives. Different from previous generations, the psychological vulnerability of the young generation need much attention (Xin & Zhang, 2009). As a practitioner in design education, I wonder if design thinking can help individuals configure the entanglement in their life. In specific, if self-narrative and articulation are crucial for retrieving psychological well-being, could design initiate this process by taking a reflexive position?

To test the feasibility of the assumption above, I composed a teaching plan of a four-week college-level design class named "Traversing the Mist of Growing-up" with Kirill Cheburashkin, who is the co-founder of Che Design School in Montenegro. The class aimed to guide students to communicate with their younger selves, launching a retrospective journey that could clarify the perplexity in their life.

Pedagogical Thoughts and Teaching Process

The design studio consisted of 26 students, in which Kirill and I took charge of product design and diagram design respectively. For the first half of the one-month semester, lectures and

exercises on "design principles" and "design for children's need" were given to prepare for design foundation. In the meanwhile, the class was divided into three research groups (Group A, B and C) for studying the social and psychological issues of the 3-7, 7-12 and 12-18 years old respectively. Later, students were grouped in two or three to investigate a memorable feeling or wish that they encountered when they were young, from which they

could develop design rationales in a personal way (see Figure 1).

As for the deliverable, Kirill and I taught students to design playful product prototypes that correspond with growing-up memories, diagrams that creatively (and critically) illustrate design narratives, and ritual performances that document how human bodies could be involved. In the process of design iteration, students were often asked to imagine themselves as the recipient of their design work and to use the class as an opportunity to probe their growing-up memories. Three weeks after the class ended, a set of interview questions were sent to some students to collect their reflections on their learning experience.

Figure 1. A class lecture and desk critics in progress

To show how the pedagogy works, two project examples are introduced below. The first project is themed in nicknaming among peers and the second in the miscommunication between parents and children. The review of each project consists of a design rationale, multiple design outcomes and two student reflections, so that we can see how each design project is articulated, actualized and evaluated.

Project 1: Nickname, Please Have a Seat! (Group B1)

Design Rationale

Interested in the phenomenon of malicious nicknaming, Group B1 was interested in learning the relationship between repulsive animals and bodily imperfections, aiming to help children overcome consequent psychological trauma. After careful analysis, the forced labeling behavior was considered a chronic entanglement process, in which animal names are associated with physical features. To disentangle the psychological knot, the group focused on the behaviors of seating and touching, which emphasizes bodily involvement and product tactility (see Figure 2). "Nickname victims" would be invited to engage with seating rituals, which may ultimately lead to reconciliation and forgiveness.

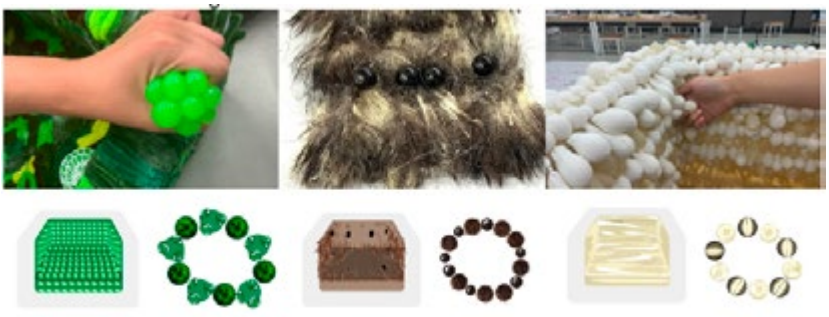

Figure 2. Material experiments and design drawings of Animal Sofa-wristband Set

Design Outcomes

Figure 3 shows the product outcome, which is named "Animal Sofa-wristband Set". The artistic images of frogs, spiders and worms were selected to refer "physical problems" of acne, leg hair and allergic rhinitis correspondingly. The selection of spider-leg hair combination originates from a group member's personal memory, who was once called "Chang-mao-guai" (hairy monster) by her classmates at the age of seven. The vivid experience inspired her to design a sofa that has long fibers and dark acrylic adornment to represent two essential features of a spider without directly replicating the animal's appearance. The same strategy is applied to the design of wristband, which is made from furry and smooth beads at intervals. When one sits on the spider sofa and plays with the spider beads, it's not that frightening any more. We can also imagine how an arachnophobia patient can approach his or her source of fear in a rather relaxing activity, as the visual aggressiveness of the nicknamed animal has been effectively reduced.

Figure 3. The final sofa models of a frog, a spider and a worm

As shown in Figure 4, the diagram "Nickname (Dis-)entanglement" takes a critical look at the psychological mechanism, explaining this process from a narrative perspective. From left to right, three pairs of bodily features and animal names are represented in lines, which traverse different phases of entanglement, ritual process and disentanglement. The energy between each pair of lines becomes more intensified as more verbal attacks appear. When they reach the phase of "Ritual Behavior", ritual performances are expected to guide the participants out of the entanglement caused by malicious labeling. Here, the diagram works as a mind map that transforms the sofa set to be a ritual prop and places it in a series of meaningful performances.

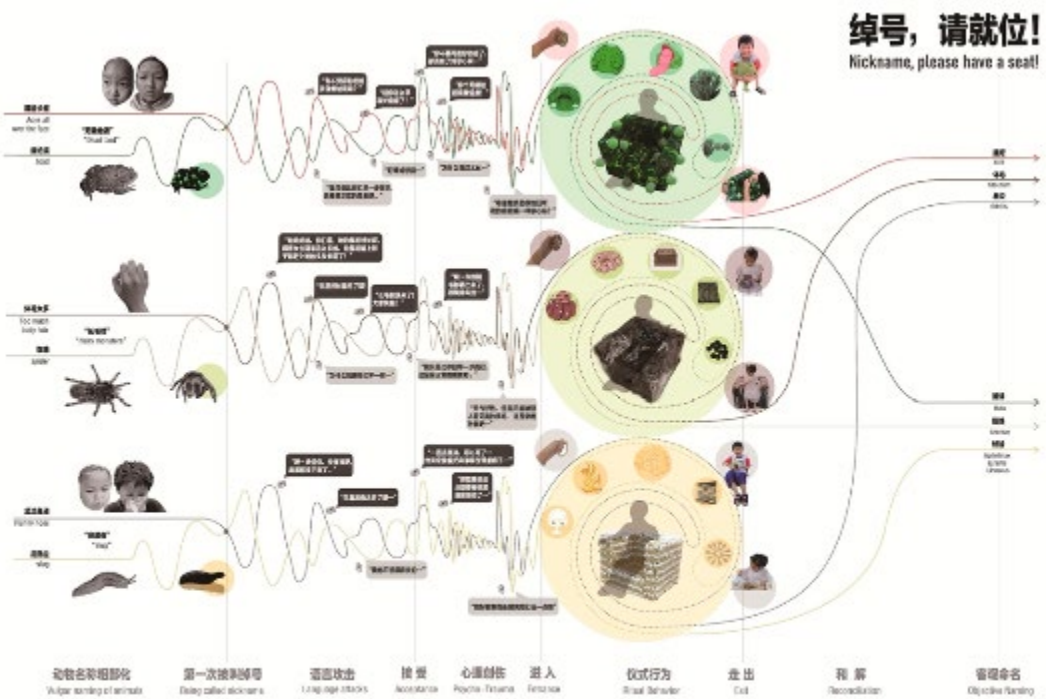

Figure 4. The diagram of Nickname (Dis-)entanglement that explains the psychological mechanism of nicknaming and explores ritual methods for healing the traumatic experiences

Student Reflections

After finishing the project, one student wrote that, "the actual process of diagramming ... led us from describing superficial facts to digging deeper into internal logic, which gave me a new understanding of the growing-up experience... In fact, it also allowed us to accept the 'imperfect' and 'different' self... and I realized that every experience is part of who I am." Another student summarized her impressions and said that, "the bad experience of children growth is like a knot to untie. At first, we felt troubled and confused, as if we couldn't untie the knot in our heart. However, as time passed, we began to understand that growth was a gradual process, which did not happen overnight. I realized that self-compassion was an important restorative force that could help me move on from the hurt."

According to their words, both students became more receptive to bodily imperfections, and the past experience no longer appalled them that much. Through biographical narrative, students may also acquire more self-awareness, which constitutes an important aspect of their well-being (Thomson et al., 2021).

Project 2: Speak Kindly (Group C2)

Design Rationale

According to research, family function has great impact on the mental health of children, which may lead to depression, if it does not work well (Liu et al., 2020). In China, prevalent psychological control from parents also lowers the self-efficacy of children in their social performance (Cheng et al., 2019). Driven by this problem, Group C2 concentrated on the miscommunication problem between teenagers (aged from 12 to 18) and their parents. The core reason may be the lack of empathy in considering each other's stance and concerns. To better communicate with each other, the group designed a device for Chinese families that can soften the violent tone through meaningful translation, preventing the wrangling situation from deteriorating.

Figure 5. Communicating through Barrel Translator and the examples of meaningful translations

Design Outcomes

As shown in Figure 5, once misunderstanding happened, parents and children could sit in front of a Barrel Translator, which would "translate" the aggressive words that one expresses into mild ones for the other to read. It not only creates a gentler mode of dialogue, but can also appear to be a lovely symbol at home, reminding family members of possible peaceful conversations.

Figure 6 shows the diagram design, which is called "The Wheel of Position Exchange". It combines graphics and mechanics to create an installation that is interactive and playful, subverting the common diagrammatic format of a still image. The exchange of position is metaphorized in the movement of turning a wheel: once it rotates 180 degrees, the actual meaning in mother/daughter's words is shown to the other side. Three rotations from left to right would mark three occasions of mutual understanding between mother and daughter in life.

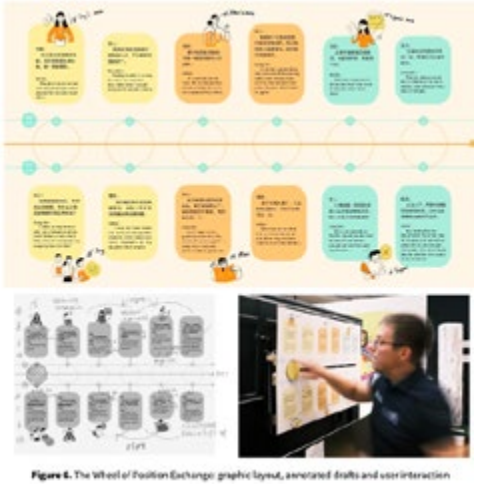

Figure 6. The Wheel of Position Exchange: graphic layout, annotated drafts and user interaction

One point worthy of noticing is the importance of writing in both Barrel Translator and the wheel diagram. As the story content came from their own experiences, the students had to recall unpleasant

memories and to contemplate the issue of non-violent communication with empathy in mind. They spent a lot of time in constructing typical scenarios and understanding what it actually meant to "translate" violent language without replacing the parent's intentions with their own wishes. As design components, the texts had to be positioned carefully on the barrel and the diagram board, so that the roller and the wheel could direct to the right words at the right moment when in use.

Student Reflections

After the class, one student reflected that, "when recalling my personal growth experience, how to get along with my parents was a topic that had bothered me for a long time. Understanding, tolerance and respect for individual ideas may be the best choices." The student who took charge of the wheel diagram said that she could start to better consider problems from her parent's perspective, because the design process let her analyze personal growth experience from a more objective and detached position. "Special attention need to be paid to future communication with family members, although this problem could only be gradually improved instead of being completely resolved", added the student.

In their responses, I found that the educational experience may not be the cure to fix complex trans-generational problems, but it at least provides an opportunity to confront with the issue seriously instead of shunning away. The project of Group C2 also reveals the problem of intrusive parenting, which is a typical behavior of parental psychological control in Chinese families (Gao et al., 2016).

Towards Healing and Transformation in Design Education

Proven by psychological studies, writing down memories has positive effect on one's mental well-being (Pennebaker & Seagal, 1999). According to the research of Danoff-Burg and his colleagues (2010), if a narrative structure is maintained in the writing process, the result would be even more promising. Given its logic and criticality, design rationale can provide such narrative structure, and the process of design thinking navigates oneself through uncomfortable memories to make sense out of it. In result, design iteration is turned into an exploratory dialogue with oneself.

Furthermore, as Goodson and Gill (2014) pointed out in their research of "critical narrative", there is much potential to fulfill in individual "re-storying" for life history writing. In the pedagogy of "Traversing the Mist of Growing-up", diagram design serves not just for representing ideas, but also for clarifying one's cognition of the past. Effective diagrams could clearly articulate thoughts in a logical and precise manner, in which visual representation usually plays a more obvious role than its linguistic counterpart. Product design, in parallel, works more as a self-giving gift to be embodied for reconciliation with past psychological struggles.

Another technical point raised by Goodson and Gill (2014) in the same book is that autobiographical memories need to be kept with a critical distance for narrative construction. The class actually offered a venue for students to behold critical distance from their past experiences, and the ultimate goal of their autobiographical works was to pursue meaning without sacrificing the quality of reasoning. In addition, research by Pizarro (2004) showed that writing therapy and art therapy have positive effects for improving traumatic experiences. If design process could be regarded as a series of self-caring behaviors, it is reasonable to predict the potential development of design therapy.

In regard with shortcomings, there are two insufficient aspects that this pedagogy need to consider. Firstly, the original plan considered ritual design as an important part for its healing effect, which was not fully carried out or evaluated due to the time restraint. Secondly, for the purpose of design research, a larger quantity of after-class feedback could be collected in the future to make the analysis more comprehensive and the design pedagogy more systematic.

Conclusion and Prospect

In this teaching experiment, design is viewed as a narrative-seeking process that re-frames growing-up experiences and prepares for early adulthood. If more attention were paid to this new realm of self-healing practice, vulnerable memory could be a source for unforeseen creativity and meaningful becoming.

In a grander view, the self-articulation of individual narratives may accrue to a collective one. When the psychological well-being of a generation evolved, it may navigate the future of a whole nation to traverse the mist of its psychological modernization.

Acknowledgement

The author is thankful to the studio co-instructor Kirill Cheburashkin and teaching assistant Shuting Chen, who collaboratively carried out this intensive design course. Thanks to the lovely students who worked very hard in reaching the pedagogical demand. And thanks to the organizers of Playshop 2023 in China Academy of Art, who made this one-month international event possible.

References

Cheng, D., Wang, S., Song, L. & Luo, Y. (2019). Relationship Between Parental Psychological Control and Children's Social Withdrawal: Mediating of General Self-efficacy. Journal of Psychiatry, 05, 344-347.

Danoff-Burg, S., Mosher, C., Seawell, A. & Agee, J. (2010). Does Narrative Writing Instruction Enhance the Benefits of Expressive Writing?. Anxiety, Stress, & Coping: An International Journal, 23, 341-352. DOI: 10.1080/10615800903191137

Gao, X., Xing, S. & Zhao, J. (2016). Parental Psychological Control and the Relationship with Children's Psycho-social Functioning. Advances in Psychological Science, 11, 1792-1801.

Goodson, I., & Gill, S. (2014). Critical Narrative as Pedagogy. First published 2014. New York, NY: Bloomsbury Publishing.

Pennebaker, J. & Seagal, J. (1999). Forming a Story: The Health Benefits of Narrative. Journal of Clinical Psychology, 55(10), 1243–1254. doi:10.1002/(sici)1097-4679(199910)55:10<1243::aid- jclp6>3.0.co;2-n

Liu, X., Wang, Q., Chi, X. & Qi, D. (2020). Family function and Depression in Adolescents: A Moderated Mediation Model. Chinese Journal of Clinical Psychology, 04, 688-693. https://doi:10.16128/j.cnki.1005-3611.2020.04.008.

Pizarro, J. (2004). The Efficacy of Art and Writing Therapy: Increasing Positive Mental Health Outcomes and Participant Retention After Exposure to Traumatic Experience. Art Therapy, 21, 5-12. doi: 10.1080/07421656.2004.10129327

Thomson, G., Gill, S., & Goodson, I. (2021). Happiness, Flourishing and the Good Life: A Transformative Vision for Human Well-being. Abingdon, Oxon: Routledge.

Xin, Z. & Zhang, M. (2009). Changes in Chinese Middle School Students' Mental Health (1992- 2005): A Cross-Temporal Meta-Analysis. Acta Psychologica Sinica, 01, 69-78.

Research on recreation scene construction of beautiful and harmonious community park with intergenerational sharing between the elderly and children

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Abstract

Since ancient times, "love" as the substrate of human emotion and wisdom has long been penetrated into every aspect of human civilization, the love of family is the cornerstone of the continuity of the Chinese nation, and intergenerational parenting has already become a subject interpreted with love. A good model of intergenerational sharing between the young and the old helps to share resources and emotions between the two generations, and enhances family cohesion and a sense of well-being. This study suggests a recreation science scene creation methodology for old and young intergenerational shared community parks based on the viewpoint of recreation science. In the three levels of touring paths, scene creation, and aesthetic education of research and study, the TOD community park of Chengdu Municipal Administrative College, for instance, realizes the practical exploration of the design of community parks for intergenerational sharing between the old and the young in order to provide new theories and understandings for the creation of lovely and harmonious intergenerational sharing spaces between the old and the young.

Author keywords

Tour-Art-Learning; Intergenerational sharing; Elderly and young groups; Community parks; Scene creation;

Introduction

According to the World Social Report 2023 issued by the United Nations, the global population aged 65 and above will be 761 million in 2021, and this number will rise exponentially by mid- century, making population aging one of the distinctive global trends of the current era. In 1996, the United Nations Conference on Human Settlements put forward the concept of "child-friendly cities" to make cities more suitable for children's healthy growth, and in 2021, the State Council issued the "Outline of China's Children's Development (2021-2030)", which proposes to implement the principle of giving priority to children, provide more public facilities suitable for children, and further optimize the environment for children's development. Along with the opening of the "three-child" policy and the growth of the elderly population in China, nearly 70% of the elderly have taken on the responsibility of caring for their grandchildren at home[5]. The old and young groups have a high degree of overlap in their daily lives and behavioral trajectories, and are the most frequent users of community parks[4]. With the advancement of urbanization, many old community parks in China face the problems of limited space, small green space, and lack of innovation in recreational facilities, which are unable to satisfy the needs of the old and the young

for common activities and emotional needs. Therefore, it is of great significance to explore the construction of intergenerational community parks for the young and the old.

The Need and Challenges of Building Good and Harmonious Community Parks with Intergenerational Sharing for the Elderly and Children

Generation, or intergenerational relationship, refers to the interpersonal relationship between two generations. Generations have differences in natural attributes such as kinship and age level, as well as cultural attributes such as concepts, lifestyles, and emotional styles [6]. Foreign research on generation sharing between the old and the young is progressing rapidly in Europe, which is the main position for research on intergenerational programs. The practice cases involve families, schools, communities, children or elderly care centers and other fields, and most of the research focuses on the old and young composite well-being facilities. Domestic research on the theory of intergenerational sharing between the elderly and the young mainly focuses on intergenerational relations and the composite of the elderly and the young, and Liu Tong (2023) defines "intergenerational sharing" from the direction of the crowded residential area as the following: groups of different age groups in their daily lives, through the sharing of the physical space environment, relevant supporting facilities and social service resources, etc., to create interaction, exchange, mutual benefit, harmony and mutual benefit, and to promote the development of the elderly. communication, mutual benefit, and harmonious neighborly relationship, so as to achieve both spiritual and life satisfaction [11].

Community park is one of the important components of the community structure, and is an important bearing space for outdoor activities of the old and young groups, and the Urban Green Space Classification Standard (CJJ/T 85-2017) defines community park as a green space with independent land, providing basic recreational and service facilities, and mainly providing daily recreational activities for the residents of the community [12]. Current research on community parks focuses on a single group of elderly people or children, and the exploration of intergenerational sharing patterns between the old and the young is relatively weak, in this regard, the construction of good and harmonious community parks for the old and the young intergenerational sharing is also facing multiple challenges. First, in view of the current situation of urban land constraints and insufficient functional space, the intergenerational sharing model can effectively improve the utilization of resources in community parks and meet the demand for public service facilities and recreational facilities. Secondly, community parks under intergenerational sharing are in line with China's family child-rearing behavior of "bringing up grandchildren", which is conducive to enhancing the sense of well-being of family relationships and promoting the communication and interaction between grandchildren and grandparents. Thirdly, community parks carry residents' needs for leisure, recreation, sports and socializing, etc. A good mode of intergenerational sharing between the elderly and children can improve the quality of intergenerational shared space and ensure the sustainable development of community vitality.

Recreation scene creation mode of a beautiful and harmonious community park with intergenerational sharing between the elderly and children

Aiming at the above challenges facing the construction of community parks, we hereby introduce the concept of playfulness and construct a model to propose relevant theoretical methods in an attempt to analyze and solve the existing problems.

The Trinity concept of recreation is feasible and necessary for the study of user groups, scene space and other neighborhoods. Liu Wei (2022) started from the perspective of campus cultural recreation, discussed the ideas and methods of campus cultural recreation landscape planning and design guided by the concept of recreation,

and built a campus cultural recreation landscape to meet the recreation needs of users [1]; Fengzihan (2022) explored the design of Children Friendly Park City parent-child recreation space from the perspective of recreation under the background of park city community environment [2]; Wangjunqian (2023) innovatively designed the high-voltage green corridor landscape of the university campus from the perspective of "meta universe+recreation" based on the existing physical landscape design [15].

This study contends that the development of intergenerationally shared community parks for young and old can be viewed through the lens of play (Figure 1). "Tour" refers to travel and excursion behavior with the purpose of travel, which requires realization of the path from the starting point of travel to the location of the clear destination point or the location of the accidental attraction point and carrying out outdoor leisure and recreational activities, in which there will be a self-organized or it organizes and temporary outdoor recreation and experience activity process. On the supply side of "art," the traditional modes of production, display, and interaction are challenged by innovation, synergy, optimization, and upgrading; on the demand side, the demand for regional culture is met by the beauty of each to the beauty of traditional art recreation, to meet the needs of both older and younger groups seeking recreation in the artistic environment of cultivation. "Learn" means to acquire or achieve something. It can be applied in a variety of contexts where the design of outdoor spaces with explicit or implicit themes broadens the thought processes of groups of young and old people, guiding them to produce a more meaningful and capable transformation of knowledge and educational significance in and of themselves.

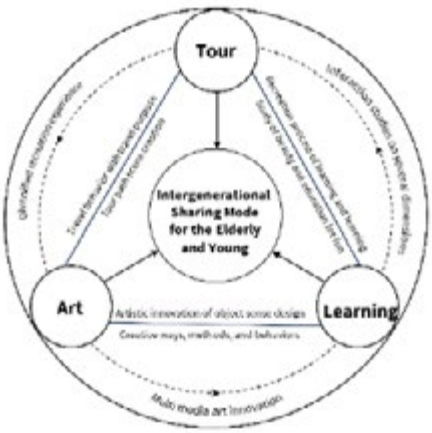

Figure 1. Recreation concept model (self-drawn)

Practice of creating recreation scenes in a beautiful and harmonious community park with intergenerational sharing between the elderly and children

This design project is placed in the first phase of Chengdu Institute of Administration's TOD neighborhood. A total of one green space is planned for community park space design, guided by the concept of recreation scenes, incorporating Chengdu's Tianfu waterside culture into the vitality display of the community park, and realizing the creation of a community park scenario for the old and young generations under the concept of recreation scenes.

Tour: Rest with Love - Tour Paths

The "tour" in the open space of the community park is optimized according to the daily living range and travel distance of the old and young groups to optimize the division of paths, with Tianfu water culture as the form of topographic design, linking the park landscape function zones, guiding the old and the young to play together for entertainment, cool viewing, recreation, education and other activities.

In terms of the trail route, the main road flow line allows older and younger groups to safely pass residential or business areas nearby and reach the park path. The secondary road flow line is based on the range of leisure activities of the young and old, as well as a suitable branching arrangement, to achieve a variety of smooth roads and clear directions. Through explicit purpose points or periodic attraction points, both elderly people and toddlers can experience the creative and experiential process of "swimming" (Figure 2). The meandering streamline trail enhances the sense of experience and ornamental nature of leisure walking for the old and young,

creates a landscape experience with different scenery, and promotes the integration of the old and young, as well as their physical and mental health. (Figure 3).

Figure 2. Overall park path (self-drawn)

Figure 3. Scenes from the trail viewing area (self-drawn)

Art: Co-dependence with Love - Scene Creation

The community park scenario, which focuses on "art", should embody the characteristics of mutual integration of people, art and natural ecology, and present the call of beautiful China under the ecological civilization. Through interactive art innovation, the design creates art in community parks under the sharing mode from the perspective of the behavioral psychology of the old and the young, respects the emotional needs of the old and the young, and enhances the artistic atmosphere and educational value of the community park space.

A park for community healing and rest, The Shared Garden The leisure corridor satisfies the needs of the old and young groups for leisure and coolness: reading books and newspapers, exchanging and haggling, playing and singing music, and picnics for parents and children. It also realizes interaction and communication between the old and young groups in a single composite space (Figure 4). The interactive and shared artistic landscape facilities encourage old and young groups to participate in the process of environmental restoration and cultivation, to improve their hands-on experience ability and artistic cultivation, to realize the shared interactive green space for the old and young, and to interpret the value of the pursuit of the harmonious coexistence of humans and nature in the urban green space in the new era (Figure 5).

Figure 4. Leisure activity gallery art scene(self-drawn)

Figure 5. Shared Garden Art Scene(self-drawn)

Learning: Entertaining with Love - Researching and Learning Aesthetic Education

Old and young intergenerational shared community park design through the "tour" and "art" contextualized display, so as to achieve the "learning" based on the results of the study of aesthetic education. Elderly people

and children through the community park outdoor "travel" and "tour" experience process, so that they can learn, learn to understand, in a subtle way to play the role of research and aesthetic education.

The open space for children to play is equipped with a scenic wall displaying science education, ground recreation paving and other physical designs, so that children can receive knowledge information during recreation, triggering knowledge exchanges and enhancing multi- dimensional research and learning interactions. Universal resting seats for the elderly and children are set up around the perimeter to bring the activity distance between the elderly and children closer and facilitate the elderly to accompany and care for their children (Figure 6).

Figure 6. Children's Recreation Scene (self-drawn)

Figure 7. Interactive fountain scene (self-drawn)

In the case of guaranteeing the safety of the old and young groups, the design of interactive fountain landscape, enriching their visual, tactile, auditory and other multiple feelings, attracting the old and young to participate in the activities of pro-water, splashing in the water, watching the water, to promote the multi-sensory interactive experience of the old and young groups to meet the two sides of the sharing of the common recreation to stimulate the possibility of more interactive behavioral activities between the old and the young, to enhance the quality of the environment of the park's public space (Figure 7).

Principles for creating recreation scenes in a beautiful and harmonious community park with intergenerational sharing between the elderly and children

In view of the above model construction and practical exploration, this paper puts forward the principles of creating recreation scenes of intergenerational shared community parks for the elderly and children, and provides a positive reference for the construction of intergenerational integration, beautiful and harmonious future community parks (Figure 8).

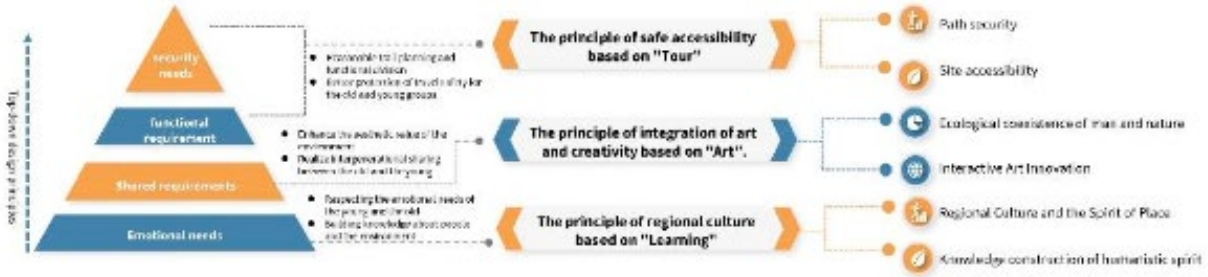

Figure 8. Principles of recreation scene creation (self-drawn)

Principle 1: The principle of safe accessibility based on "Tour". One is the safety of recreational paths. Using the site's original environment to rationally design pedestrian circulation routes, from point to line, from line to surface, to create a refined path diversion. Activity space should avoid motorized vehicles crossing [4], to ensure the needs of the old and young groups of outdoor safety travel. Secondly, pay attention to the accessibility of the old and young groups to the outdoor venues. Multi-point layout of small activity space places, improve road access efficiency, shorten the distance of road sections, and enhance the clarity and accuracy of road markings, in order to adapt to the old and young groups of high-frequency rest and proximity activities of the accessibility.
Principle 2: The principle of integration of art and creativity based on "Art". Beauty is the product of human practice, and the development of art and design cannot be separated from the necessity of aesthetics. Art creation is the epitome of art and design concepts. Through design forms and design forms, it enhances the functional value and aesthetic value of environmental space. Demonstrating the interactive artistic innovation from human behavioral psychology to human factors engineering, it gives the environment elements such as historical culture and ecological aesthetics, creates a leisure space for the old and the young with unique cultural heritage and harmony, and meets their dual needs of environment and material.
Principle 3: The principle of regional culture based on "Learning". An urban environment's regional culture should incorporate a variety of elements, such as ecology and nature, art and technology, social harmony, etc., to give its residents opportunities. The historical history of the local places and spaces must be rejuvenated and renewed for the future with a sense of cultural belonging, tranquil native land, etc. The humanistic flavor and social heritage are significant bearers of regional culture; thus, we should be aware of the fact that regional culture is inextricably linked to the spirit of the place. Second, we should focus on the development of the humanistic spirit among both the old and young groups. To do this, we could conduct "study tours" of diverse regional cultural forms.

Conclusion

For humans, love is an eternal topic, and love is always formed, interpreted, applied, and propagated by a harmonious beauty. Intergenerational affection, as defined by intergenerational parenting, is how the older generation cares for their grandkids out of love. This study investigates a fresh methodology and practical comprehension of old and young intergenerational shared community parks and proposes the principles of safe accessibility, integration of art and creativity, and regional culture in scene creation, which will serve as a direction for the following theoretical practice. Additionally, it creates a concept for creating shared community parks for older and younger generations.

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References

[1] Liu Wei, Wang Wei&Yang Lei (2022). Trinity Design of Tour-Art-Learning in Campus Cultural Recreation

Landscape. Design Research (05), 99-103
[2] Wang Wei, Feng Zihan&Wang Zhe (2022). Exploring the Design of Parent-Child Recreation Space in Child-Friendly Park City from the Perspective of Entertainment Science. Design Research (06), 75-79
[3] Zhang Jing, Peng Yuhan&Shen Maoting (2021). Research on the Design of Intergenerational Shared Neighborhood Activity Centers. Furniture and interior decoration (05), 128-132 Doi:10.16771/j.cn43-1247/ts.2021.05.026
[4] Zhang Lu&Ye Zhu (2020). All-age Regeneration Strategy of Existing Residential Areas Based on the Compound Feature of the Aged and Yong. Urban Development Research (10), 109- 115+133
[5] Shu Ping, Wang Jiaojing, Zhao Zihao&Zhang Ping (2019). Research on the types of existing residential outdoor spaces of Elderly-Children Interaction. Journal of Architecture (S1), 80-83
[6] Liu Chunyan, Chai Yixia&Yang Yang (2021). Construction Strategy of Public Space in All-age Community with Intergenerational Integration. Guangdong Garden (04), 22-26
[7] Jiang Xiaoyan&Zhu Xiaolei (2022). Study on the Interactive Behavioral Setting of the Elderly and the Young in Commercial Living Streets in Communities: Empirical Research of Three Cases in Guangzhou. Southern architecture (05), 91-99
[8] Li Han&Fu benchen (2021). Intergenerational Interaction Behavior Patterns and Supportive Environment in Public Space of Urban Settlements. Urban issues (05), 73-83. doi:10.13239/j.bjsshkxy.cswt.210508
[9] Lu Yuan, Cao Xiaofang, Li Jing&Zhang Jian (2021). Research on the Mode of Community Public Space Shared by the Elderly and Children. Journal of Architecture (S1), 80-85
[10] Jamesgibson Ecological theory of visual perception [m] Beijing: People's Literature Press, 1978
[11] Liu Tong (2023). Research on the promotion strategy of the shared space between the junior and the senior based on the spatial syntax —— take the example of the 15-minute living circle residential area of Daqing City (Master's thesis, Northeast Petroleum University) https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFDTEMP&filename=1023515462. nh
[12] Standard for classification of urban green space [s]. urban construction, 2017
[13] Liu Kun, Wan Xinyi&Zhou Peiling (2022). The Effects of Childfriendly Community Park on Outdoor Activities : A Natural Eexperiment in Hongli Community,Shenzhen. Shanghai Urban Planning Review (06), 111-118
[14] Zhaiyujia, Li Dongying&Wang De (2021). The Role of Urban Community Park in Promoting Seniors' Physical Activity and Positive Emotion—A Case Study of 15 Shanghai Community Parks. Chinese Landscape Architecture (05), 74-79. doi:10.19775/j.cla.2021.05.0074
[15] Wang Junqian&Wang Wei (2022) Exploration of innovative landscape design of high-voltage Greenway in university campus from the perspective of "meta universe+recreation". Interior design branch of China Architectural Society (eds.) 2022 interior design papers (pp.82-85). China water resources and Hydropower Press

Community mutual aid trends in the context of an inclusive society

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Abstract

Facing the increasing number of elderly and disabled people, it is important to make the environment more inclusive. Helping disabled people live like normal people is a beautiful vision. Inclusive design helps people with disabilities achieve independence by improving their abilities and reducing product design exclusion. However, existing technology cannot fully compensate for the abilities of people with disabilities, which results in people with disabilities still being We face many problems, even more so with the development of technology, such as the digital divide. In addition, disabled people need customized solutions due to their various conditions and disability problems, which brings great challenges to the design.

This article conducts research on a group of disabled people in a certain community based on student courses, and divides the problems of disabled people into three categories: individual problems, community problems, and social problems. The design of the inclusive concept solves many individual problems, but at the community and social levels And some personal problems still mainly rely on the help of others. But on the one hand, there is a lack of contact between people in modern urban communities. Many disabled people live alone. On the other hand, there are insufficient community service personnel. Disabled people are therefore forced to face problems alone.

This article uses case studies to summarize community inclusive design cases, proposes a methodological framework for community mutual aid design, and changes the way of solving problems from the mainstream of improving abilities and advocating independence to helping the disabled to establish interpersonal connections and promote mutual help among people. , improving community inclusion by restoring community resilience. Finally, the analysis is conducted based on the cases of classroom students.

Author keywords

Inclusive design; mutual aid; separated; community design; interdependence

Introduction

According to statistics released by the National Health Commission, at the end of 2021, there were 267 million people over the age of 60 in my country, accounting for 18.9% of the total population, and the number of people over the age of 65 reached 201 million, accounting for 14.2% of the total population. According to the international standard that when the proportion of the elderly population reaches 14%, it marks the entry into a deep aging society(Xie&Duan,2023). China has entered a deep aging society. According to United Nations forecasts, in the first half of the 21st century, China has been the country with the largest elderly population in the world, accounting for one-fifth of the world's total elderly population(Tang,2018).]According to the second national survey on persons with disabilities in 2006, the total number of persons with various types of disabilities

in my country was 82.96 million. Data from the China Disabled Persons' Federation shows that as of the end of 2021, there were approximately 38 million certified disabled people across the country.

Facing the huge group of elderly and disabled people, the Accessible Environment Law establishes standards from three aspects: barrier-free facility construction, barrier-free information exchange, and barrier-free social services, aiming to strengthen the construction of a barrier-free environment and ensure the protection of disabled people, The elderly can participate in and integrate into social life equally, fully and conveniently(2023).

In courses related to smart elderly care, in order to gain a deeper understanding of the current construction of barrier-free environments and the current problems faced by people with disabilities, we cooperated with Changsha Xinkaipu Community (Figure 1)and conducted interviews with leaders and staff responsible for community services. Unstructured interviews, and help staff conduct household interviews with more than 30 disabled people in the community, collect basic information archives of disabled people, and provide registration assistance for relevant digital online platforms. Through in-depth analysis of the disabled people in the community(Figure 2), we found that due to their own disability and different living conditions, the problems faced by the disabled are unique and complex. Therefore, many problems are difficult to solve through separate products, such as disabled people living alone going out to seek medical treatment. , it is often necessary to contact family members or community service personnel to provide help. Current barrier-free hardware and services are not enough to support disabled people to achieve independence. On the other hand, services require personnel and financial support. The economic status of a large number of disabled people is not enough to support the operation of the service system. Without government investment and support, corresponding services cannot be established.

Figure 1. Xinkaipu Community Public Space and Interview

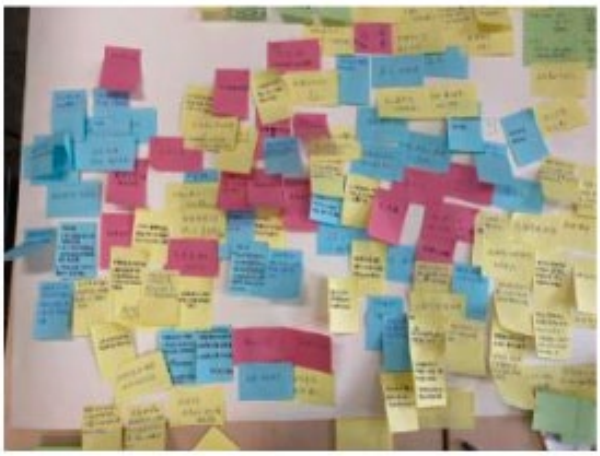

Figure 2. Collation and classification of issues for people with disabilities

Table 1. Question Form for People with Disabilities

Issues	Example
Individual issues	● Safety issues at home for the elderly living alone ● Lack of motivation to change life ● Feeling bored and lacking entertainment ● Poor eyesight, unable to use smartphone ● Difficulty managing emotions ● Family bathroom renovation ● ……
Community issues	● Knowledge no one shares ● Lack of companionship (children, friends) ● It is difficult for newcomers to integrate into community activities ● ……
Social issues	● Difficulty integrating into society and interacting with others ● Limited scope of activities ● Lack of re-employment opportunities and job training ● life safety issues ● Lack of income and low living standards ● ……

During the epidemic, community volunteers and staff provided a lot of care and assistance to the disabled. This inspired me to think about whether design has the ability to directly solve problems. The mainstream in the design field is to help disabled people achieve independence through products. However, in fact, due to economic and technological development, it is currently difficult to achieve independence (Bennett,2018). Thinking about the community society in the early days of community research in sociology, close ties based on blood and geography can achieve good neighborly mutual assistance(Tonnies,2002). The community is more flexible and the problems of the disabled are solved. It can be seen that good community network relationships can solve the problem of disabled people. Problems for capable people. If design faces difficulties in directly solving complex real-life problems, implicit mutual aid design may be a possible solution, that is, to rebuild and repair neighborhood relationships through design and use mutual help among community members to indirectly solve problems.

Relevant research and ideal community

The term "inclusive design" first appeared in 1994. As a design method, it allows designers to ensure that the designed products or services can meet the needs of as many people as possible, emphasizing the relationship between humans and nature, and the efficient use of resources. (Clarkson,2012). Inclusive design initially focused on the field of product design, designing devices that exclude and simulate the disabled to help product design. Later, it was gradually used as a concept to be integrated with various design fields, such as service design, participatory design, and interaction design. Through this combination, we can achieve better attention and help to disadvantaged groups in the design process and results.

But to what extent can design address issues of inclusion? Many designers are beginning to question traditional design perspectives. As a discipline, design has traditionally served capitalist enterprises, and its main value is to help enterprises achieve better profits. A wealth of products and services have been developed that help people with disabilities achieve independence to a certain extent but also weaken interpersonal connections. For example, from the perspective of care, it has contributed to the expansion of the platform-based daily care demand market, such as pet sitters, and destroyed our public care resources and care capabilities by implanting market logic into traditional non-market areas (The care Collective, 2020).Therefore, while the design helps the disabled become independent, it also weakens the problem-solving method of neighborly mutual assistance and puts more emphasis on benefit-based services.

When we transform design from the problem-solving perspective of individuals with disabilities to the overall research perspective of communities and social contexts, it provides more possibilities for solving inclusion issues. The field of sociology has conducted many studies on interpersonal relationships. . The study of community first originated in the field of sociology in Tonnies's "Community and Society". The book compared the relationship between primitive tribes based on blood and geographical relations and modern communities based on interests. Compared with the relationship between traditional communities Helping each other and being closely connected, modern urban communities are indifferent and lack connections. There are many definitions of community, but three common elements are the people who live in a specific area, share common ties, and interact with each other(Xu,2005).

Social interdependence theory is the study of interpersonal relationships and interactions. It originated from Gestalt psychology and field theory. It was formally proposed by Morton Deutsch(1949) and expanded on this basis by Johnson and Johnson(2005). Interdependence theory provides a conceptual framework to organize thinking about cooperation and competition. This theory states that the situational structure of social interdependence between individuals determines how those individuals interact with each other, and

the manner of interaction determines the outcomes. Social interdependence exists when individual outcomes are affected by each other's actions. Social interdependence situations can be dichotomized into two extreme situations, namely cooperation and competition. Since SIT was proposed, it has been widely used in establishing specific educational practice procedures, business, individual and group psychotherapy, family therapy, organizational and community development, international conflict and peace-building and other fields. In terms of design, Bennett et al.(2018) studied the significance of interdependence for the field of assistive technology. Compared with assistive technology's traditional focus on social independence, interdependence emphasizes the interconnectedness between people and focuses on the positive contributions of people with disabilities, breaking the tradition. of hierarchy. Through case studies of three emerging areas: group work, competency-based design, and navigation, the interdependence is shown to synthesize the growing research in the field of assistive technology and help us locate additional design opportunities and possibilities.

The mutual aid model embodies the cooperative situation in SIT theory and is relatively mature in the field of elderly care. In the theory of mutual aid, Molm summarized three reciprocity models, namely direct negotiated exchange, direct reciprocal exchange, and indirect generalized exchange(Luo,2021). In terms of specific applications, the most classic time bank model uses time as currency to achieve mutual help between the two. Successful cases such as Singapore's senior care community and Japan's Neighborhood Mutual Aid Association all reflect the potential of mutual aid design in the field of senior care. The problem with the current mutual aid model is that many cases have certain regional and particular characteristics. There are differences in community interpersonal relationships and community environments in different regions, making it difficult for other countries and regions to directly copy and learn from it. Many mutual aid-designed plans are difficult to maintain vitality and active public participation in actual implementation. Many design projects attempt to build mutual aid models through products or services, but remain at the conceptual stage. Part of the reason is that interpersonal relationships in most urban communities are indifferent, there is a lack of prerequisites for mutual aid, and there is no cooperative interdependence between people. Therefore, this article proposes a mutual aid design strategy. The purpose is not to directly establish mutual aid relationships, but to help residents in the community establish interdependent relationships and good community interpersonal relationships through design, and promote the spontaneous generation of mutual aid in the community.

Both independence and interdependence help disabled people to a certain extent. These two concepts are not contradictory and each has its own advantages and disadvantages. Rehabilitation medicine scholars(White,2010), for example, believe that independent teaching enables disabled people to realize their own needs. However, interdependence makes them contributors, not just recipients, of community support and assistance. Mia Mingus believes independence is a myth. All of us are constantly dependent on others, even if those others are invisible to us. The ideal community inclusiveness is to help disabled people solve personal problems independently as much as possible, while establishing interpersonal connections through mutual aid design, shaping the soil for mutual help, and solving social problems in the community.

Case studies and implicit mutual aid design strategies

Implicit mutual aid: the purpose is to establish the soil for solving problems

Faced with the diverse and complex problems of people with disabilities, not focusing on solving specific problems may actually solve the problems better. We should realize that design cannot solve all problems, and the purpose of mutual aid design is different from traditional inclusive product design that directly and specifically focuses on the specific problems of people with disabilities. For example, electric wheelchairs are developed to solve the travel problems of disabled people. The purpose of mutual aid design is to build

	case	picture	form	Purpose	area	year	people
1	El Laurel Inclusive Children's Park		Space: Children's Park Products: Entertainment facilities	Provide leisure and entertainment venues for children, disabled people, and adults	Tenerife		children, residents, disabled people
2	urban furniture		Space: outdoor exhibition Products:Outdoor public installations	Enhance connections between people and space and restore community resilience	Shanghai	2022	Tourists, ordinary residents, disabled people
3	Design of barrier-free comprehensive public transportation system for long-term care in Taiwan		Services: Travel services for people with disabilities Digital product: app	Helping people with disabilities achieve point-to-point commuting	Taiwan	2017	disabled people
4	Design Museum Dharavi		Space: Outdoor Mobile Museum	Help poor areas establish connections with the outside world	mumbai	2016	resident
5	Shuangjing Street Community Micro Update		Space: Inclusive Community Interaction Space	Provide inclusive outdoor space	China	2019	Ordinary residents, children, the elderly
6	Design living Lab		Services: Offline activities	Transform the community environment and enhance connections among students, residents, and people with disabilities	HongKong	[illegible]	Disabled people, students, residents

Figure 3. Community Mutual Aid Design Case Study

situations between people, just like when training a new team, some small games are often used to mobilize everyone's enthusiasm and weaken the sense of strangeness among members. Through situations built through activities or facilities, people develop positive connections that can be the key to solving social problems in the disabled community. For example, disabled people living alone can make appointments in advance to be picked up and dropped off by service personnel for medical treatment through active contact with community service personnel. Volunteers regularly visit elderly people living alone during the epidemic and provide special care. Compared with direct attention to specific problems, this implicit non-purpose is easier to attract people's participation, can reduce the guilt and inferiority complex that disabled people have when receiving help, and build a relatively equal and lasting hierarchy. Except for Case 3 in the table, which is promoted and implemented by the government, other projects focus on the interactive relationship itself.

Establish connections: build cooperation situations based on multi-person interactive products or activities

What forms of design are used to build community connections? Mutual aid design is mainly based on product design or activity projects that allow multiple people to participate at the same time, such as public interactive devices and digital communication software to establish mutual relationships between people. For example, in the environmental design of Case 1, not only did ramps and Braille introductions be added to achieve inclusivity

for children with disabilities, but also a large number of multiplayer interactive game devices were designed to increase the interconnection between children. In Case 6, students, ordinary residents of the community, and disabled residents of the community participated in the entire process of community holiday decoration activities. Through the activities, community members and students improved their understanding of each other, and realized the social integration and social participation of the disabled.

Public space transformation: a catalyst for social participation and design empowerment

In designing products or activities, public space renovation is a theme that appears frequently. The exhibitions and activities in the case have changed the public environment of the community. First of all, public space is related to everyone's common interests. Residents are also very familiar with their surrounding environment, so it is easier for everyone to participate. Assigning the right to environmental modification to each resident embodies design empowerment and improves social participation of persons with disabilities in the process. As a result, the updated environment is also more inclusive, promotes more interconnectedness between people, and achieves positive outcomes.

Exhibition: as a new medium to establish connections and express oneself

In communities, if there is a lack of consideration at the initial construction stage, it will be very difficult to transform the community later, which requires government support and funding. Exhibitions are relatively short-term and easy to implement. The exhibition itself has low participation costs and is public. Residents can easily participate in the process at almost no cost. During the participation process, residents are encouraged to discuss and establish connections on common topics, eliminating misunderstandings and prejudices. Case 2 designed a series of urban furniture for public exhibition, and Case 4 attracted the attention of outside tourists by displaying local culture.

Course Outcome Analysis

At the end of the course, the students were divided into groups and designed concepts based on the opportunities found in the community and nursing home surveys. There were no specific theme restrictions. Two of the concepts reflected the trend of mutual aid design and thinking about interpersonal relationships in the community. On the one hand, this is because the social integration of disabled people is a relatively serious problem in itself, and on the other hand, many problems are difficult to directly solve through technology.

The joymail companion communication system is designed to alleviate the loneliness of the elderly in nursing homes. It uses anthropomorphic robots to help the elderly write letters and maintain long-term contact with volunteers. Joymail does not try to solve the problem directly, but helps the elderly establish connections, which is itself While alleviating loneliness, it also allows volunteers to better understand and help the elderly, and improve the inclusiveness of the living environment. TELI TIEE is an intergenerational interactive community device that plays past stories as a link to establish connections between the elderly and children, and the elderly and the elderly in the community.

Conclusion

Mutual aid design looks at the inclusion of people with disabilities from the perspective of the community as a whole, and considers the overemphasis on independence in design and the damage to community relationships. Faced with the difficult-to-

Figure 4. Community Mutual Aid Design Case Study

solve problem of community social inclusion, this article proposes a mutual aid design strategy, shifting the design purpose to promoting the establishment of interpersonal relationships, building connections through multi- person interactive products or activities, taking community environmental transformation as the theme, and disseminating and communicating through exhibitions. Express. Help disabled people integrate into the community, develop good community flexibility, promote spontaneous mutual aid trends, and improve community inclusiveness.

References

.(2023).Barrier-free Environment Construction Law of the People's Republic of China. Communi que of the Standing Committee of the National People's Congress of the People's Republic of Ch ina (05),503-513.

Bennett, C. L., Brady, E., & Branham, S. M. (2018, October). Interdependence as a frame for assistive technology research and design. In Proceedings of the 20th international acm sigaccess conference on computers and accessibility (pp. 161-173).

Deutsch, M. (1949). A theory of cooperation and competition. Human Relations, 2, 129-152. Johnson, D.W. & Johnson, R.T. (2005). New Developments in Social Interdependence Theory. Genetic, Social and General Psychology Monographs, 131(4), 285-358.

Luo,Y K.(2021). Innovative design of mutual aid elderly care model (Master's thesis, Guangdong University of Technology).https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202202& filename=1021794122.nh

Tango,j. & Liu,W W.(2018). The development process and misunderstandings of China's aging po pulation. Journal of Beijing University of Technology (Social Sciences Edition)(04),8-18. Tonnies, F., & Loomis, C. P. (2002). Community and society. Courier Corporation.

Clarkson, P. J., & Coleman, R. (2015). History of inclusive design in the UK. Applied ergonomics, 46, 235-247.

The Care Collective. (2020). Care Manifesto: The Politics of Compassion. Verso Books.

Tronto, J. C. (1993). Moral Boundaries: A Political Argument for an Ethics of Care. Routledge. Wachter-Boettcher, S. (2017). Technically Wrong: Why digital products are designed to fail you. W. W. Norton.

White, G. W., Lloyd Simpson, J., Gonda, C., Ravesloot, C., & Coble, Z. (2010). Moving from independence to interdependence: A conceptual model for better understanding community participation of centers for independent living consumers. Journal of Disability Policy Studies, 20(4), 233-240.

Xu,Q.(2005). The concept and theoretical origin of community. Journal of Yuncheng University (01),32-36. doi:10.15967/j.cnki.cn14-1316/g4.2005.01.009.

Xie,W. & Duan,L.(2023). Research on the reshaping and path of family care function under the ba ckground of profound aging. Journal of Zhejiang Industry and Commerce Vocational and Techni cal College (01),1-5.

Interpretations of "Love" in Contemporary Artworks within Eastern and Western Contexts

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Abstract: This article examines the interpretations of "love" in contemporary art within different cultural backgrounds and explores how varying perceptions of "love" in Eastern and Western contexts influence artists' works. Using a comparative approach, case studies are divided into two cultural contexts: Eastern and Western. The article begins by analyzing the commonalities and conflicts between "benevolence" advocated in Eastern Confucian culture and "agape" advocated in Western Christian culture. It then delves into the interpretations of "love" by artists from different cultural backgrounds, focusing on familial love and romantic love. Finally, the article explores the spiritual significance and societal implications that arise when personal "love" in artworks transforms into a love for society.

Keywords: Love; Eastern and Western Contexts; Contemporary Art; Interpretation.

The Relationship Between Benevolence and Agape

Confucian culture and Christian culture, as the essence of Eastern and Western cultural development, serve irreplaceable roles in the creation and expression of contemporary artworks in both Eastern and Western contexts. They share some commonalities and differences, with the Bible and the Analects of Confucius serving as representative works of these two distinct cultures. At the ethical and moral level of "love," both Confucian and Christian cultures endorse a transcendent love that promotes societal harmony and harmonious interpersonal relationships. This influence extends deeply into shaping the personalities of artists and their creative expressions.

"Ren" (benevolence) is at the core of Confucian thought, starting with familial love, initially directed towards one's own family and then expanding to relatives and friends, eventually encompassing all members of society. This reflects a hierarchical aspect of love. On the other hand, Christian thought reaches its highest level in the concept of "God and humanity as one," with "agape" as its core, advocating for ethical universalism that All man created equal in God's eyes.1 "Agape" entails a broad love for all living beings, stemming from God's love. The reasons for individuals' sense of security and vulnerability vary under the guidance of these different cultures.

Regarding the scope of love, various "commandments" in the Bible emphasize an egalitarian and undiscriminating love, extending equal love to all people. In contrast, Confucian "love" is clearly hierarchical, graded, and limited. This article will use the Bible and the Analects of Confucius as exemplars to analyze the commonalities and conflicts between the "benevolence" advocated in Eastern Confucian culture and the "agape" advocated in Western Christian culture. It will also examine how artists from different cultural backgrounds interpret "love."

Interpretation of Love in an Eastern Context

In Confucianism, "benevolence" (" 仁 爱 ") is built upon the foundation of blood relationships, originating from the love of filial piety (" 孝悌之爱 "). The Analects of Confucius consistently
regard filial piety as the root of benevolence, with filial piety being the starting point of love. Love begins with "filial love" for one's parents and gradually extends to others, following the principle of "Do not do to others what you do not want done to yourself" and "Desire not to do to others what you would not have done to yourself." 2 Although Confucius emphasizes that loving one's parents is fundamental, and filial piety is indeed the root of benevolence, the object of love transcends familial ties and extends to love for others and society. Love is seen as an inevitable path for self-improvement and a responsibility and task that individuals should fulfill. Its ultimate goal is to establish good interpersonal relationships, create a harmonious and beautiful social environment, and promote a positive and optimistic worldview. In this regard, Confucian culture brings cultural characteristics of collectivism and family values to the creative expression of Chinese artists.

Love for Family

In the works of Song Dong, one can observe the influence of love derived from the concept of family on his artistic creations. As he himself admits, "My family is my source of artistic inspiration." This core concept is woven into the fabric of his creative work, which often draws from family memories. His trilogy collaboration with his father, "Touching My Father," his work with his mother, "Waste Not," and his collaboration with his wife, Yin Xiuzhen, in "Chopsticks," as well as his work dedicated to his daughter, "My Daughter Is My Four Seasons," all demonstrate this influence. Song Dong appears as an observer of his own life, documenting his emotions toward his family and transforming them into works of art. By presenting these everyday, ordinary materials in their most original state, he allows the audience to feel the universality of resonance driven by personal life experiences.

Figure 1. Song dong, "Touching My Father"

In the artwork "Touching My Father," Song Dong employs various means to "touch" his father, whom he has always held in awe, felt distant from, yet deeply loved. The relationship between Song Dong and his father is akin to the father-son relationships in many Chinese families— marked by distance and estrangement but also underpinned by profound love. Such relationships often lead to mutual misunderstandings, increasing barriers, and ultimately result in mutual harm, sacrifice, grievances, or submission on one side. Song Dong, too, feared and deeply loved his father from a young age. He feared his father's sternness, perceiving it as a form of control, but simultaneously found it challenging to express his love. After moving to Germany in 1997 for various reasons, his homesickness grew stronger. Song Dong began to reflect on his communication with his father and started to understand the sternness his father had shown him before. He wanted to express his love to his father but was hesitant to articulate it directly. Consequently, he decided to use the medium of film to "touch" his father, a way that could be seen but not physically felt.

In 2002, Song Dong's father passed away suddenly, leaving an indelible pain in Song Dong's heart. However, it was at that moment that Song Dong finally had the courage to physically touch his father, the cold body of his deceased father. He recorded this process on video, but he could not bear the pain and could not bring himself to watch that footage. The third "touching" is driven by Song Dong's longing for his father. He wanted to touch his father one more time. So, he projected his father's image onto water and used his hand to touch the reflected

image of his father's face on the water's surface. The moment his hand made contact with the water, his father's image would disappear, only to reappear when he removed his hand.

This series of artworks reveals the complex and profound father-son relationships prevalent in many Chinese families. This love, rooted in "filial piety," has universal qualities that resonate emotionally with the audience. It transcends familial love and extends to love for others and society. Song Dong, through his artistic expressions, reestablishes contact with his father and seeks to adjust their relationship. He puts his most intimate emotions with his father into his artworks as a way to address the issues between them. As his father passed away, his creative process became a means of consolation for his own emotions and those of his mother. It provided a form of artistic therapy and elicited emotional impact on the audience. This is the core value of Song Dong's artistic creation—an exploration and integration of his personal emotions that brings solace to others.

Love Between Partners

The concept of "benevolence" (" 仁 爱 ") in Confucianism is also reflected in the works of Liu Beili, where she explores the idea of love between partners and seeks to find ways to express intimate relationships in a modern context, drawing from the symbolism of traditional culture. In her artwork "Lure," she uses thousands of circular disks wound with red thread, each pierced by a sewing needle, allowing them to hang from the ceiling by red threads. Each circular disk can be paired with another, resembling "doubles," and each pair is connected by a single red thread. Each thread is hand-sewn through the center of the disk, suspending the disk a few feet above the ground. The faint red circles sway like air currents and eventually slow down, entangling with one another. The inspiration for this work stems from the ancient Chinese legend, " The red thread of fate," which suggests that true soulmates are connected by an invisible red thread at birth.3 Over time, this red thread draws them closer, enabling them to overcome various obstacles and distances, transcending social and cultural differences to find each other and become each other's partners. In this context, the red thread serves a dual purpose: on a physical level, it connects the circular disks and threads, while on a spiritual level, it serves as a guiding thread for the fate and connections between the disks. The title of the artwork, "Lure," implies both temptation and confusion. Thousands of circular disks, connected by red threads, hang in the air and sway gently in the subtle air currents, expressing the artist's contemplation of encounters and partings between people.

Figure 2. Liu Beili. "Lure". 2008-2020

Liu Beili spent six months crafting this piece by hand, one by one, meticulously winding the threads around 3,000 circular disks. Each disk has a single thread as its axis, delicately spiraled around it. Another work in Liu Beili's "Lure" series, titled "Bound #2" or "Red Thread Legend," consists of two weathered pillars, each representing a person, facing away from each other. They are neatly connected by countless red threads, with needles at both ends of each thread, penetrating the opposite faces of the pillars. This connection imparts a sense of desolation and sorrow to the viewers. These two artworks depict simple relationships between individuals, but they also explore themes of connection, confusion, contact, and separation that we all experience and share.

These two artworks move from reflecting on relationships between partners to a sense of the inevitable separation between human beings. Liu Beili uses the material of the red thread, which carries traditional cultural symbolism, combined with the complex and lengthy creative process, to convey the nuances of traditional female

"handcraftsmanship." She also infuses her deeply personal artistic language, emotional fusion, and profound humanistic thinking. In her works, the things entwined and attached by the threads, as well as the threads themselves, construct the rich inner world of the artist and the emotional expression she yearns to convey, as well as unintentionally revealing a sense of female consciousness. The seemingly flexible material reflects a powerful inner spirit, echoing the compassion for the world and humanity found in Confucian culture.

Interpretation of Love in a Western Context

In a Western context, the interpretation of love has been influenced by Christianity, shaping the perspectives of Western philosophers and consequently influencing the creative expressions in contemporary Western art. Christianity emphasizes love and makes "love" its central theme, with the core concept being "agape" love, advocating an ethical universalism of equality before God. "Agape" refers to the unconditional and universal love for all living beings. In Christianity, everyone, aside from God and Jesus (the ultimate authorities), is considered equal, and therefore, the love one receives within this divine family is equal, unconditional, and absolute. This universal and egalitarian love holds significant practical and moral value in shaping social ideologies, including the concept of "agape love." In Plato's view, the concept of love, or "eros," refers to the love for beautiful objects, the essence of beauty, and the knowledge of beauty itself. Beauty represents absolute truth, and love driven by eros compels individuals to seek immortality, with death being the ultimate evil to overcome. Augustine believed that the goal of love is to conquer death, and love for God is eternal love, the prerequisite for resurrection and immortality. Descartes, through the concept of the highest form of devout love in a dual relationship of love, responded to Augustine's idea of divine love. Spinoza advocated a diversity of love, a geographic map of love, and an escape route for love in the spirit of Boccaccio. These religious and philosophical trends have had a profound impact on the social significance and artistic creation in contemporary Western contexts.

Love for Family

Louise Bourgeois' artwork "Maman" illustrates her love and nostalgia for her mother. This enormous spider sculpture is supported by delicate legs, towering over every corner of the world, observing passersby with wisdom and depth. Standing beneath the spider, one can feel its symbolic presence between humanity and the non-human. It is both transcendent like a deity, possessing immense power to protect and shelter everything, and maternal, displaying fragility yet unwavering protection of her children. In traditional Western Christian culture, spiders are often symbolic of evil and the impulse to suck human blood. In the modern context, Bourgeois ascribes new cultural symbolism to the spider, dissecting her inner world through this autobiographical creation. "Maman" is composed of welded metal tubes, bronze, stainless steel, and marble. Compared to the towering leg structure, the main body is relatively small. Its abdomen is filled with marble spheres, representing ovaries nurturing countless new lives. This colossal spider fiercely guards her precious offspring tucked within her cage-like body, evoking awe and fear in people. Simultaneously, her disproportionate and unrealistic body perched atop her delicate legs conveys a poignant sense of vulnerability. The spider serves as a profound symbol in Bourgeois' work, a hymn to her mother. She hopes that her mother's love will endure through her art. The mother is also Bourgeois' best friend, like the spider hunting pests and weaving her web, quietly dedicating herself to the family, cleverly and resolutely protecting her children. For

Figure 3. Louise Bourgeois. "Maman". 1999.

the artist, the spider symbolizes the source of her mother's protection and sense of security. Bourgeois views art as a form of healing, with her creative inspiration closely linked to her childhood experiences and traumas.
Experiencing the transition from modernism to contemporary art, Louise Bourgeois was one of the first modern artists to showcase the power of emotional depth and family-related themes. Over nearly a century of her life, Bourgeois lived through two world wars, which had a profound impact on her family and herself. She understood and grasped the notions of love and hate, sin and mercy within human nature more profoundly and thoroughly than most. The spiritual and emotional dimensions her artworks evoke are both intensely personal and universally human. She explored common human qualities such as emotions, memories, vulnerability, and fear. Through her art, she expressed the innermost feelings about "love." Her works have continued to inspire and provoke thought across different generations over the span of a century.

Love between Partners

Marina Abramović and Ulay, both performance artists and a couple, created numerous deeply intense artworks together. Their love-hate relationship is one of the most discussed and famous love stories in the history of art. Abramović's artwork "The Lovers" expresses Christian love with highly dramatic performance art, exploring the intimate relationship between a man and a woman through religious and artistic lenses. "The Lovers" is one of the works in the "Anima Mundi" series, dedicated to exploring symbolic relationships between men and women. The atmosphere in this series is both contemplative and highly dramatic. The work is based on a documentation of a performance by Abramović in 1983 in Bangkok. It draws from Christian art's iconic imagery of the Virgin Mary cradling the dead Christ in her lap. Similar to Michelangelo's "Pieta," Abramović wears a red robe, extends her arms, and tenderly embraces the lifeless body of her former lover, the German performance artist Ulay, who had been abandoned. "Anima Mundi" translates to "Soul of the World" and is about the relationship between men and women. "Anima" represents the female soul, while "Animus" represents the male soul, similar to the Chinese concept of "Yin and Yang." In traditional definitions, nature and the Earth are considered feminine attributes, which explains the female form in the title. To some extent, the image of the Virgin Mary cradling her deceased son, which has captivated Ulay and Abramović, is also about the relationship between a man and a woman. Virgin Mary is a symbol of feminine nature and the soul of the world; she calls her son back to her as he lies on her lap, lifeless. The artists further dramatize universal concepts such as life and death, male and female, mother and son through the color contrast between red and white. What adds even more drama to the story is Ulay's passing in 2020. During Ulay's funeral, Abramović delivered a eulogy from afar, sincerely stating, "He will turn into dust, become a greater force." Even though the two had been separated for many years, and Ulay had already passed away, their jointly created, unforgettable artworks will not fade away. Each artwork deeply contains their flesh, blood, and emotions, making them the perfect interpretation of love.

Figure 4. Marina Abramović. "Pieta". 200

Marina Abramović and Ulay's collaborative works focus on exploring the gender dynamics between men and women, especially the complex psychology of attraction and contradiction that exists between the sexes in human society. They express the desire for their sexual and emotional lives to merge as one, using their bodies in performance art to depict the complexities of the male-female relationship, from power imbalances to codependency. Their works vividly portray the emotional fluctuations, struggles,

hesitations, pursuits, and joys involved in the relationship between men and women. Through their art, they fully express the sameness and distinctiveness of genders.

However, in reality, Abramović and Ulay discovered through living together and collaborating in art that such a union made it impossible for them to coexist. In the end, they had to separate into two distinct natural individuals, each taking on different gender roles. Abramović once said in a lecture, "You can have unconditional love for many people; it's easy to love your family, your lover, your family, but it's hard to have unconditional love for your enemies; it's hard to love all of humanity. Because love is unconditional and unreciprocated. Our world is going through hardships right now, and this unconditional love for all of humanity is very important for the world today."4 She transitioned from personal exploration of consciousness to discussing gender issues and finally to addressing societal concerns, demonstrating an all-encompassing spirit of love and social responsibility as an artist. Her continuous innovation in the field of performance art has allowed us to truly understand the different artistic expressions and societal significance of "love."

Conclusion:

Everyone has their own understanding of love and a multitude of objects of affection. These four artists from different cultural backgrounds have gone beyond the exploration of personal love in family or partner relationships to focus on a broader perspective of love in society. The artists' social responsibility, humanistic care, and exploration of societal development consciousness as pioneers who pay attention to social issues that are often overlooked or not easily touched upon by others. Through their values on the spiritual level, they transform these social issues into intense, direct forms of expression in their art.

Each person is influenced by Confucian or Christian culture in their understanding of "love," but through self-awareness and integration with the outside world, one can form their own understanding of love and interpret "love" from various diverse perspectives. The responsibility of an artist is to drive the development of art and the entire human society. This prompts artists to touch the hearts of the public through their personal emotional development, concepts, and energies. In the contemporary context of a society lacking in public spirit, the artist's responsibility is no longer merely to create art but to serve as a conduit and guide for the public through participation. This transforms art from personal "love" into "love" for society, resulting in the spiritual value and social significance of artistic creation.

References

1. Confucius. (1996). Yan Yuan, The Analects, translated and annotated by Chen Guoqing, Shaanxi People's Publishing House, p. 22.

2. New Testament, Matthew, The Bible, translated by Liu Yiqing, Peking University Press, 2012, Chapter 22, Verse 37; Chapter 12, Verse 50; Chapter 6, Verse 33.

3. Beili Liu. (2022) Sculpture. "Soft Persuasion: A Conversation with Beili Liu" [Online]. Available: https://sculpturemagazine.art/soft-persuasion-a-conversation-with-beili-liu/. Accessed on February 3, 2022.

4. James Westcott. (2000) The Biography of Marina Abramović, Jincheng Press, 259.

Cultural Design for Benevolence in Different Periods of New China

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Abstract

Chinese traditional themes animation comes into revival with the rapid development of the cultural industry market. Under the promotion of IP content about traditional literary that has attracted a large number of fans, a lot of works stimulating audience's emotions were created to present and export trad 巾 onal Chinese culture. Compared with works from the planned economy era, these works born in the market economy era show differences in the cultural design for the benevolence in traditional culture. In the study, the story of the traditional Chinese cultural symbol "Nezha" was taken as an example to compare the cultural design for benevolence in animation stories in the planned economy era with that in the market economy era, so as to explore the differences. The results indicate that there have been changes in the love in families and love the between relatives, and maternal love has been clearly expressed. The story has substantial description about cultural design for love between friends and love between mentors and apprentices. The love of social responsibility for collective interests is the core of the story. The core of this traditional cultural ideology has never changed. It can be understood on the basis of this conclusion that the cultural design for benevolence in traditional culture was manifested in the story content, The expression of love between characters needs to be transformed and innovated with the changes of the eras, but the traditional idea of collective love needs to be inherited. Based on a comparative analysis on the traditional themes animation stories, how to better present traditional Chinese culture to the world through cultural content was studied by taking the love narration in traditional culture as an example and considering the characteristics of the eras in order to explore the development path of presenting and exporting Chinese traditional culture external in the future.

Author keywords

Traditional culture; Benevolence; Cultural design for love; Cultural industry; Animation

Introduction

In 2019, the traditional themes animation "Nezha: Birth of the Demon Child" ranked second in Chinese film history with a box office revenue of over 5 billion yuan, shocking the whole animation market. It inherits, promotes and innovates traditional Chinese culture, tells a new Chinese story, and represented mainland China to compete for Best Foreign Language Film of the Oscar. Although the reasons for this success can be found in marketing methods, visual effects or media development, the special strategies of p「esenting traditional cultu 「al ideas was also hidden in the cultural design for love between characters and between people and society Actually, in 2012, China introduced a set of policies at the national level for the first time to greatly support

the development of Chinese animation thereafter. In the following years, the number of Chinese animation experienced explosive growth, but they failed to obtain the recognition of the public due to pay too much attention on "young children", only focusing on the external form of animation but overlooking deep meaning and traditional cultural connotations of animation content. In 2015, "Monkey King: Hero Is Back" was released. This animation, which explores the profound connotations of traditional Chinese culture, brought confidence to the Chinese animation market. Redefining the cultural design for the "narratives of love" between the characters, it sparked widespread discussion among the public and gained recognition of the public. However, Chinese animation re-entered a tepid state. Chinese animation, which had to face the fierce struggle, step on the way to combine traditional culture through "Nezha". While adhering to the core of traditional cultural ideology, it has re-improved its strategy of cultural designing for "narratives of love". Despite the preservation, transformation and innovation of traditional culture in "Nezha", it won the recognition of the public and the market.

This animation in the market economy era has been compared multiple eras with the peak work of the same theme in the planned economy era," Prince Nezha's Triumph Against Dragon King". Gong Suning analyzed the differences in the text structure, theme reconstruction and text adaptation ideology of the two animation films using the Greimas'symbol matrix, believing that the ideology, cultural transformation and potential social issues of the different eras have important influence on text adaptation. Comparing the two animation stories with the original story(Gong, 2020), Chu Xinmei believes that story adaption should keep up with the eras and reflect the cultural characteristics of different eras(Chu, 2020).」in Qi also believes through the analysis on the traditional Chinese cultural symbol "Nezha" that the constantly modifying character images and storylines with the changing historical and cultural context are an effective way to sp「ead traditional culture(Jin, 2020). Feng Zhuanhong compared the traditional cultural elements of clothing, music, painting, a「chitecture, philosophical thinking and other regional elements in Nezha's animation, and emphasized transformation and innovation of emotions between the characters(Feng, 2020). Wen Binyan discovered the transformation of the mother's role and her love to Nez ha by comparing the three stories of "The Legend of the Gods", "Prince Nezha's Triumph Against Dragon King " and "Nezha: Birth of the Demon Child "(Wen, 2022). On this basis, it can be found that studies on the content related to Nez ha in traditiona I culture have been very comprehensive in both story text and story narration, and these studies gradually turn to a direction of how to reflect traditional culture, and also present a trend to explore the love relationship between characters. 压 a result, this study based on the concepts of benevolence in traditional Chinese culture were compared and summarized to analyze the love between the characters and people's love for social responsibility in animation "Prince Nezha's Triumph Against Dragon King" and "Nezha: Birth of the Demon Child" stories within the benevolence conceptual scope, and explore the embodiment of the concept of benevolence in traditional Chinese culture in cultural industry content and the poss 心 lity of critical application, thereby enabling the inherent beauty of benevolence in traditional Chinese culture to create a new field du「ing presenting and exporting Chinese culture to the world.

Character Prototypes and Psychological Aesthetic Characteristics of Love

The Psychology of Love in Traditional Chinese Culture

The explanation of love in traditional Chinese culture mainly originates from the Confucian concept of "benevolence". "benevolence" is an emotional concept between people, mainly manifested as caring, helping, giving and dedication between people. It is a unique thinking of mankind. Despite the complex explanation of "benevolence" in the academia, some scholars have divided it into three levels for understanding(Yang, 2018).

The first level is the theory of "moral emotion". The study on benevolence is an inheritance of the past and a guide to the future. The academia adheres to Cai Yuanpei's moral emotion view that "benevolence" is the basic

principle of all virtues. "Mercy" is the core of "benevolence", which starts from human nature and sprouts from emotions. It is an affection of giving and dedication. The study on the concept of "benevolence" is based on the fundamental affection, and "benevolence" refers to caring for and caring for others. TangYijie said, human is born with benevolence, and loving families is the most fundamental(Tang & LI, 2011, p.24). In his opinion, loving families is the foundation of "benevolence", based on which people will be considerate to others, so that the "Great Harmony" society can be achieved(Tang, 2014, pp.5-7). The theory of "mo「al emotions" holds that benevolence is rooted in emotions and people attempt to establish ethical philosophy based on it.

The second level is the "philosophical ontology" theory. Benevolence is the core of Confucianism, the source of human nature, the foundation of humanity, and the essence of emotion. Tang Yijie clearly pointed out that the "benevolence" in the saying "people with benevolence loves others" has the meaning of "upholding virtues". It is not only a political and moral category, but also his philosophical category(Chinese Confucius Institute, 1987, pp.67-68) From this perspective, the "philosophical ontology" emphasizes the humanistic ontology.

The third level is the theory of "fusion of ideas". "Mercy" is "love" and vice versa. The "Mercy" said by Confucius refers to the love for human. "Mercy" refers to "loving others", so it can be simply believed that "mercy is "benevolence". The idea of "mercy" is also known as the idea of "benevolence". They are the same(Yang, 2006, p.12). Benevolence transcends simple emotions and morality. It is the integration of "mercy" in the Confucian school and "love" in modern social life. The combination of many concepts led to the multidimensional nature of benevolence.

In brief, Confucian benevolence is an affection, a source of human nature, and a collection of many practical concepts. "Benevolence" holds an important position in traditional culture, and it is the root of Chinese culture and the" core of Eastern civilization "(Zhang & Xia, 2004, p.5).

Characters in Traditional Chinese Stories and the Aesthetic Characteristics of Love in Traditional Culture

Although Hollywood screenwriter Christopher Vogler structured character prototypes into eight types(Wang, 2011), this structure has relative changes due to the unique national conditions and cultures of each country. For the characters in traditional Chinese stories, Li Wenyao divided the characters of the animation adapted from traditional stories in the planned economy era into five types: Hero, Helper, Threshold, Herald, Shadow, and divided the ones of the same type of animation in the market economy era into five types: Hero, Ally, Threshold, Herald and Mentor, and Opponents(Li, 2023).

Just like the previous discussion on the psychology of benevolence in traditional Chinese culture, love is an affection, the source of human nature, and also a collection of many practical concepts. It is the emotional concept between people and between people and society. Loving families is the most fundamental. Loving families is the foundation of "benevolence", and the basis of loving society. "Benevolence" makes people considerate to others, so that the "G「eat Harmony" society can be achieved. On this basis, a progressive relationship of loving families, loving others and loving society is formed

Thus, the discussion of the interrelationships between the five types of characters in traditional Chinese stories and the love in traditional culture should be conducted from three aspects: family affection, friendship, and social responsibility. Family affection can be divided into father's love and mother's love; Friendship includes the love between friends and between master and apprentice. Therefore, the cultural design for love in the two Nezha animation films in this way should be compared into five parts: father's love, mother's love, love between friends, love between master and apprentice, and love for social responsibility.

Comparison of Love in "Nezha" Animation

The comparison of Paternal love

In the animated movie "Prince Nezha's Triumph Against Dragon King," the portrayal of Li Jing, though embodying the character of a strict father, there is a touch of warmth compared to the description in the original literature. Nevertheless, this portrayal maintains a solemn tone. Nezha's experiences of companionship and paternal care are notably infrequent, with the reflection of this affection being subtle. There is not much guidance or mentoring in Nezha's upbringing, only appearing when difficulties arise. When the Dragon King comes to seek revenge and kill Nezha for the first time. At this juncture, Li Jing consistently assumes the role of protector and advocate for his son. However, as events escalate to the point where the Dragon King seeks vengeance by inundating the entire city, Li Jing is confronted with a profound ethical dilemma. This dilemma centers on the conflict between his duty to safeguard the people and to preserve the life of his own child, thus fulfilling his paternal obligations. In this challenging moment, Li Jing finds himself torn between the two.

In "Nezha: Birth of the Demon Child," the father-son relationship between Li Jing and Nezha is quite a highlight. Within the narrative, Li Jing transcends the cliched portrayal of weakness and rigidity, becoming a stern yet deeply caring father. Upon Nezha's birth, Taiyi Zhenren, the True Man of the Grand Unity, harbors concerns that Nezha may eventually turn into a malevolent force, endangering the people. He contemplates removing this perceived threat. However, in his role as a father, Li Jing stakes his own reputation, prestige, and even his life, pledging to safeguard Nezha. This underscores the profound responsibility in fatherhood. Moreover, Li Jing cares about Nezha's growth, accompanying Nezha during his formative years while providing firm guidance. He cannot bear to witness the villagers unjustly accusing Nezha and goest to voice for him during his birthday celebration. In the en, he willingly offers his own life to save Nezha's, and as the story reaches its conclusion, he shows the grandeur of paternal love to both Nezha and the audience.

Through this comparison, we can discern the shifits in the cultural design of paternal love within traditional culture. Paternal love has been expressed in a more direct and open manner, becoming unwavering.

The Comparison of Portrayals of Maternal Love

In "Prince Nezha's Triumph Against Dragon King," maternal love is noticeably absent. Li Jing's wife gives birth inside their home while everyone anxiously waits outside. However, intriguingly, the film never presents any scenes involving Li Jing's wife, and she is not mentioned again in the subsequent storyline.

On the other hand, "Nezha: Birth of the Demon Child" redefines Nezha's mother, Lady Yin, portraying her as a contemporary female role model. Internally, she exudes qualities of gentleness, kindness, and loving motherhood. She engages in playful moments with her son Nezha, guides him through various trials, and witnesses his growth. Externally, she stands as a symbol of loyalty, courage, and justice, joining her husband, Li Jing, in protecting Chentangguan and combatting monsters and demons. Moreover, as the storyline unfolds, it becomes evident that Lady Vin's unwavering commitment to vanquishing demons is driven by her desire to follow a virtuous path for Nezha.

Comparing the cultural depictions, or design, of maternal love in the two animated films, maternal love is not all about bridging father and son any more, becoming an independent entity explicitly. It has risen to the same level as paternal love, becoming a central theme in the storyline's depiction of love.

The Comparison of Friendship's Love

In "Prince Nezha's Triumph Against Dragon King," owing to the characteristics of animation during the planned economy era, there doesn't exist the character of partner Instead, the narrative often includes pets or servants, serving primarily as decorative elements impact on the plot.

In contrast, "Nezha: Birth of the Demon Child" introduces Ao Bing as both a companion and a rival to Nezha. They share the common experience of being considered freaks. Notably, Nezha, a human, dislike being branded as a monster. As for Ao Bing, a demon, tries hard to hide his identity. Their struggles as freaks or outsiders lead to a

bond of empathy, making them each other's sole friends. Their friendship deepens as they collaborate in rescue efforts and engage in shared activities. However, their divergent life missions eventually drive them into conflict. Nonetheless, in the end, their friendship prevails over all obstacles, and they confront challenges together.

In summary, the contemporary depiction of friendship's love in animation witnesses a notable departure from the past, emphasizing its pivotal role in cultural narratives, or designs. Friendships may experience turbulence, but they exemplify the Chinese philosophy of "harmonizing differences" through love, leading to cooperative endeavors.

The comparison of Mentor-Disciple(Mentorship) Love

There is an old saying in China, "One day as a teacher, a lifetime as a father." It highlights the role of a mentor in imparting skills and life's wisdom to their disciples. In "Prince Nezha's Triumph Against Dragon King," True Man of the Grand Unity, as Nezha's mentor, bestows magical weapons upon Nezha at his birth and during his resurrection through a lotus flower. When Nezha faces challenges, his mentor provides encouragement, acceptance, and recognition. However, the mentor-disciple relationship in this narrative only becomes apparent when Nezha encounters difficulties.

In "Nezha: Birth of the Demon Child," the mentorship bond between Nezha and Taiyi Zhenren (True Man of the Grand Unity) profoundly touched me. Confronted with Nezha's recurring misadventures, Taiyi Zhenren made the heartfelt decision to accept Nezha as his disciple. While imparting magic arts, he also guided Nezha in moral and ethical development, accompanying Nezha' during his growth. During Nezha's birthday celebration, Taiyi Zhenren generously bestowed upon Nezha all his magical artifacts, including his dearest steed. When he witnessed Nezha and Ao Bing enduring the hardships of thunder, he fearlessly rushed to their aid. As a mentor, he devoted his all, leaving a lasting impression on the audience.

Comparing the mentor-disciple love in these two animations, it is evident that in "Prince Nezha's Triumph Against Dragon King," the mentor only appears and imparts exceptional abilities to the disciple when the disciple faces challenges. In contrast, in "Nezha: Birth of the Demon Child," the mentor not only bestows extraordinary abilities but also accompanies the disciple throughout their growth, representing a emotional theme in the storyline.

Love for Social Responsibility

In "Prince Nezha's Triumph Against Dragon King," the Dragon King exploits his authority by withholding rain from the people and demanding the sacrifice of young boys and girls. Motivated by justice and empathy for the people, Nezha, fearlessly confronts the tyranny of the Dragon King, even at the peril of his own life. The central plotline is straightforward and clear right here.

In "Nezha: Birth of the Demon Child," the hardships stem from calamities brought about by the Dragons. The Dragons seek to conceal their crimes and wipe out the entire population. While Nezha would like to evade due to being unjustly accused, the profound love instilled in him by his parents and mentor guides him to overcome these challenges. As such, he fulfills his social responsibility.

If one were to characterize Nezha's love for social responsibility in "Prince Nezha's Triumph Against Dragon King" as unyielding, in "Nezha: Birth of the Demon Child," Nezha's approach is represented by moments of hesitation and inner conflict. However, both versions of Nezha confront difficulties head-on and express their unwavering commitment to fulfilling their social responsibilities whatever happens.

Conclusion

Animation, with its low cultural discount rate, serves as a universally accessible cultural industry medium worldwide. It is also a potent vehicle for promoting traditional culture. In China, the majority of animated stories finds its origins in classical literary works. As such, when crafting the content of animated stories, it is imperative to consider contemporary elements with the preservation of traditional cultural counterparts, allowing for

adaptation and rejuvenation to meet the demands of the modern era.

By comparing two influential works from different eras, namely "Prince Nezha's Triumph Against Dragon King" from the era of planned economy, which had a remarkable global impact, and "Nezha: Birth of the Demon Child," the highest-grossing film in the Chinese market during the era of market economy, we can observe that as times change, various transformations have occurred in the design of the "culture of love" when it comes to the traditional culture.

Firstly, paternal love is no longer expressed in a subtle manner, but rather, in an open and direct one. Fathers now embrace their responsibility with unwavering dedication, believing in their children and remaining by their side throughout. Secondly, the cultural portrayal of maternal love has undergone a profound transformation. It has evolved from merely bridging the relationship between father and child to becoming an independent entity. As such, it represents an essential component of love within the story. Thirdly, the influence of friendship is no longer relegated to the sidelines. Instead, friendship love has become an indispensable and integral element in the cultural narrative. While conflicts may arise among friends, they eventually find common ground and collaborate. Fourthly, the cultural design of mentorship's love has witnessed changes. The mentor's role has gained much more presence in the storyline and guided the protagonist. As such, this very relationship in certain aspects, even substitutes for paternal love. Last but not least, the commitment to social responsibility has remained unwavering. Individuals no longer face these responsibilities alone but are accompanied by partners or friends. In the end, with the collective support of paternal love, maternal love, mentorship love, and friendship love, they managed to fulfill their social responsibilities.

The Nezha animation delves into the cultural design of benevolence within traditional culture. Importantly, it has delivered audience acclaim across different eras or periods by sucessfully adapting to the changing contexts. Through a comparative analysis of the cultural design of benevolence in these two animations, it becomes apparent that skillful application, transformation, and innovation of traditional cultural elements can bring about remarkable commercial benefits. To formulate a distinctive strategy in cultural industries, it is imperative to grasp and harness this methodology as a valuable wellspring of creativity.

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References

Chinese Confucius Institute. (1987). Confucius Study Thesis. Beijing: Education Press.

Chu,X.(2020).Exploring the Sustainable Development Path of Adapting Chinese Mythology intoContemporary Animation Works - Taking Twice Successful "Transformations" of Nezha asan Example. Art Evaluation, 2020(02).

Feng, Z. (2020). Comparison of Chinese Elements in the films "Prince Nezha's Triumph AgainstDragon King " and "Nezha: Birth of the Demon Child"[Master's thesis]. NorthwesternUniversity.

Gong, S. (2020). Analysis of the Differences between Text Adaptions of "Prince Nezha'sTriumph Against Dragon King " and "Nezha: Birth of the Demon Child". Masterpieces Review,2020(29).

Jin, Q. (2020). Research on the Animation Adaptation of the Chinese Traditional Cultural Symbol"Nezha"[Master's thesis]. Hubei Minzu University.

LI, W. (2023). A Study on the Heroic Mythology Storytelling Strategy of Chinese Feature-LengthAnimation

-Focusing on(2015)-[Doctor's thesis]. SejongUniversity.
Tang, Y & Li, Z. (2011).History of Chinese Confucianism. Beijing:Peking University Press.
Tang, Y. (2014). A Brief Discussion on the Confucian Doctrine of "People-orientation andMorality-first". Journal of Peking University (Philosophy and Social Sciences), 51(01).
Wang, C. (2011). The Writer's Journey: Mythic Structure for Writers. Beijing: Publishing House ofElectronics Industry.
Wen, B. (2022). From "Absence" to Presence - The Evolution of Mother's Image in the "NezhaStories", Xin Jishi, 2022(14).
Yang, C. (2006). Further Understanding of Confucius' Concept of Benevolence, "Confucianismand Practical Learning and Their Modern Values". Proceedings of the International AcademicSymposium, China Confucius Foundation.
Yang, Q. (2018). "Thirty Years of Research on the Confucian Thought of 'Benevolence' and ItsProspects". Eastern Forum,2018(01).
Zhang, R & Xia, J. (2004).The Eastern Love Sutra: The Life Wisdom of the Analects, Changchun :Changchun Press.

The Law of Love:
A Philosophy of Gender Equality through the Symbolism of the Zipper

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Abstract

Gender equality is one of the 17 global Sustainable Development Goals (SDGs) identified in the 2030 Agenda for Sustainable Development, adopted by the United Nations in 2015. Its aim is: "Eliminate gender inequality and ensure equal rights and opportunities for women and men in all spheres"; this still seems difficult today after the epidemic, and the reason for this difficulty not only comes from the biological differences between the sexes, but also the idea of inequality that still exists in history and culture.

In this paper, we have sorted out the history and operation of the zip, and refined a drawing method that can produce a line as a zip. In this method, the artist can reflect on his/her own gender identity, and think about what are the characteristics of love in both genders, and how to construct love under gender equality. Is love eternal? If not, what are its trends?

The law of love is implied in the characteristics of the zip, for example, in the drawing of the zip, there are many times of symmetry, interlocking and so on, which are brought about by the morphological characteristics of the zip itself, and also the reason why the zip can be lengthened infinitely; from "point" to "line" to "plane", and finally to form an entity that can be infinitely fastened to each other, signifying the love that men and women carry for each other, the process of which explains the growth and solidity of love. Why is the model of love in the past no longer applicable to the present, and is this kind of love "outdated" under the influence of patriarchy? From a historical perspective, and asking questions about gender equality, how should the love of the past and the love of today be celebrated?

Author keywords

Draw therapy; Zip; Evolve; Physiognomic property;

Multiple Attempts At the Same Goal： Three Inventors in Search of a " one-pull closure"

In the beginning, metal zips were made from silver or gold bullet-shaped fasteners and were marketed as the first generation of zips. In the subsequent development, new materials for the production of zips emerged, such as plastics, nylon, and so on. and the weight of the zip are also changing from heavy to light. Fastener's visual volume of largeness is also fading away and becoming invisible. Therefore, I tried to explore the history of the invention of the zipper and sort out its changes and found that the fasteners were in different forms in each period before the zipper was widely used by society.

At the end of the 19th century, long boots were prevalent, but the design of rows of buckles or iron hooks are very inconvenient to put on and take off, not only time-consuming and labor-tedious, but also causing frozen shoulders and muscle strain which is struggling and tiring for people to zip. In this social context, there are three inventors who begin their quest one by one.

Elias Howe

Elias Howe, Jr., as the inventor of the sewing machine. Howe came up with "certain new and useful Improvements in Fastenings for Garments, Ladies' Boots, and other articles to which they may be applicable," (Fig.1)

But this design did not evolve into a successful product, Nonetheless, it introduced a "one-pull closure" concept that established the groundwork for subsequent research on zipper closures.

Whitcomb Judson, Chicagoan

Forty years later, Whitcomb Judson continued to invent new zippers, as seen in his first patent, which consisted of

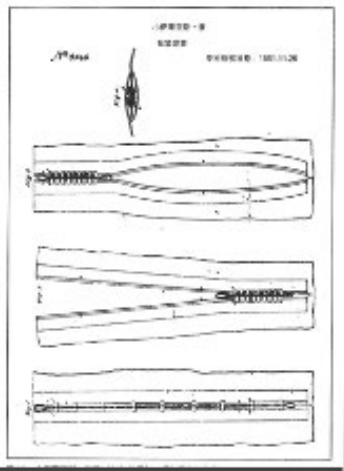


Figure 1

Figure 2

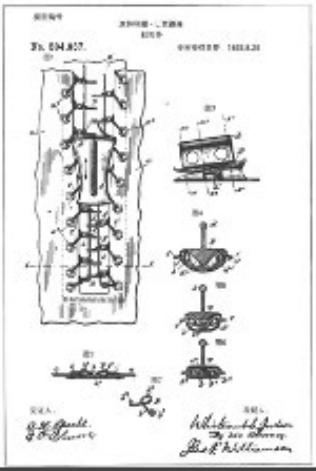


Figure 3

Figure 1 Elias Howe, Jr.'s patent, **Figure 2** W.L.Judson's first patent, **Figure 3** W.L.Judson's second patent,

two rows of tooth-like fasteners (Fig. 2), and each fastener was squarely aligned rather than misaligned. However, this was still a patent for a zipper that hadn't been made, and it was improved upon to invent a zipper that consisted entirely of hooks and loops. When the zipper slider is sliding, the hooks hook together into a single piece. Judson's second patent was published on August 29, 1893(Fig. 3). but the fact was proved which is impractical in the market, and it is hard to open and close.

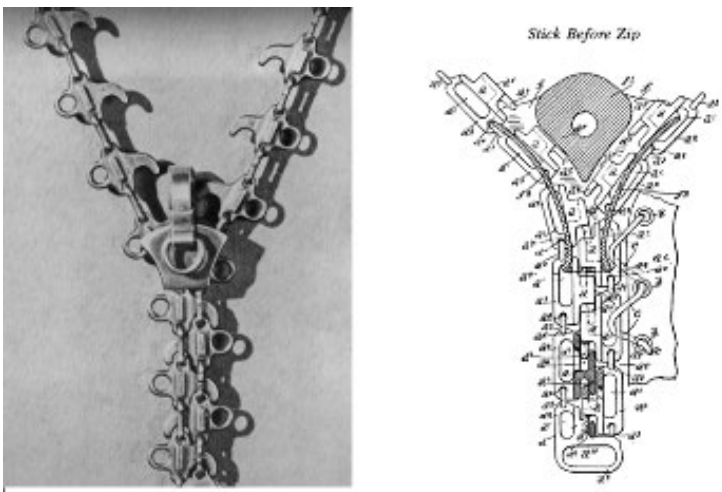


Figure 4

Figure 4 Anonymity (zipper of universal fastener company)

In 1904, the company that Judson worked for acquired a large number of zipper companies from around the world(Fig. 4). In this year, Judson hired an assistant, and with his help, Judson succeeded in making the first marketable zipper by machine, named C-curity(Fig. 5). However, the zipper would burst open at inopportune times during use, and then the anticipation of a new product was deflated again. Anderson Pete suggested that

Judson hire a new engineer and recommended Gideon Sunback.
Gideon Sunback

Figure 5 C-curity

Sunback, a man with a flair for zipper design, was quick to point out the illogicalities in the C-curity design. Between 1909 and 1903, there was a ray of hope for the failing zipper company when Sunback designed a zipper called the Hookless No1. The form of this zipper is similar to Elias Howe's zipper and is also very similar to the sliding plastic bags we commonly use today. Shortly after the company was approved for marketing on May 15, 1913, Sunback developed the hookless No. 2. It was the last invention of Sunback's life, a zipper made of countless silver bullet-shaped fasteners, and it was the zipper that would be widely used in the future. (Fig. 6)
Summarize：

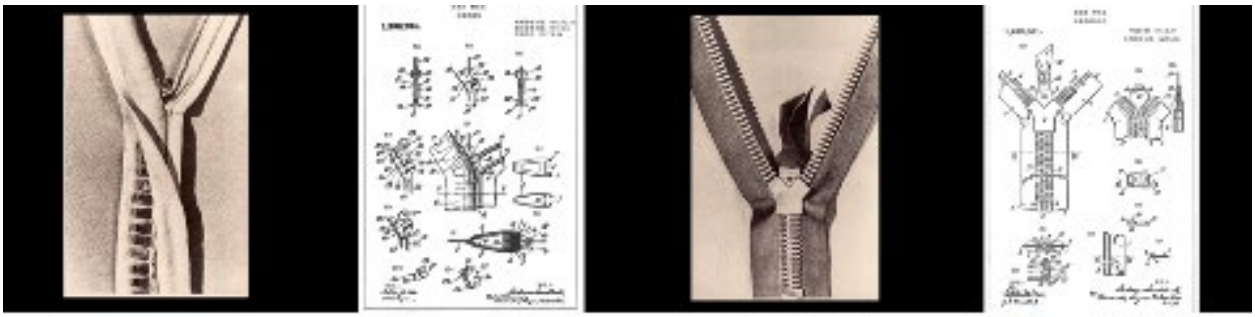


Figure 6 Hookless number one(left) and hookless number two(right)

This chapter lists a variety of zippers from around the world (although inventors with patent records are concentrated in the US). They come from different cultures, but share a common goal: to create the " one-pull closure " zippers. They have designed a variety of fastener shapes, but underneath the structure, There is an evolutionary line of "points, lines, plane, and volume" that characterize the shape of fasteners.

Breaking down the walls： Painting methods for creating new zippers

Instead of an inventor inventing the zipper, the times shaped it. In the history of zipper inventions, the spirit of continuous innovation has awakened generations of inventors to find inspiration in the despair of failure. So I modeled the timeline after the history of invention and studied the changes in the internal structure of the fasteners, then copied and combed the shapes from each period (Fig. 7), followed by making some three-dimensional paper models. (Fig. 8)

The "four elements": four stages of evolution

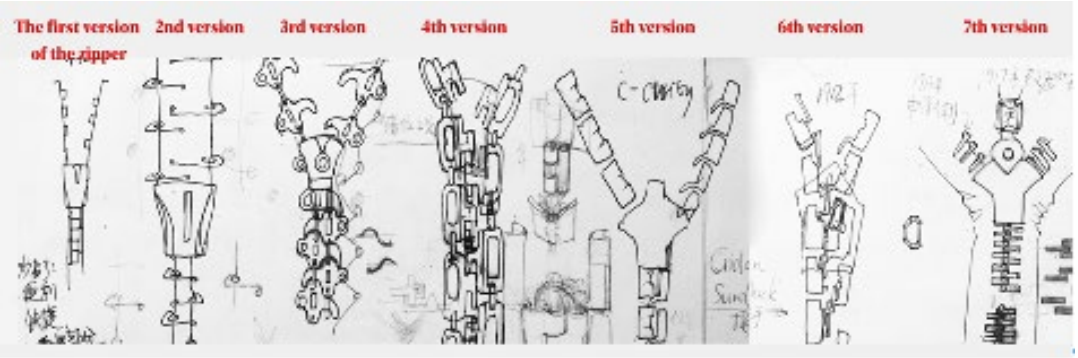


Figure 7 Evolving versions of the zipper

"point" and "line" periods

As can be visualized from the figure (Fig.7), the first version and 2nd version are the first patent and the modified version of Judson's patent, which also represent the "point" and "line" periods respectively. The former fasteners are shaped like teeth and close without misalignment; the latter fasteners bite with misalignment, and their shape has evolved into hooks deformed from bent metal rods;

"plane period"

The 3rd and 4th versions are of unknown provenance, coming from non-American cultures. The shape of the former's fastener is the one we see in the picture, which is not too bulky, and this period is called the "plane period"; (the fastener is closed by a "tabbed hook" that passes through the loop of the opposite chain, paper model 1) The latter, although it looks complicated, is actually a closed groove instead of "the loop" of the previous period.

The 5th and 6th versions are in fact the two C-curity models designed by Judson and Sunback respectively. The so-called "C" structure is a transitional period from flat to three-dimensional, and its fasteners are similar to a hollow cylinder, which can be regarded as bending the flat metal into a "c" curve and then clamping it onto the fabric or leather (Paper Model 2, Paper Model 3). (Fig. 8)

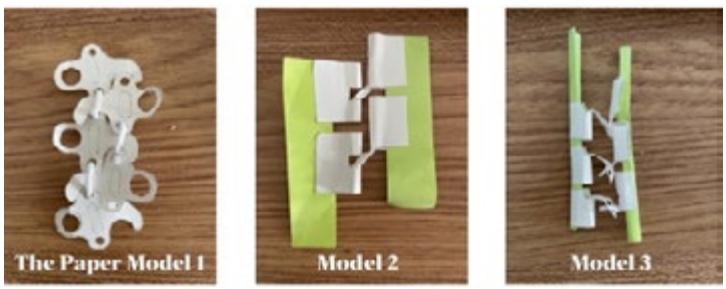


Figure 8 Paper Model

"volume period"

The 7th version is Sunback's best-selling zipper made of bullet-shaped metal, and it is the period of "completely three-dimensional fasteners.

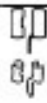
"Four Elements Drawing Method" （FEDM）

Using the logic of "points, curve lines, planes and volumes" to create an ever-continuing zipper.

The inspiration behind the history of invention

Summarize and characterize the salient features of fasteners in the history of invention as "point- line-plane-volume". See Table 1.

Table 1. points, curve lines, planes and volumes

*Convex and concave *shape distribution of closure positions (凹凸)	lift/right	lift/right	up/down	up/down	up/down	up/down
Direction of pulling : L/R (lift/right) (up/down)	L↔R	\L↔R/	↑ up ↓ down	ˆ up ˙ down	ˆ up \L↔R/ ˙ down	↑ up \L↔R/ ↓ down
Shape	Hole/hook	Hole/hook	Hole /hook	凹凸	凹凸	凹凸
Structure	Single Symmetry *Zig zag*	Single Symmetry Zig zag	Single Symmetry Zig zag Insert	Double Horizontal Insert	Double Horizontal Insert	Single Symmetry Zig zag Insert
Front View						
Attribute	Line	Plane	volume	volume (C)	volume (C)	volume

Drowing steps: (Fig. 9)

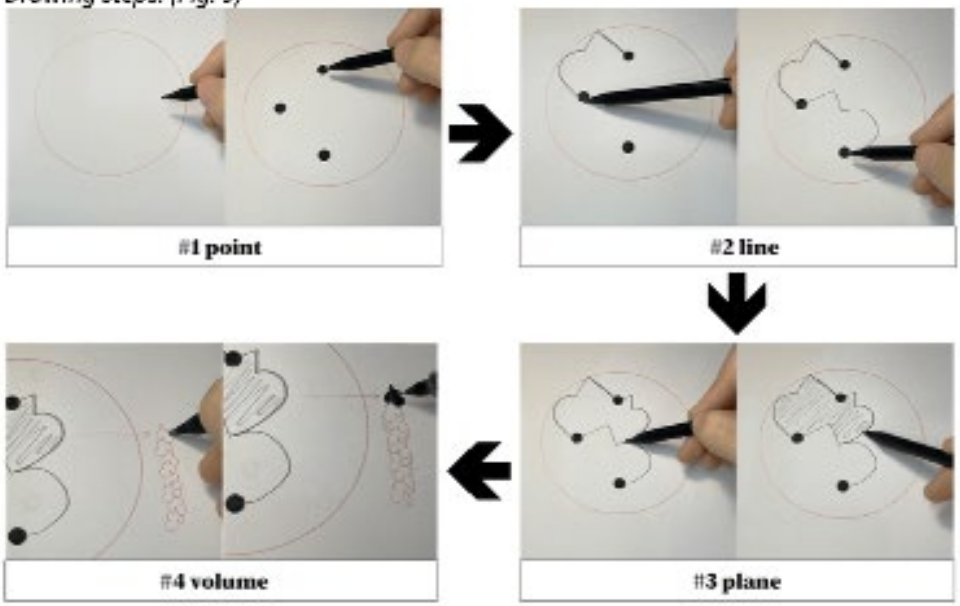


Figure 9 Steps for drawing a new zip(#1,#2,#3,#4)

Step 1

First draw three points as shown in the figure. Draw an "irregular line" between the two points near the upper area, then flip the "irregular line" to a mirror image, and then draw the reversed line on the two points. (Fig.#1)

Step2

Take the length of the second curve according to the artist's own feeling, and then combine it with the line on the left to close the line to form a plane (Fig.#2).

Step3

Invert the image of this complete and full plane, then make a large number of copies of the two planes in different directions, and in the next step, splice them together to form a "long strip" and rationalize them. (Fig.#3).

Step4

Finally, add thickness to the plane to make it a fastener (Fig.#4).

"Points, lines and plane" are the common denominator of art.

Kandinsky's investigation done a hundred years ago, into the proto-elements of art—the point, line, and plane—and his deep belief in the spiritual needs of the artist to create according to an inner need provide art historical background that validates today's artistic freedom and connects every person's creativity to all possible materials and ways of making art, figurative or abstract, providing that an authentic need to create is awakened. (Kandinsky, W. 1979) On this basis, (the FEDM) is not only modelled on the world-building process, but is applicable in a wide range of arts. The "point, line and plane" in dance refer to the part of the dancer's body that exerts force, the trajectory of the limbs and the eight directions around the dancer (to determine the audience's viewing angle). Kazuo Ohno believes that dance can awaken us to the experience of being in the womb, a frantic memory of playing and swimming with abandon in a gravity-defying environment.

In dance therapy, dancing leads us back to our embryonic selves, and in dancing everyone can feel the freedom that they crave so much, and at the same time, it is a process of reinventing ourselves. In painting, "point, line, plane" is the process of starting from a few points on a blank sheet of paper to constructing an entity; similarly, in other arts such as music, "point, line, plane" are the three elements that are unavoidable in most arts. So whether you are studying the origin of art or the origin of zip, they are both looking for a vibrant love from which to get a healing power for the body and mind.

How does the process of drawing through the FEDM method connect people to nature?

The artist dose not 'render' nature , nor dose he 'imitate' it, but he creates it anew. He controls the world through his work.p119(Kris,E 1953) Zipper drawing is different from traditional art creation, it is more like a kind of art design. In drawing, we play the role of God, which makes us detached from ourselves, putting ourselves aside, and following the "Four Element Drawing Method(FEDM)", the drawer can experience the creation of nature by art, and redefine nature inthesimplestlines. (Afterthemannerofcannibalisticbelief,psychicallythesamemagicalthing results, vis omnipotent control over the incorporated objects, and a magical endowment with the powers of the incorporated.p120)。"(Ella Sharpe 1950a)Therefore, The power of creation can be felt in the process of drawing, which creates a way of understanding the unknowable state of the world at the beginning. The zip is an object that can carry personal feelings, by means of feeling a great truth in a small substance. Starting from drawing a line and changing it into a voluminous substance, we can feel that things come from nothing and that everything has a spirituality, and thus reconceptualise life.

Boundaryless Love - Primal Healing Power

Rudolf Arnheim —— "physiognomic property".

In prehistoric societies and cultures, sick people were considered to be victims of magic practiced by rival tribes, who were innocent and deserved to be treated as they should be, and therefore, tribal shamans usually cast spells and performed rituals in order to get rid of the evil spirits or demons attached to the patients.

The type of music used during the rituals is carefully chosen by the shamans according to the nature of the evil spirit that has invaded the patient's body. These healing séances or songs and dances performed by the tribes provide great mental and emotional comfort and support to the sick members of the tribes. Gao, T. (2008).In primitive societies, "music" therapy, surrounded by the entire tribe, was unimaginable to modern man. An ailing man, seen as an innocent victim, who is treated with carefully selected music smothering him under the gaze and

surrounded by the crowd. The man must have been thrilled, or at least happy and touched, that he was cared for by everyone within the tribe. The joy that comes from a sick person being surrounded by people is soothing to the body and mind. In the past, nature was unpredictable and people were small, but they were more cohesive with each other; later on, people conquered nature and no longer feel fearful of it, and we are gradually entering a society that emphasizes individuality, so we need the diverse objects in the world to heal our bodies and minds.

Rudolf Arnheim has argued that all things, object animate and inanimate, as well as human beings, have or contain expressive qualities. Take, for example,the tree we refer to as the weeping willow: this tree does not in itself feel sad, neither does it make us feel sad, but because of its form, the passive hanging of its long slender branches, low and brushing the ground, it mirrors the structural properties of the mood or feeling, and sadness is communicated.These expressive qualities of objects have been called physiognomic properties and are seen as directly perceptible; it is Arnheim 'the primary content of vision in daily life(Arnheim 1954).Objects in the world are given different names because of their different characteristics. In the subsequent development, the constraints of environment, climate, growth habit, geographical location and many other kinds of information make people perceive things differently.The richer the information an object carries, the more it becomes a popularly recognised culture and settles in people's subconscious. This is especially true for artistic creations.

Superfluous things:The continuous nature of the zip itself brings a sense of continuous life.

The Chinese Ming Dynasty's "Superfluous things", written about the art of living, "Superfluous" means "unnecessary or more than you need or want"; But for the literati on an internal level, the objects written about in "Superfluous things" could construct a spiritual world, and with the help of objects, they could be used for emotional support and the cultivation of good character; for the outer level of the individual, they can be used to display his or her charm, talent and feelings. The aesthetic concepts depicted in this book by Wen Zhenheng are not only a guide for contemporary people to create a livable living environment, but also an important revelation and significance for the inner and outer shaping of the self. This book sees objects as living beings like people, experiencing contemplation and gaining insights from the qualities of objects. It relies on the human imagination of the object and the qualities of the object itself.

Wrote by Charles Rycroft, this ability 'to endow the sensory world with symbolic meaning' is important, He cited some examples，the tall buildings，particularly if they lack windows, are austere and forbidding and houses with bay window and wings coming out to meet one are inviting.' In reacting in this way,we are reacting 'as though they were people who might embrace, ingnore or cold-shoulder us. (Pycroft 1985)From the previous two chapters, it is clear that the zip has a continuous quality, which is fundamentally due to the fact that the structure of a single fastener has both concave and convex qualities. The qualities that make the left and right parts of the zip into one are easily associated with our own life experiences and thus inspire us. Some people associate it with the two sides of the individual, such as Hermaphroditus in ancient Greek mythology, the relationship between the sexes, the individual and intimacy, and the rethinking of life etc.

Rycroft says that no one has experience that are sensations and nothing else. Consciousness and，more particularly self-consciousness induce us to reflect on experiences, to assimilate...(Pycroft 1985) The concepts of the beginning of the century, the beginning of the world, and the beginning of everything are expressed through the zip "FEDM" drawing method. When the artist draws a line with a unique curvature between two points, he gives life to the line, and this line constitutes the DNA of the zip. Based on this, the picture and the artist's heart sympathise with each other, so that the idea of creating a unique zip is realised, and the artist can express his certainty about his own tenacity of life through this object.

Whether it's the word animate and Superfluous things in the Chinese context or the word "physiognomic property" in the English context, we're really talking about the same thing, it's just that the language makes us

focus on different faces".

Conclusion

The lines created by the hand of the artist are unique and are closely related to the artist himself. Assuming that in the end the resulting zip is a plant, then the participation of the artist himself determines the DNA of the germ. There is a loving connection between things and people, and the process of refining the DNA of the lines and creating things brings both internal and external spiritual formation. This is not only a nourishment of one's spirit, but also a manifestation of one's personal style in the real world. The zip, which is explored in this paper, is also a symbolism of gender equality. Although the zip is an imported product from the West, it also contains cultural ideas from Chinese philosophy. There is a strong resemblance between the evolutionary illustration of the zip and Zhou Dunyi's Tai Chi diagram. Tai Chi is: A taijitu is a symbol or diagram in Chinese philosophy representing "Taiji" representing both its monist and its dualist aspects. Zhou Dunyi's Taiji diagram which illustrates the cosmology.

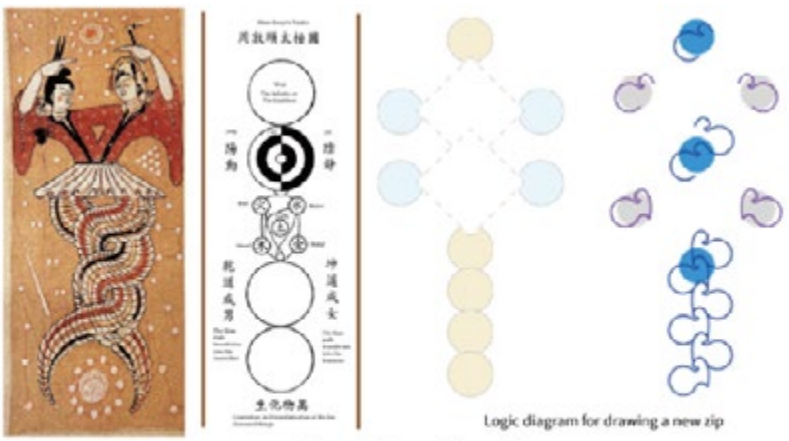


Figure 10 From left to right
Silk painting of Fu Xi and Nv Wa Tang Dynasty (618-907 AD)
Zhou Dunyi's Taijitu diagram
The Logic diagram for drawing a new zip

The interpretation of the Taiji diagram and the symbolism conveyed by the evolution of the zip, they both express the same concept. Not only it is a medium through which one can speak of one's aspirations and express one's feelings through objects, but it is itself rooted in the same cosmic love.

The zip quality demonstrates the worship of the reproduction of all things from nothing and the praise of nature. Just like the connection between human beings and objects, the Chinese are accustomed to express the meaning that everything has a spirit, while in the English system, it will be interpreted as Arnheim's expressive perception of the object. The zip, as a clear object symbol, also encompasses two seemingly distinct cultures, and can even be interpreted from multiple cultural perspectives, which is the root of the love that the universe conveys to us for all of humanity.

References

Slote, J. (2014, July 28). The Zipper - A History [Video]. YouTube. https://www.youtube.com/watch?v=N2f6-t9YmGU

Petroski, H. K. (2000). Invention by Design: How Engineers Get from Thought to Thing (pp. 66–68). The United States of America.

TATE KIDS. (n.d.). Data Sharing [Infographic]. Who Is Yayoi Kusama? https://www.tate.org.uk/kids/explore/who-is/who-yayoi-kusama

Kandinsky, W. 1979.Steinhardt, L. (2017). From Dot to Line to Plane: Constellating Unconscious Imagery in Art Therapy. Art Therapy, 34(4), 166.

The Dance of Rebirth (2023). Walkers Tabloid.

Case, C., & Dalley, T. (2005). The Handbook of Art Therapy (pp. 119-120). Routledge.
Kris,E.(1953)Psychoanalytic Explorations in Art.London,Allen and Unwin.
Sharp,E.(1950). Certain Aspects of Sublimation and Delusion (1930).In Collected Papers on Psychoanalusis. London:The Hogarth Press and the Institute of Psychoanalysis.
Gao, T. (2008). Introduction to Music Therapy (Revised Edition). Beijing: World Book Publishing Company Beijing
Waller, D., & Gilroy, A. (Eds.). (2000). Art Therapy: A Handbook (p. 113). Open University Press.
Rycroft,C.(1985)Psychoanalysis and Beyond, London: Chatto and Windus/Hogarth Press. Stott,J. and Males,B. (1984) Art therapy for people who are mentally handicapped. In T. Dalley (ed.) , Art as Therapy, London: Tavistock.
Arnheim,R.(1954) . Art and Visual Perception.University of California Press.

Aesthetic feeling nourishes the soul: Research on the display design of children's art experience Museum

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Abstract
Children's education forms a crucial foundation for the entire education industry. Over time, the focus of concerns regarding Chinese children has shifted from material aspects to emotional well-being, highlighting the considerable influence of art on children. Children possess varying levels of physical and psychological cognition, which are influenced by their age. Design interventions are tailored to address the distinctive requirements of children at different ages, aiming to offer them an art experiential space that aligns with their physical and psychological developmental stages.

Keywords: Experience Hall; Children; Art education; Display Design

Introduction

An essay named "a strong youth makes a strong country" is showed by Liang Qichao, a famous thinker and educationalist in China. The cultivation of the intelligence, ability and quality of a generation of children is related to the future of the country. In recent years, China's schools have paid more and more attention to children's moral, intellectual, physical and aesthetic education. Schools have rich experience in moral and intellectual education. Physical education in family education can also be improved and exercised through the guidance of parents. Aesthetic education, also known as the education of cultivating beauty [1], needs to be imperceptibly cultivated in a certain place environment, Schools and families not engaged in art related industries cannot provide such places, so more social education is needed to fill the children's awareness of aesthetic education.
IEducation in museums and exhibition halls holds a significant role in social education. However, the majority of exhibition methods in China's existing exhibition halls are geared towards adults, with limited designs tailored for children. Moreover, there is a scarcity of children's pavilions that prioritize aesthetic education. These pavilions are limited in number and exclusively located in large and medium-sized cities. Furthermore, their popularity is limited, and they fail to cater to children nationwide. Therefore, it is worthwhile to explore and research spaces where children can experience and engage with art. Building upon this, we suggest conducting a study on art space experience halls for children that can be implemented in multiple locations, aiming to address the artistic needs of children in diverse areas.

1、Theoretical Review of Children's Art Experience Hall

Currently, there is a scarcity of academic papers concerning children's art experience halls.
The majority of these papers explore the construction of children's art experience halls by integrating perspectives from children's art museums and art education, aiming to fulfill the role of children's art education

[2]. Four domestic studies have focused on constructing children's display spaces with the primary objective of creating independent educational spaces for children. These spaces are designed by analyzing children's psychological and physiological characteristics and considering spatial form and color direction to stimulate children's creativity

[3]. Carving out an exclusive educational space for children within a comprehensive museum provides an environment of educational significance [4]. Designing themed exhibitions that cater to children's interests, accomplished through model construction, scene design, and physical representation in museums, enables the exhibition hall to fulfill an educational role for children [5]. there are sixteen research articles pertaining to children's experience spaces, which can be broadly categorized into two groups: commercial entertainment and educational experiences. Educational research primarily focuses on understanding children's needs and designing spaces that cater to their learning requirements. The fundamental criteria include creating an artistic environment that fosters active learning and captivates children's interest [6].

The above sections represent the current literature available for reference. However, the discussion in China regarding children's art space exhibition primarily revolves around architectural forms and the analysis of exhibition content and methods. There is a scarcity of designs specifically tailored to children, and there is a lack of precedent for researching art display designs based on the distinct psychological development characteristics of children. Therefore, this paper aims to explore exhibition methods that cater to the physical and mental development of children, taking into account the actual needs of Chinese children and their psychological characteristics at different ages. The goal is to nurture the minds of children, provide them with rich and vibrant artistic content, and offer an effective reference for the development of experiential children's art exhibition spaces in related professions in the future.

2、 children's demand for art experience museum design

1. Children's audience groups and objects

This article focuses on the spatial display design of the Children's Art Experience Hall,
specifically targeting children. In our country, there have been varying criteria for defining the age of children throughout history. The Convention on the Rights of the Child, adopted by the United Nations in 1989, defines a child as anyone under the age of 18. The Chinese government ratified the Convention on the Rights of the Child in April 1992, which came into effect at the same time. However, from a physiological perspective, the medical community in my country defines pediatric research subjects as children between 0 and14 years old. Similarly, the age limit for my country's children's organization, Young Pioneers, is also under 14 years old. Taking into account the aforementioned factors and China's national conditions, this article establishes a maximum age limit of 14 years old for children. Psychological research indicates that children around the age of 3 start developing independent thinking abilities. Therefore, this study temporarily categorizes the children under investigation into the age range of 3 to 14 years old, based on an understanding of their cognitive and developmental traits.

2. Cognitive needs of children during their growth stages

Piaget, a Swiss child psychologist, discovered through laboratory testing that children of
different ages make distinct mistakes, while children of the same age tend to make similar types of mistakes. This finding demonstrates that children of different ages exhibit varying patterns of errors. Children's cognitive level and thinking ability vary across different stages, indicating that their development is characterized by stages.

Research on the development of children's aesthetic psychological structure reveals three distinct stages. During the early stages of infancy, from 0 to 3 years old, newborn babies have not yet developed an aesthetic psychological structure. Around the age of 3, children begin to recognize beautiful objects and develop the

prototype of an aesthetic psychological structure.

During early childhood, from 3 to 7 years old, children in this stage can generally appreciate beautiful works of art and develop aesthetic attitudes. However, children in this stage are unable to appreciate abstract, absurd, and non-realistic works. They prefer cheerful and lighthearted stories without tragic elements. During school age, from 7 to 12 years old, children develop relatively stable criteria for beauty and ugliness. They can independently discern between beautiful and ugly objects and start appreciating "ugly" aesthetic forms. Children over 12 years old begin to transition into the stage of artistic aesthetic development [7].

Based on the varying psychological abilities of children at different stages, their cognitive levels and aesthetic development exhibit a phased pattern. Given that aesthetic awareness typically emerges around the age of 3, infants and toddlers aged 0–3 are not considered within the scope of this study for the design of children's art experience exhibitions. Children are categorized into three stages for artistic cultivation: 3–5 years, 6–9 years, and 10–14 years.

Due to the diverse intellectual and cognitive development across different age groups, educational activities must align with the stage-specific characteristics and receptivity of children. Education should not arbitrarily accelerate children's cognitive processes; instead, it must adhere to the developmental patterns of their logical reasoning abilities, following a necessary path to achieve the ultimate educational goals. Therefore, in children's education, it is crucial to identify the interests of children at different stages. Children's art experience centers should be designed with specificity according to the characteristics of children at different age stages, ensuring that their cognitive development is adequately stimulated and enhanced.

3、 Display design positioning of children's art experience hall

The Children's Art Experience Center is a specially designed space for art and cultural education for children. Its aim is to promote children's artistic experience and foster creative thinking through visual, auditory, tactile, and interactive means. The display in the children's art experience hall is an artistic and experiential open space designed specifically for children. The hall focuses on cultivating children's perception and fostering their aesthetic appreciation of art as they engage with and experience the displayed content within a specific environment. Compared to traditional children's museums, children's art experience halls primarily engage children through displays, games, and interactive activities, fostering a sense of participation and enhancing their viewing efficiency, thus promoting their overall abilities. They also enhance children's thinking, creativity, and language expression skills, while cultivating their perception and appreciation of beauty. Art experience halls are designed utilizing spaces similar to museums and science and technology museums. Despite their primary focus on education and training, children's art experience halls offer a greater variety of display media and methods compared to traditional museums and art galleries.

Traditional display design primarily revolves around the exhibits, placing pure visual display as the main focus and adopting a one-way input display method. Visitors are limited to this single mode of observation, which constrains their understanding due to variations in cognitive abilities across different fields, preventing them fromfully comprehending the intended content. Utilizing experiential methods to convey display theme information involves viewers engaging their senses of vision, hearing, touch, smell, and taste to immerse themselves in the experience. This approach breaks free from the previous one-way transmission method, transforming it into a two-way or multi-directional information transmission method. This enables visitors to form a comprehensive and immersive experience, facilitating their maximum cognitive understanding of the displayed content.

Establishing an art experience center for children provides opportunities for personal

engagement, tactile exploration, and sensory experiences. By utilizing art as a medium, children can broaden their understanding and recognition of the diverse content within the art field through active engagement, personal involvement, and direct experience. Nurturing the development of children's logical thinking and imagination and enhancing their creativity are crucial for their overall healthy growth.

4、Space display design strategy for children's art experience hall

1. Children's art experience center display space structure design

The display design of the experience hall includes three module display areas for different age groups, as well as areas for displaying children's work and hosting theme activities. These areas cater to the specific characteristics of children of various ages and provide tailored services for them. The exhibition areas are categorized based on age groups: 3-year-olds to 5-year-olds, 7-year-olds to 9-year-olds, and 10-year-olds to 14-year-olds. Categorizing children into different age groups provides parents and children with guidance, enabling them to have a purposeful visit tailored to their specific needs. This approach facilitates the provision of specialized display experience services for children. For instance, Shanghai Disney Children's Park offers amusement projects that align with children's interests and abilities. Additionally, certain projects provide recommendations tailored to the children's age group.

With a focus on children's art education and training, this approach fosters children's self-development and cultivates their artistic and creative thinking abilities. Each exhibition hall features three themed display modes: exploration, knowledge seeking, and creation. The exploration theme area space, as its name implies, offers children the opportunity to freely explore the display space, akin to embarking on a maze-like adventure. They can delve into their areas of interest, fostering their curiosity, and gaining a deeper understanding of the world while enjoying themselves. In the knowledge-seeking theme area space, visual elements such as dynamic or static pictures, engaging mime performances, character animations, and more, are employed to communicate knowledge effectively. This aids children in building a substantial knowledge foundation. The creation theme area space facilitates interactive engagement between children and pavilion information, empowering them to design their own content and create unique artworks. This fosters the development of children's imagination and hands-on abilities.

The following are modified sentences for the exhibition areas targeting different age groups: (1) Exhibition area for children aged 3-5:

• Exploration module: Offers an immersive experience in the exhibition space, featuring diverse choices and dynamic changes in foot traffic. The space design incorporates exhibits of varying heights to provide children with diverse visual experiences. The flow of people is organized to be straightforward, while the booths and paths are strategically designed with engaging variations in elevation, continuously capturing children's interest, attention, and fostering their curiosity for exploration.

• Knowledge-seeking module: Provides a compact space for individual interactive experiences with dynamic spatial changes. Animated model patterns are employed to enhance children's understanding of the content.

• Creation module: Designed to be ergonomic, concise, and easily understandable for children.

(2) Exhibition area for children aged 6-9:

• Exploration module: Features a semi-open space designed for interactive experiences, where each space is interconnected with short link paths and offers rich variations. The pedestrian flow route is strategically set to an appropriate difficulty level, stimulating children's thinking and fostering their exploration psychology.

• Knowledge-seeking module: Provides expanded spaces for individual interactive experiences with rich spatial changes. Animated model patterns are used to enhance children's understanding of the content.

• Creation module: Designed with an optimized sequence for displaying content cases, facilitating children's

interactive experiences and stimulating innovative thinking.

(3) Exhibition area for children aged 10-14:

• Exploration module: Offers an immersive experience in a diverse and dynamic exhibition space. The design incorporates exhibits of varying heights to offer children different visual experiences. The flow of people is organized to be straightforward, while the booths and paths are strategically designed with engaging variations in elevation, aiming to continuously capture children's interest, attention, and foster their curiosity for exploration.

• Knowledge-seeking module: Provides intimate spaces for individual interactive experiences with rich spatial transformations. Animated model patterns are employed to enhance children's comprehension of the content.

• Creation module: Designed with child-friendly ergonomics, ensuring clarity and ease of comprehension. This space has a better rhythm to display content cases, promoting children's interactive experiences and stimulating innovative thinking.

2. Space scale design of children's art experience halls of different ages

Based on the compiled height reference table for children of various age groups, the average heights of the three age groups range from 90cm to 110cm, 110cm to 130cm, and 130cm to 160cm, respectively. These values are displayed in Table 1. There is a height difference of approximately 70cm between the highest and lowest measurements. Children have varying ranges of vision, and they can fully optimize their experience by engaging in activities within their visual range. Considering the significant height difference, the exhibition hall design should account for variations in children's heights. Additionally, the display design of each venue should be tailored to accommodate different height ranges.

3. Exhibition hall design adapted to children's safety

Within the art experience hall for children, various forms of experiential activities and interactive games are offered. Due to the diverse experiential methods and adaptable spatial configurations, children tend to exhibit more active behavior when excited. Children possess limited self-protective instincts and

Table 1. Children's height comparison table

Children's Height-Age Reference Table											
Height	60	70	80	90	100	110	120	130	140	150	160
Age (years)	0.5	1	1、2	2、3	3、4	5、6	7、8	8、9	10、11	12、13	14、15
Weight (kg)	6	9	64	13	16	19	23	29	34	42/43	48/51
Body Height		56	11	73	82	92	103	110	120	128/129	137/140
Waist Height		39	45	52	59/58	66/64	73/71	80/78	87/85	94/92	100/98
Upper Inseam	13	14	15	16	17/16	18/16	19/17	20/18	22/20	24/22	25/23
Lower Inseam	17	22	27	32	38	43	49	54	59	63	68
Shoulder Width	17	20	22	24	27	29	30	32	35	37	40/41
Sleeve Length	18	21	25	28	31	35	38	41/42	45/46	48/49	52
Chest Circumference				48	52	56	60	64	68	74	80
Waist Circumference	40	42	45	47	50	51	52	55	57	58	62
Hip Circumference	41	44	47	52	58	61	63/62	68/67	73/71	83/77	88/83
Foot Length	9	11	13	15	16	17/18	19	20/21	22	23/24	24/25

exhibit playful tendencies. Therefore, safety measures should be considered during display design to proactively prevent potential hazards.

When designing display racks or space walls, it is crucial to avoid sharp edges and protruding corners, opting for curved surfaces instead. Refrain from employing sharp, rough, or fragile materials within children's reach. The

flooring should be made of shock-absorbent and non-slip materials, and inclined surfaces should replace stairs to ensure better traction. Protruding displays on the ground or walls should be positioned based on children's visual range to prevent accidental collisions.

In the technology experience display area, the ambient lighting should be low to minimize accidental disturbances for children. Design straightforward pathways without obstacles and clearly delineate activity zones within the visited area. Children will engage in practical operations, tactile experiences, and simulated interactions within the exhibition space to avoid overcrowding and competition among them.

During the initial design phase, determine the maximum capacity and individual space requirements. The specific locations can be referenced in Figure 1. Pre-set designated areas, allowing children to engage in activities based on assigned locations to prevent overcrowding.

Conclusion

Fig. 1 Partial display design Picture source: self-drawn by the author

By applying relevant theories from psychology and pedagogy, we can comprehend the characteristics of children at various ages, identify the interests of children across all age groups, choose artistic content that caters to the needs of children in every age group, and present it through targeted design. Regarding the spatial structure, we understand the overall characteristics and needs of children and subsequently incorporate them into each exhibition hall, employing varied spatial display methods based on different age groups. Concerning the design of the spatial scale within the experiential hall, we ensure that children can visit and experience within a suitable range based on their specific conditions. Each exhibition hall should have its own display design size table, taking into account the children's height reference table.

Lastly, in the specific details of each exhibition hall, children's safety concerns are thoroughly addressed. Proactively mitigating risks helps prevent unnecessary accidents. Only by comprehensively considering all relevant factors can we guarantee that children can comfortably, efficiently, and safely engage in display and experiential activities within this space, allowing them to experience the joy of beauty and nurture their souls through aesthetic education.

Reference

[1] Zhou Dechang, Jiang Yuesun. Concise Dictionary of Education [M]. Guangzhou: Guangdong Higher Education Press, 1992-01.

[2] Chi Lanqian, Miao Si. Research on the Construction of MUSE Art Experience Museum [D]. Tianjin: Tianjin Academy of Fine Arts, 2017.

[3] Bi Penghao. Research on Interactive Space Design of Children's Experience Area in Science and Technology Museum [D]. Shandong: Shandong Jianzhu University, 2015.

[4] Ding Jinjin. Research on Comprehensive Museum's Exclusive Space for Children's Education – Children's Experience Museum [D]. Nanjing: Nanjing University of the Arts, 2016.

[5] Wang Yun. On the Display Design of Children's Exhibitions [D]. Shanxi: Shanxi University, 2017. [6] Li Ji. Research on Commercial Display Design with Children's Education as the Theme [D].

Hangzhou: China Academy of Art, 2016.
[7] Wang Zhenyu. Developmental Psychology of Preschool Children [M]. People's Education Press, 2015.

Camellia chrysantha: Illuminating the Rare Flower through Information Visualization Design

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Abstract

Camellia chrysantha(Camellia Chrysantha Tuyama1) , classified as a second-level protected plant in China, possesses significant ecological and practical value. However, due to its high cultivation requirements and the ability to grow only in specific environments, the population of Camellia chrysantha is extremely scarce. Due to the highly ornamental and medicinal value of Golden Camellia, many illegal activities have disrupted its natural habitat. Apart from protected areas, Golden Camellia in many production regions is on the brink of extinction, and some species have already disappeared completely. This paper, viewed through both biological and sociological lenses, explores the visual design techniques and social imagery of Camellia chrysantha. It elucidates how information graphics and visual design can be used to convey information about Camellia chrysantha, including its floral characteristics, cultivation process, and developmental value. The aim is to provide a new exploration and reference for popularizing and conserving endangered plant species. This paper draws on the study of Camellia chrysantha to consider how we should treat our precious heritage that needs to be preserved, and how we can develop and use design.

keywords

Rare Flower; Camellia Chrysantha; Information Visualization; Visual Design.

Introduction

Due to the extremely high ornamental and medicinal value of Camellia chrysantha, many illegal activities have disrupted its natural habitat. Apart from protected areas, Camellia chrysantha in many production areas has been pushed to the brink of extinction, and some varieties have completely disappeared. It can be said that human factors are the primary contributing factor leading to a sharp decline in the population of Camellia chrysantha. Aside from malicious harvesting, Camellia chrysantha has a naturally low fruiting rate, and its community competitiveness is low. Compared to other shrubs, it struggles to gain a dominant position, making population growth exceptionally challenging. Considering all these factors, the endangered status of Camellia chrysantha has remained unchanged for many years.

With the development of the information age, the field of information design has evolved to encompass a rich and practical array of information visualization techniques. In an era where both print and electronic media have thrived, people are exposed to a wide range of information every day. The abundance of textual data can often make people feel overwhelmed and disorganized. The abundance of textual data can often make information

appear cluttered and disorganized. Information visualization, on the other hand, helps people receive the information and updates we need in a clearer and more comprehensible manner. It effectively aids people in swiftly, conveniently, and accurately extracting the meanings concealed within data information, presenting and explaining key information in a highly intuitive visual format. This paper takes Camellia chrysantha as the research subject and employs information visualization techniques to interpret relevant information about this endangered flower. Visual language is used as the primary narrative method. Based on the reflections on the effectiveness of information visualization in communication, this paper analyzes the practical application of information visualization for disseminating botanical knowledge about the endangered flower, Camellia chrysantha. The aim is to express the botanical characteristics, cultivation methods, and research value of Camellia chrysantha in a language that the general public can understand. Ultimately, the goal is to raise awareness for conservation, encouraging people to come together to focus on and protect endangered flowers. This article explores endangered flowers using information design language and practical methods, broadening the design forms for promoting the protection of endangered flowers in China. This approach seeks to capture the reading interest of a broader target audience. Additionally, it holds a certain reference value for the presentation of other ecological issues.

Design Background

In an era where both print and electronic media shine brightly, people encounter a plethora of diverse information every day. The abundance of data presented in textual form can often lead to a sense of disorder and chaos. Data, as abstract facts of the world, requires a method to translate it into concrete interpretations, transforming quantitative data into qualitative information. Information visualization serves as such a method, helping receive the information and update it in a clearer and more comprehensible manner. It aids us in swiftly and accurately extracting the meanings concealed within data information, presenting and explaining key information in a highly intuitive visual format.

While simplifying complex charts, data, and knowledge, information visualization also possesses a degree of creativity and aesthetics, aligning perfectly with contemporary society's needs for information acquisition. British cartographer Henry Beck's design of the London Underground map is often considered one of the earliest examples of information visualization. However, the term 'information visualization' in its modern sense first appeared in the article 'A Cognitive Co-processor for Interactive User Interfaces,' published in 1989 (Card et al., 1989)2. This term referred to the visualization of large-scale non-numerical information content and the application of interactive techniques. Modern information visualization design, influenced by interdisciplinary theories including psychology, sociology, and statistics, has seen a gradual improvement in visual representation capabilities. With the continuous advancement of computer technology, contemporary information visualization design increasingly emphasizes the systematic organization of data information and the artistic expression of visual elements. Information visualization has found extensive applications in various fields both domestically and internationally. However, its utilization in the field of botany is still in its nascent stages. Currently, both domestic and international research in the field of 'Plant Visualization' includes cases such as the foreign paper by Dawei Li titled Digitization and Visualization of Greenhouse Tomato Plants in Indoor Environments.3 In this paper, the author primarily focuses on the digitization and visualization of potted greenhouse tomato plants in indoor environments. Using L-system theory and digitized data, the author constructs realistic 3D models to demonstrate the growth structure and posture of tomatoes. In Data Visualization for Success:Interviews with 40 Experienced Designers4 authored by TULP interactive's Steven Braun, there is a chapter that features the Italian public initiative "Natural Memories". This visualization, based on the data found in "The Future of Plants" (online

resource), presents the medical and culinary values of plants in the form of information visualization.

Information Integration through Visualization Design for Camellia chrysantha

Camellia chrysantha is a rare and fantastical flower. Although it has been recorded in the Compendium of Materia Medica during the Ming Dynasty5, it states, "Tea plants... some have red leaves, some have white leaves, and there are countless variations with slightly different leaves. It is said that there are also yellow ones." In the mid-19th century, the British explorer known as the "Plant Hunter", Robert Fortune, and in the 1940s, the renowned Japanese horticultural expert, Monk Tsuyama, both attempted to trace the whereabouts of the Camellia chrysantha, a flower that was dubbed as the "Plant of Fantasy". However, their quests proved fruitless, and they even left behind works like Adventures in Search of the Imaginary Camellia Camellia for future generations. In fact, the Camellia chrysantha was first discovered in the remote mountains of Guangxi, China, by the botanist Zuo Jinglie in 1933. It was subsequently officially named "Camellia chrysantha" for the first time by the renowned botanist Professor Hu Xiansu in 1965.

The research on the visualization design of Camellia chrysantha, involves the extraction and categorization of information from six main sections: species introduction, distribution habits, cultivation methods, species resources, primary values, and plant culture. This process aims to integrate essential information for the effective visualization design of the simulated cultivation experience of Camellia chrysantha, and laying the foundation for subsequent visual transformation.

Application of color borrowing

In information graphics, readers have a significantly higher perceptibility for colors than for shapes and text. Colors not only attract readers but also, through the use of different hues and brightness levels, help readers quickly organize and categorize information. This greatly enhances the efficiency of readers in comprehending information, assisting them in forming a more comprehensive visual workflow. As shown in Figure 4, the application of colors has extracted the inherent bright yellow, orange-yellow, and orange colors from the Camellia chrysantha as the foundational color scheme. Bright yellow and orange-yellow are derived from the camellia's natural hues, while orange is extracted from the camellia's stamens. Through visual transformation, this color scheme is utilized to express the unique botanical characteristics of the Camellia chrysantha. By mixing a small amount of high-purity green and brown, with high-purity green representing the water source necessary for plant survival and brown representing the soil, this color scheme to some extent replicates the color proportions of the Camellia chrysantha during cultivation and growth. It enhances the reader's impression of the Camellia chrysantha.

Graphic Design

The theoretical foundation of the visual design is built upon the previously discussed integration of information regarding Camellia Chrysantha's visualization. It employs scenario- based flowcharts, visually appealing data charts, and personified illustrations to explore the botanical characteristics and cultural significance of the Camellia chrysantha. The primary design objective is to optimize the dissemination of botanical knowledge, incorporating elements of fun and educational value into the visual format. In the transformation of information related to the Camellia chrysantha, many pieces of information naturally follow specific steps. Flowcharts, as the name suggests, are ideal for visually describing the concrete steps of a workflow. Using graphical representations to convey the flow of ideas is an excellent method. In the transformation of specific information about Camellia chrysantha, a simple and easy-to-understand activity flowchart can assist readers in quickly organizing the sequence of activities. This makes the logic of activity planning and thinking clearer and smoother, promoting more efficient communication of activity information. Flowcharts consist of three major types of structures:

sequential structure, selective structure, and loop structure. In this paper, the primary structure used is the sequential structure.

First, identify and distinguish the categories of scene-based flowcharts. As seen in Figure 1 below, the content displayed in this figure is all related to processes, but the categories are different. In the cultivation overview, the flowchart steps are primarily based on the sequence of cultivation steps. On the other hand, in the timeline of significant events related to Camellia chrysantha, the flowchart steps are based on the years when major historical events related to Camellia chrysantha occurred. Although both are flowcharts with a sequential structure, the logic behind the flowcharts differs.

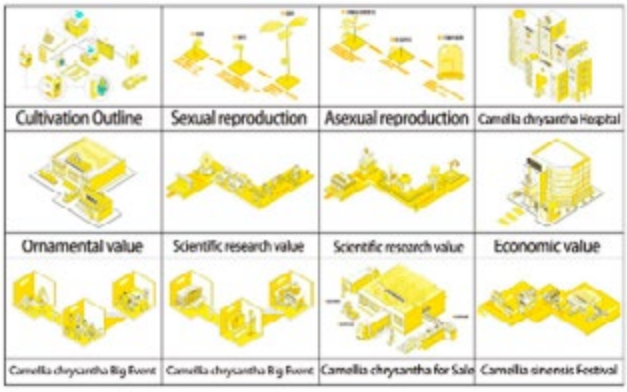

Figure 1. Scenario based flow chart table

Taking Figure 2 as an example, the flowchart depicting the chronology of significant events related to Camellia chrysantha relies primarily on chronological occurrences. The key techniques employed are the use of arrows and steps. These elements play an incredible role in this image; even without any accompanying textual explanations, the visual focus naturally follows the directions they indicate. Arrows have the dual function of representing the passage of time and the movement through space. Step3 explains the sequence of events from the initial discovery of Camellia chrysantha by Zuo Jinglie in the remote mountains of Guangxi, China, in 1933, to its formal naming by the botanist Hu Xiansu in 1965, and finally its classification as a national protected species in 1984. These significant events, timelines, and settings are elegantly encapsulated in a single visual representation, following the chronological order from 1933 to 1984. The use of arrows and steps conveys the spatial dimension of these events, adding depth to the visual narrative.

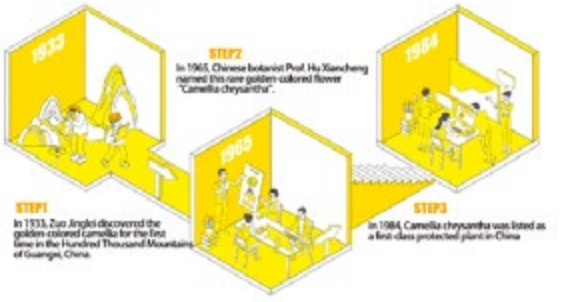

Figure 2. Timeline of Camellia chrysantha

The arrows in Figure 3 primarily represent spatial movement. Although there is only one arrow in the image, the combination of the arrow and lines provides direction for the reader's visual movement. Readers follow the guidance of the arrow and lines as they embark on a journey through the Camellia chrysantha Festival. They start with the culinary activities at the first, second, and third stops, proceed to the exhibition and sale of Camellia chrysantha flowers at the fourth stop, and finally end with home delivery of purchased items. The construction of a three-dimensional scene enhances the spatial perception of the illustration, making the flowchart more vivid and intuitive.

Figure 3. Festivals of Camellia chrysantha

Visualized information graphics in design mainly involve the integration of concrete information about Camellia chrysantha and abstract information through the use of visual graphics. Concrete information includes specific addresses, plant morphology, diseases and pests,

and control methods, while abstract information includes nutritional components and causes of death, among others. As shown in Figure 4, visual graphics and specific information are seamlessly integrated, assisting in the interpretation of information through a method of text-graphics isomorphism, which enhances the recognizability of the graphics. Visual graphics serve as the primary design element, while text provides further explanations of the graphics.

Figure 4. Visualize data charts

Taking Figure 5 as an example, it concretely represents four types of pests that cause damage to Camellia sinensis: winged viviparous tea aphids, scale insects, tea seed weevils, and wood- boring moths. Readers not only experience visual beauty and enjoyment but also gain insights into the specific forms and levels of harm caused by different pests. This eliminates the unfamiliarity readers might have about these pests, enhances memorization, and achieves an educational and entertaining effect.

When dealing with abstract information without a specific visual form, it requires the use of imagination and creativity to represent the essence of the information intuitively and rationally. In the visual representation of Camellia chrysantha's nutritional components, as shown in Figure 6, The function of total saponins has been creatively imagined and depicted. Total saponins have the effects of promoting blood circulation, regulating menstruation, relieving pain, and alleviating itching. In this visual representation, a child stretching and flexing their healthy limbs is depicted. This simple and relatable form is more likely to resonate with the audience's emotions.

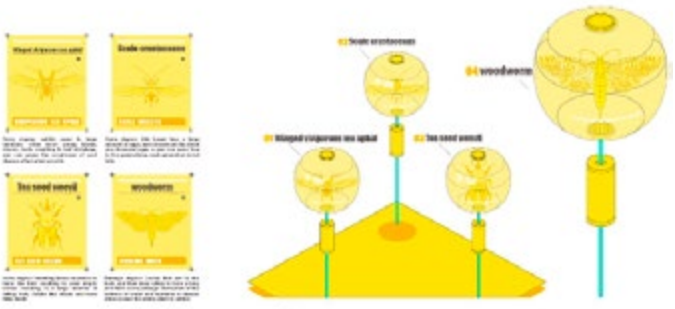

Figure 5. Pests

By extension, visual design doesn't limit the interpretation of text to its literal expression but also employs abstraction, imagination, and visual representation to convey its meaning. Information visualization transforms specific information about Camellia chrysantha into corresponding visual images, making the plant's image less distant and unfamiliar. Instead, it becomes imbued with botanical features and characteristic attributes. This approach achieves a comprehensive visual interpretation of the information, making botanical education less rigid and more engaging. At the same time highlights Camellia chrysantha's botanical characteristics and cultural significance.

Figure 6. Nutrient composition

Conclude

Through studying and researching relevant theories such as information charts, rare flower Camellia chrysantha, visual design, and principles of visual design, explored ways to promote and protect rare flowers. As a result, a completely new visual design pattern for the protection of rare species has been proposed. This work integrates and summarizes information on six aspects of Camellia chrysantha: species introduction, distribution habits, cultivation methods, species resources, primary value, and plant culture. Information visualization design is used as a design technique to explore the advantages of information visualization in popularizing and protecting rare flowers. The design combines functionality and interest, further exploring the visual design research on rare species' visualization.

The aim is to explore the integration of information visualization design with the conservation of endangered wildlife, specifically focusing on Camellia chrysantha. Through information visualization design, the goal is to transform informational text content into a visual language that is both intuitive and engaging. This approach aims to effectively disseminate information related to endangered wildlife species, including Camellia chrysantha. The intention is to enable readers to interpret information efficiently within a relaxed and enjoyable atmosphere, fostering an understanding of the current status and cultural significance of endangered wildlife species. Ultimately, raises awareness and encourages more people to prioritize the conservation and promotion of rare species.

Reference

Lü, S., Pan, J., & Ren, Y. (2019). Research on Information Visualization Methods Based on Elderly Potted Plant Enthusiasts. Art Appreciation, 18, 71.

Zhang, L. (2017). Research on Information Visualization Design of Plants in the "Book of Songs". (Master's thesis). Xi'an Academy of Fine Arts.

Dawei Li,Lihong Xu,Chengxiang Tan,Erik D. Goodman,Daichang Fu,Longjiao Xin. Digitization and Visualization of Greenhouse Tomato Plants in Indoor Environments[J]. Sensors,2015,15(2).

Steven Braun.Data Visualization for Success:Interviews with 40 Experienced:Interviews with 40 Experienced Designers[M].Images Shenyang,2017

Johnson, S. (Author), & Xiong, T. (Translator). (Year). Death's End: How London's Great Plague Devastated a City and Shaped the World Today.Electronic Industry Press.

G.Robertson,S.K.Card and J.D.Mackinlay.The Cognitive Co-processor for Interactive User Interfaces.Proceedings of the ACM SIGGRAPH symposium on User interface software and technology,1989,Pages 10-18.

Zhang, W., & Cai, X. (2021). An Exploration of Information Visualization Design for Minnan Dialect Characters. Art World, 37(06), 149-158.

Li, S. (2019). Compendium of Materia Medica [M]. Beijing United Publishing Company.

Nigel Holmes .Wordless Diagrams[M].Bloomsbury USA.2005

Shen, F. (2018). An Analysis of Visual Elements in Information Visualization Design. Western Leather, 40(21), 95.

FU Jian-nan. The Application of Graphic Symbols in Graphic Design[J]. Business Herald, 2011(14): 265.

Yan. Discussion on the Application of Figurative Graphics in Logo Design[J]. Art and Technology, 2013 (6): 179.

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Designology of the Live Creature: Designing for love ——Research Series on the Construction of the Theoretical System of Modern Designology in China

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Abstract

Abstract: From the perspective of Design, the "Zibo Barbecue" event is not just a lively tourism activity, but also a social design that starts from human nature based on the principle of heaven and benefiting people. Through phenomenological analysis, Zibo, as an emerging tourist city, stands out because it returns to a city life world full of human warmth and love, reflecting a designology problem of the live creature. Starting from the life where human nature precedes materiality, a holistic living world that integrates human survival and vitality is designed, which is the true world of humans. The Live Creature Design aims for good governance, pursuing the long-term well-being of humanity and improving social order.

Keywords: Zibo Barbecue, the Live Creature Design, heaven and benefiting people, design governance, good governance

1 ZIBO BARBECUE: DESIGNOLOGY OF THE LIVE CREATURE

During this year's May Day holiday in 2023, the "Zibo Barbecue" (Figure 1) was extremely popular. It was the first May Day holiday after three years of the end of the pandemic, and it was a retaliatory tourism vacation. People returned to the bustling world, where trust and kindness between people were restored, and they returned to the authentic world of human connection - a return to a city life filled with human warmth and love. According to the explanation of 'love' in Webster's Dictionary, this emotion originates from intimate relationships between people or the connection between people and things, and it can also originate from admiration, benevolence, or common interests. From the perspective of Design, Zibo Barbecue event is a true design force, a design that revives the essence of human life, a design for '活 人'(Huoren) - a genuine design for life. Therefore, I propose the question of "Designology of the Live Creature."

Figure 1: Zibo Barbecue, via Baidu Commons (https://baijiahao.baidu.com/s?id=1765326828985409868&wfr=spider&for=pc)

1.1 The concept of Huoren

What is the Chinese term '活人'（Huoren， the Live Creature, Living Creature, Alive Creature) mean? According to the explanation for 'Huoren' in the Chinese Dictionary, there are two basic meanings: 1. to make a person alive; to save someone's life. 2. a person with life. Both of these definitions emphasize the fundamental qualities of a person - their survivability and their life. Survivability emphasizes the physiological, individual, and unique way in which a person exists, which is the manifestation of the continuous movement and development of the human body. Life emphasizes the social, valuable, and transcendent way in which a person exists, which is the core value pursuit of the construction of the human living world. Survivability is the foundation, and life is the characteristic; they are inherently consistent. 'Living creature' is a holistic living world based on the continuity of existence and filled with life. Designing from the perspective of a 'living creature' should be the foundation of design, as well as the foundation of fields such as 'social design' and 'service design' today. Designing for 'living creatures' is a form of design governance - the pursuit of quality in human life, social innovation, optimization, and well-being."

1.2 The Live Creature

The concept of "the Live Creature" is closely related to the American philosopher Dewey. Dewey discussed the issue of "the Live Creature" in his book "Art as Experience". Dewey is widely known as one of the most important thinkers of the 20th century, and "Art as Experience" is a core text in his aesthetic system. Dewey's aesthetic system, and even his entire philosophical system, is derived from a fundamental concept he created - "the Live Creature". The first chapter of "Art as Experience" discusses this concept, highlighting the significant role Dewey assigned to it. In Chinese translations, "the Live Creature" is generally translated as " 活的生物 " (Gao, 2006) or " 活的生灵 " (Sun, 2015).In the Chinese language system, the term " 人 " not only refers to humans who have the social and creative value that distinguishes them from other animals, but also encompasses all things and matters that are beneficial to society and serve humanity, known as " 人事 ". Similarly, in English, the term "Creature" refers not only to animals and plants but also to humans and their affairs. Considering this, I believe that translating it as " 活 人 " is more rational and aligns better with Dewey's ideas. He sought to overcome the dualistic concepts of essence and appearance, subject and object, matter and spirit, art and non-art, nature and society, theory and daily life. Instead, he aimed to emphasize the continuity between human animality and humanity, the continuity between nature and society, the continuity between artistic experience and everyday experience, and the continuity between art and technology. These ideas are rooted in a monistic theory of life values centered around humans. As he said, "The first great consideration is that life goes on in an environment; not merely in it but because of it, through interaction with it. No creature lives merely under its skin; its subcutaneous organs are means of connection with what lies beyond its bodily frame, and to which, in order to live, it must adjust itself, by accommodation and defense but also by conquest. At every moment, the living creature is exposed to dangers from its surroundings, and at every moment, it must draw upon something in its surroundings to satisfy its needs. The career and destiny of a living being are bound up with its interchanges with its environment, not externally but in the most intimate way."

1.3 Living Creature Design

The concept of Living Creature Design refers to a design approach that truly embodies the essence of humanity. Living Creature Design is not just about the physical aspects of design, but rather about designing with the intention of bringing life to people. It is a vibrant and dynamic form of design that is rooted in the human experience, rather than being abstract or detached from human nature. Living Creature Design also aims to give meaning and value to the world, and to foster a harmonious relationship between humans and nature, design and the environment, design and life, design and civilization, technology and life, and design and human well-

being. The final goal of the Live Creature Design is to realize the ultimate value of human beings. This kind of designology is based on the principles of heaven and benefiting people. This is a naturalistic ontological design theory of human nature, not a conceptual ontological design theory, nor just a human-centered design theory. Naturalistic ontological design theory emphasizes that human design and creation originate from nature, imitate nature, follow nature, surpass nature, create new nature, and ultimately return to nature. Nature is always the premise and demand for human design and creation, as well as the constructed world of the continuous natural organism of human existence, life, and development. Therefore, this living creature design theory is essentially a design approach that seeks long-term human well-being based on design governance - a truly vibrant design theory that empowers people.

2 DESIGN GOVERNANCE: DESIGNING FOR HUMAN NATURE

Naturally, the governance of design has gradually become a key issue in the construction of human design theory and design discipline. When I first proposed the concept of "design governance" in 2019, I primarily focused on the logic and demands of the construction of contemporary design theory in China. I believe that the construction of contemporary design theory is a completely new endeavor, which requires the creation of a large number of new concepts and categories based on national development, practical design needs, and future development trends of humanity. Only in this way can we have new materials for the construction of a new design theory system and truly achieve the creation of a new design theory system, establishing a contemporary design theory system in China that is distinct from other design theory systems in the world - a third kind of system. This will positively contribute to the design discipline in China and humanity as a whole.

Based on the logical structure constructed by the contemporary design theory（Figure 2）, design governance belongs to the core category of the social-designology system, which is one of the three major structural components (meta-designology system, prax-designology system, and social-designology system) of the contemporary design theory. The social-designology system (also known as the industrial design system) refers to the comprehensive integration of the meta-designology system and the parx-designology system, promoting the design behavior system of the human living world. It is a fully integrated and innovative system that combines design theory systems (discourse system, academic system, disciplinary system, technical system, management system, behavioral system, etc.) with human social practice.

Figure 2: the contemporary design theory system.

Nature itself is inherently beautiful, harmonious, and perfect. There is no such thing as a "governance" issue in nature, as nature does not require human governance (most human attempts to alter nature result in its destruction).

Therefore, when creating the system of "artistic beauty" and establishing human standards of beauty, the goal or standard pursued is that of "natural beauty". The Enlightenment era, which emphasized comprehensive understanding of nature, learning from nature, and creating new "natural" elements, initiated a great movement in human design and governance. As creations of the human-made world, designs, arts, and all human behaviors and creations (artifacts) have inherent imperfections, flaws, and unnaturalness. These issues stem from human imperfections, limitations due to time and place, and various subjective and objective factors related to human existence. Therefore, human design is constantly striving for goodness and beauty, and is always in need of progress and implementation of "design governance".

Since the Industrial Revolution, the field of human design innovation has experienced rapid development. Humans have gained increasingly powerful abilities to transform nature and create an artificial world. Artificial objects have come to occupy a significant portion of human life, greatly altering our ways of survival and living. In particular, the issue of "gigantism" coined by Mumford, which includes mega-cities, mega-buildings, and mega-machines, has led humans to become increasingly distant from nature and live in a busy and terrifying state. The relationships between humans, nature, and society have become more unfamiliar, and we have lost the natural emotions and care that humans should possess. The "Zibo barbecue" event can be seen as a case of design governance, aiming to return to a city life that embraces human warmth, integrity and humanity.

3 CONCLUSION

Living Creature Design in order to make people more vibrant and humanity, through design governance to make the natural and cultural life of people as a whole. Design governance is an integral part of the national governance system and is a form of good governance (Zou, 2021). This form of good governance is a governance system that showcases the holistic design activities of humanity under systematic thinking. I have previously elaborated on the basic structure and core issues of the theoretical framework of design governance in my article "Design Governance" (2021). However, there is still a need for more efforts and advancements in the systematic study of the theoretical framework of design governance.

REFERENCES

[1] Webster Dictionary.Retrieved July 25, 2023.from https://www.merriam-webster.com/dictionary/love.
[2] Chinese Dictionary.Retrieved July 25, 2023.from https://www.hanyudacidian.cn.
[3] Dewey, J.(1980).Art as experience.New York: Penguin Publishing Group,13.
[4] Gao,J.P.(2006). 从自然王国走向艺术王国——读杜威美学 [From the Kingdom of Nature to the Kingdom of Art: Reading Dewey's Aesthetics]. Journal of Graduate School of Chinese Academy of Social Sciences(05),103-109.
[5] Sun, B.(2016). 艺术在何种程度上是一种行动？——对杜威美学思想的一个考察 [To what extent is art an action? -- An investigation of Dewey's aesthetic thought].Journal of Tongji University (Social Science Edition)(04),82-88.
[6] Zou,Q.C.(2021)." 设计治理 "：概念、体系与战略——" 社会设计学 " 基本问题研究论纲 [Design Governance": Concept, System and Strategy -- Research outline on the basic issues of "Social-designology"]. Journal of Cultural and Artistic Studies(05),53-62.

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More than human-centered design: Drawing Nourishment from Chinese Philosophy

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Abstract

The current "human- centered " design, which is essentially based on the anthropocentric dichotomy of subject and object, is fundamentally flawed. The reality we are experiencing is the end of nature, the rise of autonomous smart objects and artificial intelligence, new technologies, forms of power, and cognitive logics are being constructed. This paper reflects on the shortcomings of human- centered and looks beyond it to introduce the philosophical ideas of the Chinese philosopher Shiying Zhang, and proposes the Chinese wisdom of the design idea of the "All Things Are One". The Western enlightenment has aroused mankind's concern for their own value, but it has also brought about the tragedy of anthropocentrism. The unity of Eastern philosophy can provide nourishment for new design ideas and offer possibilities for future design.

Author keywords

Flaws of Human-Centered Design; More than Human-Centered Design; Chinese philosophy; All Things Are One; Future design.

Flaws of Human-Centered Design

Since the 19th century, modern design has continued the trajectory of conquering nature initiated by the Industrial Revolution(Bardzell et al., 2021), and has continued to expand its influence along with the expansion of commerce. From ergonomics to design thinking, the concept of "human-centered" design can be traced back to the Renaissance artists' focus on the aesthetics of the human body. Later, driven by business, ergonomics, UCD, HCD, design thinking and other design-related concepts were proposed and developed. Human-centered is constantly reinforced and has even become a metaphor for innovation. Through the commitment of "human-centeredness", design has indeed achieved success in practical business.

However, "human-centered" is rooted in anthropocentrism, which implies a view of humans as the center of the world and all other entities as means to achieve human goals(Ma, 2015; Shotunde, 2022). As design increasingly becomes a tool for solving complex problems, intervening in social issues, and even contributing to the transformation of human well-being, the validity of the "human-centered design" approach is constantly being questioned(Cruickshank & Trivedi, 2017; Forlano, 2017; Stead & Coulton, 2022a). Modern design has evolved with capitalism, and human-centered has been alienated in practice. In a way, the more human-centered the design process is, the more likely it is to reinforce the damaging effects of this perspective.

Alienation of Human

The concept of "human" has continued to expand, evolving from the original notion of users and consumers to

more recent understandings of human beings, communities, and societies in order to adapt to the evolution of society. However, this may be futile as design approaches developed from "human-centered" principles such as empathy have been shown to be biased (Bloom, 2017; Soni et al., 2022). We are biased in favor of people who are physically similar to us, come from the same race or ethnicity, think in a similar way to us, and have similar values and beliefs. in a similar way to us, and share similar values and beliefs. Moreover, the logic of empiricism often leads designers to be more concerned about their immediate environments, communities, and countries. Consequently, in the current design discourse, the concept of "human" is frequently limited to young, affluent, and relatively privileged white males who are immersed in Western cultural contexts, have received higher education, possess industrialized democratic ideologies(Forlano, 2017).

Driven by the growth-oriented business world, designers are expected to create value for companies, and are even kidnapped by them to study human weaknesses and stimulate user desires, elevating "addiction" to one of the highest honors(Chianella, 2021; Neyman, 2017). The emotions, experiences, social relationships, values, etc. of human beings as complex creatures are often simplified into commercially favorable data and labels that become fodder for the addictive system. Individuals gradually become slaves to their desires, losing the basic ability to think critically and distinguish reality from illusion, while designers unwittingly play the role of "accomplices".

The reality we are experiencing is the end of nature and the rise of autonomous intelligent objects and artificial intelligence(Barrat, 2023; Zhang & Tao, 2020). The interwoven, interdependent systems of humans, technology, and algorithms are breaking through the narrow understanding of "human" that industrial age designers had. The users of the design process are evolving from concrete individual to information that only contains business needs that can summarize people's behaviors, preferences, emotions and even desires, and the relationship between people is being alienated into a string of codes.

Alienation of Non-human

Non-human encompass non-human animals, plants, fungi, and various other life forms, as well as a range of objects, from rocks, landscapes, and bodies of water to natural ecosystems and human-made artifacts(Mathews, 2011; Veselova & Gaziulusoy, 2022). When people are simplified into consumption-related roles, non-human beings are often regarded as assets or resources whose own meaning and value are ignored. For instance, in urban planning and design, human-centered principles often overlook the fact that cities fundamentally involve a vast space of interaction between humans and non-humans(Tomitsch et al., 2021). The early emphasis on human-centered urban design often resulted in the disappearance of non-human organisms.

At a certain stage of development, what was considered to be of no value in "human-centered" design began to be considered valuable, and new problems caused by human-centered design came to the fore. But even this emphasis on diverse life forms is still built around the premise that humans are the measure of all things. Animals bestowed with cultural value, such as cranes, giant pandas, and golden monkeys, receive additional attention and may even have dedicated conservation areas established for them. On the other hand, species with negative reputations or perceived threats to humans, like mice, mosquitoes, feral cats, and wild dogs, are vigorously eradicated as pests(Smith et al., 2017).

"Human" implies an inherent subject-object dichotomy with other non-human life forms, and "center" implies a hierarchical order favoring humans. In this framework that encourages binary opposition, relationships between humans and non-human entities are construed as interactions between subjects and objects. The intricate, multi-faceted connections between humans, nature, and artifacts are mechanistically reduced to utilitarian judgments of usefulness. It creates psychological distance between humans and animals and the natural world, fostering a utilitarian attitude towards the world and challenging fundamental ethical perspectives(Donly, 2017; Plumwood,

1993).

More than Human-Centered Design

As Montiero puts it, "The world is working in a designed way. But it's not very well."(Monteiro, 2019) In the face of current and possible future challenges, the design field has, on the one hand, continuously adjusted the connotation and practice of human-centered, and on the other hand, it has also borrowed many theories from ecology and postmodernism to try to break out of the anthropocentric framework, to reflect on human-centered design, and to re-position the contribution of design so that it can go beyond consumption and towards sustainable development.(Blevis & Stolterman, 2009).

Design related to ecology

Within the framework of human-centered design, the more human designers emphasize the understanding, development, and focus on human needs, the less attention is paid to other non-human forms of life in the design process. Driven by factors such as environmental threats and sustainability imperatives, certain design research and practices are introducing ecocentric theories to explore emerging design fields that attempt to reawaken awareness of other non-human entities in the natural world, such as animals, plants, and microorganisms. Simultaneously, this shift beyond the human-centered perspective enhances people's understanding of the interdependence between the human subject and the natural world(Coulton & Lindley, 2019; Haraway, 2016; Poikolainen Rosén et al., 2022).

Ecocentrism acknowledges the contributions of non-human to our lived world, recognizing that a sustainable world cannot be solely human-centered. By emphasizing the roles and interactions of non-human like animals, plants, microorganisms, mountains, rivers, and nature itself, it promotes a view of more than human-centered. For example, the use of fungi in textiles(Chieza & Ward, 2015; Jones et al., 2021).

Green design, life centered design, biological design(Karana et al., 2020), and so on are all reflections on human centered design that integrate ecologism. Although in essence, human designers cultivate and control non human life forms by considering the needs and intentions of organisms, in order to achieve a desired effect or be utilized by humans, it does not treat these non human life forms as equal subjects with humans(Keune, 2021). But recognizing from a sustainable perspective that humans and all things in the world are not in a relationship of conquest and conquest, but rather coexist on the same Earth, surpassing traditional "human-centered" design.

Design related to technology

In addition to advocating for the development of new design disciplines to address ecological concerns, emerging issues from technological advancements have gradually rendered "human-centered" design less feasible. For instance, new technologies have transformed the invisible interactions between atomized artifacts of the industrial age into a networked structure in the non-internet world(Pierce & DiSalvo, 2017; Stead & Coulton, 2022b). This has resulted in novel forms of agency, value, and power, human-centered design can be counterproductive. Long before the broader, chaotic social impact of these technologies, the field of human-computer interaction was already introducing different theories to speculate about potential futures(Rod, 2009).

Whether it's introducing philosophies like object-oriented ontology(Hayles, 2014; Lindley et al., 2020), animism(Marenko, 2014), or actor-network theory(Yaneva, 2009) and feminism(Buchmüller, 2012) from the humanities and social sciences, these views emphasize the transcendence of human-centeredness. They break down the boundaries between traditional dichotomies such as humans and objects, nature and artificiality, and humanity and technology. These perspectives advocate for non-human subjects like data, technology, and viewpoints to be treated as research subjects, and emphasize the interdependent relationships among these subjects, refraining from assigning any viewpoint, especially human viewpoints, as the definitive perspective.

While the new design field related to ecology calls for moving beyond human-centered to focus on non-human life forms, it still often perceives these entities as resources for human well-being. On the other hand, the design considerations related to technology, particularly in the realm of human-computer interaction, strive to treat humans and non-human equally as forms of existence(Gurpinar, 2022). But this idea is not widely used, not distinguishing between human and non-human may also create an identity crisis for humanity.

Discussion

It's becoming difficult to staunchly uphold the tenets of "human-centered." Apart from its hierarchical categorization of all things and its disruption of the symbiotic relationship between humans and nature, leading to ecological crises, this view is also challenged by the impending future where technological developments are causing the boundaries between technology and humanity to become increasingly indistinct. Natural language processing, social robots, artificial intelligence, cyber-physical systems, virtual reality, augmented reality, and neural implants are all exploring the limits of the convergence between human endpoints and technological beginnings(Frauenberger, 2019). Technology has shattered the industrial-era definition of "artifact" where it no longer only refers to physical entities but also includes invisible elements like data, algorithms, regulations, and business models. Similarly, in the future, the concept of "human" may no longer be limited to traditional "humans" but could encompass semi-mechanical entities, artificial intelligences, and other forms(Clarke, 2005).

The influential design perspectives mentioned above that transcend anthropocentrism are rooted in a reflection on the problems encountered in the practical application of "human-centered." However, these explorations, on the one hand, it has not completely broken away from the dualistic thinking inherent in the Western perspective, which tends to adhere to a problem-solving paradigm that is insular in nature. On the other hand, these explorations are still utilitarian in nature, sidestepping the alienation of relationships between humans and other things in the world as well as between humans themselves that are resulted by human-centered design.

Drawing Nourishment from Chinese Philosophy

Differing from the path of Western philosophical development, traditional Chinese philosophy embraces a holistic perspective that considers all things interconnected. In the increasingly complex context of today's society, this perspective offers new avenues for the advancement of design. However, Chinese traditional philosophy is hard to summarize. Thus, this text draws upon the philosophy formulated by Chinese philosopher Shiying Zhang, who combined the strengths of both Chinese traditional philosophy and Western philosophy(Keji, 2006). This theory different from all of the above theories, contains Chinese wisdom.

Worldview

Regarding the relationship between humans and the world, there are two viewpoints. One regards the world and everything in it as external to humans. In this perspective, humans are the subjects while others and objects are the objects, and the subject aims to understand and conquer the object's nature and laws, making the object useful to the subject.

Another is to view all things in the world as interconnected with human flesh and blood. All things in the world, including human innate and acquired physiological and psychological factors, form various intersections in varying degrees of distance and ever-changing ways. These intersections constitute all things in the world and form a whole with them. Others and other things are not objects of exploitation and conquest, but an equal whole, that is, a worldview of "All Things Are One".

However, the all things are one not mean that animism or pantheism ignores the uniqueness of human beings. Chinese philosophy recognizes that human beings are coexisting in the world with all things in the world with the identity, and at the same time, it emphasizes more on the uniqueness of the value of human beings. That is to say,

the love,emotion,understanding of human beings for all things in the world come from the sense of responsibility brought about by this oneness and uniqueness that human beings purposefully and consciously integrate their destiny with that of all things in the world.(Shiying, 2020).

In other words, under the framework of this view on the relationship between human and the world, it not only overcomes the lack of individual consciousness in the traditional view of the unity of heaven and man, but also overcomes the dualistic thinking that people are opposed to everything in the world. On the one hand, it recognizes and encourages people's subjective initiative, that is, people can know others and other things and use them for themselves. On the other hand, the emphasis of human beings and all things in the world lies in the integration of interactive relations(Chunfang, 2022), rather than in who is the center.

Three Turns

This philosophical theory of the "All things are one" is reflected in the three turns of design, namely, from empathy to sense of responsibility, from static closed system to dynamic open system, and from human-centered to improving life-realm.

From empathy to sense of responsibility

In a human-centered framework, a common challenge is that people have difficulty connecting with the non-human world (animals, plants, natural ecosystems, etc.). People tend to interpret the world in terms of their own values and experiences. In the human-centered framework, designers' understanding of human needs come from empathy, and in the development of design as a discipline, methods such as experience mapping, design walkthrough, and role playing have been developed to amplify this empathy, but this cannot overcome the bias and resulting alienation generated through empathic empathy.

In Shiying Zhang's philosophy, Because people and all things in the world are in a common, interrelated and interdependent world, there is the possibility of understanding the connections and modes of connection that constitute all things in the world. Man does not stand outside the world and "watch" the world, but as a participant "entangled" in the world of all things. This knowledge of the nature of the things that make up the world is also the reason for the sense of responsibility between man and everything in the world, and it gives man and everything in the world the possibility of mutual understanding, dialogue and connection. This sense of responsibility of human beings is to treat all things in the world equally without any difference between near and far, so that both the concepts of users, consumers and stakeholders constructed by the business man and the instinctive bias of people's nearness and farness will be dissolved.

From static closed system to dynamic open system

The traditional "human-centered" design often follows the problem solving model, and design is to solve human problems. But where the problem came from, why it exists, and whether solving it in a certain way will create new problems are all neglected. This paradigm tends to limit the designer's experience to specific events and thus lagging and isolated. At the same time, In an increasingly complex society, although it has become common knowledge in the design community that design is regarded as a system, the current human-centred design takes "people" as the logical centre and the process of satisfying human needs as the boundary, and pursues to exhaust all the possibilities in the system and to give answers and improvement solutions based on specific problems. But can designers really exhaust the problems, scenarios and solutions? Must human needs be realised in a specific way?

Under the philosophical logic of the "all things are one", all things in the world, including visible and invisible, innate and acquired, physiological and psychological factors, are the factors that constitute all things in the world. Behind the present factors such as human, scenes and processes, there are endless absent factors such as human emotions, social relationships, preferences and so on. The focus of design is on what constitutes the

absence behind these presences, and what absences allow the presence to emerge. which means to focus on the factors behind the problem and the linkages between them in the light of reality in order to build a dynamic and open system that can be adapted to contribute to the realization of individual and societal needs and well-being.

From human-centered to improving life-realm

In the human-centered framework, human are often regarded as the measure of all things, and it is believed that taking care of individuals can take care of society. However, most things in the world are designed without the human-centered design process, and the scale that regards human as all things's center is also quite short from the time dimension of human existence. In fact, human-centered design covers up human beings' pursuit of a better level of a better life and simplifies it into the utilitarian satisfaction of needs. Adhering to human-centered design can indeed avoid creating unwanted products or products with no commercial value, but it cannot reflect the value of design.

In Shiying Zhang's philosophy, although human beings are the same as all things in the world, they are also special, similar to but different from all things in the world, and because they have "Ling Ming（灵明）"(Shiying, 2020). Taking people as the center and treating others as the object and the object to be used inevitably leads to the lack sence of "All Things Are One", and the fundamental thing to change this situation is to improve the life-realm of human(Shoukan, 2005). The life-realm of human life is exactly the world in which a person is illuminated and in which he lives. That is to say, life in the world does not lie in the satisfaction of needs, but in the fact that people can recognise the true nature of things, through design, people can recognize the real face of things, inspire a sense of similarity and responsibility for all things in the world, so as to achieve the realm of "all things are one", and realize the education of human beings, the transformation of society, and the enhancement of the spiritual realm of human beings.

Conclusion

More than human-centered design is a new idea put forward by some researchers with foresight and future perspective in the face of the dual problems of environmental crisis and technological change in recent years. Faced with different specific problems, the current design research has made some responses, but just like "human-centered" has its own Eurocentric bias(Reisenbichler), Beyond human-centered does not escape this bias.

This paper attempts to introduce Chinese philosopher Shiying Zhang's theory of "All Things Are One", overcome the defect of "human-centered" and put forward a design view with Chinese wisdom for the future world. However, this new viewpoint is not to deny the efforts made by design researchers, nor is it to argue that "human-centered" is outdated, but to draw nourishment from Chinese philosophy to enrich the design theory beyond human-centered.

References

Bardzell, J., Bardzell, S., & Light, A. (2021). Wanting to live here: Design after anthropocentric functionalism. Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems,

Barrat, J. (2023). Our final invention: Artificial intelligence and the end of the human era. Hachette UK.

Blevis, E., & Stolterman, E. (2009). FEATURE transcending disciplinary boundaries in interaction design. Interactions, 16(5), 48-51.

Bloom, P. (2017). Empathy and its discontents. Trends in cognitive sciences, 21(1), 24-31.

Buchmüller, S. (2012). How can Feminism contribute to Design? A Framework for a feminist Design Research and Practice.

[Record #197 is using a reference type undefined in this output style.]
Chieza, N., & Ward, J. (2015). Design in the age of living technology. Proceedings of the 2nd Biennial Research Through Design Conference,
Chunfang, G. (2022). On Zhang Shiying's Philosophy of Hope. Journal of East China Normal University (Philosophy and Social Science Edition).
Clarke, R. (2005). Human-artefact hybridisation: Forms and consequences. Proc. Ars Electronica 2005 Symp. on Hybrid-Living in Paradox,
Coulton, P., & Lindley, J. G. (2019). More-than human centred design: Considering other things. The Design Journal, 22(4), 463-481.
Cruickshank, L., & Trivedi, N. (2017). When your toaster is a client, how do you design? Going beyond human centred design. The Design Journal, 20(sup1), S4158-S4170.
Donly, C. (2017). Toward the eco-narrative: Rethinking the role of conflict in storytelling. Humanities, 6(2), 17.
Forlano, L. (2017). Posthumanism and design. She Ji: The Journal of Design, Economics, and Innovation, 3(1), 16-29.
Frauenberger, C. (2019). Entanglement HCI the next wave? ACM Transactions on Computer-Human Interaction (TOCHI), 27(1), 1-27.
Gurpinar, A. (2022). Towards an object-oriented design ontology.
Haraway, D. J. (2016). Staying with the trouble: Making kin in the Chthulucene. Duke University Press.
Hayles, N. K. (2014). Speculative aesthetics and object-oriented inquiry (OOI). Speculations: A journal of speculative realism, 5, 158-179.
Jones, M., Gandia, A., John, S., & Bismarck, A. (2021). Leather-like material biofabrication using fungi. Nature Sustainability, 4(1), 9-16.
Karana, E., Barati, B., & Giaccardi, E. (2020). Living Artefacts: Conceptualizing Livingness as a Material Quality in Everyday Artefacts. International Journal of Design, 14(3).
Keji, L. (2006). "All things in one": a new philosophical view of the unity of truth, goodness and beauty——A preliminary study of Zhang Shiying's philosophy. Fujian Forum (Humanities and Social Sciences Edition).
Keune, S. (2021). Designing and living with organisms weaving entangled worlds as doing multispecies philosophy. Journal of Textile Design Research and Practice, 9(1), 9-30.
Lindley, J., Akmal, H. A., & Coulton, P. (2020). Design research and object-oriented ontology. Open Philosophy, 3(1), 11-41.
Ma, J. (2015). When human-centered design meets social innovation: the idea of meaning making revisited. Cross-Cultural Design Methods, Practice and Impact: 7th International Conference, CCD 2015, Held as Part of HCI International 2015, Los Angeles, CA, USA, August 2-7, 2015, Proceedings, Part I 7,
Marenko, B. (2014). Neo-animism and design: A new paradigm in object theory. Design and Culture, 6(2), 219-241.
Mathews, F. (2011). Towards a deeper philosophy of biomimicry. Organization & Environment, 24(4), 364-387.
Monteiro, M. (2019). Ruined by design: How designers destroyed the world, and what we can do to fix it. Mule Design.
Neyman, C. J. (2017). A survey of addictive software design.
Pierce, J., & DiSalvo, C. (2017). Dark Clouds, Io&#!+, and [Crystal Ball Emoji] Projecting Network Anxieties with Alternative Design Metaphors. Proceedings of the 2017 Conference on Designing Interactive Systems,
Plumwood, V. (1993). The politics of reason: Towards a feminist logic. Australasian Journal of Philosophy, 71(4), 436-462.
Poikolainen Rosén, A., Normark, M., & Wiberg, M. (2022). Towards more-than-human-centred design: Learning

from gardening. International Journal of Design.
Reisenbichler, G. V. Revising the Human Subject: From Human-to Posthuman-Centered Design.
Rod, J. (2009). Post Human-Centered Design Approach for Ubiquity.
Shiying, Z. (2020). Introduction to Philosophy.
Shotunde, A. O. (2022). Biocentric Egalitarianism and the Challenge of Anthropocentrism toward Environmental Sustainability. Philosophia, 30(2023).
Shoukan, Y. (2005). Studying the time between heaven and man, connecting the past and the present into one family's words——Zhang Shiying's philosophy. Jianghai Academic Journal, 2005， 02.
Smith, N., Bardzell, S., & Bardzell, J. (2017). Designing for cohabitation: Naturecultures, hybrids, and decentering the human in design. Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems,
Soni, S., Mason, J., & Sherman, J. (2022). Beyond Human-centered Design: The Promise of Anti-racist Community-centered Approaches in Child Welfare Program and Policy Design. Child Welfare, 100(1).
Stead, M., & Coulton, P. (2022a). A more-than-human right-to-repair.
Stead, M., & Coulton, P. (2022b). Sustainable Technological Futures: Moving beyond a One-World-World Perspective. Nordic Human-Computer Interaction Conference,
Tomitsch, M., Fredericks, J., Vo, D., Frawley, J., & Foth, M. (2021). Non-human personas: Including nature in the participatory design of smart cities. Interaction Design and Architecture (s), 50(50), 102-130.
Veselova, E., & Gaziulusoy, İ. (2022). Bioinclusive collaborative and participatory design: A conceptual framework and a research agenda. Design and Culture, 14(2), 149-183.
Yaneva, A. (2009). Making the social hold: Towards an actor-network theory of design. Design and Culture, 1(3), 273-288.
Zhang, J., & Tao, D. (2020). Empowering things with intelligence: a survey of the progress, challenges, and opportunities in artificial intelligence of things. IEEE Internet of Things Journal, 8(10), 7789-7817.

Innate Self-Redemption: An Exploration of the Healing Power of Art

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Abstract
The famous poet Bei Dao has this line: "Everyone has his own name / his own voice, love and wish". This study clarifies the relationship between the concept of art and the human spirit through the discussion of the concept of art creation, and the relationship between artwork and design through the discussion of the literature and works of art on the formation of personal character, in order to understand the inherent redemptive power of the artist. Art is not only a means of healing the viewer, but also a channel for self-healing, which is embodied in the well-being of design.

Author keywords
Art Healing; Personalities; Creativity; Self-Redemption

Conceptual Studies in Painting Art

Art is a concrete expression of man's inner creativity, it is a way of storytelling and a way of communicating the relationship between man and his environment. Painting, as a form of artistic expression, is technically an act of adding colour to a surface as a supporting surface. Examples of such surfaces are paper, oil canvas, wood, glass, lacquer or concrete, etc. The tools used to add colour can be paintbrushes, knives, sponges or other media such as paint sprayers. At the level of artistic terminology, the meaning of painting also involves the use of this artistic act in conjunction with graphic, compositional and other aesthetic methods to achieve the expression of the concepts and meanings that the practitioner wishes to convey. The art of painting allows the person who paints to express himself by depicting the visible world.

In his book The Meaning of Art, Herbert Read suggests that "art is quite simply and quite ordinarily defined as an attempt to create forms of pleasure. Beauty is satisfaction." (Herbert Read, 1976)

"The methods and rules by which the artist achieves form are themselves a form of expression". Herbert Read, 1976) The positioning of art as a form-making desire also expresses that art can serve as an expression of our emotions, and in the process of living with it over a long period of time, it influences our emotions, and in turn, shapes our character.

The great aesthetician Theodor Lipps put forward the theory of "The Theory of Empathy", which means "Emotional Transference". When a person looks at a work of art (or any other work of art for that matter), he or she will project himself or herself into the form of the work under certain circumstances, and then feel the mood of the artist. In the process of creation, the painter also uses certain material existence or personal emotions as a material for painting. This long-term observation of things, the way the creation transforms the relationship between the object and the work, and even the personal emotion invested in the creation process are all brought about by unique personal attributes. This kind of behaviour comes from the painter's personal characteristics,

and at the same time, it will have a certain shaping effect on the formation of the painter's personality.
There is a technique in the art of painting that is similar to that of literary art, namely, "lyricism and symbolism". Although it is difficult to compare the rationalised symbolism of literary art to the sensual art of painting, the similarity of art is certain, and the expression of rationality in literary art is still for the purpose of expressing sensual cognition. Therefore, the similarity between them cannot be denied, and it is even possible to imagine and explore them.
The famous German philosopher Arthur Schopenhauer (1788-1860) affirmed the importance of personal desires, which he considered to be the inner, true core of all things in the world. He believed that desire is the true core of everything in the world, and that everything we touch is the result of the objectification of our desire in reality. Therefore, art, as a form of expression, is also the result of the externalisation of our desires, a way to express our certain self. In Schopenhauer's Essays on Beauty, Schopenhauer argues that the extraordinary gift of artists is their ability to recognise the subject world while forgetting themselves, which is their special capture of beauty. The purely objective knowledge we have of this world and of everything - it is this knowledge as the original that forms the basis of art, poetry and purely philosophical concepts. (Arthur Schopenhauer 1788-1860, 2008)
Herbert Read writes in his book The Meaning of Art: "Because art, though quite different from real life, is after all one of the spiritual natures of man, and an important activity in life that should not be isolated or alienated, we should learn about it and get close to it in various ways." The way to get close to it is through the process of learning art, perceiving art, performing art, experiencing art, and exploring art to achieve the closeness between us and art.

A Survey of Literature on Personal Character Development

Psychologists believe that human behaviour is determined by a combination of internal mental processes and external environmental forces. All personality theories acknowledge the importance of both internal factors and external environmental events in determining behaviour. The social cognitive school of thought has argued that people's personality is shaped by the constant back-and-forth influences or interactions between people and their environments (e.g., familial, interpersonal, social, and cultural situations) in everyday life (Lawrence A. Pervasen, 2011).
Human beings are seen as people who acquire a sense of humanity and build their character through interaction with the culture in which they live. People's personality is shaped by the constant back-and-forth influence or interaction between people and their environments (e.g., familial, interpersonal, social, and cultural situations, etc.). (Lawrence A. Pervasen, 2011) Psychologists believe that personality and the self are social constructs within a culture. What if we were to place the art of painting as a culture in such a context? Is it possible that the art of painting as a cultural context has inadvertently shaped me in such a long period of time in the company of me?
Wang Zhengping, in his article "The Dual Reconstruction of the Sense of Life Meaning: The Predictive Effects of "Purposeful" and "Connected" Sense of Meaning on the Satisfaction of "Self-realisation" and "Relationship" Needs", puts forward his view that the sense of purposefulness and connectedness in the study of the meaning of life have certain effects on the self-realisation of an individual. The source of the sense of meaning can be obtained through the relationship between people's inner worlds and external things that we expect to have an effect on. Among the views summarised by the authors, some scholars suggest that the nature of meaning is a connection (Baumeister & Vohs, 2002), and that this sense of purposefulness and connectedness constitutes both of our senses, and that there is an internal and external echo that creates something when we engage in certain activities. I think this connection is the relationship between inner spiritual companionship and outer painting form from my personal point of view, and I think that the long-term cultivation of one's inner spirit must be an

important factor in the formation of one's character, which is a theoretical basis of the research framework that is helpful to me in my creations to a certain extent.

Poet Ai Qing once made this thought-provoking remark: "Misfortune is the hotbed of poetry, is it fortune or misfortune for poets? The poet Du Fu, in his poem "Reminiscing about Li Bai at the end of the day", has this legendary line: "Writings are hateful to life, and demons are happy to pass by", which means that people with literary talent are always envied for their thin life, but I personally believe that there is another deeper meaning, which is that great pains often lead to great enlightenment, which leads to great talent, and which leads to great works. In the process of generating these realisations, talents and works, a different self is born, and a new self is formed.

An Exploration of Creative Work Related to Art and Personalities

In the article "Quilting Art and the Exploration of Women's Self-realisation", Iris Zhou mentions the diversity of quilting art techniques. In Storytelling Quilting Art, the author mentions that storytelling quilting art expression can express the author's personal experience through the works and express the author's life philosophy and values, so we can examine and explore ourselves based on such works. In her discussion of the American housewife's use of embroidery techniques in her home crafts as a way to showcase America's glorious and beautiful past, the author says, "Innovation means the beginning of a new life.

Phoenix Art's March 2017 list of '201 Remarkable Women Artists of All Time' includes Faith Ringgold (1930-), an artist who used the figure as a means of self-expression. Faith Ringgold is an American artist and writer. She has achieved a certain harmony between words and paintings, which is also what the author tries to achieve in this work.

Faith Ringer majored in oil painting when she was young, and her painting experience also stopped for a period of time after graduation, and she returned to the United States from Europe ten years later to continue painting. This kind of discontinuous painting experience is exactly the fractured process that I have experienced, and this similar analogy is helpful to me in this creation. Beginning in the 1970s, Faith Linger began to use art as a way to tell her personal story when she and her mother sewed a quilt containing thirty panels of portraits of thirty people who lived in Harlem, New York. Harlem is where Faith Ringer grew up, and this is her way of telling the stories of the people in her hometown as she grew up.

After the death of her mother, Faith Ringer used the technique of quilting and combined it with her background in painting and writing to create her first quilt, Who's Afraid of Aunt Jemima? Against the backdrop of the civil rights movement at the time, Ringer's work expresses Americans' demand for equal rights. Through the drawing of figures and the collage of words, this work expresses the words that each person wants to express, and is presented in the form of a children's drawing that depicts the story of Aunt Jemima, a successful black woman who attempts to subvert the traditional stereotypes of black women in the United States.

Nicco Zhu's Master's thesis, "Memory. Sublimation: Nicco Zhu's Self-healing Creation" is based on the keywords: memory, creation, self-healing, and sublimation. Starting from the tracing back of memories and the description of personal growth, the author presents her feelings towards painting creation and the damage caused by the breaks in painting during the process of growing up, and even links them to the feelings of being unable to redeem herself in the memories of her mother, and finally, she uses eggshells, which are full of protective elements, as the source of inspiration in her creation to design her own ceramics works.

Based on such an emotional foundation, the author uses memory as a base, suggesting that every present moment is a compilation of our unforgettable past, thus sublimating her own realisation, telling herself that "the past will never come back, and there's no need to look back at it ..... Only by letting go of the past will we

be able to embrace the present and the future". Through this work, she also says goodbye to her past self, and says goodbye to her own memory of drowning in uncontrollable pain. Even though the cure is not complete, the author understands through this work that there is a time for everything, and that there is a time for everything, so why not go with the flow of life and not act presumptuously, and learn to let go of loss, deal with it, and understand that where there is loss, there will be love.

The famous Taiwanese picture book creator, Geometrics, has been my favourite picture book author since I was in secondary school, and I have a complete series of Geometrics' works on display in my bookcase at home. The Beginning of the Story is a record of Geamy's own work, as well as an account of his work and persona by some of the biggest names in the industry and academia. In the book's opening chapter, "Before I Became a Geometer", he says, "When I started to create, I came to understand more deeply that creation is not only a combination of lines and colours, but also the thoughts behind the work - the personality of the creator is the element that outweighs everything else in the creation of a work. (Geometrics, The Beginning of the Story, p. 17) After suffering from a brutal illness, Mr. Geometrics became emotional and sensitive, and began to feel the smallest things in life. This was the starting point of Mr Geamy's work. In the midst of his illness, he poured his confusion and worry about the future into his works, thus expressing his search and helplessness. After twelve years of working as an advertiser, painting returned to his life.

For him, painting was a long-lasting healing companion in the time of pain and suffering, and after the pain and suffering, his view of life changed, and many small things that were originally insignificant became important, and many small things that were originally important became insignificant, and painting became an outlet for him to express himself and to interpret himself. The illustration for Mr. Geamy's first picture book, Thank You Hairy Rabbit, It's Been a Fun Afternoon, was a story whose centre he was once confused about what it was trying to convey. He said, "I just drew the picture in my mind. It's like a dream, a language; it's like the scene that my heart longs for every quiet morning; maybe it's my longing for life at that time; maybe it's a fragment of my childhood memories; or my imagination of the future of my infant daughter." (Geometrics, 2014) .

Conclusion

Through a review of literature and works on the personalities of the creators, the works of art, and the relationships and healing that the works imply, this study suggests that the inextricable relationship between the works and the people is like a net cast by the years, and that no matter if it is your pain or my sorrow, there is no way to escape it, because the works tell a story, they flow through your veins, and they tell your story. Maybe it's a dream, maybe it's a thought, maybe it's an epiphany, maybe it's an expectation.

References

王正平。（2014）。生命意義感的雙重建構：「目的性」與「連結性」意義感對「自我實現」與「關係」需求滿足程度之預測效果。桃園：國防大學政治作戰學院心理及社工學系未出版碩士論文。

林淑娟。（2013）。詩性造境：林淑娟風景繪畫探索。臺北：國立臺灣藝術大學美術學院美術學系未出版之碩士論文。

周若淳。(2016)。拼布藝術與女性自我實現之探索。新竹：國立藝專新竹教育大學藝術與設計學系未出版碩士論文。

朱品蓁。（2012）。回憶．昇華 -- 朱品蓁的自我痊癒創作。臺北：國立臺北教育大學人文藝術學院與造型設計學系未出版碩士論文。

Lawrence A.Pervin·Daniel Cervone 著，業光輝譯。(2011)。性格心理學：理論與研究（二版）。臺北：雙葉書廊出版社。

Read Herbert 著，杜若洲譯。(1976)。藝術的意義。台北：巨流出版社。

The Guerrilla Girls 著，謝鴻均譯。(2000)。游擊床頭版西洋藝術史。臺北：遠劉出版社。

幾米。（2014）。故事的開始（新版）-- 幾米作品 027。台北：大塊文化出版社。

Translate

Wang, Zhengping. (2014). Dual Reconstruction of Life Meaning: The Predictive Effects of "Purposeful" and "Connected" Sense of Meaning on the Satisfaction of "Self-realisation" and "Relationship" Needs. Taoyuan: National Defence University, School of Political Warfare, Department of Psychology and Social Work Unpublished Master's Thesis.

Lin, Shujuan. (2013). Poetic Landscape: Exploration of Landscape Painting by Lin Shujuan. Taipei: Unpublished master's thesis, Department of Fine Arts, College of Fine Arts, National Taiwan University of Arts.

Zhou, Ruo-Iris. (2016). Exploration of Patchwork Art and Female Self-Realisation. Hsinchu: Unpublished M.F.A. thesis, Department of Art and Design, National Hsinchu University of Education.

Zhu, Pinnic. (2012). Memory. Sublimation - Nicco Zhu's Self-healing Creation. Taipei: National Taipei University of Education, College of Humanities and Fine Arts, and Department of Plastic Design, Unpublished M.F.A. Thesis.

Lawrence A. Pervin-Daniel Cervone, Translated by K.F. Yeh. (2011). Personality Psychology: Theory and Research (2nd ed.). Taipei: Double Leaf Bookstore Publishing House.

Read Herbert, translated by Du Ruozhou. (1976). The Meaning of Art. Taipei: Jurassic Publishing House.

The Guerrilla Girls, translated by Hsieh Hung-kwan. (2000). The Guerrilla Girls, translated by Hsieh Hung-kyun. Taipei: Yuan Liu Publishing House.

Geometrics. (2014). The Beginning of the Story (New Edition) - Geamy's Works 027. Taipei: Big Block Culture Press.

Research on the application of Compound Frame of Visual Thinking in basic course of art Design Specialty

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Abstract

The current demand for art design education personnel training, not only to let the college art design major students master the art design knowledge and skills needed in the modern society, but also to play the art design in cultivating students' thinking ability and creative ability and other aspects of the unique value. In order to meet the requirements of the future complex world, we should cultivate the information density, historical span and thinking dimension that can deal with things and weave the clues of the design subject, so as to cultivate comprehensive, three-dimensional and multi-dimensional design thinking talents. In this context, this paper aims to strengthen the role of visual literacy in the teaching of basic courses of art design major in colleges and universities, and solve the problem of improving the literacy of creative visual expression and critical visual thinking.

Firstly, based on Arnheim's visual thinking theory, this paper extracts direct perceptual ability and image ability from visual thinking to cultivate visual literacy, and uses interdisciplinary research method and literature research method to study the different stages of aesthetic cognition, aesthetic perception, aesthetic imagination and aesthetic understanding, so as to confirm the aesthetic psychological mechanism and law. Secondly, through the collection and analysis of the practical data and interview questionnaire of the undergraduate basic course of the School of Design of the Central Academy of Fine Arts, the specific problems of direct perception ability and image ability

in visual thinking are solved by using the educational empirical research method and questionnaire method.

The research result of this paper is to design a compound framework of visual thinking, so as to deepen the theory of visual thinking and verify it in the basic education of art design. The design of the compound framework makes the expression of students' visual thinking practice more accurate, comprehensively highlights the creative expression of students' direct perception and image expression, and lays a foundation for cultivating the visual quality of comprehensive talents of art design in the stage of basic education of art design.

Key words

visual thinking; Composite architecture; Art and design education; Specialized basic courses; Visual literacy

I. Introduction

In our country, the output of content and form in the teaching process of basic course of art design specialty has the problem of "unchanged", while visual thinking is infused into art design education by a unique and scientific teaching means, and the talents cultivated by it will be comprehensive, three-dimensional and multi-dimensional talents. As for the study of Visual thinking, Art and Visual Perception is a classic work in art education

and psychology1 , by Rudolf Arnheim, a contemporary American German art psychologist 2. Shenyang Jianzhu University, 201 3. In 1 987, Mr. Teng Shouyao

1 Specifically, the book mainly tells the following aspects: First, the basic principles of visual perception: it introduces the basic principles of human visual perception, including the physical characteristics of light, the structure and function of the retina, visual perception and cognition and other aspects of knowledge. Secondly, the way of composition of art works: through the analysis and comparison of art works, different ways of composition are introduced, including points, lines, shapes, colors, textures, space and other elements. Thirdly, the practice of art education: it introduces how to improve the effect of art education through the study of visual perception, including teaching methods and strategies.

2 Yan Shan. Research on the Application of Optical Illusion Principle in Interior Design [D] translated "Visual Thinking -- Aesthetic Intuition Psychology" into Chinese, which aroused a wave of innovative thinking among scholars at home and abroad. The book mainly explores the basic concepts and principles of visual thinking and its application in art and design.3 The reason why Teng Shouyao and Zhu Jiangyuan translated Art and Visual Perception into Chinese is that they found people's ability to perceive things regardless of physical reality experience. 4Arnheim points out that many philosophers in ancient Greece and China have tried to emphasize the great role of perception in human life, believing that perception is the source and starting point of discovering truth, and that perception already contains noble reason and the discovery of truth.However, people separated rationality from perception, ignored perceptual feelings, thought only floating in the abstract world of nothingness, and degraded the sensory system into a tool to only measure and identify the real world. The visual thinking process is complicated and rarely paid attention to. In this case, educators often only carry out theoretical knowledge popularization or simple and crude copying or sketching of artistic works. In this case, it is impossible to pay attention to and cultivate college students' perception ability of artistic language, and college students cannot understand and understand the result of modeling training, which is the link between cultivating perception and thinking.

Therefore, based on the transformation logic of the two related factors "direct perception and image" in Arnheim's visual thinking, the author tries to re-examine how it

3 The book mainly talks about the following aspects: first, the basic principles of visual thinking, the book introduces the basic concepts and principles of visual thinking, including perception, cognition, representation, symbol and meaning, and shows how these principles are applied in real life and artistic creation through rich cases. The second is the application of visual psychology in art and design, which is discussed in the book, such as how to use principles such as symmetry, balance and proportion to build the structure of art and design works, and how to create different emotions and atmosphere through visual elements such as color, line and texture. Thirdly, the evaluation criteria of art works include elements of form, content, expression and creativity, and the practical application of these evaluation criteria is explained by discussing classic works in art history and the development trend of modern art.

4 By Rudolf Arnhim; [TENG S Y. Visual Thinking -- Aesthetic Intuition Psychology. Chengdu: Sichuan People's Publishing House, 1998.03.] is constructed and what visual literacy is constructed as the basis of human visual perception and thinking. How to practice? What is the practice path?

To answer this question, the following three questions need to be clarified: first, what kind of visual literacy is constructed by "visual thinking" based on human visual perception and thinking? Second, how is "visual thinking" constructed in the basic course of art design major and the operation logic and basis between the constructed links? Thirdly, how does "visual thinking" construct and develop the practice path and model design in the basic course of art design major?

II. the connection between visual thinking and art design creation

The concept of "visual thinking" is put forward from the perspective of aesthetic perception psychology. From the perspective of psychology, this is a creative thinking in the theory of psychological intention, and a profound rational thinking extended on the basis of perceptual vision. Arnheim argues that "the cognitive activity regarded as' thinking 'is not the prerogative of some other mental force above perception, but is an important and fundamental part of perception itself." 5In perception, especially visual thinking, not only has the ability of perception, but also has the ability of cognition and understanding. Arnheim focuses on the rational function of visual organs in perceiving external things and the great role of visual images in general thinking activities.

1 . Direct perceptual thinking in visual thinking

Definition of the concept of direct perception: "Direct perception" refers to the primary modeling of raw materials, specifically to see whether the perceptual image acts on memory. One is that the shape of the perceptual object is a general category and does not stimulate memory traces; The second is that mechanical replication of a particular stimulus produces a unidirectional increase in memory traces. One of the most primitive forms of perception, it is realized only by the human visual organ, and does not require direct experience through any creature or tool. The results obtained from this observation are not merely the personal experience of the observer, but also show the universal basis of human perception and the basis of mental structure. Discussion of the

5 Wang Ju. Arnheim Art Education Thought and Its Enlightenment [D]. Nanjing Normal University, 2016.

scope of direct perception: Arnheim is highly conscious of the scope of his research objects and the validity of his theory. More strictly, the scope of his research on the direct experience of visual perception is limited to the common foundation and basic formation mechanism, that is, the universal and effective formation mechanism of visual perception in any time and space. This concept has also been reflected in Baudelaire's narration: modernity is transitional, transient, accidental, half of art, the other half is eternal and unchanging.6

The direct perception of visual thinking explains the direct experience of visual perception from the level of aesthetic psychological dynamic mechanism. Arnheim explains the mechanism of aesthetic psychological motivation by postulating the process that generates visual formal motivation. He believes that the visual cortex can be equalized by electrochemical dynamic free configuration, so that the electrochemical field in the brain is balanced. When visual perception perceives a response of cells or organs and organisms that can cause organization in the internal and external environment, these forces interact with the form of the above stimuli to form the perceptual object. The importance of direct perception is that it comes from the first link of visual analysis system. Through effective training, it can further stimulate the potential of "perspective" things, and the development of this potential can help art designers analyze the essence of things. There is thought in all perception, intuition in all reasoning, and creation in all observation.7Visual image is never a mechanical copy of perceptual materials, but a creative grasp of reality. The image it grasps is a beautiful image with rich imagination, creativity and sensitivity.8

6 (France) Baudelaire. Selected Essays on Baudelaire Aesthetics (Baudelaire). Beijing: People's Literature Publishing House, 2019.(America) by Rudolf Arnheim.

7 Art and Visual Perception [M]. Chengdu: Sichuan People's Publishing House, 2019.06.

8 By Rudolf Arnheim. Art and Visual Perception [M]. Chengdu: Sichuan People's Publishing House, 2019.06.

In general, the design principles and applications of art design creation based on direct perceptual thinking can be divided into the following two categories: clarity and study of perception, insight and experience of thinking. The most important embodiment of direct perception in the professional basic courses is the extraction of the general structural characteristics of the perceptual object, and the most important embodiment is the innovative

use of the perceptual object's characteristic sensitivity observation.

2. Image thinking in visual thinking

Arnheim's image discussion is related to visual perception and is a kind of "reflection" of perception. The overall image of things is formed through the integration of brain thinking, which is different from specific things because the thinking subject in this context contains the understanding and abstraction of the object, and even forms the mental image and thinking image of the thinking subject. Visual thinking theory connects perception and thinking through visual perception.

By carefully reading the summary of the interpretation of image in all of Arnheim's written works, we can conclude the connotation of image: first, image does not directly indicate the internal law of things, but the image of visual perception to achieve subjective experience through the interaction of external stimuli. Secondly, the perfection of the image refers to the originality of doing activities that have not been done before, and may even include social value, that is, the result or product created has practical or academic, moral, aesthetic value, etc. Again imagery is a gestalt that includes all forms of objects, actions, ideas, meanings, and so on. Therefore, it can be said that visualized language is actually a form of Gestalt. [What Gestalt psychology refers to as form is the whole of experience organized through perceptual activities. In other words, Gestalt psychology holds that any "form" is the result or function of active perceptual organization or construction, rather than the object itself. . The most striking point is Arnheim's belief that imagery has the nature of thought. As a gestalt in visual perception, image is a real gestalt only when it has the ability to think and grasp the essence of things.

III . Compound architecture based on visual thinking

1 . The path of building elements in the compound architecture

Direct perception is the first production of thought, while image is the second perfection of thought. "Direct perception" refers to the primary modeling of raw materials, specifically to see whether the perceptual image acts on the force of memory. Direct perception is the direct action of objective things on senses and experience, thus producing a comprehensive understanding of things as a whole and emotions. Since perception is always influenced by knowledge and experience, it has strong personalized characteristics and triggers memory, imagination and necessary thinking activities. Several key words are involved here: wholeness, experience, relevance, meaningfulness, selectivity, and scalability. These characteristics constitute the irreplaceable value role of perception in artistic creation. "Image" refers to the further assembly and processing of raw materials, specifically the perceptual image plays a role in the force of memory. In art practice, it is found that emotions can be effectively processed through rational combing, so as to obtain the fit between creative content and creative form, which is contrary to the general response of visual psychology, and is one of the ways to enter the creative state efficiently.

2. Theoretical advantages of composite architecture

The compound framework is a theoretical framework formed based on Rudolf Arnheim's visual thinking theory, which explores the trajectory of "perception" in visual thinking in the basic course of majors through the compound framework formed by direct perceptual ability and image ability in the theory. By visualizing the four key nodes of motivation, method, mode and value, the information density, historical span and thinking depth of visual image "perception" are clarified. Compound education is to meet the requirements of The Times and cultivate complex talents with technology, economic sense, expertise and adaptability. Compound talents refer to the talents with profound theoretical foundation and broad knowledge, interdisciplinary consciousness and innovation ability. In this paper, the compound framework theory of visual thinking discusses the framework structure set up in the categories of aesthetic perception psychology and art design pedagogy. The compound

framework of visual thinking refers to cultivating profound and extensive basic theoretical knowledge of art design and having interdisciplinary consciousness and innovation consciousness.

3. The significance of compound architecture theory in the development of art design education

The significance of compound architecture theory in the development of art design education involves understanding the basic elements of image information and breaking through the visual perception of knowledge, emotion and meaning. Vision has a strong active perception. Let us make a correct interpretation of the visual organ, the eye is not only a common tool, but also in use with the state of survival and evolution. In other words, every "movement" through the visual organ is an instinctive product of the coordination of conscious reactions, and this subjective initiative can also produce a series of activities with strong significance, such as finding problems, asking questions, making hypotheses, solving problems, and even presenting emergencies or details. Therefore, viewing and understanding can only be effective when a concept is resonated by combining what observers have seen and obtained beyond direct experience, that is, it must be related to the internal mechanism of activity of the perceived object or event. From the macroscopic bird's eye view of the development of art design education, when the thinking of the educated works with scientific viewing and understanding, they can deeply explore the correct image starting from direct experience; The meaning of education is to enrich or integrate complex empirical phenomena under simple concepts. The most important thing of compound structure is that educators should systematize visual training and explore and cultivate the instinctive reaction ability of perceptual thinking. The essence of visual thinking is to regard visual shape as a mode of action that supports a "structure of forces" that exists in our eyes. This model has a wide range of applications, involving physical and mental activities. However, it has been reflected in art design education for a long time. The objective and subjective factors of modeling can show their own essence, which can arouse deeper feelings and simpler "power" of the educated. The compound framework theory can further explain how visual perception is realized in perceptual activities, and can also explain the internal reasons for the acquisition of beauty and the generation of beauty.

IV. The path of applying the compound framework of visual thinking to the basic courses of design specialty

In the context of art design education, it has become urgent for visual thinking's compound architecture theory to participate in professional basic courses. Colleges and universities should pay attention to the improvement of visual literacy as the backbone, and cultivate students' ability to apply the theory of compound architecture. Visual literacy is the ability to use visual senses for cognition, and to analyze, understand, evaluate and create the visual information9. The implementation of the professional basic courses specifically includes training and improving the ability of visual image cognition and understanding, identification and criticism, presentation and expression. In the professional basic course teaching course of art and design colleges and universities, taking the Central Academy of Fine Arts where the author works as an example, the course is "Modeling foundation -- Image Expression -- Using Sketch as a tool to construct the world" interwoven around the concept of design and sketch. This course has very strong practical value and significance for the basic teaching of design.

1 . The motivation for the compound structure to dominate the basic courses of majors On the basis of the requirements of current curriculum teaching, we can clarify the motivation of the compound structure to dominate the professional basic curriculum, so as to innovate and optimize the teaching mode of the curriculum, and then overturn the stereotype of the curriculum of college students and ignite their enthusiasm. According to the investigation of the author as a teaching assistant teacher of the Central Academy of Fine Arts and the questionnaire on the basic course of "Modeling Basis -- Image Expression", three levels of conclusions are drawn:

defining image demand, discovering and acquiring images, and interpreting and analyzing images.

The compound architecture can guide college students to analyze different visual images, analyze the characteristics of the image itself, the acceptance method and degree of the image and display needs, and promote college students to accurately identify whether the information is effective and whether it has a specific meaning. Through the analysis of the survey results of questionnaires and face-to-face interviews, it is found that most college students have a strong interest in visual images, but only at the surface level, and cannot understand the deep meaning behind the images. 1 0

9 Pang Mingmei, Xue Wei, Wang Yi. Research on the Teaching of Art Appreciation in Colleges and Universities guided by visual literacy [J]. Beauty and Times (China), 2021, (08):67-68

10 Pang Mingmei, Xue Wei, Wang Yi. Research on the Teaching of Art Appreciation in Colleges and Universities guided by Visual Literacy [J]. Beauty and Times (China), 2021, (08):67-68.

Under the premise of the diversified source channels and forms of visual materials, the compound architecture can assist college students to discover and obtain the value of images. The compound architecture enables college students to find that visual images are often not a single external feature or important information, but carry a variety of information types that can be recognized. Each image is independent at the beginning. In terms of conception, we should understand the characteristics of these images, integrate and think about how to find closely related points, so as to create art design. Therefore, according to the differences of college students' visual perception, multi-dimensional promotion teaching is carried out to assist college students to accurately grasp the diversified perspectives of visual images.

The compound structure can assist college students to study and select visual materials, which is the key link of interpretation and analysis. Nowadays, college students increasingly regard visual information as the main source, basis and communication tool of visual materials. We should give full play to college teachers in the professional basic courses to assist college students to correctly interpret and analyze images in the cutting-edge academic environment with the help of the compound framework.

2. The way in which the compound structure dominates the basic courses of the major The method of compound architecture dominating the basic courses of majors is divided into the following three steps: expressing the boundaries of visual elements and the transformation of thinking, presenting the logic and method of constructing visual elements, and verifying the deduction of visual elements and the fullment of themes. "Visual element" is regarded as the most familiar and common minimum unit of information in the professional basic course. In the context of professional basic course, the understanding of visual element is different from the broad meaning. The reason why college students should be trained to express the boundaries of visual elements and the transformation of thinking is that the differences of personal, social, economic and cultural elements will have different impacts on the perception and thinking of visual elements brought by each person. College students can use various possibilities of visual elements to understand the purpose, meaning and direction of visual elements, and such inference can become the support of basic insights in daily life and study.

On the basis of clarifying the concept of traditional visual elements, a new cognition of visual elements is formed. That is, visual elements will use tools as carriers to convey thoughts and emotions for the author, so as to form new and effective links for the functions and values of visual elements in different contexts. The logic of constructing visual elements usually presupposes a specific context, analyzes the overall construction method of image, relationship, form and emotion among visual elements, and then combs out the starting point and logical framework of creation. In this way, a spiral-rising logical state of combination of elemental concepts, formal deduction and promotion, and expression of thinking integration is formed. The compound architecture practices the presentation of differentiation, importance and planning with "thinking" intervention and leading methods.

In the application of compound architecture, it is necessary to strengthen college students' perception of visual elements. One is to simplify and typify the visual elements in the visual world starting from direct perception. Second, based on the cognition of the former, the visual elements are deduced to a more abstract and logical state after cognitive processing. The above two points will become the training focus of professional basic courses. To teach college students to think about the meaning of "modeling" in the nature of visual elements, whether it is the thinking mode based on rationality or a rational other, to establish the transformation from unitary to multiple, from one center to multiple centers.1 1 In the course, Rene Magritte's work "Personal Value" as an example, teachers and students appreciate, trigger college students to think and communicate.

3. The mode in which the compound structure dominates the basic courses of majors The key point that compound architecture inspires college students to art design creation is the overall view and the development view. To cultivate students' basic quality of design, we should emphasize on cultivating their understanding and observation of the real world, their interest in exploring and changing things, and their aesthetic ability of visual performance. 1 2We should also be good at observing images through the path of comparison and connection. The things we see and feel in vision are complex and diverse, and the things have diversified interpretations in different contexts. In addition, the

11 Deng X T. On the influence of Rene Magrit's Art works on postmodernism [J]. Art Literature, 2022, (02):94-96.

12 Zhou Zhiyu. Let students "stand up and look around" -- My thinking and practice on basic teaching of Design [J]. Chinese Fine Arts, 2014, (03):90-97.

meaning changes after aggregation and dimensionality rise, and the "abstract" meaning is emphasized after condensation, which is the focus of the "comparison" and "connection" method.

The independent aesthetic judgment of college students is the ability to judge the quality and authenticity of image information, and to think and evaluate the existing image content. The difference in judgment ability can be made up by the compound structure. As a way of cultivating comprehensive ability, compound architecture is initially affected by individual's artistic and cultural accomplishment, ideological level, knowledge reserve, life experience and so on. Generally speaking, the broader the knowledge, the more life experience, the more flexible the application of the compound framework, the stronger the creative thinking ability, the more able to develop a good habit of independent study. The visual image itself has multiple means of expression, but also has its own specific symbol identification. The function of each symbol is similar to the language symbol of adult thinking accepting reality, which contains the dialectical interpretation of "ability meaning" and "meaning". "Nengyi" refers to the original meaning and characteristics; "Meaning" refers to the actual performance and generalization in a specific context, which mainly depends on how college students as the subject perceive. The cultivation of compound structure is to include the interpretation of the two dimensions of visual objects. The stronger the ability of compound structure is, the higher the level of understanding the meaning of visual objects will be, which will train good study skills for college students in the future professional courses.

With the development and change of modern society, aesthetic characteristics, aesthetic vision and aesthetic consciousness are constantly innovating, extending and improving. We should take the compound structure as the way to broaden, actively build the bridge of thinking extension, and innovate the design concept of image with dynamic thinking system and diversified expression methods. The innovative visual thinking and design concept of diversified compound architecture can enable more audiences to experience different aesthetic interests and thus achieve empathy, and also actively experience the world view, values and outlook on life of art creators.

4. The compound structure dominates the value of basic courses

The value of the composite framework dominating the basic course is reflected in the improvement of the visual

perception ability of the image, the deepening of the visual interpretation ability of the image, the enhancement of the aesthetic judgment ability of the image, and the diversification of the application and creation ability of the image. The combing and application of compound structure will soon become the only way to realize the professional basic courses. It is the experience of visual thinking ability to point out the original problems of art design works, optimize and simplify the structure of auxiliary elements to the greatest extent, and control the proportion and position of each element in the process. This transformation of visual thinking is beneficial to clarify the boundary between art and design, and to more clearly point to meaning. In this process, we can enjoy and experience the integration and collision of thinking and value in different contexts, try to explore the rise and fall of things, and try to compare them to the way of acquiring the cognitive world, so as to construct a rich spiritual world in the future work, study and life.

V.Conclusion

The setting principle of professional basic courses in art design education is to closely combine the educatee, knowledge and society, and promote the development of the three in a relatively stable direction, while enriching each other in the dynamic, with more characteristics of The Times. First of all, with the goal of combining quality education with professional basic courses, art design education is committed to cultivating what kind of talents for the society, which is also the special meaning given by this era. Quality education is also an effective way to obtain creative thinking, which is not only manifested as independent knowledge selection, processing and application, but also manifested as the pursuit of positive attitude and the exploration of knowledge boundaries. Secondly, with the combination of general knowledge and professional basic courses as the goal, with the enrichment of material and spiritual life of the educated generation after generation, knowledge and skills in various fields are gradually more widely required for life and study, including knowledge and ability education other than professional, vocational and utilitarian, and even not directly preparing for career. The purpose is to comprehensively improve the knowledge and culture accomplishment of the educatees and form a reasonable and complete knowledge structure. Thirdly, with the aim of combining the modern transformation of art design with the professional basic courses, we must face the challenges and needs of the development of social reality. Predecessors have gone through the difficult exploration process for us, and the renewal and iteration of art design concept will promote the reform and development of modern educational design. The author's research has been designed to support the thesis from the theoretical and practical levels, and has carried out case examples and analysis in each link. The original shelved theory is vividly applied in the course, which has taken an important step in cultivating students' visual literacy.

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Transferability vs. Repeatability: Consolidating the Ontological Nature of Design Research

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Abstract

Over time we have begun to build foundations for design ontology moving it away from efforts to align with a scientific rigour model based on reproducibility and generalisability towards a new direction supporting design's emergent and abductive qualities. Two of the key issues that have escaped our grasp has been a better understanding of design ontology and what equates to rigour in constructive design research. Recent work by the authors has positioned transferability as a candidate for a design ontology based on an ontological mirror along with a series of attributes addressing the rigour issues of future-forwards knowledge generation. Here we use two case studies to test the future forwards rigour of a transferability property for design knowing and speculate as to how researchers can build confidence and trust.

Author keywords

Transferability; Design Ontology, Design Futures; Design Research

Introduction

thinking by CP Snow (Snow, 1959) and Archer's claim for design as the third culture, (Archer, 1978) a number of design thinkers have suggested temporal relationships between forms of knowledge production across different domains. Herbert Simon "Design, on the other hand, is concerned with how things ought to be,⋯" (1969, p.115), John Chris Jones "⋯that which exists only in an imagined future" (1992, p.10) and finally Ranulph Glanville "⋯ there is a third kind of knowledge that converts knowledge of into knowledge for⋯ (2005, p.112) explored the idea that design has a distinctly different temporal relationship to scientific and Arts & Humanities knowledge building. This culminates in Glanville's proposition of 'design for future transformation'. It aligns with work by many others positioning design as an abductive form (Douven, 2011) of thinking imagining new futures.

The issue previously explored by the authors (Hall & Galdon, 2023) concerns rigour and more specifically how knowledge that is being generated for future transformation in a forever-forwards mode can be built upon and at some future stage perceived to be truthful and worthy of acting on. While the authors have explored theoretical avenues leading towards transformation, we also seek to test tangible examples.

Towards a Design Ontology

Several developments have come together for identifying the core foundations of knowledge generation in design research. These are substantially different to those of other domains of thinking and the call for distinct design foundations made most recently by Dixon "⋯with the potentially special approach to knowledge claiming in design, there is also the possibility that the evolution might take on a different form here too." (2023, p.127).

Dixon identified the impossibility of reproducibility and generalizability as foundations for design research and opens the door towards several other approaches.

Gaver et al (2012, 2022) have identified emergence in the context of Human Computer Interaction (HCI) as an essential quality for design research where methodologies are rarely set in advance. This contrasts to the 'preregistration movement' in HCI which seeks to evaluate the outcome of research according to a prior public registration of research aims. Here design and the sciences clearly diverge in their expectation of rigour models where one appears to view divergence as suspect and the latter sees it as essential for investigation. Koskinen and Krough (2015) inspired by Gaver (2001) explore accountability in the context of constructive design research by way of the entanglement of theory and practice. They describe the tensions of design research that builds on practice and must navigate competing interests and multiple concerns. Building on this Krough and Koskinen (2020) consider the implications for moving from a practice based to a knowledge-based discipline and how this affects research outcomes. They explore through four different epistemic traditions using the concept of 'drifting by intention' and emphasise in line with Gaver that context is crucial, and that drifting is conceived within a constructivist design research tradition and would be out of place for example in an engineering context. Binder and Redström (2006) review the three traditions of design research and described how drift can emerge in research cycles as practice uncovers new opportunities and directions. They contrast the inside and outside view of design research programs to illustrate the projected verses the perceived research experience akin to Jacob's research night and day (Jacob, 2001). Zimmerman, Forlizzi & Evenson (2007) propose relevance and extensibility as criteria for reliable knowledge production in design research. Earlier Guba and Lincoln (1985) in the social sciences point towards transformation as one of a series of trustworthiness attributes including credibility, transferability, dependability, and conformability. The context here is producing knowledge of the world via rich and thick descriptions of socio-cultural scenarios rather than knowledge for future transformation. Nowell et al (2017) extended this concept challenging that a researcher cannot know who, how and where their research may be transmitted or extended to hence a question arises as to how design researchers who initiate research can enhance their practice, anticipate transmitted context and extensibility capacity of their work. Interestingly Krough and Koskinen (2015) contend that design researchers build on the ideas, methods, and practices of other researchers rather than the objects that might be outcomes of their work indicating that 'thingness' has less influence in design research for transferability.

We can draw threads of similarity through a special approach to knowledge claiming (Dixon), emergence (Gaver et al), drifting by intent (Krough and Koskinen), extensibility (Zimmerman, Forlizzi and Evanson) and transformation (Guba and Lincoln) leading towards a proposition that if design's purpose is to create knowledge for future transformation, then transferability becomes a contender to underpin ontology. Three of these concepts have spatial relations to research outcomes in terms of direction as illustrated below in Fig.1.

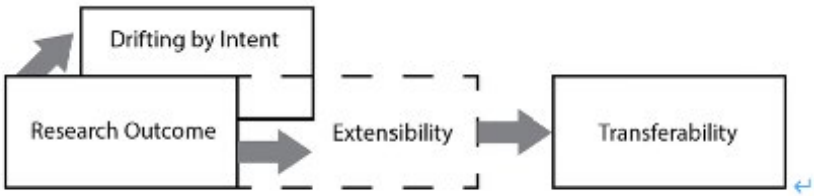

Figure 1. Candidates for core ontology attributes in the context of constructive design research.

Methodology

In order to test transferability in concrete research examples we have reflected on two design research projects undertaken by the authors that deal with design futures and supports thinking that addresses the key issues above: a framework for prospective design (Galdon and Hall, 2019a), and a design for safety foresight review (Anderson, Hall, Ferrarello, Cooper and Ross, 2018). Reflecting across these publications has supported new thinking towards contributing to the ontological quality of design knowledge production, and a further consideration about what this means in terms of rigour for practice-based design research.

Case studies enable the exploration and investigation of applied research within a defined context by using a variety of data sources (Baxter et al., 2008). This methodology allows design researchers to develop and to enhance:

"…the capacity of comprehension and analysis of real problems, the capacity to propose and evaluate alternatives for the improvement of the problem considered, to work collaboratively, [and facilitates] their capacity of information management and synthesis of problems" (Herrera et al, 2016).

In this context, we will use comparative studies. According to Bukhari (2011) a Comparative Study analyses and compares two or more objects or ideas to examine, compare and contrast them to show how two or more subjects are similar or different.

Transferability Case Studies

We have selected two case studies from the research projects of the co-authors to test diverse transferability motivations, methods, mediums, and audiences for research. Neither of the case studies were created with the express purpose of facilitating transferability or making a case for ontological significance and we have approached the comparison of the cases to operate on a critical basis to develop a preliminary set of criteria for considering transferability factors. Therefore, our approach is retro-speculative.

Case Study 1 – Prospective Design

Prospective Design differs from other forms of future design studies, such as Critical and Speculative Design, in its focus on systematic and relational ideation. Prospective Design aims to design on behalf of the user to shape frameworks and mitigate unintended consequences. Its focus, building on Nigel Cross's work (1983), is on building preparedness, readiness, and appropriateness. This methodology repositions the designer as an expert in future-led technological potentialities aimed at reducing risks and protecting citizens/users. The success of the output is determined by its potential to affect change, which depends on the weight of the actors involved within the system. This future-led, mixed-methodology aims to design trust and incorporates trajectories, probabilistic extrapolation, asymmetries, consequential analysis and counter-fictions to design novel strategies to mitigate unintended consequences in prospective technological developments.

The methodology was developed in the context of artificial intelligence (Galdon, Hall, & Wang, 2019a). Four publications (Galdon and Wang, 2019b: Galdon and Wang, 2019c; Galdon and Wang, 2019d; Galdon and Wang, 2019e) were submitted to the National Data Strategy board for review. The committee accepted all four publications as pieces of evidence to inform the development of the framework which will determine the use of artificial intelligence (AI) in the UK. This framework was synthesised, adapted, transferred, and implemented in the context of publication aimed at future covid-19 type events (Rodgers, Galdon, and Bremner, 2020) to build preparedness, readiness and appropriateness. Building from the work conducted in prospective design, the covid-19 work also made use of time via longitudinal studies, the adaptation of probabilistic extrapolations via evolutive traces, and the execution of a concrete output via the generation of a book supported by the Arts and Humanities Research Council in the UK. This adaptation mirrored the process developed in prospective design.

This project is an example of the synthesis, flexibility, contextual adaptation, and transferability process in which design operates. Currently, we are implementing a new case study to further synthesise, adapt, transfer, and implement prospective design in the context of regeneration and sustainability via the development of deep products (Galdon and Hall, 2022).

Case Study 2 – Design for Safety Foresight Review

The Design for Safety (DFS) Foresight review (Anderson, Hall, Ferrarello, Cooper and Ross, 2018) was a strategic design research project commissioned by the Lloyds Register Foundation (LRF) following the successful design for safety grand challenge that focussed on saving lives at seas working with ship's pilots and the Royal National Lifeboat Institution (RNLI) on the river Thames (Hall, Ferrarello and Kann, 2017). The LRF is a charity funded from profits derived from business operation by the Lloyds Register surveying ships with remit of improving safety and have commissioned and published a series of strategic reports on diverse safety areas from fishing and ferries to robotics and critical infrastructure. The DFS research team at the Royal College of Art were commissioned to develop a DFS foresight review that would identify the top global risks from the perspective of DFS and identify any gaps in knowledge and capability.

The foresight review consisted of an international questionnaire and a two-day symposium with an international representation of geographies and safety critical industries. The review was focussed through a DFS matrix which identified the capability gap. A series of strategic mapping exercises were conducted during the symposium including mapping safety case study examples from each expert to ask where should design operate and what is missing from design; design future scenarios based on future forecasting techniques, which outlined future global risks that cross-sectors experts need to tackle through design; a strategic session where experts prioritise future design risks. Following a second one-day symposium with lead researchers and the Lloyds register foundation an onion diagram was developed to communicate the gap in capability and knowledge related to future global DFS issues. These were a DFS gap in ethics and principles, safety culture and safety practices.

Comparison

Case study 1 (CS1) contains several transfers from the original project into four papers for the UK AI Data Strategy Review Board and separately another strand supports a research publication aiming to improve design systems response to future pandemics. Case Study 2 (CS2) has developed a number of publications including one on emergent methodology (Hall, Ferrarello, Anderson, Cooper, Ross, 2019). The DFS project informed a new research project also in the marine environment seeking to support a new economic model for the world's oceans.

Both case studies take a 'knowledge for' future transformation approach from different directions. The prospective design case study (CS1) develops a philosophical perspective on futures and develops a methodology for prospective design that encourages stronger feedback loops from future projections allowing us to 'design in' preferred futures taking a collaborative directional role rather than a passive anticipatory stance. Design for safety (CS2), on the other hand, takes an applied approach of evidence gathering and collaborative activity in a two-day symposium followed by a second one-day event with a group of around 40 participants transferring knowledge through socially facilitated sessions, foresight and documents.

Comparing the two case studies we have proposed an explorative comparison with criteria selected to identify rigour, type, medium, audience and indicators of transferability in the context of generating knowledge for future transformation. When comparing criteria, we see that the case studies diverge in their aims, building a new approach to design futures and uncovering design for safety issues and limitations of design methods for tackling future global issues. Neither form of knowledge calls for repeatability or a retesting of its findings, yet both place emphasis on forward facing future action for 'knowing what to do next' in the context of knowledge for future

transformation. The intended audiences diverge between academics, practitioners, industry and government.

Discussion

The case studies take place in complex dynamic environments tackling wicked or even very wicked problems (Alford & Head, 2017) and hence deal with 'unknowable problems' that prevent repetition. The intricacies of working with systems present a significant challenge for designers. Traditionally, these issues were framed around the concept of wicked problems, developed by Horst Rittel and Melvin Webber in the 1970's to deal with complex social issues (Rittel & Webber, 1973) and led to the challenging of fixed step-by-step models of the design process. Wicked problems are complex and interconnected, sometimes they are nested or overlapping and often involve conflicting demands from various stakeholders with different perspectives making them impossible to fully solve.

As we look towards the future, we must also consider the critical role of contextuality. The output of a design projects will be subject to contextual forces such as economic, social, and environmental factors, and its value will be determined by a posteriori exchange based on these factors. Moreover, the intersection of complexity and contextuality gives rise to two additional variables: ambiguity and uncertainty. These elements prevent repeatability and create an environment in which contextual transferability demands design frameworks with flexibility to adapt to different contexts.

Vectors

Based on the spatial and directional needs of transferability we propose vectors to understand the relationship of the core ontological design research practice and its fundamental differences to the sciences and arts and humanities. We envisage vectors describing the adaptability of knowledge and its transferability as a form of 'future rigour in the making' that could potentially satisfy the challenges that require design's collaborative response to global challenges.

Specifically, we propose vectors for how we might understand the interactions between the future forwards potentials for more successful inter-domain collaborations. We make the case that a vector-based concept improves the potential for inter-domain collaboration. This leads us to the concept of transferability as directionality and a key domain knowledge quality for design which we compare (mirror) to repeatability in the sciences. In terms of rigour, we discuss the qualities of transferability that could address issues for practices which are often validated a posteriori. In our model rigour refers to integrity (collection of original data, material, findings), rather than being disciplined in the implementation of a method (repeatability).

Fig. 2 describes an initial set of vectors emerging from the case studies. We can see internal vectors from within the researcher's projects in CS1 and CS2 moving into knowable transfers. Agreeing with Binder and Redstrom we can see transfer vectors that are internal and external to the project (knowable) and agreeing with Nowell recognise that some may be unknowable hence impossible for the researchers to build on, predict or trigger. We could also speculate that relevance (Zimmerman et al) provides a retro-speculative connection for both knowable and unknowable vectors. Krough and Koskinen's assertion that design researchers tend to follow the ideas, methods and practices of other researchers rather than the objects indicates that we will have to revisit what we view as research outcomes and their influences.

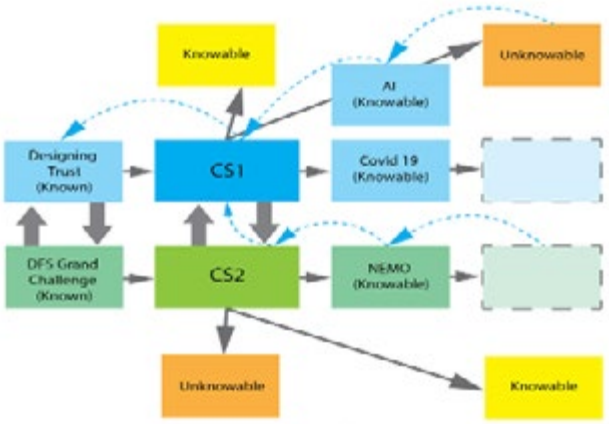

Figure 2. Vectors emerging from case studies.

Vectors that are knowable to the researchers are indicated by grey arrows while blue arrows show reverse retro-speculative trajectories linking to rigour claims. Further vector possibilities are indicated by the additional dashed boxed on the right to infinity. Many more cascading vectors and reciprocal transfers are possible even between indirect contact as in CS1 and CS2 where the authors who were not involved in both case studies yet exchanged other research activities.

Many questions remain and a more extensive analysis of the vectors from other more extensive research projects including knowable and unknowable transfers could provide greater confidence and trust in design research as a constructive special approach to knowledge claiming. Some of these questions include how we can navigate the knowable/unknowable transfer contexts, who decides what success looks like (if success is a consideration in a constructive context)? Are the outcomes traditional research forms (artifacts or the equivalent in practice-based research) or is the researcher practice influence, methods and concepts a 'cultural' research transfer? And how do vectors cascade through knowable, unknowable, external and internal to the researchers? Ultimately the vector network takes on the form of a cultural production.

Although it can sometimes seem like design research is continually flooded by adjacent fields and disciplines these also provide insights for shaping the foundations of design research. Most value seems to be gained for advancing the special approach to claiming knowledge in design research when we 'rub up' against related areas ranging from HCI to design engineering, philosophy, and the social sciences amongst many others.

Conclusions

In comparing our case studies, we have found that diverse approaches to design futures research ranging from rigour, type, methods, audience, output, and indicators offer some potential in supporting an idea of knowledge for future transformation supporting an argument for an ontological design claim for transferability as a key ingredient. The concept of vectors allows us to begin to spatialise these relations of forward knowing whether the relations are past, present or future. In this context, we introduce the factors that make possible transferability; Synthesis, Flexibility, Contextuality, Adaptability, and Comprehensibility.

We offer this as a potential contribution to design ontology as an experiment emerging from a theoretical argument. There are of course alternative, contradictory, and complementary arguments for a design ontology and our thinking here is based on an initial set of comparative criteria applied to a pair of case studies. Other methods may elicit alternative arguments and propositions however we believe the temporal arguments made by Simon, Chris Jones, Glanville still hold and point towards a more radical position of design ontology which

we support here. Further research is anticipated towards detailed investigation of the factors for successful transferability and how this can build towards a framework.

References

Alford J & Head B.W., (2017) Wicked and less wicked problems: a typology and a contingency framework, Policy and Society, 36:3, 397-413, DOI: 10.1080/14494035.2017.136163

Anderson, P., Hall, A., Ferrarello, L., Cooper, R., Ross, C., (2018) Foresight Review on Design for Safety, Lloyds Register Foundation, London.

Archer, B. (1978). Time for a Revolution in Art & Design Education. RCA Papers: 6. London, UK: Royal College of Art.

Baxter, P., & Jack, S. (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. The Qualitative Report, 13(4), 544-559. https://nsuworks.nova.edu/tqr/vol13/iss4/2

Bukhari, S. A. H. (2011). What is Comparative Study (November 20, 2011). Available at SSRN: https://ssrn.com/abstract=1962328 http://dx.doi.org/10.2139/ssrn.1962328

Cross, N., (1982). Designerly ways of knowing, Design Studies Vol. 3, No. 4 October 1982, pp. 221-227.

Douven, I. (2011). "Abduction", The Stanford Encyclopaedia of Philosophy (Spring 2011 Edition)

Galdon, F., Hall, A. & Wang, S. J. (2019a). Prospective design: A future-led mixed methodology to mitigate unintended consequences. Proceedings of the International Association of Societies of Design Research Conference IASDR2019, The University of Manchester, UK

Galdon, F., & Wang, S. J. (2019b). From apology to compensation; A multi-level taxonomy of trust reparation for highly automated virtual assistants. In: Proceedings of the 1st International Conference on Human Interaction and Emerging Technologies (IHIET 2019) conference August 22- 24, 2019, Nice, France.

Galdon, F., & Wang, S. J. (2019c). Addressing accountability in highly autonomous virtual assistants. In: Proceedings of the 1st International Conference on Human Interaction and Emerging Technologies (IHIET 2019) August 22-24, 2019, Nice, France.

Galdon, F., & Wang, S. J. (2019d). Optimising user engagement in highly automated virtual assistants to improve energy management and consumption. In: Proceedings of the 2019 Applied Energy Symposium AEAB Conference Proceedings, MIT, Boston. 22-24 May 2019.

Galdon, F., & Wang, S. J. (2019e). Future development of AI Virtual Assistants (VAs) in Energy management and consumption. In: Proceedings of the 2019 Applied Energy Symposium AEAB

Galdon, F., and Hall, A. (2022) Deep products via undisciplined stewardship: Towards an environmentally- led design pedagogy for the 21st century, in Lockton, D., Lenzi, S., Hekkert, P., Oak, A., Sádaba, J., Lloyd, P. (eds.), DRS2022: Bilbao, 25 June - 3 July, Bilbao, Spain. https://doi.org/10.21606/drs.2022.455

Gaver, W., Hooker, B., & Dunne, A. (2001). The presence project. London, UK: RCA CRD Research Publications.

Gaver, B., (2012) What should we expect from research through design? CHI '12: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pp 937–946, https://doi.org/10.1145/2207676.2208538

Gaver, B., Krogh, P. G., Boucher, A., Chatting, D., (2022) Emergence as a Feature of Practice-based Design Research. In: Designing Interactive Systems Conference. ACM, New York, USA, pp. 517-526. ISBN 9781450393584

Glanville, R., (2005) "Design Prepositions." In: The Unthinkable Doctorate, 1–9. Brussels, UK and Australia: Cybernetics Research, American Society of Cybernetics.

Guba, E., Lincoln, Y.S. (1985) Naturalistic Inquiry, London, Sage.

Hall, A, Galdon, F., (2023) Transferability: Exploring ontological properties for design knowing, CUMULUS, CAFA, Beijing.

Hall, A, Ferrarello, L., Kann, M., (2017), Safety Grand Challenge: Safe Ship Boarding and Thames Safest River 2030,

Report for the Lloyds Register Foundation, pp 128. ISBN: 978-0-9561364-3-5
Herrera, S., Cruz, C., Ramírez, Y., & Cisternas, L. (2016). Conceptual process design for Boric Acid: A case study for engineering education. 26th European Symposium on Computer Aided Process Engineering, 1437–1442. doi:10.1016/b978-0-444-63428-3.50244-
Jacob, F., (2001) From night bustle to printed quietness. Treballs de la Societat Catalana de Biologia: 11–13.
Jones, J. C. (1992). Design methods. New York: Van Nostrand Reinhold.
Krogh, P.G., Koskinen, I. (2020) Drifting by Intention, Design Research Foundations, Springer, https://doi.org/10.1007/978-3-030-37896-7_3
Koskinen, I., & Krogh, P. G. (2015). Design accountability: When design research entangles theory and practice. International Journal of Design, 9(1), 121-127.
Rodgers, P., Galdon, F., Bremner, C. (2020). Design Research-in-the-Moment: Eliciting Evolutive Traces during the Covid-19 Crisis. Design Research Journal 13(3):18. https://doi.org/10.4013/sdrj.2020.133.02
Rittel, H, Webber, M. (1973) Dilemmas in a General Theory of Planning, M.M. Policy Sci 4: 155-169.
Simon, H. (1969) The Sciences of the Artificial. Cambridge, MA: MIT Press.
Zimmerman, J., Forlizzi, J., Evenson, S. (2007) Research Through Design as a Method for Interaction Design Research in HCI, CHI 2007, April 28–May 3, 2007, San Jose, California, USA.

Advanced Design for human-non-human digital and creative ecosystem

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Abstract

Contemporary societies are experiencing local and global challenges which have highlighted the complex nature of our present and its systemic problems; in this context, human actors find themselves collaborating and interacting with new technological tools which are becoming increasingly relevant in daily activities. The main changes concern the relationship between human/technology and human/environment, whose relations are in continuous transition and evolution. This new collaborative modality allows us to imagine new future scenarios and design spaces where human and non-human agents cooperate and interact, producing increasingly accurate information and artifacts. In this contribution we discuss possible strategies for integrating Advanced Design (AD) methodology with the growing availability of technological tools and data. In particular, we argue that the support of technology and the information it produces in design drive processes is helpful in establishing an empathic relationship with the heterogeneity of agents that inhabit the ecosystem and can foster more conscious and sustainable processes and innovations.

Author keywords

Advanced Design; Non-human Actors; Data; Methodology

Introduction

Contemporary societies are experiencing social, environmental, and institutional challenges due to critical issues intertwined in complex and systemic problems, creating a confused and troubled present (Haraway, 2016), where different actors, such as individuals, public administration, companies, researchers and environment, find themselves collaborating in different contexts and relating to new technological tools and system which are becoming increasingly relevant in daily activities (Figure 1).

Climate change, increasing economic inequality, and the clear criticality of the current economic system, characterize today's society and identify it in the concept of "permacrisis" (Turnbull, 2022), or "polycrisis" (Lawrence, Janzwood & Homer-Dixon, 2022), which is defined as "a series of serious long-term challenges, now often labeled as global systemic risks". Due to its specific features, the concept of crisis offers a dual perspective: it can be conceptualized as an opportunity for progress, but at the same time it can be seen as a contradiction

between opposites forces that allows for acceleration from past to future (Koselleck & Richter, 2006; Turnbull, 2022), observing how the resulting impacts are interconnected.

The topic of acceleration and overlapping, in turn, is identified by the increasing velocity at which transformations are happening across society, culture, and environment. Technology-driven transformation has a noticeable impact on human cognitive, creative and social skills and evolution (Hayles, 2012; Stiegler, 1998). Potentially, every aspect of human daily activity is mediated by interaction with technological interfaces. According to models of embodied and extended cognition, digital interfaces and media shape not only the way we think but also our bodies (Clark, 2008). On the other hand, the productive system struggles to adapt to such transformations due to its intrinsic inertia. Although initiatives such as Industry 4.0 support and finance technological innovation in the industrial sector, established manufacturing processes, especially in heavy industrial sector, still rely on significant amount of energy consumption, raw material extraction and cheap labor cost.

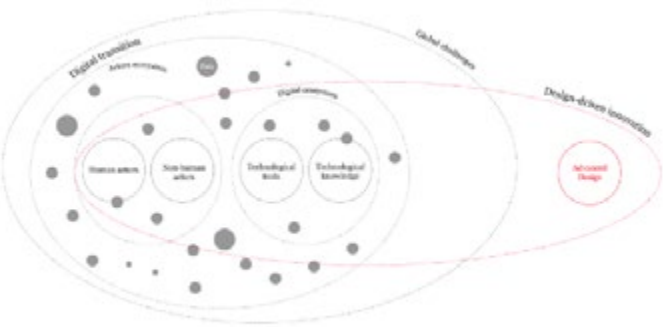

Figure 1. Background, actors and design approach

In order to address such challenges, community-based and shared vision presents itself as a possible opportunity to address such complexity and foster a transition to a more sustainable future (European Commision, 2019), including solutions derived from collaborative actions and integrated planning among the ecosystem of actors and tools, through multidisciplinary approaches (Akata et al., 2020).

Design cultures have developed design spaces and approaches to managing such complexity assuming different characteristics depending on the context; currently, digital technologies, such as machine learning and Internet of Things, have begun to permeate design-driven disciplines, leading the design community to ask different questions about the ways in which design is done (Giaccardi & Redström, 2020). Among these approaches, Advanced Design (AD) has focused on the time factor as a central parameter to consider in developing design-driven innovation (Celaschi, 2015; Celi, 2010, 2015). Together with the adoption of anticipatory and speculative practices (Celaschi et al., 2018; Celi & Formia, 2015), advanced designers engage with multiple specializations and disciplines to decode the complex structure of possible future scenarios.

In recent decades, the growing availability of electronic devices equipped with a variety of sensors and interconnected through mesh network and to the web, has generated a layered structure of digital georeferenced information (Zannoni, 2018). Social transformation can be observed by applying computational methods on cultural data (Manovich, 2020) as well as climate change is studied through the analysis of environmental data. Over time, data has become a central aspect to consider during the design process. However, the complexity of connecting data between the global and the local dimension emerges due to both the heterogeneity of collected information and the definition of an appropriate knowledge structure (Cattabriga, 2022).

The successful or adverse relationships established among those participating in this transition are also constantly evolving, and one of the major changes concerns the relation between humans and technology, and between humans and the environment.

These interactions have enabled a process of consciousness-raising in relation to the diversity between individuals themselves, context and technological tools, where the concept of difference assumes the

characteristics of an ontological source of societal empowerment which, however, allows for the connection of the individual with the collectivity itself (Haraway, 2018). The heterogeneity of society is reflected not only in the identity of individual people but also in the defining characteristics of the physical objects and technological systems with which people interact every day; this redefinition of the relationship between human and non-human, decreases the gap between physical and digital worlds, detaches itself from standardized ideals and accepts the fluidity of bodies (Ferrando, 2017). In fact, it is possible to identify a new space for the expression of the individual, of personal exploration and relationship with technological tools where corporeity is no longer defined by its material characteristics but assumes the definition of virtual corporeity (Braidotti, 2018). Human and artificial capabilities interact and define new forms of relationship, immateriality of bodies and overcoming of social patterns, according to the concept of glitch, that is an error in the corporeity of the binary society that is identified thanks to digital tools (Russel, 2020).
In this contribution we discuss the possible strategies to integrate the AD methodology with the growing availability of data. In particular, we argue that using data to establish an empathic relationship with the heterogeneity of agents that inhabit the ecosystem, can foster more context-aware processes and innovations.

Design-driven innovation in complex environments through Advanced Design

The transformations taking place in the relationship between people and digital tools have made it possible to initiate a series of experimentations and identification of possible future scenarios related to the evolution of this interaction and to figure out what could be the ways to develop a multi-agent collaborative process, moving from the concept of "Human-machine interaction" to that of "Human-machine Cooperation" (Hoc, 2000) and heteromation (Ekbia & Nardi,2014), introducing a collaborative and knowledge-sharing aspect.
Collaboration represents a human behavior naturally present in people's genes, but it is a capacity that must be exercised and deepened to foster an environment and context that can lead to open, cross-sectoral (Sennet, 2012) and responsible innovations (Blok & Lemmens, 2015). The theme of cooperation acquires particular relevance when included in the current process of digitization of our society, which is considered among the most relevant changes taking place and is an intrinsic condition of today's society (Escobar, 2018).
In fact, technological support to human, cognitive and operative capacities (Monari & Baraldi, 2020) can be an asset for policy making, public interest actions, and innovation of operational and project processes (Hoc, 2000), stressing the need to identify hybrid spaces which allow the co-existence of human and non-human agents.
According to this perspective, technological systems, their development and the information it produces would no longer be neutral and indifferent from a functionally and ethical point of view (van de Poel, 2001) but becomes an agent who interacts and actively participates in the design process, initiating a context in which human actors design not for technologies but with technologies (Giaccardi & Redström, 2020).
The experience of these digital systems is undergoing a change. In fact, the industrial design artifact is created to perform a function in relation to an operator (Troncon, 2016), becoming a complex performance of object properties and senses according to the Donald Norman's affordance concept (Norman, 1988, 2007, 2011, 2013) and the relationship with the "ecological psychology" (Gibson, 1979) theme of the surrounding environment; technological systems and the data produced by them, become active agents of the process in the mode of "co-performance," (Kuijer & Giaccardi, 2018; Giaccardi & Redström, 2020) i.e., an approach to design where such objects collaborate together with people, introducing the possibility of conceiving the artificial activities of things as a decentralized design practice in a hybrid mode based on intentionality and experience (Akata et al., 2020; Kamar, 2016). This 'co-productive' aspect introduces the field of socio-technology, a field of innovation in which complex technological systems have a political, ethical and environmental impact wherever technological

development involves a heterogeneous combination of human and non-human elements. (Vermaas, 2011).
Accepting this multi-agent collaborative vision, it is therefore necessary to inquire in what way design disciplines and cultures can evolve through the presence of non-human actors participating in the process, overcoming the limitations due to the current approach of a few methodologies, such as Human Centered Design.
As the human agent opens to new forms of co-operation, it is important to identify future scenarios and new design spaces based on the more-than-human concept, including technologies in the discussion.
Therefore, it is relevant to understand how the conceptual design space can change to a new modality of interaction with technologies and data, which become designing actors (Nicenboim et. Al, 2020) and address a further level of complexity of the reality around us where the cognitive flows of humans, animals and machines co-exist (Hayles, 2006); identifying new design-drive modes that are collaborative and declined in the multi-agent sphere, the figure of the designers also evolves, finding themselves interacting with actors of a different nature, and the role that is exercised in the relationship with digital tools also changes (Cattabriga 2020; Lim & Jung, 2018).
Starting with an in-depth analysis of some design driven methods and processes currently put into practice, it is possible to explore their characteristics and understand how they can be reshaped, according to the previously mentioned methods and tools.

Introducing non-human actors in Advanced Design methodology

In order to introduce these theoretical models into design practice, the research proposes to use an Advanced-Design driven approach, trying to understand how and if it is possible to include non-human agents in this design framework.
Advanced Design (AD) is to be considered as an articulated system of design practices used to design processes, products or services for complex scenarios set in the future (Celaschi, 2015), a systemic approach that is based on collaborative practices between multiple actors to drive transformative change within the realities in which it operates.
In the last 15 years, it has started to emerge how the concept of anticipation and future studies (Poli, 2010,2019; Zamenopoulos & Alexiou, 2007) can be drivers to support an "advanced design approach" capable of responding to the complexity of the ever-changing dimension of innovation,tryingtoclarifythe"relationshipbetweentheevolutionofthetimefactoranddesign- led innovation" (Celi, 2010 cited in Celaschi, Celi & Formia, 2014, p.22).
Over the years, this methodology has opened up the vision of industrial design to the concepts of anticipation (Celi, 2015; Formia, 2017; Iñiguez Flores et al., 2019; Celaschi et al., 2019) and has led it to propose itself as an approach that intervenes in the complexity of relationships linked to the changing context (Celaschi, 2015), and to innovation processes conditioned by environmental and social factors and lack of resources.
In the synoptic framework developed in recent years, which includes four main integrated and interconnected macro-fields of action in AD (Succini, 2022; 2023), the factor "Time, future and anticipation" has relevance to our reasoning. AD inserts the time factor as a field of action (Celaschi, et al, 2018) within the design process, linking past, present and future and seeking to "anticipate change and make it accessible through the materialization of processes, paths, artefacts and conjectures" (Celi & Morrison, 2019, p.807). It enables the ability to imagine possible, probable, potential futures (Celaschi et al., 2019) and applies to the context by reacting to change through continuous innovation.
Another macro-field is represented by Innovation of Collective Sharing Processes, in which people - the community and the territory - interacting through co-design processes and collective intelligence practices (Celaschi, Celi & Formia, 2014) - are considered actors and active agents for the development of new forms of

design capable of responding to current challenges. The foundation is the idea that "the collective, social and shared construction of the vision is the key to success" (Celaschi et al., 2014, p.28) of more sustainable products, services, systems.

A third subject on which AD focuses its work is Transformative Innovation. It is based on three principles: i) adaptability (Mozota, 2006; Iñiguez Flores et al., 2014), which supports change, activates collective forms of learning, and allows design to transform critical issues into opportunities through anticipating practices; ii) sustainable transformation, which leads designers to reflect on responsibilities in transforming the behavior of individuals and communities; iii) cultural change, through iterative and continuous experimentation, creating forms of design that start from the future and lead to changes in the present (Celaschi et al., 2019).

Last but not least is Knowledge Innovation: in AD the sharing of knowledge and the activation of collective knowledge constitute forms of innovation (Celaschi et al., 2019) characterized by: i) interdisciplinarity and cross-fertilization between both academic and non-academic competencies; ii) forms of 'Reflection-in action' (Schon, 1983) in which design is read as a reflective practice; iii) 'learning by doing' training systems and by the collective (Iñiguez Flores et al., 2014) and co-produced learning processes.

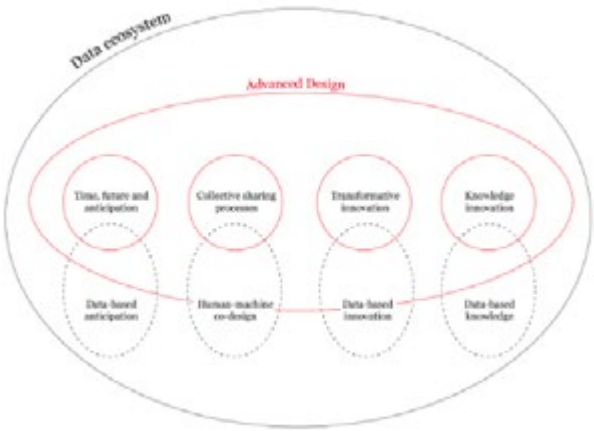

Figure 2. Advanced Design and relation with data

Conclusion

In this contribution, we hypothesises that a design approach such as AD, which already has in itself ingredients such as multi-stakeholder collaboration and cocreation, anticipation, collective intelligence and knowledge practices, and cultural change through continuous experimentation, can be thought of as introducing non-human agents to facilitate design problem-solving, using data as real active agents that can act on the outcome, thanks also to the mediation of designers who are able to manage this new variable.

The re-definition of the mediation roles considering the emergence of non-human agents in the Advance Design system can be addressed from two main directions. The first aspect concerns knowledge transfer and facilitation between specialized research and technology providers, companies, professionals and users. The second one is the definition of new tools and strategies to embed in the design practice in order to extract value from the continuous data collection and systematization that designers carry on.

Regarding the first aspect, design education is characterized by a significative multidisciplinary approach, as well as the professional practice articulates across multiple specializations. These intrinsic qualities, together with the capability of designers to build effective narratives around their research, give the designers the opportunity to build empathic connection between stakeholders and consumers. Also, through their mediation, designers have the capability to demystify preconceptions towards technology, but also to address and intervein in complex topics such as privacy and data use. Such mediation is of growing importance as new technologies, such as AI-based systems, raise concerns across professionals, institutions, consumers and regulatory bodies. Strategies to transfer information and vary depending on the targeted audience. Practices that are commonly used in AD and that translate complex data into more comprehensible and usable information include data visualization, scenario building, design fiction, and reports.

Such practices need to be developed in synergy with data collection and systematization tools. Since 2019, the Advanced Design Unit of the University of Bologna has been developing a digital tool to systematize the continuous process of case studies collection. This custom system is built
on relational connections between the database elements. This structure allows to highlight the emergence of patterns, relations and relevant insights.
As discussed so far, the framework proposed by Advanced Design addresses the complex challenges that the production system is facing. The development of a wider sensibility in respect to data and their interpretation appears to be relevant in design practice dealing with future and anticipatory scenarios. The ongoing development of design strategies and tools is a significant aspect of Advanced Design methodology, in which designers become mediators between different stakeholders, production sectors and customers (Celaschi, 2008). The mediating role of the Advanced Designers, we argue, is extending towards the new emerging technological and non-human agents.

References

Akata, Z., Balliet, D., de Rijke, M., Dignum, F., Dignum, V., Eiben, G., Fokkens, A., Grossi, D., Hindriks, K., Hoos, H., Hung, H., Jonker, C., Monz, C., Neerincx, M., Oliehoek, F., Prakken, H., Schlobach, S., van der Gaag, L., van Harmelen, F., ... Welling, M. (2020). A Research Agenda for Hybrid Intelligence: Augmenting Human Intellect With Collaborative, Adaptive, Responsible, and Explainable Artificial Intelligence. Computer, No. 53(8), pp. 18–28.

Blok V., Lemmens P., (2015). The Emerging Concept of Responsible Innovation. Three Reasons Why It Is Questionable and Calls for a Radical Transformation of the Concept of Innovation. In: Koops, B. J., Oosterlaken, I., Romijn, H., Swierstra, T., & van den Hoven, J. (Eds.) (2015). Responsible innovation 2: Concepts, approaches, and applications. (1 ed.) Springer International.

Cattabriga, A. (2023) Systemic Relational Insights: a new hybrid intelligence approach to make sense of complex problems. RSD11: Proceedings of Relating Systems Thinking and Design Symposium "RELATING SYSTEMS THINKING AND DESIGN ... SYMPOSIUM PROCEEDINGS", Systemic Design Association.

Celaschi, F. (2015). AdvanceDesign Points of View. In M. Celi (A c. Di), Advanced Design Cultures (pp. 3–17). Springer International Publishing. https://doi.org/10.1007/978-3-319-08602-6_1

Celaschi, F., & Celi, M. (2015). Advanced design as reframing practice: Ethical challenges and anticipation in design issues. Futures, 71, 159–167. https://doi.org/10.1016/j.futures.2014.12.010

Celaschi, F., Celi, M., & Formia, E. (2014). Quando il design incontra il futuro. When Design Meets Future. Planning Design Technology. Utopia. Futuro.Past, Present, 3, 20–29.

Celaschi, F., Formia, E., & Franzato, C. (2018). Ritorno al futuro. Il fattore tempo e i futures studies nell'approccio design driven all'innovazione. DIID Disegno Industriale Industrial Design, 18(64), 126–133.

Celaschi, F., Formia, E., Iñiguez Flores, R., & León Morán, R. (2019). Design Processes and Anticipation. In R. Poli (Ed.), Handbook of Anticipation, pp. 773–793. Springer International Publishing. https://doi.org/10.1007/978-3-319-91554-8_48

Celi, M. (2010). Advanced Design: Visioni, percorsi e strumenti per predisporsi all'innovazione continua. McGraw-Hill.

Celi, M. (2015). Advanced Design Cultures. Springer.

Celi, M. (2010). Advanced Design: Visioni, percorsi e strumenti per predisporsi all'innovazione continua. McGraw-Hill.

Celi, M., & Elena, F. (2015). Advanced design practices for sharing futures: a focus on design fiction. In The value of design research-Proceedings of the 11th International Conference of the European Academy of Design (pp. 1-13).

FRA.
Celi, M., & Morrison, A. (2019). Anticipation and Design Inquiry. In R. Poli (Ed.), Handbook of Anticipation: Theoretical and Applied Aspects of the Use of Future in Decision Making (pp. 795–819). Springer International Publishing.
Clark, A. (2008). Supersizing the mind: Embodiment, action, and cognitive extension. Oxford University Press.
Ekbia, H., & Nardi, B. (2014). Heteromation and its (dis)contents: The invisible division of labor between humans and machines. First Monday. https://doi.org/10.5210/fm.v19i6.5331
Escobar, A. (2018). Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds (pp. 25-48). Durham: Duke University Press.
European Commission [EC]. (2019). Communication from the commission: the European Green Deal. Retrieved from: https://eur-lex.europa. eu/legal-content/ EN/TXT/HTML/?uri=CELEX:52019DC0640&from=IT
Formia, E. (2017). Storie di futuri e design: Anticipazione e sostenibilità nella cultura italiana del progetto. Maggioli Editore.
Giaccardi, E., & Redström, J. (2020). Technology and More-Than-Human Design. Design Issues, 36(4), 33–44. https://doi.org/10.1162/desi_a_00612
Gibson, J. J. (1979). The ecological approach to visual perception. Houghton Mifflin. Russell, L. (2020). Glitch feminism: A manifesto. Verso.
Hayles, N. K. (2006). Unfinished Work: From Cyborg to Cognisphere. Theory,
Culture & Society, 23(7–8), 159–166. https://doi.org/10/dkx839
Hayles, N. K. (2012). How we think: Digital media and contemporary technogenesis. The University of Chicago Press.
Haraway, D. J. (2018). Manifesto cyborg: Donne, tecnologie e biopolitiche del corpo (L. Borghi, A c. Di). Feltrinelli.
Haraway, D. J. (2016). Staying with the trouble: Making kin in the Chthulucene. Duke University Press.
Hoc, J.M. (2000). From human – machine interaction to human – machine cooperation. Ergonomics, No. 43(7), pp. 833–843.
Iñiguez Flores, R., Celaschi, F., Formia, E., & León Morán, R. M. (2019). The Extended Praxis of Design: Towards a Characterization of the Advanced Design Cultures, in The Design After. Cumulus Conference Proceedings 2019, 449–458.
Kamar, E. (2016). Directions in Hybrid Intelligence: Complementing AI Systems with Human Intelligence. IJCAI'16: Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence, pp. 4070-4073.
Koselleck, R., & Richter, M. (2006). Crisis. Journal of the History of Ideas, 67(2), 357–400. https://doi.org/10.1353/jhi.2006.0013
Kuijer, L., & Giaccardi, E. (2018). Co-performance: Conceptualizing the Role of Artificial Agency in the Design of Everyday Life. Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, 1–13. https://doi.org/10.1145/3173574.3173699
Lawrence, M., Janzwood, S., & Homer-Dixon, T. (2022) 'What Is a Global Polycrisis?' Version 2.0. Discussion Paper 2022-4. Cascade Institute.
Lim, J.-S., & Jung, E.-C. (2018). A Study on the Roles of Designers Co-Evolving with Tools. DRS Biennial Conference Series. Retrieved from: https://dl.designresearchsociety.org/drs- conference-papers/drs2018/researchpapers/77
Manovich, L. (2020). Cultural analytics. The MIT Press.
Monari, P., & Baraldi, L. (2020). De Arte Intelligendi.
Nicenboim, I., Giaccardi, E., Søndergaard, M. L. J., Reddy, A. V., Strengers, Y., Pierce, J., & Redström, J. (2020). More-Than-Human Design and AI: In Conversation with Agents. Companion Publication of the 2020 ACM Designing

Interactive Systems Conference, 397–400. https://doi.org/10.1145/3393914.3395912
Norman, D. A. (1988). The psychology of everyday things (trad. it (1990) La caffettiera del masochista: psicopatologia degli oggetti quotidiani, Firenze: Giunti editore). Basic Books.
Norman, D. A. (2007). The design of future things (Trad. it. Il design del futuro, Milano: Apogeo 2008). Basic Books.
Norman, D. A. (2011). Living with complexity. MIT Press.
Norman, D. A. (2013). The design of everyday things (Revised and expanded edition). MIT Press.
Poli, R. (2010). An Introduction to the Ontology of Anticipation. Futures, 42(7), 769–776. https://doi.org/10.1016/j.futures.2010.04.028
Poli, R. (Ed.). (2019). Handbook of anticipation: Theoretical and applied aspects of the use of future in decision making. Springer.
Sennett, R. (2012). Together. Rituals, Pleasures and Politics of Cooperation. New Haven:Yale. Stiegler, B. (1998). Technics and time. Stanford University Press.
Succini, L. (2022). Processi e Pratiche di Innovazione Responsabile: il ruolo dell'Advanced Design nella trasformazione collaborativa dei territori. [Dissertation thesis], Alma Mater Studiorum Università di Bologna. Dottorato di ricerca in Architettura e culture del progetto, 34 Ciclo.
Succini, L. (2023). Leggere l'Innovazione Responsabile attraverso l'Advanced Design. In E. Formia, V. Gianfrate, & L. Succini (Eds.), Design per l'Innovazione Responsabile. Guida per processi formativi in trasformazione (pp.21-36). Franco Angeli.
Troncon, R. (2016). Il modello ecosistemico del design reasearch e la problematica etica in progettazione. I castelli di Yale online, volume IV, 49-69.
Turnbull, N. (2022). Permacrisis: what it means and why it's word of the year for 2022. The Conversation. Retrieved from: https://theconversation.com/permacrisis-what-it-means-and- why-its-word-of-the-year-for-2022-194306
van de Poel, IR. (2001). Ethics, technology assessment and industry. TA Datenbank Nachrichten, 10(2), 51-61.
Vermaas, P. (A c. Di). (2011). A philosophy of technology: From technical artefacts to sociotechnical systems. Morgan & Claypool Publishers.
Zamenopoulos, T., & Alexiou, K. (2007). Towards an anticipatory view of design. Design Studies, 28(4), 411–436. https://doi.org/10.1016/j.destud.2007.04.001
Zannoni, M. (2018). Progetto e interazione: Il design degli ecosistemi interattivi (Prima edizione). Quodlibet.

Design Strategy for Agricultural Waste Recycling System Based on UTAUT2 Model Psychological Needs and Behavior Analysis

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Abstract

Background: n the face of ecological pressures arising from population growth, wastage of natural resources, and environmental degradation, finite resources cannot meet the future global demands. However, addressing global challenges necessitates an analysis of the psychological needs and modes of participation from a symbiotic ecological perspective, identifying issues and directions, and improving the construction and optimization of social innovation strategies while ensuring the preservation of ecological interests.

Subjects and Methods: Initially, a regional survey is conducted with a focus on the rural population, and, in conjunction with the 'UTAUT2' model, an analysis is undertaken from both the psychological needs and modes of participation perspectives. This analysis aims to identify the factors influencing the willingness and behavior of agricultural waste recycling. Ensuring the integrity and authenticity of the data, the study clarifies the direction of the research questions and further refines the design strategy for agricultural waste recycling and reuse while maintaining data accuracy and completeness.

Results: By conducting a comparative analysis of the obtained average scores, the factor with the highest mean is determined. Subsequently, each factor is reintroduced into the "UTAUT2" model to reconstruct the mechanism of agricultural waste recycling intention and behavior. In this process, "Expectation of Performance" is replaced with "Ecological Utility," "Expectation of Effort" is substituted with "Convenience," "Social Influence" is replaced by "Public Awareness," "Facilitating Conditions" are substituted with "Infrastructure," "Hedonic Motivation" is replaced with "Subjective Initiative," "Price Value" is replaced by "Economic Income," and "Habit" is substituted with "Adaptability."

From a dimensional perspective, as "Gender" has no significant impact on behavioral intention, it is decided to retain "Age" and "Experience" unchanged, remove "Gender," and add "Education" and "Income" to the original "UTAUT2" model. Consequently, the dimensions with more significant influence are "Age," "Education," "Experience," and "Income."

Conclusions: Under the influence of psychological needs and behavior, a systemic interactive network should be constructed, centered around symbiotic ecology, while simultaneously addressing and optimizing three aspects: Energy Economy, Social Services, and Branding Culture. This forms the primary strategy for design. The aim is to encourage more people to focus on ecology and society, particularly in the face of global threats in the current Anthropocene era, ultimately contributing to interdisciplinary research for the future.

KEYWORDS: Ecology; Ecological Design; Social Design; Social Innovation, Psychological Needs

1. Introduction

The realization of ecological civilization and eco-economy construction can not be fully adopted by the government"s mandatory management and the public"s passive implementation of policies but needs to be carried out on the basis of respecting the farmers" individual wishes, supplemented by flexible policies. This can fully mobilize the farmers" will and drive the public"s recycling behavior, which will play a positive role in agricultural waste recycling. However, the factors affecting the willingness to recycle agricultural waste are very complex. By searching for analytical models in the field of science and technology, we found that the Unified Theory of Acceptance and Use of Technology II (UTAUT2) in the IT field can analyze the factor conditions and clarify the target technical problems. Therefore, the construction of the strategy mechanism mainly refers to this model.

The Technology Acceptance Model (TAM), proposed by Fred Davis in 1989, is the prototype of "UTAUT2", which emphasizes the importance of perceived usefulness. The model emphasizes the impact of perceived usefulness and perceived ease of usage on technology adoption and use. However, researchers later found that the TAM model could not fully explain people"s behavior toward technology adoption and use because it did not take into account other important factors, such as personal beliefs and social pressures. Researchers began to develop and improve the TAM model, and finally in 2003, Venkatesh, Morris, and other experts proposed the"UTAUT" model, which is a further development and refinement of the TAM model, covering more decision-making factors, and has been widely used and validated in practice. In 2012, Venkatesh et al., added "Hedonic Motivation", "Price Value" and "Habit" variables to the "UTAUT" model in order to better adapt to the user"s technological acceptance and usage context. Therefore, it is necessary to set up the questions of the questionnaire on the basis of the "Unified Theory of Acceptance and Use of Technology II" and analyze the results of the factors influencing the behavioral patterns of the current recycling process. The research model "UTAUT2" (Figure 1) was used for this study. 1) is an extension of the first-generation "UTAUT" model. The UTAUT2 model (Figure 1) is an extension of the first generation of the UTAUT model. Its core factors are: "Performance Expectancy", "Effort Expectancy", "Social Influence", "Facilitating Conditions", "Hedonic Motivation", "Price Value", and "Habit" influence a user"s "Behavioral Intention" and "Use Behavior", and are moderated by "Gender", "Age", and "Experience"[1]. Since the "UTAUT2" model can address the use and acceptance of technology based on the understanding of the user"s "Behavior Intention", in order to better optimize the agricultural waste recycling system, "technology" as the subject of the study was replaced by "system mechanism", and then a series of related questions and dimensions were set up based on the "UTAUT2" condition. There were three types of questions: single-choice, multiple-choice, and matrix questions.

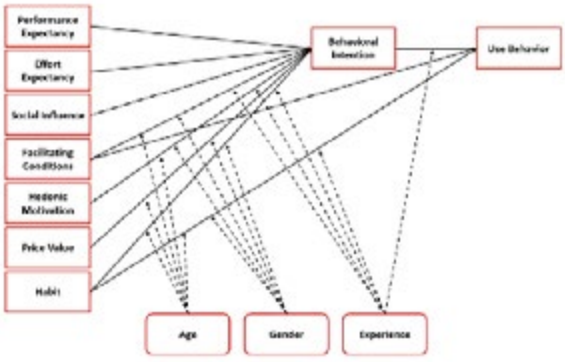


Figure 1. Unified Theory of Acceptance and Use of Technology II (Unified Theory of Acceptance and Use of Technology II, or "UTAUT2")

Source: A Acceptancelab.com

2. Materials and Methods

2.1 General Information

2.1.1Data Analysis of Behavior Intention and Use Behavior of Agricultural Waste Recycling Systems

As the main users, rural farmers are the backbone of agricultural waste recycling, and they are also the largest beneficiary group of this practical study. Therefore, around 1000 questionnaires were distributed indiscriminately to farmers in various regions of Shandong Province in China. After the questionnaire collection, a total of 1002

data from various cities and villages in Shandong Province of China were analyzed to find out the current status of agricultural waste. First of all, from the basic information portrait of the target population, it can be seen that there are more male farmers in Shandong Province; they are generally older and more than 45 years old; it can also be seen that the education level of the villagers is mostly in elementary school or junior high school; among the villagers, more than 5 years of farming experience is the main group; and those with an annual income of less than 50,000 yuan account for the majority of the villagers.

First of all, by comparing the average values of the matrix scale questions in the questionnaire (Table 1), we can rank the basic conditions of agricultural waste recycling Behavior Intention and Use Behavior, which is: Price Value > Habit > Effort Expectancy > Hedonic Motivation > Facilitating Conditions > Performance Expectancy > Social Influence. Therefore, from the perspective of agricultural workers, the four conditions that are closely related to their behavior are price value, habit, effort expectation, and Hedonic Motivation, in that order.

Table 1. Average Value of Conditions Underlying Agricultural Waste Recycling System Behavior Intention and Use Behavior

On the basis of the above conditions by refining the questions in the base conditions and making further

Factor	Average Value
Price Value	4.12
Performance Expectancy	3.3
Effort Expectancy	3.59
Social Influence	3.25
Facilitating Conditions	3.38
Hedonic Motivation	3.5

comparisons of the average scores (Table 2), it is sought to clarify the influencing factors of the willingness and behavior of the agricultural waste recycling mechanism by summarizing the key initiatives of the questions with high relevance to the agricultural waste recycling mechanism.

Table 2. Mean values of factors influencing the Behavior Intention and Use Behavior of agricultural waste recycling systems

Factor	Related Questions	Average Value
Price Value	Economic Income	4.26
Performance Expectancy	Ecological Utility	3.48
Effort Expectancy	Convenience	3.78
Social Influence	Public Awareness	3.37
Facilitating Conditions	Infrastructure	3.57
Hedonic Motivation	Subjective Initiative	3.62
Habit	Adaptability	4

By comparing the mean scores of the previous questionnaires on agricultural waste recycling Behavior Intention and Use Behavior, we finally came up with the factors with the highest mean values and brought them into the "UTAUT2" model one by one to reconstruct the mechanism of agricultural waste recycling Behavior Intention and Use Behavior. Among them, "Performance Expectancy" is substituted as whether the utility of agricultural waste recycling reaches the standard required by the government in ecological issues, i.e. Ecological Utility; " Effort Expectancy" replaces the ease of agricultural waste recycling by farmers, i.e. Convenience; "Social Influence" replaces the policy direction based on the judgment of the government and the villagers, i.e. Public Awareness; Facilitating Conditions" is replaced by "the need to consider the degree of perfection of the recycling site and recycling process, the maturity of the technology of agricultural waste treatment and secondary development of related wastes, as well as the popularity of recycling facilities and other related factors, i.e. Infrastructure; "Hedonic Motivation" is substituted for the mental positivity and emotional outpouring of the public, as well as the interest of farming villagers in agricultural waste recycling, i.e., Subjective Initiative; "Price Value" is substituted for the weighing of the degree of economic income generated by farming villagers from agricultural waste recycling, i.e. Economic Income; "Habit" is a proxy for the degree of acceptance of the whole recycling process by farmers within a certain time frame, i.e., Adaptability.

According to the user profile, the dimensions of agricultural waste recycling Behavior Intention and Use Behavior from the perspective of rural farmers are specifically in the five dimensions of "Gender", "Age", "Education", "Experience" and "Income". Therefore, by using the Multiple Linear Regression (MLR) model different factor variables in different dimensions are analyzed below.

In this model, one of the dependent variable is set as Y, and k independent variables , modeled as equation (1):

$$Y = \beta 1 \times X1 + \cdots + \beta k \times Xk + \epsilon \quad (1)$$

In the model of Eq. (6) is the regression coefficient of the independent variables X1 ,$\cdots$,Xk, and ϵ is the error term. Estimate and Test of the regression coefficients are used to determine whether different independent variables have an effect on the dependent variable and whether the effect is positive or negative. Least Square estimation is used to obtain the estimated regression coefficients and their Standard Error (Std. Error) and the test t-statistic (t value) is obtained from Eq. (2):

(2)

By using Eq. (7) to examine the test statistics for t, the test P-value for each regression coefficient can be obtained . The smaller the P-value, the more significant the effect of the independent variable on the dependent variable. The regression results are shown below (Table 3).

Table 3. Dimensional Regression Analysis of Pr (>|t|)

Pr (>|t|)	Gender	Age	Education	Experience	Income
Price Value	5.329290e-01	2.999181e-20	1.791594e-10	5.848821e-23	6.996346e-16
Effort Expectation	5.032379e-01	1.169367e-18	1.376094e-09	2.123983e-20	1.305238e-12
Performance Expectations	6.161710e-01	1.126503e-23	4.644049e-16	1.411483e-23	1.062317e-17
Facilitating Conditions	1.711051e-01	4.263002e-21	6.018358e-12	2.715126e-24	1.311945e-12
Habits	6.731635e-01	5.174873e-24	6.676264e-15	1.144299e-24	1.956919e-16
Social Influence	7.023360e-01	9.848884e-33	1.432071e-20	1.557119e-34	1.222002e-24
Hedonic Motivation	9.515001e-01	6.580629e-20	1.410087e-11	2.528577e-22	4.490753e-15

Furthermore, for the first row of regression coefficient estimates for the four variables with significant effects, namely age, education, experience, and income, the following can be observed. As age increases, the score for this question decreases, indicating less agreement. Conversely, a higher level of education results in a higher score, indicating more agreement. Greater experience leads to a lower score, indicating less agreement, while a higher income results in a higher score, indicating more agreement.The regression results are shown below (Table 4).

Table 4. Dimensional Regression Analysis of Estimate

Table 4. Dimensional Regression Analysis of Estimate

Estimate	Gender	Age	Education	Experience	Income
Price Value	-0.03826857	-0.21172089	0.13750568	-0.21878979	0.17540137
Effort Expectation	0.06291619	-0.31067785	0.20021724	-0.31525335	0.23697433
Performance Expectations	-0.04116173	-0.30698997	0.23275529	0.29671186	0.24859158
Facilitating Conditions	0.1235489	0.3182136	0.2178567	-0.3313315	0.2276578
Habits	-0.03188051	-0.28461072	0.20579619	-0.27946427	0.21998146
Social Influence	0.02819831	-0.32439696	0.23826049	-0.32253848	0.26510346
Hedonic Motivation	-0.005949701	-0.334450307	0.231866266	-0.343700523	0.271811630

According of analysis, the middle-aged and elderly, low-income, basic education, and long-term farmers have larger bases and lower scores in many dimensions. On the one hand, more consideration should be given to these groups and their needs should be maximized in the development of social innovation strategies under the influence of Behavior Intention. On the other hand, the higher scores on multiple dimensions and the strong recognition of these groups can lead and influence the lower scoring groups, which is also helpful for strategy optimization. However, the gender dimension does not have a significant effect on Behavior intention. Therefore, age, Education, experience, and income were the more significant dimensions. Therefore, based on the original dimensions of UTAUT2, Age and Experience were kept unchanged, and Gender was eliminated. The "Gender" dimension was removed, and two new dimensions, "Education" and "Income", were added. The combination of dimensional analysis and factor analysis resulted in a new "Behavior Intention and Use Behavior Model of Agricultural Waste Recycling System" (Figure 2). The model became the main theoretical tool for social innovation strategies and practices.

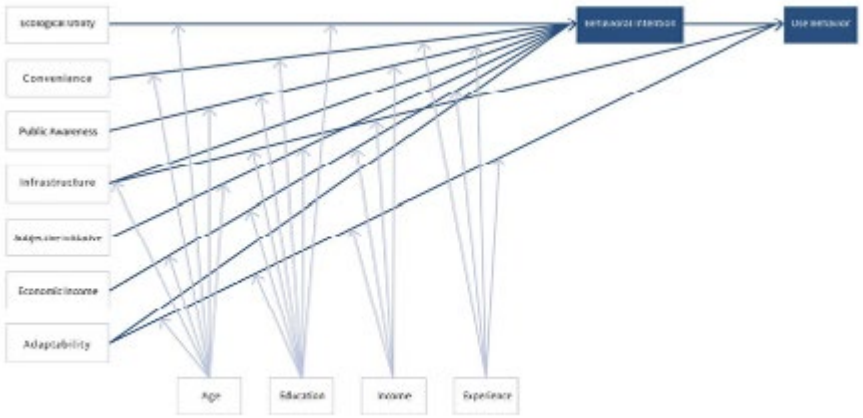


Figure 2. Behavior Intention and Use Behavior Model of Agricultural Waste Recycling System

2.1.2 Feasibility Analysis of Energy Economy Mechanism

In collecting straw agricultural waste, the collection methods are not exactly the same, so there is a wide range of recycling and development costs. By investigating the transportation cost of straw recycling, it was found that the transportation cost varies with the distance of the collection place. Therefore, the straw within a certain area is transported to the cooperative by the farmers, and thus a model of straw recycling logistics is developed, which is to transport the straw within a specific area around the villages to the cooperative. The transportation cost mainly includes the cost of transporting the straw, and there is also the cost of loading and unloading. Due to the topographical differences in different straw collection areas, different factors affect the transportation costs, which are used as a basis for the analysis and assumptions. Firstly, the type of crops is not considered, and the collection of crops is targeted in the target area; secondly, the amount of straw is sufficient in terms of quantity and planting area to satisfy the cooperative"s storage and development; furthermore, there is no need to pay attention to the seasonality and regionality of the crops; finally, there is sufficient capacity for transportation and collection; in addition to the above, the uncovered area is directly mortgaged by the villagers to the Cooperative. cooperatives directly.

Labour is present in the logistics stage of recycling, which is more common, and in order to materialize this labour in monetary terms, the labour is thus materialized, which is the logistics cost of straw recycling. The cost structure (Figures 3) contains not only the pretreatment and development costs of straw, but also transportation costs, and possibly some other costs. The first one is the transportation cost, which is the cost of transporting the mortgaged straw to the economic community. The transportation cost is incurred when the straw is transported by the farmers and villagers to the Economic Community. Secondly, there is the cost of straw pretreatment and development, which includes the processing of straw through different stages such as crushing, compression and baling, which results in processing costs, as well as the development of the straw from pretreatment products into biomass clean energy in order to facilitate its development and utilization, which requires a certain amount of costs; and there is also the depreciated cost of the whole process and development of the machinery and equipment used in the development of the straw. Finally, a portion of the other costs, which are costs other than those mentioned above, are also included in the calculation. Other costs mainly include loading and unloading costs and labor costs. Since the value of other costs is relatively small,

they are not included in the calculation.

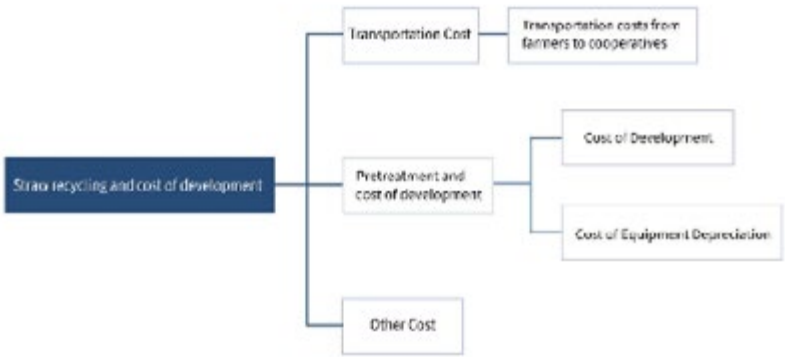


Figure 3. Cost Structure of Straw Recycling and Development

Transportation cost of straw transported directly to cooperatives by farming villagers

In this case, it is assumed that the distribution of the stalks is within the radius of r and the density is , then the transportation of the stalks is carried out by the farmers themselves and the place of transportation is the cooperative. The three figures , and , represent transportation cost, loading and unloading workers" cost, and transportation cost, respectively. They are mainly curvilinear parameters. The transportation cost of the farmers and villagers is shown in Equation (3):

(3)

tn represents the unit transportation cost of a common tractor, including labor and fuel, in Yuan/(t-km).

The logarithmic score (4) is obtained:

(4)

The service farmers and villagers load the straw onto the trucks first, and then unload the straw when they arrive at the cooperative, and the loading and unloading costs are as in Equation (5):

(5)

qn denotes the unit loading and unloading cost, i.e., the cost of labor income paid to working farmers for loading and unloading, unit: yuan/t.

The total cost of transportation for service farmers and villagers is shown in equation (6):

(6)

Straw pretreatment and development costs

In the process of revaluing agricultural waste, it is necessary to calculate its cost, which includes the cost of pretreatment, such as compression, crushing and enzymatic digestion of straw, as well as the cost of development and conversion for upgrading. The cost of pretreatment and development is composed of the depreciation cost of the equipment and the cost of using the equipment . The operating cost is shown in Equation (7):

(7)

O denotes unit fuel consumption, unit: L/t; CO denotes unit fuel price, unit: Yuan/L.

Representing mainly the specific costs applied in the process of acquiring equipment, the formula for calculating

the average depreciation method is as in equation (8):

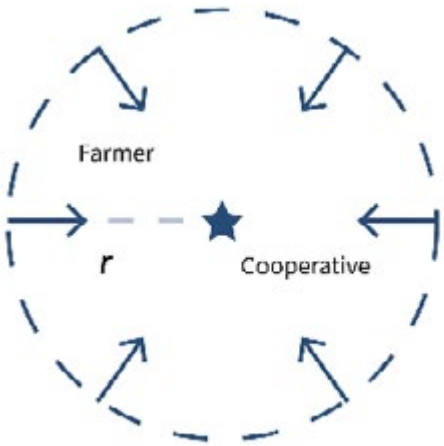
(8)

Depreciable life is n; net salvage rate of fixed assets is RV.

Therefore the total pretreatment and development costs are as in equation (9):

(9)

The density of straw in the surrounding farmland of Xi Niuquan Village, Niuquan Town, Laiwu District, Jinan City, Shandong Province, China, is 95.9t/km2 . It was found that the radius (r) of straw collection is 70km (Figure 4), and then when there are many crops within 70km radius of the cooperatives, the farmers and villagers transport the straw to the cooperatives. The related data information is shown in (Table 5), and the cost of straw recycling is obtained by bringing the data into equations (3), (4), (5), (6), (7), (8), and (9) for calculation (Table 6).



Note: Radius (r) of straw collection is 70km

Figure 4. Schematic diagram of straw collection area

Table 5. Straw Cost Related Data

Indicator	Numerical value	Indicator	Numerical value
r	70	π	3.14
ρi	18.19	tn	1
o	0.85	qn	5
T	20	RV	0.5
β	√2	Co	7.72

Table 6. Extrapolation of Costs for Straw Variations

	Transportation Costs	Pretreatment & Development costs	Total Cost
Price/Million	11219.1	968.7	12187.8
Percentage/%	92.1	7.9	100

Using the above data, the total price of hydrogen energy sold is deduced. It is known that the radius of collection is 70km, so the total amount of straw in this area is 1476266t, which is calculated as in Equation (10):

(10)

By calculating that 1kg of straw can produce 34,541ml of hydrogen, 21078.82t of straw can produce about 51 billion liters of hydrogen, calculated as in Equation (11):

(11)

Due to the volatility of the market price of hydrogen, reference is made to the price in the Yangtze River Delta region on November 21, 2022 from the Shanghai Environmental Energy Exchange (SEE), which is approximately RMB 33.69/kg. Therefore, the total selling price of hydrogen is approximately RMB154,405,796, calculated as in Equation (12):

(12)

After deducing the costs, the total cost is deducted from the total selling price of the hydrogen energy to get the gross profit earned by the rural farmers is $32,527,307. The calculation is shown in Equation (13):

(13)

Therefore, the prospect of economic transformation of biomass energy is very promising and feasible. Roughly estimated, the income of farmers and villagers can be increased by more than 30 million dollars. It can not only improve the behavior and willingness of the farmers and villagers, but also effectively help the farmers to generate income and improve the agricultural income. The project will be deepened in detail through practice in the future.

2.2 Research Methods

2.2.1 Systemic Construction of Social Innovation Strategies

In the practice of design, the strategy is aimed at achieving sustainable innovation, fostering the emergence of new ideas, new processes, and new models, and stimulating creativity in new and interdisciplinary domains. According to Neri Oxman"s Krebs Cycle of Creativity ("KCC") theory[3] The four forms of human creativity are science, engineering, design and art. They generate "creative energy" through interconversion, where the role of science is to rationalize and analyze ecological phenomena and known data and information about agricultural waste, to conduct experiments on resource agricultural biomass waste, and to find experimental conclusions through questions. Engineering is the transformation of experimental methods into bio-processes where the experimental conclusions should be applied to the ecological problems of the agricultural waste recycling system. The design aims to provide a concrete presentation of social innovation strategies, radially expanding biotechnology to solve ecological problems in multiple ways, and transforming systemic applications into behavioral intentions. Art（"Art" in KCC refers to culture in general in this study） is to think about ecological attributes at the level of creativity and value, to observe ecological phenomena again to get information, to question them again, to form new behaviors into new ecological perceptions, and ultimately to move towards a scientific form, to start a new "KCC" cycle.

Based on the "KCC" principle, a holistic assessment of all aspects of the problem is required prior to the construction of a social innovation strategy. Therefore, on the basis of the analysis of the known problems mentioned above, the systematic participation in the design can fundamentally balance the relationship between society and ecology, and further optimize the ecosystem. By synthesizing the different dimensions of perception that farming villagers and administrators are in, specific directions for solutions were generalized (Table 7).

Table 7. Direction of Solution for Different Cognitive Levels

Factor of Behavior Intention and Use Behavior Model		Solution Direction
Economic Income	Ecological Utility	Energy Economy
Convenience/Adaptability	Infrastructure	Social Services
Subjective Initiative	Public Awareness	Branding Culture

The key to implementing a social innovation strategy is to combine the three aforementioned directions. Through a designed pathway, clean energy derived from agricultural waste can be applied as an ecological economic strategy, thereby promoting rural economic development. Secondly, to further drive multidimensional economic development, it is necessary to establish ecological facilities and a social service system for agricultural waste recycling, incorporating community service functions related to ecological and social environments. This will create comprehensive spaces and provide good hardware facilities. Ecological culture needs to be concretely presented, so in terms of enhancing the public"s ecological literacy, it is essential to create ecological cultural products and ecological intellectual property (IP) as ecological brands. Additionally, disseminating the essence of ecological culture will contribute to the construction of ecological civilization. Based on these three directions, the service functions should be further refined, allowing each part to interact and mutually reinforce each other, thereby forming a networked interconnected system. (Figure 5).

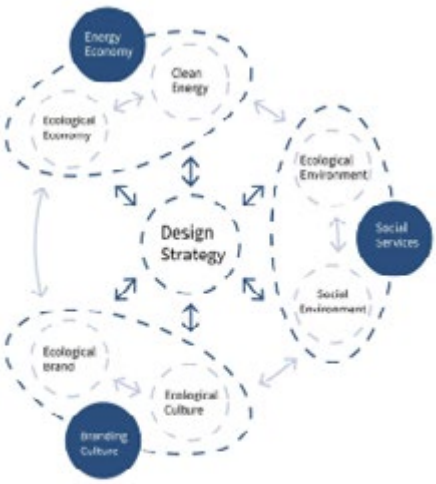


Figure 5. Multi-Interconnection Design Strategy Pathway

The sustainable utilization of agricultural waste is a primary direction in ecological economics. Currently, the main approach for the sustainable utilization of agricultural waste involves enterprises and related departments acquiring it and directly reimbursing the recycling costs to local farmers. The major drawback of this approach is its single-mindedness, high costs, and low returns. Enterprises, on the other hand, gain higher value by trading the reclaimed essential energy in the market, resulting in significant profits (Figure 6). Therefore, enterprises are the primary beneficiaries, such as thermal power stations, gas stations, chemical plants, and so on. While agricultural waste may not hold significant value for local farmers, it is still their private property. Starting from this perspective, a redesign of the economic mechanism is proposed, aiming to enhance the value of agricultural waste through biotechnology and shifting the focus of benefits back to the local farmers.

A new type of cooperative was established based on a newly designed eco-economic mechanism. Co-operatives are a form of economic organization based on co-operation and common ownership explored by socialists and social reformers including Robert Owen, Charles Fourier, and Pierre-Joseph Proudhon as an alternative to the traditional capitalist enterprise[4]. One of the most important theoretical underpinnings is the labor theory of value, which states that labor is the only source of productive value[5]. The theoretical basis of cooperatives holds that laborers should share in the wealth they create and should have greater control over their own production processes. This can be achieved through the democratic management and common ownership of

cooperatives[错 误 ! 未 找 到 引 用 源。]. The theoretical foundations of cooperatives also include the principles of solidarity, mutual aid and benefit, and social responsibility. These principles emphasize mutual support and cooperation among members and encourage members to contribute to the community and society[6]. Cooperatives develop a just, equitable and sustainable eco-economy based on the co-operative theories of co-operation, common ownership and democratic management, and require a certain amount of upfront technical and financial support from the government and infrastructure construction to kick-start the whole system. Here, the "cooperative" replaces the "enterprise organization" as the new intermediate link. The farmers and villagers use agricultural wastes as "collateral" and entrust the cooperatives to second develop the value of the products, either for "recycling" or "upgrading". The profits from trading the developed products to the market, after deducting the basic costs incurred by the cooperative, are fully returned to the villagers. In this way, the villagers receive indirect value gains (Figure 6). In this way, it can positively influence the agricultural waste recycling behavior of the farmers and solve some of the fundamental problems in the questionnaire and interviews, so that the farmers can earn something for their work in recycling and contribute to the development of the rural economy. While reducing the ecological burden of the country, it will also help the "Carbon peak and carbon neutrality" policy and better implement it in the lives of the public.

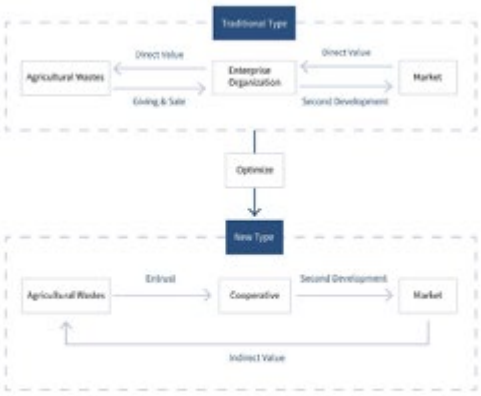


Figure 6. Eco-economic Design Optimization

2.2.2 Ecological Strategy for Social Services

Although the transformation of clean energy is the mainstay of the rural eco-economy in this case, there is still a need to establish a networked value chain around the energy economy as the core, which can be linked to the development of multi-level value interactions. However, the strategic study of social services aims at "KCC", where economic utility is intervened by design optimization to change behavioral activities, which in turn affects the perception of culture. The ecological perspective of social services focuses on the relationship between the social environment and the ecological environment to achieve cyclical improvements and changes in the "symbiosis" between human beings and nature. Social service also interacts with two other levels, including the biomass of the ecological environment, which can be used as a raw material in the energy economy and serve the development of clean energy, and the social environment, which contributes to the promotion of ecological concepts in the brand culture.

Sociality is the behavioral and interactive attributes of human beings or a certain group of animals in a social environment. Therefore, social design usually involves the consideration of human behaviors, needs, and values, as well as integrated thinking with political, economic, technological, and environmental factors. As a pioneer of social design and eco-design, Mr. Victor Papanek believes that design is first and foremost about responsibility. Design is not only about creating goods or products, but also about taking social responsibility and paying attention to human needs and environmental sustainability. Secondly, the impact of design on economic development and consumption patterns cannot be ignored. Design should follow the principles of practicality, simplicity and resource conservation; furthermore, design should be integrated with local cultures and traditions, and designers should respect and understand the needs of people from different cultures; and finally, the importance of environmental protection, design should consider the impact of products on the environment, and advocate the use of recycled and renewable materials to minimize the pollution of the environment.

Social design is a design methodology that uses a creative and systemic approach to solving social problems. It focuses on how people interact and collaborate in social and economic systems, and aims to create fairer, more inclusive and sustainable societies. Professor Michael Porter of the Harvard Business School puts forward the idea of "Creating Shared Value". It includes: redefining the value chain: re-examining the value chain and considering how to meet social and environmental needs by improving the supply chain, optimizing the use of resources, and developing new products; focusing on social issues: looking at social phenomena, identifying problems that can be solved, and using innovative thinking to find solutions and strategies to increase profitability and productivity, thereby creating shared value. Shared value is created through innovative thinking to find solutions and strategies that increase profitability and productivity. This can be achieved through more efficient use of resources, waste reduction, and energy conservation, etc.[8] The practice is therefore based on the above theory. Therefore, in this practice, based on the above theories, the social design needs to be further updated and iterative, with a change in dimension from the relationship between the human individual and the social set to the relationship between the social set and the ecological whole (Figures 7). The center of social design in the Anthropocene is the human being, i.e., the human-centered society. That is to say, from the perspective of human beings, social pain points are discovered, and the society is shaped by the ability of human beings to make the society complete, and the final destination is to serve human beings. The center point of the iterative social design is the ecological whole, i.e. the symbiotic ecology. This includes clarifying the ecological needs from the ecological perspective, and utilizing the ability of social service to carry out ecological renewal, which ultimately serves the ecological whole. The renewed and iterative social service strategy, as the basis of the whole social innovation strategy, will be designed and improved in two aspects, namely the spatial design of the infrastructure and the optimized design of the service system. In the design process, the hard condition of infrastructure construction and the soft condition of service system optimization will be coordinated with each other. This is to realize the overall synergy of cross-disciplinary "sociality".

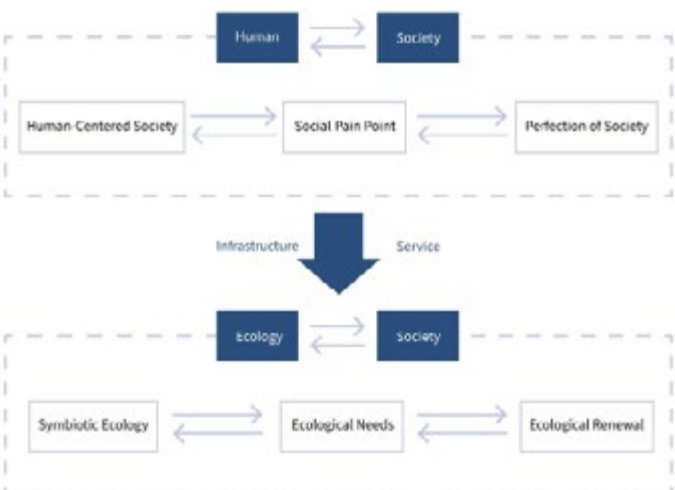


Figure 7. Iterations of the Social Innovation Concept

Based on the concept of social innovation after renewal and iteration, according to the previous questionnaires, although the state has promoted the development of ecological civilization and economy with the collaboration of policies, regulations and administrative management. However, farmers agrees that the current agricultural waste recycling process still has problems at the social and ecological levels, especially in terms of Convenience, Adaptability and Infrastructure. This is due to the weak "Affordance" of the original process. Therefore, in addition to strengthening the administrative management, it is necessary to explore the availability between the ecological and social environments in the design process and to highlight the ecological value and social services through the interplay of facilities and services.

2.2.3 Social Design and Social Services

Through the ecological needs and social pain points derived from the previous problem analysis, the scope of the front-end service content of the cooperative is firstly categorized based on the principle of availability at the social service level (Table 8), so that the value of services for the high-level population and the service needs of the low-level population can be realized in multiple dimensions as much as possible.

Table 8. Scope Breakdown of Available Service Content

Combining the dimensions of the questionnaire and the service contents, the high scoring groups are

Table 8. Scope Breakdown of Available Service Content

Scope of Services	Business Economy	Ecological Activities	Rural Community	Brand Culture
Services Project	Market and sale of clean energy, sale of community DIY eco-products, and sale of eco-derivatives	Eco DIY Handicraft Experience, Eco-Design Workshop, Biotechnology Laboratory, Eco-Lecture, Bio-Art Creation	Sharing of environmental tips, online and offline mutual aid, sharing of eco-activities, and opening of environmental exchange meetings.	Creation of eco-IP, created eco-visual elements, internet operation, promotion of eco-culture, multi-media presentation

summarized (Table 9). From this, it can be understood that the high scorers can provide service assistance to the low scorers based on their own strengths, realizing the integration of service resources and creating shared value to match the needs.

Table 9. Service Capacity Classification of High Scoring Populations

Crowd Classification	Knowledge-based	Experienced	Affluent & Prosperous	Youth & Prime of Life
Service Capability	Not interested in recycling waste personally, but concerned about low-carbon environmental protection and sustainable development. Interested in knowledge of ecology and biology, and willing to popularize various activities related to environmental protection and	More experience in agricultural waste recycling; longer time in farming; ability to effectively utilize specific waste materials and is trying. For agricultural activities,	Have a certain economic base and purchasing power, and have the ability to invest in eco-environmental conservation or help others to advance funds to invest; have transportation tools and automated recycling equipment and resources, in addition to personal use, there	Participate in environmental protection activities with high enthusiasm, and hope to play an effective role in improving the ecological environment, cultivate life interests, or like to buy eco-cultural products, IP and derivatives;

eco-education; able to promote eco-culture to influence others.	the police have invested relatively more time and energy to deal with issues such as straw recycling and waste disposal.	is a sufficient amount of surplus to be used for sharing or renting to others can help to introduce some eco-environmental technology.	advocate a healthy and organic lifestyle, and regard low-carbon environmental protection as the quality of life and enjoyment of interest; and contribute to the ecology through physical action.

Combining the service content and service capacity, it can be seen that since part of the service content of the commercial economy focuses on the purchasing power of commodities and the degree of liking for derivative commodities, it can be accomplished with the capacity of the young, middle-aged and well-off people, thus stimulating the development of the eco-economy; in terms of the eco-activities, basically, they are based on the popularization of knowledge and educational experiences, so the knowledge- and experience-type people can share their experience and help the audience create value. The rural community is a communication and sharing platform for the public, which exists in the form of online forums and offline exchanges, so young and experienced people are the mainstream. Young and experienced people can inject enthusiasm and vitality into the social platform, while experienced people can share practical tips on environmental protection in their daily lives; and finally, the brand culture, which is based on knowledge. Culture is based on knowledge, and branding is based on business, so the knowledge-based and well-off groups are the main drivers. Knowledgeable people have relatively good education, which can enrich ecological and cultural creativity, and operate Internet content

professionally. The well-off have relatively strong resource capacity, which can promote the rapid multi-channel dissemination of the brand.

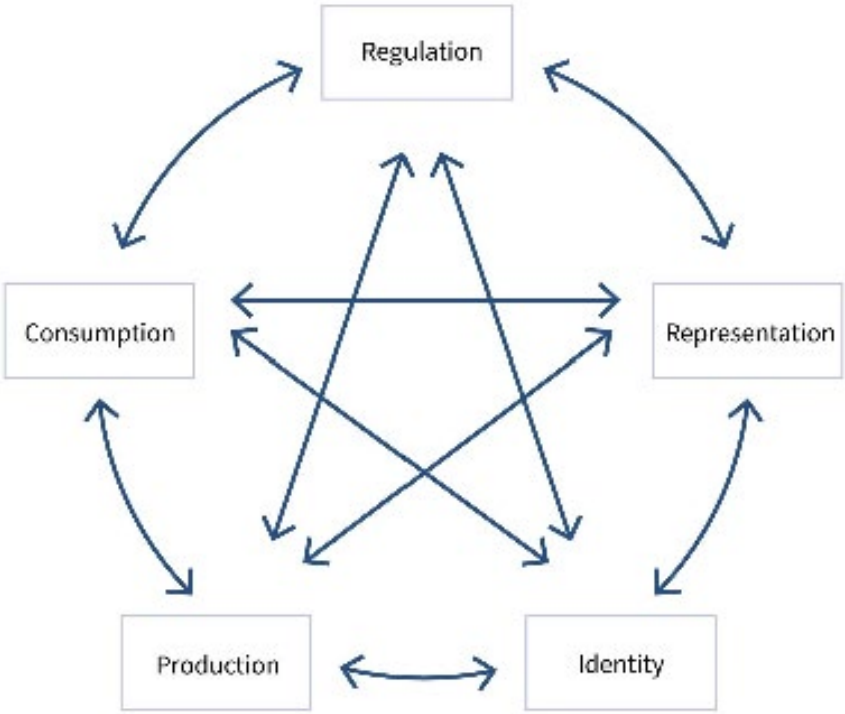
Maximizing the value of eco-services, as described by Professor Michael Porter"s "Creating Shared Value", is also embodied in "sharing". Therefore, no matter how one divides up the dimensions and equalizations, people are both the service providers and the served, creating shared value for ecological services in a complementary way.

2.2.4 Branding Strategy for Ecological Culture

In the whole mesh interconnection, the brand culture mainly contains eco-brand and eco-culture. The formation of an ecological culture needs to be based on an ecological outlook. Ecology is a concept of ecological benign value that adopts sustainable development and steps into symbiotic ecology. Ecological culture is more inclined to the ideological system of ecological aesthetics of inter-subjectivity. Although it is difficult to be fully realized in the era of anthropocentric humanity, the concept of symbiosis is the most ideal goal of cultural connotation and guides human behavioral activities. Therefore, eco-culture relies on the ecological brand to spread its ideas, and the core of eco-cultural ideas is the philosophical theory of eco-aesthetics. Italian futurist Aurelio Peccei firstly put forward the concept of "eco-culture", he thinks that "due to the erosion and over-exploitation of the natural environment by human beings through technological progress, we have destroyed the foundation of our future life. In order to save ourselves, we need to carry out a cultural revolution that meets the requirements of the times and creates a new form of culture, namely ecological culture. This is our only option"[9]. Ecological culture starts from the nature of human beings and nature, and explores the fact that nature itself has value just like human beings, and not only because of the existence of human beings. Through this new perspective, on the one hand, eco-culture reinterprets the species relationship between nature, including human beings, and guides human beings to construct the value concept of coexistence and co-prosperity with the natural ecology. On the other hand, ecological culture believes that all living and non-living things in nature, except human beings, have their own forms of existence and are not subject to the control of human will. Therefore, in order to survive and develop, human beings must recognize and respect the rights of nature. This view is based on the idea that nature has a clear objective value, and that mankind should be cognitively aware of this. This also coincides with James Jerome Gibson"s "Affordance" in ecological psychology[11]. In the process of brand design and construction, the theory of "Affordance" is still used to visualize the connotation of ecological culture.

2.2.5 Basic Connotation of Ecological Culture

The connotation of rural ecological culture refers to the interactions and influences between human beings and the natural environment, as well as the values, beliefs, knowledge systems and behavioral patterns that result from them. It needs to be analyzed on the basis of cultural theory, combining the ecological research background of this practice and the context of symbiosis in ecological aesthetics. The study of eco-culture is informed by the theoretical approach of cultural studies. Raymond Henry Williams, a pioneer of the Birmingham School of cultural studies, recognized culture as a holistic way of life, marking a new era in cultural studies[12]. On this basis, contemporary cultural researcher Stuart Hall inherited the Birmingham School"s view that "culture is a process of material production" and "culture is a symbolic system of social relations". He believes that representation, identification, production, consumption and regulation constitute the process of culture, and thus proposes the theory of "Circuit of Culture" based on the theory of coding/translation (Figure 8). And any analysis of a cultural theme or cultural product must pass through this circuit[13]. In the "cycle of culture" there are intertwined and relatively independent aspects, each of which can serve as a starting point, and the relationships between them are non-linear and complex. Thus, representations, identities and rules are attributes that carry the symbolic system of social relations, while production and consumption are manifestations of material production processes.**Figure 8.** The Cycle of Culture



For the study of eco-culture, it is important to rely on the five aspects in the theory of the "Cycle of Culture" to study the basic connotations of the construction of eco-culture. These five steps can start from any one of them and end up in a closed loop. These steps will be divided into different modules, each of which is random, complex, overlapping and intertwined, which is the core concept and feature of the "Cycle of Culture", thus generating a three-dimensional complex structure.

In the cycle of culture, "Regulation" have an impact and influence on people"s life sphere. These "Regulation" can be interpreted from a macroscopic point of view in the context of the cycle, including the context of the times and ecological policies. At the same time, new technological structures, production systems and knowledge structures play an important role in transforming symbolic ecological meanings into ecological awareness and practices. Eco-branding is a contemporary product that is closely integrated with social innovation strategies and needs to combine the characteristics of rural lifestyles with the advantages of biotechnology. Through product design, visual communication, digital media and participatory activities, eco-cultural connotations can be disseminated, empowering "representations", enhancing a sense of identity while increasing subjective initiative, and facilitating consumption to help the eco-economy.

"Representation" refers to cultural meanings and expressive practices. From a structuralist standpoint, the value and function of "Representation" is emphasized. The products derived from eco-brands are consistent with the characteristics of "Representation", in that the image, sound and language of the product are not the main focus, but rather the functionality, sustainability and semantic meaning of the product, i.e. the meaning of the specific reference. On the one hand, the derivative products with symbolic language not only epitomize the eco-brand, but also show the cultural connotation of the eco-ecology, and construct the path of rural eco-identity. On the other hand, the representational function of derivative products focuses on the design level, which is the result of cross-disciplinary cultural and creative representations. It is jointly participated by farmers, administrators, scientists, designers, engineers and artists, and represents their common vision of ecological values. Through this

creative representation, an ecological and cultural value interchange of their own is established and maintained.
In this context, "Identity" refers to the value recognition of the concept of ecological culture. This value identity is a shared expectation across the globe, nations, societies, classes and races. However, due to the influence of factors such as technological structures, production relationships and knowledge frameworks, each individual"s perception of ecology is unique. In this study, the main focus is on value recognition in rural areas. Based on the analysis of the questionnaires and interviews, more consideration will be given to the lifestyle, cognition and behavior of the villagers when designing the products in order to find a better way to convey the value recognition of ecology. Ecological culture is not only about values, but also about the requirements, positioning and functions of the product, which affects people"s perception of the product. This is reflected in the authenticity of the product, respect for folklore and traditions, and reasonable price setting. It is important to note that people often do not recognize products not because they have different concepts, but because they are not communicated in the right way. The significance of eco-branded products lies in the use of their natural attributes to convey eco-cultural identity.
The "Production" of eco-cultural products needs to be organically integrated with the "consumption", and the "Production" of eco-cultural products is studied from the perspective of "consumption", in order to explore the medium behind the sales and production. This study examines the "Production" of eco-cultural products from the perspective of "consumption", explores the medium behind sales and production, and explains the relationship between "Production" and "consumption" from the perspective of design. In the production of eco-cultural products, design is the core of branding and culture, and plays a strategic role by closely integrating with the ecological culture of the target population and rural folk customs. Product design mainly involves marketing and product production, in addition to specific product design styles, to better convey the concept of ecology through the product is also the key to design. How to promote and sell eco-cultural products, so that they are closely related to consumers, all of which require in-depth thinking. The function of design is not only limited to the use of existing technology to increase the value of products, but it is also closely related to consumption and manufacturing, which undoubtedly becomes a key element of product innovation.
In the actual "consumption" segment, eco-cultural products have unique cultural typicality. The consumption of such products not only emphasizes their "exchange" function and "use" value in the economic aspect, but also promotes the active pursuit of ecological sustainability and conveys the value connotation of ecological culture. In other words, the cultural value of eco-cultural products is not only in their "exchange" or "use" value, but also in their "recognition" value. Commodities for the villagers should not only have natural attributes, but also cultural attributes. This demand will continue to evolve with the changes in ecological concepts, until the final ecological culture in the true sense of the word is formed, and the eco-brand is expanded beyond the countryside. Mature eco-brands target the needs of mass consumers other than villagers, and tend to be more cultural in nature. Obviously, consumer demand cannot be pre-fixed to a certain pattern of demand, and it is closely related to people"s differences. Individuals and groups of consumers often form inconsistent responses to the same material culture. In the development process of eco-cultural products, it is necessary to fully understand the consumer needs and enhance them in order to realize the optimization of the design. Consumers are therefore proactive, and in this way contribute to the development of production.
In summary, by analyzing the interrelationships among the five elements of the cyclical concept of culture, namely "Regulation", "Representation", "Identity", "Production" and "Consumption", each of them has its own unique way of meaning exchange and interaction. By analyzing the interrelationships among the five elements of the concept of cultural cycle, namely "Regulation", "Representation", "Identity", "Production" and "Consumption", each of them has its own unique way of meaning replacement and interaction. The cultural cycle

provides a theoretical framework and cognitive thinking for the construction of eco-culture, clearly explaining the basic principles. In addition, there is a need for easy-to-understand publicity and education in the form of ecological culture, so as to strengthen rural people"s awareness of ecology, establish a benign ecological outlook, and promote a harmonious relationship between human beings and nature as well as sustainable development, thereby helping to strengthen the construction of ecological civilization.

Conclusion

Combining social design strategies can expand impact and diversify attributes. Based on the questionnaire of the farmers, seven aspects of economic benefits, Ecological Utility, Convenience, Adaptability, Infrastructure, subjective motivation, and Public Awareness were examined to identify the rural needs and social pain points in both directions. Combined with the "Integrated Technology Acceptance and Use Model II", the design strategy is tailored to build a cooperative that is energy-economy oriented, accompanied by social services and brand culture. In terms of energy economy, it is necessary to optimize the industrialization of biomass energy production and the construction of a new eco-economic mechanism. On this basis, the corresponding income and expenditure should be projected to prove its feasibility. On the social service level, it is necessary to discuss the relationship between social design and community service in terms of people"s participation and resource sharing, as well as the relationship between social design and community space in terms of "spirit of place"; on the perspective of brand culture, it is necessary to use the "Cultural Cycle Theory" to discuss the relationship between social design and community space in terms of "Spirit of place". In the perspective of brand culture, with the help of "Cultural Cycle Theory", we summarize the connotation of ecological culture to construct the cultural output of brand design.

The design strategies for agricultural waste recycling systems involve further integration of theoretical and empirical rationales with the research on the system. Finding a research direction for the construction of ecology and society requires more theoretical construction and practical innovation, and we hope that more research will continue and more bio-design innovations will be born, so as to enrich the bio-design system, serve the ecology and society, and ultimately contribute to the future of interdisciplinary research. We hope that in the face of global threats in today"s Anthropocene, more people will pay attention to ecology and society.

REFERENCES

1.Davis, F. D. . (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. Mis Quarterly, 13(3), 319-340.

2.Venkatesh et al., (2003). User acceptance of information technology: Toward a unified view. MIS quarterly, 425-478.

3.Oxman,N. (2016). Age of entanglement. Journal of Design and Science.

4.Owen R. (1991). A new view of society. Woodstock Books.

5.Marx K. (2009). Das kapital : a critique of political economy. Regnery Pub. ; Distributed to the trade by Perseus Distribution.

6.Proudhon, P. J. . (1966). What is property : an inquiry into the principle of right and of government. Sky & Telescope, 93.

7.Fourier C. Patterson I. & Stedman Jones G. (1996). The theory of the four movements. Cambridge University Press.

8.Papanek, V. J. . (1971). Design for the real world. Notes from A Seminar, 43--53.

9.Porter, M. E. , & Kramer, M. R. . (2011). The big idea: creating shared value. Cfa Digest, 41(1), 12-13.

10.Peccei,A. (1984). Der Weg ins 21. Jahrhundert: Berichte an den Club of Rome; alternative Strategien für die Industriegesellschaft. Goldmann.

11.Gibson J. J. (2015). The ecological approach to visual perception (Classic). Psychology Press.
12.Williams,R. (1995). The sociology of culture. University of Chicago Press.
13.Gay et al., (2013). Doing cultural studies : the story of the Sony Walkman (2. ed ed.). SAGE.

Nature-based solutions: Understanding the value and limits for the promising future

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Abstract

Urban development has proposed globally significant challenges to the environment. Fortunately, nature-based solutions have emerged to effectively address and overcome these challenges, supporting sustainable development and fostering resilience. Hence, awareness of the potential of nature-based solutions as a promising trend for the future is growing. However, it is important to note that in the context of China, the widespread implementation of nature- based solutions is not yet commonplace.

The author used the method of research by design to develop a profound understanding of NbS and insights to inform decision-making and future development. In this study, the author acquired valuable insights into NbS for future development by examining the prototypes of the post-design project results in the Modaomen estuary. The conclusion showed that NbS presents several advantages over engineering-based projects, as highlighted in this study. It offers multi- functional benefits with ecological, social, and economic values, providing flexible and sustainable long-term solutions. NbS can adapt to changes in ecosystem dynamics, generating long-term benefits.

Author keywords

Nature-based solutions (NbS); research by design; Pearl River Delta, Modaomen estuary;

Introduction

Background

Recent studies revealed globally significant environmental threats proposed by urban development (Bouwer et al., 2010). The prevailing response to address challenges has been the deployment of traditional engineering (Vörösmarty et al., 2021), which employs engineering principles and scientific techniques, commonly known as engineering-based solutions (Gagnon et al., 2012). Engineering-based solutions often construct still and everlasting structures, such as preventing hurricanes by building higher dams. However, there are still many deficiencies shown in these solutions. Many researchers considered engineering-based solutions insufficient for the increasing risks (Meng et al., 2022), especially for sites with specific geographical features and dramatically complex dynamic natural processes, such as the estuary.

Nature-based solutions

Hence, persistent shortfalls of engineering-based solutions result in increasing attention to alternatives, such as Nature-based solutions (NbS) (Vörösmarty et al., 2021). NbS are approaches for addressing and tackling various environmental challenges while promoting sustainable development and resilience (Bennett et al., 2009; Cohen-Shacham et al., 2016; O'Hogain & McCarton, 2018; Seddon et al., 2021). These solutions are designed to conserve, restore, and sustainably manage ecosystems (Seddon et al., 2021) while benefiting humans and the environment and providing other co-benefits (Cohen-Shacham et al., 2016).

NbS often involves working with nature and enhancing nature to provide ecological services or tackle societal issues (Bennett et al., 2009). Successful examples of NbS include Qingcaosha Project (Y. Gu et al., 2008; J. Gu et al., 2009), Marker Wadden (Kolb, 2020; Riel et al., 2017), etc. For example, the Qingcaosha Project managed to store fresh water and avoid salt water by using the timetable of saltwater intrusion of the Yangtze estuary (Y. Gu et al., 2008). It provides over half of the water supply for Shanghai province, benefiting more than 10 million people (Xinhua, 2009). In the project of the Marker Wadden, those natural dynamic processes are assisted in shaping the landscape upon them. For example, water level fluctuation at the Marker Wadden will cause additional water flow into the swamp, promoting natural processes such as erosion and sedimentation, further shaping the local landscape.

There is a growing awareness that NbS is the trend of a promising future. However, the common and conventional solutions to address environmental challenges are based on engineering projects, especially on sites with specific geographical features and dramatically complex dynamic natural processes in the context of China, such as the estuary.

Methodology

The main method of this study is research by design. Research by design is a methodological approach combining design thinking principles with research methods (Roggema, 2016). It often involves interdisciplinary collaboration, human-centered design, and prototyping to explore possibilities and validate assumptions.

The study area is in the PRD (Pearl River Delta), Zhuhai province, Modaomen estuary. The Modaomen Estuary is a productive landscape with a long history of reclamation. 20% of the marshland in the Modaomen estuary is replaced by aquatic dyke ponds. The author used the iterative design process to generate and test hypotheses, gather insights, and develop solutions (Roggema, 2016) to complex problems of the site. Hence, by thoroughly examining post-design results, the author developed a profound understanding of NbS and insights to inform decision- making and future development.

Result

The author used interdisciplinary knowledge to explore an NbS to solve multiple problems of urban, agricultural, and ecological issues. Therefore, by analyzing the outcomes after the design phase, the author acquired valuable insights into NbS for future development from the prototypes of post-design results as follows:

Shaping the landscape by nature

The limitation of engineering-based solutions lies in their inability to adapt to the ever-changing nature of processes. Unlike static objects, natural processes involve interactions with and are influenced by natural conditions, leading to continuous changes. However, NbS presented a completely differentscenario. The natural dynamic processes (for example, wind, waves, currents, water level, and ice tilt) that were originally regarded as resistant are assisted in the project. Hence, natural processes can be harnessed by NbS to streamline the project construction process, making it more efficient and cost-effective.

NbS projects could be executed with enhanced efficiency and simplicity by capitalizing on ecosystems' dynamic and ever-changing nature. In this project, the primary strategy proposed was the implementation of a system featuring two new dykes. The outer dykes would be initially constructed to create brackish and freshwater wetlands. Over time, the natural erosion process would gradually reshape the landscape between the outer and intermediate dykes, ultimately utilizing the once-formed delta landscape to establish a more adaptable and feasible continuous wetland. These approaches demonstrated a conscious understanding of nature's capabilities, as the project relied on natural processes and integrated NbS to construct the landscape in harmony with the surrounding environment.

Figure 1 The succession of project phases

Moreover, it is worth highlighting that NbS projects hold significant potential for cost- effectiveness, particularly in specific contexts such as flood risk reduction along coasts and river catchments. In these scenarios, NbS minimized the need for expensive human interventions, thus optimizing the project's budgetary aspects. Seddon et al. (2021) also emphasize that NbS can be estimated to be two to five times more cost-effective than engineered structures for coastal defense (Seddon et al., 2021), particularly in less extreme hazard scenarios. This highlights the superior cost-effectiveness of NbS, further reinforcing its viability and practicality in various applications.

Living in harmony with nature

Engineering-based solutions often exhibit shortcomings regarding the negative and long-lasting impacts on humans and the environment. In contrast, NbS offers an alternative approach that leverages the power of nature to not only enhance the landscape but also address social concerns. Seddon et al. (2021) highlight that NbS projects can collaboratively work with nature, leading to an adapted environment that benefits both nature and humans in the long term. This holistic approach created a sustainable and harmonious relationship between humans and their natural surroundings.

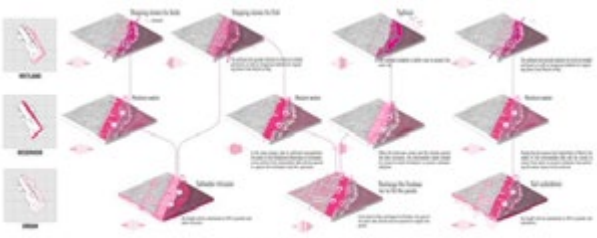

Figure 2 System operation process

NbS strategies are primarily rooted in the utilization of existing environments, enabling them to adapt to the surrounding conditions effectively. In the case of this project, the operational design of the system serves a dual purpose as both a reservoir and a protective barrier. This design allows the system to seamlessly align with the fluctuations in salinity levels within the Modaomen waterway, as shown in the above figure. As a result, the system possesses the capability to adapt and synchronize with the changes in salinity, ensuring its functionality remains in harmony with the natural dynamics of the Modaomen waterway.

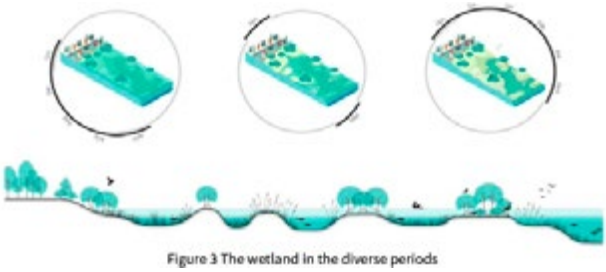

Figure 3 The wetland in the diverse periods

In addition, NbS strategies bring simultaneous benefits to both humans and the environment, offering long-term advantages beyond their primary purposes. In this project, the NbS provided multi-function with ecological, social, and economic values to provide more flexible long-term solutions. For instance, during the wet season from April to September, when the salinity of the Modaomen estuary decreases, the dyke can be opened to capture fresh water from the Modaomen waterway and replenish the reservoir. As a result, the

strategy optimizes the utilization of freshwater resources, ensuring a consistent water supply for the surrounding area throughout the year, thereby benefiting local communities. Besides the ecological value, the proposed NbS approach holds significant economic value by improving the ecological environment and enhancing resilience against natural disasters in transitional areas. This creates favorable conditions for urban transformation and provides opportunities for residents to engage in entertainment, education, cultural activities, and community building. Overall, NbS strategies offer a holistic approach that serves both ecological and human needs, delivering substantial benefits to the environment, society, and the economy.

Conclusion

This study revealed various advantages of NbS, especially compared with engineering-based projects. The NbS provided multi-function with ecological, social, and economic values to provide more flexible long-term solutions than engineered/grey infrastructure. Hence, they could adapt to ecosystem dynamics, climate change, and other stressors, offering long-term benefits. The proposal, strategies, and principles of this study could provide insight into the landscape of the project and other promising landscapes worldwide for the future.

It is also worth noting that synergies between NbS and engineered approaches could be more advantageous than framing them as alternatives. Integrated solutions that combine green (NbS) and grey (engineered) infrastructure can address various climatic impacts while considering diverging stakeholder needs.

However, even though NbS has the potential to provide low-cost, effective, and sustainable solutions to multiple impacts, there are still barriers to NbS improvement. The potential of NbS to provide the intended benefits in addressing climate change-related impacts has not been rigorously assessed or fully monetized in appraisals (Seddon et al., 2021). There are concerns over their reliability and cost-effectiveness compared to engineered alternatives and their resilience to climate change.

References

Bennett, E. M., Peterson, G. D., & Gordon, L. J. (2009). Understanding relationships among multiple ecosystem services. Ecology Letters, 12(12), 1394–1404. https://doi.org/10.1111/j.1461-0248.2009.01387.x

Bouwer, L. M., Bubeck, P., & Aerts, J. C. J. H. (2010). Changes in future flood risk due to climate and development in a Dutch polder area. Global Environmental Change, 20(3), 463–471. https://doi.org/10.1016/j.gloenvcha.2010.04.002

Cohen-Shacham, E., Walters, G., Janzen, C., & Maginnis, S. (Eds.). (2016). Nature-based solutions to address global societal challenges. IUCN International Union for Conservation of Nature. https://doi.org/10.2305/IUCN.CH.2016.13.en

Gagnon, B., Leduc, R., & Savard, L. (2012). From a conventional to a sustainable engineering design process: Different shades of sustainability. Journal of Engineering Design, 23(1), 49– 74. https://doi.org/10.1080/09544828.2010.516246

Gu, J., Lu, X., & Gu, Y. (2009). 上海青草沙水源地原水工程规划 . 给水排水 , 35(1), 50–54.

Gu, Y., Le, Q., & Jin, D. (2008). 青草沙——上海百年战略水源地 . 上海建设科技 , 1, 66–69.

Kolb, E. M. (2020). Economic valuation of Ecosystem Services Case study Marker Wadden.

Meng, M., Dbrowski, M., Xiong, L., & Stead, D. (2022). Spatial planning in the face of flood risk: Between inertia and transition. Cities, 126, 103702. https://doi.org/10.1016/j.cities.2022.103702

O'Hogain, S., & McCarton, L. (2018). Nature-Based Solutions. In S. O'Hogain & L. McCarton (Eds.), A Technology Portfolio of Nature Based Solutions: Innovations in Water Management (pp. 1–9). Springer International Publishing. https://doi.org/10.1007/978-3-319-73281-7_1

Riel, M. C. van, Leopold, M. F., & Keizer-Vlek, H. E. (2017). Notitie "Natuurambitie in de praktijk": Stand van natuurdoelen in het Markermeer en gevolgen van de ontwikkeling van de Marker Wadden (p.). Wageningen Environmental Research. https://library.wur.nl/WebQuery/wurpubs/529551

Roggema, R. (2016). Research by Design: Proposition for a Methodological Approach. Urban Science, 1, 2. https://doi.org/10.3390/urbansci1010002

Seddon, N., Smith, A., Smith, P., Key, I., Chausson, A., Girardin, C., House, J., Srivastava, S., & Turner, B. (2021). Getting the message right on nature-based solutions to climate change. Global Change Biology, 27(8), 1518–1546. https://doi.org/10.1111/gcb.15513

Vörösmarty, C. J., Stewart-Koster, B., Green, P. A., Boone, E. L., Flörke, M., Fischer, G., Wiberg, D. A., Bunn, S. E., Bhaduri, A., McIntyre, P. B., Sadoff, C., Liu, H., & Stifel, D. (2021). A green-gray path to global water security and sustainable infrastructure. Global Environmental Change, 70, 102344. https://doi.org/10.1016/j.gloenvcha.2021.102344

Xinhua. (2009). 国内最大"蓄淡避咸"河口江心水库龙口截流成功. https://www.gov.cn/jrzg/2009-01/03/content_1194573.htm

Evolving scenarios of AI in the design practice

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Abstract

This contribution concentrates on how the design work may be enhanced by generative Artificial Intelligence (AI) tools as well as the roles that designers and AI play in their collaboration, considering ethics of human-machine interaction. Recent developments in AI tools foreshadow fundamental changes in the future of the design practice, with concurrent effects including both an increase in the efficiency of creative professionals, and the democratisation of producing creative outputs by non-experts. While AI can be a component of designed solutions, this research focuses the design process itself, examining how AI can be a transformative force of not only for content generation, but also user research and conceptual development. Therefore, we aim to analyse existing generative AI tools for designers and describe potential "AI + Designer" strategies within currently widespread workflows. Initially, this article explores the potential of AI in creative fields, where the authors identify possible roles of AI to improve design work, such as AI as mediator between creative languages, or AI as a facilitator of user participation. Subsequently, the research describes a mapping and benchmarking activity of available AI tools for Designers, categorised by output type (3D, Graphics, Raster, Text, Utility, Vector, Audio & Video) and critically assessed according to the stages of the Design thinking process (Empathise & Define, Ideate, Prototype & Implement, and Validate). The mapping is organised to provide a multi-level perspective, and is divided into four main sections: a list with output-based clusters, info sheets (a product specification document), a map (a visual summary of the tools), and an introduction page. To evaluate the effectiveness of the AI tools during the design process, these were tested by replicating the processes of several projects and their output obtained by repeating tasks using AI tools. Thus, the mapping and testing showed interesting potential of AI tools in some phases of Design Thinking, but also a limited utility in the phases of empathising and validation.

Ultimately, the study focuses on the opportunities and issues of human-machine interaction and raises questions about ethics and copyright, bias and discrimination, errors and the impact on creative processes. The potentially transcendental power of AI over the thinking process poses urgent risks and opportunities, evident already today in various creative domains. Therefore it is crucial to build a strategic foresight and hence a positive vision of AI-enhanced design in order to understand how the role of the designer will change. Among possible scenarios, we conclude with the hope that the innovation model of "AI + Designer" can alleviate technical tasks, help connecting knowledge areas, and understand better people, this enforcing the Designer in the role of "sensemaker" who shapes the culture of everyday life.

Author keywords

Generative AI; Design Thinking; Creative skills; Design tools; Mapping; Benchmarking.

Introduction

The recent developments of Artificial Intelligence tools anticipates a significant change in future design, starting with an apparent democratisation of the creative process, giving non-experts an opportunity to produce creative content, while also facilitating certain tasks in the professional design process. Such phenomena can be seen as an opportunity for a more widespread diffusion of design efforts, but also as a menace to certain professional roles, raising issues about how effective (and meaningful) the "efficient" AI-enabled Design is.

These advances open up opportunities for generative AI to become trusted teammates alongside Designers (Figoli, Rampino and Mattioli, 2022), as experimented also within the ideation process of fashion design (Jeon et al. 2021). AI can be beneficial not only in the initial phases of the design process but also in the prototyping through monitoring and forecasting based on data coming from sensors and equipment (Arinez et al. 2020), such as real-time error detection and correction in 3D printing (Brion and Pattinson, 2022). In a similar vein, designers can leverage AI to enhance user experience, thereby fostering technology drive innovation at both the system and service levels (Yildirim et al. 2022). It is crucial that design works aided by generative AI are adequately aligned with human interests, including not only the short-term interests of a designer or client, but even more importantly the long-term interests of humanity, such as sustainable development or social justice, therefore, this contribution focuses also on potential ethical issues and mitigation strategies of collaboration between design and technology. In particular, we aim to offer a better understanding of currently available Generative AI tools that are useful to design work, evaluating how they can be integrated into the design process, and critically assessing the potential of the innovation model of "AI + Designer".

Participation and Creative Work with AI

While Generative AI in design is still in its infancy, we could already outline four interesting roles it may fulfil in the creative process, ranging from AI as an intermediate between creative languages and the democratisation of visual quality to a facilitator of user participation.

Firstly, AI can serve as a mediator between creative languages, and translate from one creative language to another. Creative languages in this context assume various means of expressing creativity; in design there are mainly visual (such as images, drawings, sketches, diagrams, renderings). However, with the emergence of AI, it became possible also to translate text into visual content without special design knowledge.

This leads to another possible role of AI in the creative field, namely AI as a means of democratisation of quality visual content through direct "prompting" and advanced non-expert design tools. This trend is enabled by low-code and no-code AI as a result of recent advances in the conversational AI sector, driven by interest in improving human-machine interaction. New projects are emerging also to make AI more understandable to users, such as eXplainable AI for Designers (XAID), which can be supplemented by a human-centred approach to focus on a specific user group (Zhu et al., 2018). In addition to the technical availability of AI, the work of the professionals themselves has become more accessible, because AI has made some of the design duties easier to perform, therefore their work will require less time.

The democratisation of AI, in turn, leads to the possibility for non-experts to co-produce creative AI output (e.g. graphics), allowing economic actors or social groups on tight budgets to have decent quality design interventions, even if limited in terms of originality.

The last role is the use of AI as a facilitator of participation in the design process, especially during user research. Initially, AI can function as a user research agent, interacting directly with people and using standard

methodologies such as interviews, questionnaires, and so on. After collecting user data, designers can benefit from AI that processes user generated content and identifies their needs and preferences, such as patterns of user behaviour. Based on these patterns it will be possible to develop a user simulator for designers to receive quick feedback during the design process, so follow the Human-centred approach in all the phases.

Mapping AI Tools for Design

As already mentioned, this paper aims to provide an overview and critical reflection about the current state of Generative AI tools useful for creative design activities.

There are numerous methodologies to conceptualise the structure of the design work, but, due to its widespread popularity, Design Thinking has been chosen as a way to structure the mapping of Generative AI tools.

As promoted by IDEO founders and later Stanford University, Design Thinking is a problem-solving approach structured in 5 steps: empathise, define, ideate, prototype, and test.

Due to the overlap observed between the first and second, the final four groups of the AI tools are Empathise & Define, Ideate, Prototype & Implement, and Validate.

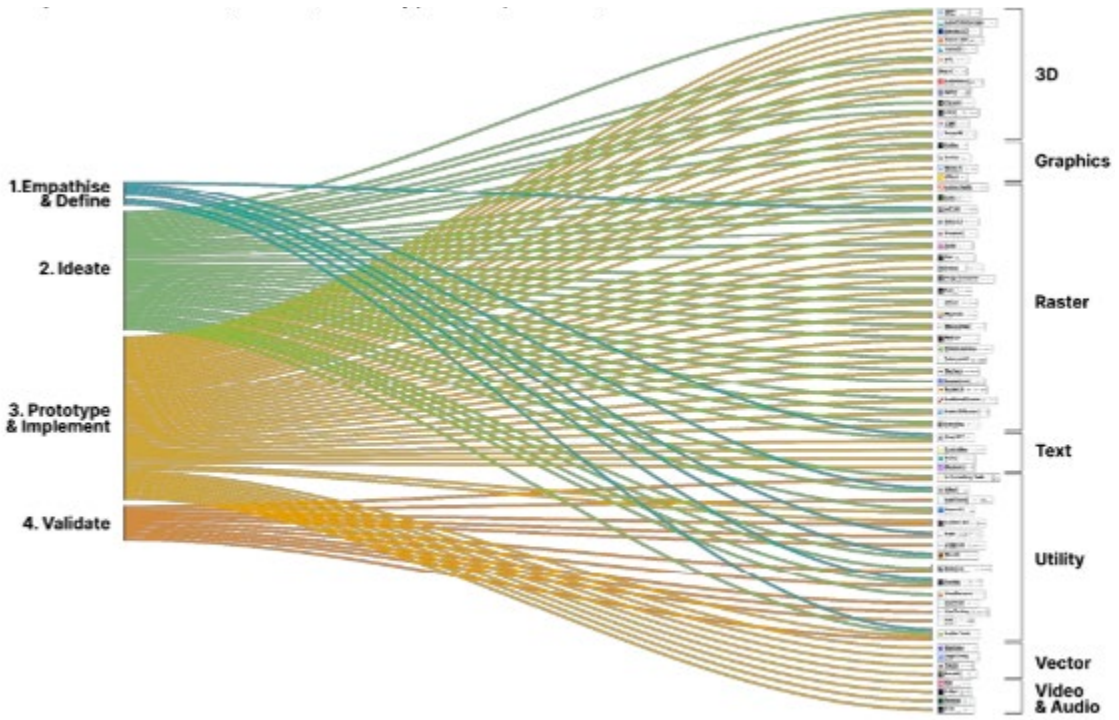

Figure 1. Map, Alluvial diagram. The collection can be explored on an open Figma board

Moreover, the possible AI outputs were classified into 7 categories:

1.3D. Topology optimisation or generating 3D models, including capabilities for texturing, rendering, and animating 3D assets.

2.Graphics. Combination of images and text, providing output suitable for UI design development and presentations, creating graphics by integrating pictures and text elements.

3.Raster. Useful to create visually captivating raster images, including the creation of mood boards, intermediate or final product pictures, as well as designing patterns and backgrounds to complement them.

4.Text. Ability to generate text content and code, making it a valuable tool for various design stages, whether it's

assisting in conceptualisation, ideation, or refining final drafts.
5.Utility. Streamlining and systematising communication within working teams, as well as optimising work processes, facilitating efficient collaboration, while including user needs investigation through Desk and Field analysis, data collection, and in-depth insights to ensure comprehensive problem-solving approaches.
6.Vector. Generation of high-quality vector images, including illustrations, icons, and logos useful to create individual images or produce whole batches of vector-based graphics, allowing for scalable and versatile designs.
7.Audio & Video. Create and edit audio and video content to support presentations or prototype demonstrations. Whether it's adding background music, voiceovers, or assembling video footage, this feature enhances multimedia production capabilities and facilitates effective communication.
To begin, we built a database to store all the tools found, tracking costs, benefits, drawbacks and input/output they produced. The final collection is organised to offer a multi-level perspective, and may be broken down into four primary sections: a list, info sheets, a map, and an introduction page. The map (Fig.1) provides a visual summary of the tools gathered about processes and outputs they offer, while dedicated simplified tool cards also display the crucial information.
Each tool is discussed in depth in the info sheet, a product specification document of each tool that includes functionality and unique characteristics, an analysis of advantages and disadvantages, and showcasing images. Finally, the list consolidates all the tools into distinct output-based clusters, enabling users to easily locate the desired tool for their intended outcomes. While omitting redundant or unproductive tools, our research at the time of writing found a total of 66 tools, and out of those is possible to identify 7 for Empathise & Define, 37 for Ideate, 51 for Prototype & Implement, and 11 for Validate, but it should be noted that some of them are useful for multiple steps.
From this subdivision emerged that there are only a few tools available that can help during the phases of process structuring, stakeholder engagement, preliminary research and final validation. Additionally, even though the majority of the tools are focused on the Prototype & Implement step, they frequently also assist the designer during the Ideate phases. Output clusters include instead 13 for 3D, 4 for Graphics, 22 for Raster, 4 for Textual, 15 for Utility, 4 for Vector, and 4 for Video & Audio. Here, it is evident that Raster outputs are among the most popular, but there is also a growing interest in Utility tools. The collection can be explored on an interactive Figma board, or in the table below.

Table 1. List of the AI Enabled Tools selected, with clickable hyperlinks.

3D & texture	Graphics	Raster		Text	Utility	Vector	Audio & Video
3DFY	Galileo	Adobe Firefly	MidJourney	Chat GPT	Ai Consulting	Illustroke	Fliki
Agisoft	Genius	Ando	NVIDIA	Controllino	Tools	Logo Livery	Kaiber
Metashape	Slides AI	ARTSIO	CanvasPotter	Duino	Albus	Stelvio	Runway
Elevate 3D	UIZard	DALL-E 2	nedAI	Magician	AppliTools	Recraft	D-ID
Fusion 360	Design.AI	Dreamer	Playform		Canva AI		
Luma AI	Tome AI	Durer	Prompthunt		Content Bot		
poly		Flair	Rocket AI		Evolv		
Shap-E		Genus	Scribblediffus		Lookback		
SolidWorks		Image	ion		Miro AI		
Spline		Computer	Stable		Notion AI		
Vizcom		Kive	Diffusion		Sembly		
vmod		Lexica	Stockimg		User Persona		
CSM		Magestic	Clipdrop		Userbrain		
PromeAI		Mokker			UserTesting		
					VAS		
					Goblin Tools		

To test

the effectiveness of the tools during the workflow, case studies were carried out where we tried to replicate the process of two projects output in the field of Product and Interaction Design by repeating the tasks using AI tools (Fig. 2). Initially in Empathise & Define, experiments were carried out in the User Research and Desk Research phases using Albus to create a vision board while researching information and images. During the Ideate phase, Chat GPT was used to create the concept taking advantage of its work speed and adaptability, even if in some cases it lacks human empathy. Next, the User Persona tool was employed, which effectively created a Persona from the project description and then the Recraft tool for Storyboard illustrations. For the Prototype & Implement phase, PromeAI transformed sketches directly into final renderings with relevant textures and then Adobe Firefly helped to add the background to them. The Interaction Design project benefited from Controllino AI to write an MQTT enabled code, while for video presentation of both of the projects Fliki tool was useful thanks to its ability to find appropriate stock video from text and generate voice overs. Finally, during the Validate phase, Chat GPT played the role of an agent that provided feedback and possible improvements that selectively made sense. AI can already assist designers in many phases of their work, despite the fact that good quality tools have not yet been found for User Research, creation of 3D models, IoT systems and websites, which could be the basis for future projects and research.

Figure 2. Tool testing: a task is carried on with the use of AI tools. The first image is the tool info sheet, the other images illustrate the process and notes about pros and contra.

Despite the rapid growth of AI-enabled tools, it is possible to highlight some usability shortcomings. The first point of intervention is the development of a new form of incremental prompting that allows the user of the tool to make small gradual changes, instead of requiring a new prompt for each output. Secondly, for the tool to actively participate in the process, the collaboration dimension must be investigated, allowing the tools to see beyond the specific task and understand the overall context of the design process. Finally, considering the inherent empathic nature of Design, it must be taken into account that AI has limitations in understanding and expressing emotions (Bakpayev et al., 2022). The toolkit was created with educational application in mind, providing a special opportunity to investigate and put design thinking concepts supported by AI into practice.

Recent rise in popularity of AI models has opened up new perspectives for students to experience the potential of these tools in Design (Bozkurt et al., 2023). However, it is important to understand potential negative consequences and rethink the roles of technology and human educators. Our collection aims to contribute to this discussion by providing the necessary tools to explore the potential of AI in educational use.

Issues and Mitigation Strategies

The benefits offered by Artificial Intelligence are numerous and extensive. However, there are various potential and practical issues already uncovered by past research. Algorithms often conceal risks, overlooked in the pursuit of innovation and cost-efficiency. AI's ethical implications stir debates in science and society: professionals in the creative fields feel attacked by the democratisation of AI tools that give free access to creative content to the general public, reducing their possibilities of employment; while, the scraping tools behind the generative tools appropriate their contents, raising issues with copyrights. Yet, some (Aziz, 2023) even propose to include AI as a copyright-worthy author. This complex issue deepens AI's societal disparities. However, limiting the fair use of machine learning might interfere with its progress (Sobel, 2017). Ethical principles alone will not ensure responsible AI; additional support and governance mechanisms at the organisational and social levels are required (Sanderson et al., 2023), such as the EU guidelines' aim to provide safe, transparent, traceable, non-discriminatory, eco-friendly AI, emphasising human supervision (European parliament, 2023).

A second risk in the use of Artificial Intelligence is that of bias: in fact, human-sourced data contaminated with sexism, racism, ableism, and religious prejudices result in corrupt and discriminatory intelligence. We are already witnessing tools such as chatbots, machine translation, and speech recognition, or generative tools that can encode and perpetuate gender stereotypes (Suresh, 2021) and ethnic discrimination (Buolamwini, 2016). Having diverse and representative data is thus essential for creating realistic and inclusive AI systems: responsible AI requires not only technical interventions but also changes in Societal recognition (Waelen & Wieczorek, 2022). An accurate and uncorrupted source is essential, as it is established that AI needs human-sourced data. Otherwise, the risk is the phenomenon of "AI hallucination", as illustrated by Alemohammad and colleagues (Alemohammad et al., 2023), who reached the condition of Model Autophagy Disorder (MAD) by repeatedly feeding the generative AI with cycles of synthetic data. Leaving complete control to algorithms is thus still counterproductive and unpredictable, and it is thus necessary to supervise and, most importantly, cooperate on an equal footing between users and AI (Larsson et al., 2022).

AI, like previous technological advancements, threatens employment due to its wide-ranging automation potential (Su, 2018). Creative jobs were once considered immune to AI, relying on intuition and human qualities hard to replicate (Birtchnell, & Elliot, 2018). However, as AI grows more sophisticated in generating top-tier content, concerns arise about artists and designers losing relevance, shrinking job opportunities, and devaluing man-made labour (Zhou & Nabus, 2023). Despite these risks, the authors have concluded that collaboration between creatives and AI generates fruitful outcomes, backed by research showing AI's positive impact on computer-intensive fields, boosting employment and productivity (Georgieff & Hyee, 2021). Nevertheless, AI can't replace creative minds in the present and near future, as it lacks the creative capabilities (Horton et al., 2023) and eco-spiritual values (Cooney, 2023) essential to replace humans.

Discussion and Conclusions: new designer roles

In his book "Fully automated luxury communism" (2019), Bastani sees technology as a potentially liberating force that could emancipate people from alienating repetitive work and enable them to pursue creative and cultural interests. This poses the question: In a scenario of AI-driven design, what are our creative margins and how to

shift creative capabilities and education?

With the potential of AI to participate in creative and innovative processes, it is crucial to understand how the role of the designer will change. According to Verganti and colleagues (2020), the designer-AI symbiosis may elevate the designer to the role of leader, capable of identifying a problem and providing instructions on how to solve it, thus shifting the focus on sensemaking. This strategical adaptation positions designers as vital actors in shaping the creative and general culture. Here, designers take a keen interest in how users perceive their creations and how seamlessly they integrate into users' lives and stories (Krippendorff, 2005). This perspective transforms design into a discipline that fosters not only cross-field collaboration but also between products and their users, as well as between designers and stakeholders (Cross, 1982).

The collaboration between Artificial Intelligence and Creative Intelligence (or "the acts of the imagination, ingenious reasoning and problem-solving, and curiosity, play, and exploration," (Shevlin, 2021)) will pave the road to a "Hybrid Intelligence" fostered through continuous human–AI interactions (Jarrahi et al., 2022). The authors suggest that the new competencies of designers should be associated with the ability to effectively use AI and, in addition, develop creative thinking that will allow them to operate on high-level concepts and curation.

References

Alemohammad, S., Casco-Rodriguez, J., Luzi, L., Humayun, A. I., Babaei, H., LeJeune, D., ... & Baraniuk, R. G. (2023). Self-consuming generative models go mad. arXiv preprint arXiv:2307.01850.

Arinez, J. F., Chang, Q., Gao, R. X., Xu, C., & Zhang, J. (2020). Artificial intelligence in advanced manufacturing: Current status and future outlook. Journal of Manufacturing Science and Engineering, 142(11).

Aziz, A. (2023). Artificial Intelligence Produced Original Work: A New Approach to Copyright Protection and Ownership. European Journal of Artificial Intelligence and Machine Learning, 2(2), 9-16.

Bakpayev, M., Baek, T. H., van Esch, P., & Yoon, S. (2022). Programmatic creative: AI can think but it cannot feel. Australasian Marketing Journal, 30(1), 90-95.

Bastani, A. (2019). Fully automated luxury communism. Verso Books.

Birtchnell, T., & Elliott, A. (2018). Automating the black art: Creative places for artificial intelligence in audio mastering. Geoforum, 96, 77-86.

Buolamwini, J. (2016). How I'm fighting bias in algorithms [Video]. TED Talks. https://www.ted.com/talks/joy_buolamwini_how_i_m_fighting_bias_in_algorithms?utm_campaign=tedspread&utm_medium=referral&utm_source=tedcomshare

Bozkurt, A., Xiao, J., Lambert, S., Pazurek, A., Crompton, H., Koseoglu, S., ... & Jandri⌧, P. (2023). Speculative futures on ChatGPT and generative artificial intelligence (AI): A collective reflection from the educational landscape. Asian Journal of Distance Education, 18(1).

Brion, D. A. J., & Pattinson, S. W. (2022). Generalisable 3D printing error detection and correction via multi-head neural networks. Nat Commun 13.

Cooney, S. (2023, June). Imagining LIMITS: Can ChatGPT radically re-imagine a new world?. In Ninth Computing within Limits 2023. LIMITS.

Cross, N. (1982). Designerly ways of knowing. Design studies, 3(4), 221-227.

EU AI Act: first regulation on artificial intelligence | News | European Parliament. (2023, August 6). https://www.europarl.europa.eu/news/en/headlines/society/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence

Figoli, F. A., Rampino, L., & Mattioli, F. (2022). AI in design idea development: A workshop on creativity and human-AI collaboration. PROCEEDINGS OF DRS, 1-17.

Georgieff, A., & Hyee, R. (2021). Artificial intelligence and employment: New cross-country evidence.
Horton, C. B., White, M. W., & Iyengar, S. S. (2023). Will AI Art Devalue Human Creativity?.
Jarrahi, M. H., Lutz, C., & Newlands, G. (2022). Artificial intelligence, human intelligence and hybrid intelligence based on mutual augmentation. Big Data & Society, 9(2), 20539517221142824.
Jeon, Y., Jin, S., Shih, P. C., & Han, K. (2021, May). FashionQ: an ai-driven creativity support tool for facilitating ideation in fashion design. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (pp. 1-18).
Krippendorff, K. (2005). The semantic turn: A new foundation for design. crc Press.
Larsson, T., Font, J., & Alvarez, A. (2022, October). Towards AI as a creative colleague in game level design. In Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (Vol. 18, No. 1, pp. 137-145).
Sanderson, C., Douglas, D., Lu, Q., Schleiger, E., Whittle, J., Lacey, J., ... & Hansen, D. (2023). AI ethics principles in practice: Perspectives of designers and developers. IEEE Transactions on Technology and Society.
Shevlin, H. (2021). Rethinking creative intelligence: comparative psychology and the concept of creativity. European Journal for Philosophy of Science, 11(1), 16.
Sobel, B. L. (2017). Artificial intelligence's fair use crisis. Colum. JL & Arts, 41, 45.
Su, G. (2018). Unemployment in the AI Age. AI Matters, 3(4), 35-43.
Suresh, H., & Guttag, J. (2021). A framework for understanding sources of harm throughout the machine learning life cycle. In Equity and access in algorithms, mechanisms, and optimization (pp. 1-9).
Verganti, R., Vendraminelli, L., & Iansiti, M. (2020). Innovation and design in the age of artificial intelligence. Journal of Product Innovation Management, 37(3), 212-227.
Waelen, R., & Wieczorek, M. (2022). The struggle for AI's recognition: understanding the normative implications of gender bias in AI with Honneth's theory of recognition. Philosophy & Technology, 35(2), 53.
Yildirim, N., Kass, A., Tung, T., Upton, C., Costello, D., Giusti, R., ... & Zimmerman, J. (2022, April). How Experienced Designers of Enterprise Applications Engage AI as a Design Material. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (pp. 1-13).
Zhou, K. Q., & Nabus, H. (2023). The Ethical Implications of DALL-E: Opportunities and Challenges. Mesopotamian Journal of Computer Science, 2023, 17-23.
Zhu, J., Liapis, A., Risi, S., Bidarra, R., & Youngblood, G. M. (2018, August). Explainable AI for designers: A human-centered perspective on mixed-initiative co-creation. In 2018 IEEE conference on computational intelligence and games (CIG) (pp. 1-8). IEEE.

Design Comedy: Shaping Speculative Design with the Power of Humor

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Abstract

Based on the evident challenges and issues in promoting speculative design in China, this article introduces the concept of design comedy, using the power of humor to reshape speculative design. While preserving the critical aspects of speculative design, it aims to broaden the audience, enhance the potential for dissemination, and mitigate the risk of speculative design becoming formulaic.

Author keywords

Specultive Design; Design Fiction; Critical Design; Chindogu

Introduction

In recent years, Speculative Design, as a unique and promising design approach, has garnered attention from Chinese art institutions. However， The promotion of speculative design in China encounters some challenges. This paper shifts its focus to a variant of speculative design known as "Design Comedy." It explores the concept, characteristics, and potential of design comedy, as well as its role in addressing the challenges faced by speculative design in China. Initially, the background and motivation behind design comedy are introduced, highlighting its distinctions from common speculative design. Subsequently, the paper delves into three key advantages of design comedy: concealing didactic elements, having strong sharing potential, and employing "Hutopia" as an alternative to dystopia. Finally, the application and potential impact of design comedy are illustrated, demonstrating how it can expand the horizons of speculative design in China.

Speculative design, proposed by Anthony Dunne and Fiona Raby, is a design approach aimed at exploring possible futures and social issues through the design of fictional products, scenarios, or concepts. Essentially, it stimulates thought experiments through design, allowing people to engage in discussions about contexts or topics(Dunne & Raby, 2013).

Around 2017, some art schools in China began introducing the concept of speculative design into their teaching methods. Especially in the last two or three years, speculative design works have frequently appeared at graduation exhibitions in art schools like the Central Academy of Fine Arts and the China Academy of Art. While this design method has been spreading and developing in China, it also faces some noticeable challenges.

Firstly, there is an issue with the exhibition and presentation methods. Many speculative design works, in addition to their visual forms, are accompanied by extensive explanatory texts, following a typical standard paradigm of research-based art. These works are usually disseminated through art and design exhibitions, reports, and specialized media. Although these works may receive discussions within these channels, they rarely make appearances in mainstream culture. In Western countries, due to the well-established development context of art

and design (with speculative design seen as an extension of radical design), the general public is more accepting of these kinds of design works. Additionally, visiting exhibitions is a common entertainment, allowing some speculative design works to stimulate social discussions. However, in China, resources in terms of art galleries and museums are highly concentrated, with many regions lacking appropriate exhibition spaces. Even in cities like Beijing and Shanghai, where exhibition resources are relatively abundant, there is limited attention given to design for debate. Only a few representatives like the Hyundai Motorstudio in Beijing and Chronus Art Center in Shanghai, which have organized related exhibitions, show interest in such works. For most residents in many areas, visiting exhibitions is not a daily entertainment choice. What's popular are primarily art exhibitions focused on "aesthetic spectacle" because they are more likely to appeal to the masses as they serve as ideal photo backgrounds. Furthermore, within the professional field, acceptance of this type of design is also limited. Except for a few art colleges, the general public has a hard time encountering speculative design works, which limits widespread discussion.

Secondly, there is an issue with the accessibility threshold for viewers. Speculative design, as a form of practice as research, faces many challenges common to research-based art. Claire Bishop, in her article INFORMATION OVERLOAD, points out the problems associated with research-based art due to the abundance of text and information, mentioning that "Many of these pieces convey a sense of being immersed—even lost—in data"(Bishop, 2023, para. 27), and "When large amounts of text are deployed in an installation, it is more likely to be experienced as a continuation of data overload rather than as a sensuous respite"(Bishop, 2023, para. 31). Speculative design, due to its goal of raising questions, places a strong emphasis on logical deduction in design, requiring a substantial amount of rigorous research as the foundation for "world/context-building." The research increases the threshold for understanding, and the complexity and specialization add to the burden on the audience. The audience is typically composed of design students and researchers, meaning that speculative design cannot reach a broad audience, thus limiting its potential impact.

Thirdly, there is the issue of the formalization and routinization of speculative design. In their book Speculative Everything: Design, Fiction, and Social Dreaming, Anthony Dunne and Fiona Raby explained why they introduced the concept of speculative design after proposing critical design. After the introduction of critical design in Hertzian Tales, it gained attention and recognition and gradually became "a design label rather than an activity"(Dunne & Raby, p. 34). Speculative design, introduced roughly a decade later, faces a similar predicament. After extensive practice, speculative design has generated many standard paradigms. For audiences familiar with speculative design, these paradigms fail to provide fresh stimulation. Many works use speculative design as a label or design trend, emphasizing aesthetics over the establishment of a solid foundation. Deliberately constructed dystopias cannot effectively provoke criticism and reflection and may even come across as forced or lacking depth. In recent years, Anthony has shifted his research focus away from speculative design after leaving the Design Interactions of Royal College of Art. This is not to declare that speculative design is outdated but rather to call for more contemplation in the face of this trend.

The development of speculative design in China is facing several challenges, with the need to lower the accessibility threshold and reach a broader audience being a key concern for practitioners. To avoid elitism and ensure that speculative design doesn't become a self-entertainment game of academia, the internet provides the ideal platform. There are numerous media platforms in China such as TikTok, Bilibili, Xiaohongshu, WeChat, and Kuaishou, with hundreds of millions of users. Leveraging these platforms, speculative design has the potential to genuinely reach the masses. However, for speculative design to thrive on these platforms, it may need to adapt to online communication. Handy Geng, a highly popular video blogger in China with over 7.5 million followers on Bilibili, has created numerous useless inventions such as the "Broken Boat Treadmill" and the "Fully Automatic

Upside-down Hair Washing Machine." These humorous creations have gained immense popularity on the internet and have been covered by mainstream media. Handy Geng's success can be attributed to the fact that the general public typically associates design, especially product design, with solving practical problems and serving a clear purpose. Handy Geng's useless inventions defy conventional expectations, creating a sense of humor and novelty. Similar content creators like He Tongxue, who designed a "keyboard that types automatically," and "switch lights controlled by throwing a ball," regularly garner tens of millions of views for each video. She Lu Yun, a graduate of the China Central Academy of Fine Arts, created a "Contemporary Art Generator," a simple device that combines high-frequency vocabulary from contemporary art to generate seemingly profound sentences. This prop alone has sold thousands of units on Taobao, an online marketplace. Clearly, humor wields significant power on social media platforms.

There are many inventors worldwide who engage in similar endeavors. In the United States, Steven M. Johnson began experimenting with such designs as early as the 1980s. In Japan, these inventions have received considerable attention and affection. Groups like Maywa Denki, DIY DEPT, and individuals like Marina Fujiwara have embraced these creations. In Japan, such designs are referred to as Chindogu, a concept introduced by inventor Kawakami Kenji. Kawakami Kenji has created numerous Chindogu and developed a serious philosophy and set of rules behind them. He views Chindogu as subversive and opposes the commodification of certain products in consumerism. One of his ten tenets, "The creation of Chindogu is fundamentally a problem-solving activity. Humor is simply the by-product of finding an elaborate or unconventional solution to a problem"(Kawakami, n.d.). It emphasizing that the purpose of Chindogu is not simply to evoke laughter; humor is a means rather than the predefined goal. When humor is introduced as a tool for rethinking speculative design, it still shares the same foundation as speculative design, rooted in critical thinking, with humor serving as an external expression.

Most of time, speculative design is expressed through design fiction. When reshaped through the power of humor, fiction transforms into comedy. Therefore, the concept of "Design Comedy" is introduced here. Design comedy is a design approach that is built on humorous narratives. Its purpose is to stimulate the audience's imagination and provoke thoughts on technology, culture, and societal issues through humorous and absurd storytelling and visual presentation.

Design comedy is a variation of speculative design, maintaining the same form of design fiction. However, when emphasizing "the power of humor," design comedy offers three advantages that speculative design often lacks:

Firstly, concealing the critique and didacticism of the work. In their book Design Noir: The Secret Life of Electronic Objects, Anthony Dunne and Fiona Raby introduced the concept of "Design Noir." The term "Design Noir" is derived from the concept of "Film Noir" in cinema, conveying a deep, complex, and sometimes slightly dark way of thinking. Film Noir often explores themes such as crime, moral dilemmas, and social injustice, and Design Noir attempts to delve into the relationship between design, technology, ethics, and societal issues. This concept sheds light on some of the challenges faced by critical design and speculative design. These types of designs often present a dark secens, especially in speculative design, where constructing dystopian scenarios is a common approach. Such methods can come across as aggressive and preachy to many viewers. Design comedy can effectively avoid this issue. Comedy often takes a humble approach, with viewers initially focusing on humorous situations rather than the deeper issues within the design. Humor can create a relaxed and joyful atmosphere, making viewers feel at ease during the viewing process. This helps break down tension and defenses in the audience, reducing the discomfort that can arise from overly direct critical viewpoints. Design comedy uses a progressively revealing approach to guide the audience to think deeper, conveying more information and perspectives in an easily digestible manner, gradually leading the audience to accept and understand the critical

elements within the design.

As an example, consider the Mr. Boring project by the Shanghai-based studio MorrowAgent in 2018. During that time in China, social media often featured posts about "Things Boyfriends Should Do" or "Things Girlfriends Should Do," which set various standards for intimate relationships, often pointing towards specific consumer behaviors. Responding to this quantification and commodification of emotions, the project engaged in a discussion through the lens of Design Comedy. In the project, the male character is an extremely unromantic individual who possesses various contraptions to hinder his girlfriend's affectionate gestures. For instance, there's a machine that causes him to sweat excessively to avoid arm-touch, and a helmet that automatically sprays makeup remover on his girlfriend's face. The male character's lack of romance is portrayed through absurd props, resulting in narratives and comical scenarios that defy conventional norms. These scenarios sharply contrast with the prevailing standards of a "good boyfriend" as defined by contemporary media. However, perhaps this awkwardness is precisely what makes the other person endearing, and it might have been the initial reason they were attracted to each other. MorrowAgent exaggerated the awkward and uncomfortable aspects of intimate relationships to explore whether we should view our partners as real individuals or as objects providing experiences for ourselves.

Figure 1. Mr. Boring

Secondly, having strong sharing potential. Due to its appeal, design comedy may attract a broader audience, including those who typically don't pay much attention to design. This can help disseminate the ideas and concepts from design fiction into a wider society. Furthermore, happiness is a positive emotional expression, and on the internet, people tend to share and spread content that evokes emotional resonance. Humorous content often has a high degree of shareability, and design comedy presents interesting and comical elements and situations. People share such content to showcase their sense of humor or to share joy with friends, and this sharing behavior helps content spread rapidly on the internet. Design comedy, with its humor and absurdity, can spark conversations and discussions among the audience. People often share these designs and comment on them or express their own opinions on social media, which can expand the influence of the design.

Thirdly, using hutopia as an alternative to dystopia. The construction of dystopias in speculative design often leads to a sense of despair and can become cliched, mirroring conventions found in movies, literature, and games. Many times, these extreme scenarios are not effective pathways for sparking thought experiments. "Hutopia" is an alternative reality constructed through critical thinking. In contrast to the real world, hutopia is characterized by absurdity and humor, serving as a tool for critiquing and reflecting on the real world. Hutopia can be seen as the initial state of a dystopia, where society has not yet spiraled out of control but exhibits trends that appear absurd when viewed through the perspective of our present reality. Thus, hutopia can present a non-committal vision of the future, showing irrational tendencies within a non-extreme hypothetical, which aligns better with the realistic progress of technology and societal development. In the context of design comedy, hutopia can help shape the concept of the work, making it both creative and effectively critical. For example, by rigorously researching and speculating on a corresponding hutopia, one can create design comedy that exaggerates, satirizes, or humorously

portrays the potential consequences of technological and scientific advancements. This encourages the audience to think about how to wisely address these consequences.

Conclusion

In summary, design comedy has the potential to address the challenges faced by speculative design in China. Through humor and absurdity, it can expand the audience, promote online dissemination, and avoid the trend of labeling and standardization in speculative design. It offers a more relaxed and friendly way to communicate and engage with the general public. As professionals, it's important to recognize the current challenges of speculative design and the trend of becoming a self-indulgent practice within academia. By adjusting and promoting it according to the specific context of China, speculative design can truly harness its expected power.

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References

Dunne, A., & Raby, F. (2013) Speculative Everything : Design, Fiction, and Social Dreaming. Mit Press.

Dunne, A. (2005) Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design. MIT Press.

Malpass, M. (2017) Critical Design in Context: history, theory and practice. Bloomsbury Academic.

Bishop, C. (2023) INFORMATION OVERLOAD, Artforum International Magazine. Available at: https://www.artforum.com/print/202304/claire-bishop-on-the- superabundance-of-research-based-art-90274 (Accessed: 19 September 2023).

Kawakami, K. The Ten Tenets of Chindogu, Chindogu. Available at: http://chindogu.com/ics/?page_id=336 (Accessed: 19 September 2023).

Dunne, A. and Raby, F. (2001) Design Noir: The Secret Life of Electronic Objects. London: Bloomsbury.

Conceptualizing Digital Humans: A Historical Overview of Existing Design Practice

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Abstract

With breakthroughs in simulation technologies and artificial intelligence, computer-generated digital humans are continuously emerging and expanding into interdisciplinary research fields. While the terminology related to digital humans has not yet undergone systematic clarification and differentiation. What exactly is a digital human? What are their core attributes? How will digital humans maintain their presence as an emerging media over the long term? In this article, we begin with a discussion on the concepts of 'virtual' and 'digital' to analyze the inherent nature of digital humans. Next, we provide an overview of the literature and existing practice on constructing digital humans from various disciplinary perspectives. We found that scholars and designers employ inconsistent definitions across their working process due to different research objectives and paradigms. In this regard, we endorse a more generalized definition to provide clear conceptual and operational instructions for future research and practice. Finally, we engaged in a discussion regarding future research directions and propose that researchers consider digital humans not merely as interfaces in the realm of digital communication, but also as emerging approaches that catalyze media integration and transformation.

Author keywords

Digital Humans; Digitization; Virtual Humans; Literature Review.

Introduction

Digital humans, also known as virtual humans or metahumans, can be technically defined as realistic computer-generated human images created through computer graphics, motion capture, and 3D rendering techniques (Hussain et al., 2011). With rapid advancements in artificial intelligence, cloud rendering, and information technologies, digital humans have ventured into multidimensional explorations within virtual environments. For instance, photorealistic digital actors employed in film and television productions can be modified and enhanced to improve visual effects (Alexander et al., 2010); virtual influencers, such as fashion brand endorsers featured in advertising campaigns, have introduced new opportunities for brands to engage with their audience in immersive ways (Lee & Park, 2022). Moreover, virtual guides used in museums can provide real-time information to visitors, serving as a highly humanized communication interface.

Figure 1. NEON, SAMSUNG Realtime AI-powered digital humans project, 2020. Source: neonlife.ai

From the examples mentioned above of digital human applications, we can identify two interconnected concepts related to digital humans: 'digital' and 'virtual'. Given that these two concepts have varying impacts and implications across the realms of technology, culture, and society, clarifying the distinctions between them can aid scholars in more accurately delineating technologies, innovations, and phenomena. It can also help in understanding the functions, responsibilities, and identities inherent to digital humans. Such clarity and precision are necessary because existing research demonstrates that these differences go beyond semantics (Nowak & Fox, 2018), they are primarily influenced by variations in research objectives and paradigms.

Key concept clarification

The term 'digital' or 'digitization' was first used by mathematician George Stibitz in 1942, aimed at establishing precise calculations for targeting and launching anti-aircraft artillery positions during military conflicts (Booch, 2018). Over more than half a century of development, the term 'digital' has become widely employed to describe various aspects of 21st-century societal, economic, and design practices. In its basic form, a digit is a number (Ritter & Pedersen, 2020). The term 'digital humans' underscores their existence as written programs consisting of numerous fundamental data units such as "0" and "1" and executed on computing devices. It is evident that digitization constitutes the fundamental mode of existence for digital beings, American computer scientist Nicholas Negroponte, in his book "Being Digital" (Negroponte, 1995), emphasized the role of digitized interactions in blending virtual and real worlds in a multidimensional manner. This viewpoint was further extended by Han Byung-Chul, a German philosopher who portrayed digital beings as a "survival tableau of human digitization" (Han, 2017). Han's aesthetics of digital beings signify a profound integration of digital technology and human essence (Xian, 2021).

The distinction between "virtual humans" and "digital humans" lies in their primary focus and attributes. "Virtual humans" emphasize the virtual identity and interactive capabilities of the characters. They are often digitally customized with specific appearance for identification in particular application scenarios (Takano & Taka, 2022) and equipped with perceptual abilities, expressive capabilities, and interactive capabilities (Cheng et al., 2022). However, at their core, they remain digital simulations of physical entities. It can also be seen as a phenomenon that closely approximates real human presence in particular spaces or scenarios (Lee, 2004), delivering an experience equivalent to human interaction through technological means (Yang et al., 2022). For instance, virtual idols and virtual assistants fundamentally represent digital beings with predefined functions and appearances. Thus, we are looking for a more generalized definition and argue that digital humans are digital representations of the human user that facilitate interaction with other users, entities, or the environment, this definition highlights the media attributes of digital humans, emphasizing their role as intermediaries for human interaction within digital contexts.

The evolution of digital humans

Following the clarification of pertinent concepts, we proceeded to delineate the historical development of digital humans. Tracing the origins of digital humans assists in positioning our study and comprehending its relative context. It also entails an exploration of the interplay between digital human research and fields such as design studies, computer graphics, and medical simulation while establishing connections with evolving knowledge (Neuman, 2007). According to our review, the evolutionary progression of digital humans can be categorized into four distinct phases (Table 1).

Table 1. Phases in digital human research.

	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**
Time	*1964-1980s*	*1980s-2001*	*2001-2021*	*After 2021*
Phenomena	Early Computer Graphics Human Figure	Visible Human Project	High Fidelity Metahumans	Real-time Avatars
Main focus	Gesture Simulation	3D Visualization Human data set	Personalized Image Expression	Embodied Interaction, Identity Construction
Driven Technology	Computer Perspective Animation	Super-Sampling Visualization Algorithms	Communications Technology	Artificial Intelligence, Mixed Reality
Leading discipline	Computer Graphics, Industrial Design	Computer Graphics, Medical Image Analysis	Information Technology, Communication	Social Science, Communication

Early Computer Graphics: Exploring Visual Representations of Human Figure

In the mid-20th century, driven by the demands of industrial engineers and technicians, computer graphics (CG) research began to explore the potential of computer-generated visual representations (Jones, 1990). During this period, the exploration of computer-generated human figures evolved from simple line drawings to more realistic depictions (Wu, 2016).

Accurately describing the structure, functionality, form, and inherent connections of the human body has been a common goal pursued by humanity for millennia (Zhong et al., 2002). The idea of constructing human models can be traced back to ancient civilizations or even earlier. In terms of technological exploration, the initial concern of modern scholars was how to create flexible and lifelike digital avatars to simulate human motion (Wu, 2016). However, the realism of character depictions and drawing precision heavily relied on the advancement of computer technology. Early digital humans were often composed of symbols or simple lines (Fetter, 1966). In 1964, the first full-body digital human figure, known as the "Boeing Man", was 'born' in the design laboratory of Boeing Company in the United States. This digital human model consisted of seven movable segments, enabling articulation at the pelvis, neck, shoulders, and elbows. It was utilized to simulate a series of postures performed by pilots (Fetter, 1982).

Figure 2. Boeing Man, developed by William Fetter, 1964. Source: Boeing Image Archive

The digital image of the "Boeing Man" served as one of the early examples of converting data into images through computers, yet its limited geometric wireframe outline was still far from resembling a realistic human figure. In the early 1970s, the University of Utah's Computer Graphics Research Group made remarkable breakthroughs in simulating human walking movements, facial expressions, texture mapping, and more (Gaboury, 2016). By the early 1980s, with significant improvements in overall computer performance and the invention of several important algorithms, the quality of computer-generated characters experienced remarkable enhancements (Wu, 2016). In 1980, the first digitally generated character with volume and shading, named Adam Powers, made a public appearance in color 3D imagery at the ACM SIGGRAPH Electronic Theater. Although Adam's facial features and body movements were relatively stiff, his realism had greatly improved through the 3D reconstruction system compared to the line-based "Boeing Man" (Demos, 2005). For instance, Adam's skin tones were composed of smoothly shaded colors, closely resembling the appearance of real humans. The attempt to simulate different materials' textures on clothing and props also contributed to improved realism. These visual enhancements were primarily attributed to the achievements in the field of computer graphics algorithms in the 1970s, such as in occlusion culling, texture mapping, and rendering (Wu, 2016).

Figure 3. Adam Powers, computer animation created by Information International Inc., Source: www.Imdb.com

Visualization of Medical Research: Precise Replication of the Human Body

Since the 1980s, with the gradual maturation of computer graphics, medical research conducted numerous experiments in the field of human body simulation with the aid of computer imaging technology. Initiatives including the Human Genome Project (HGP), the Visible Human Project (VHP), the Virtual Human Project (VHP), the Human Brain Project (HBP), and so on (Sandelowski, 2023). These endeavors aimed to digitally replicate human anatomical features, marking a significant fusion of computer graphics technology with medical visualization research (Zhong et al., 2002). In this context, digital humans, presented as three-dimensional anatomical models, were employed to represent internal structures for concentrated observation and study of

organs within the human body (Hong, 2022). Displaying anatomical features in three-dimensional form entails capturing size, shape, position, and spatial relationships among organs, thus achieving the digitization of human anatomical structures through the utilization of human body information. This approach found significant applications in medical education and clinical diagnosis by offering a visual means of teaching and understanding human anatomy.

Figure 4. The Visible Human Project, Source: https://www.voxel-man.com/gallery/visible-human/

In 1989, the NATIONAL LIBRARY OF MEDICINE (NLM) initiated the 'Visible Human Project', aiming to construct a comprehensive virtual dataset of the human body utilizing computer image reconstruction techniques. By combining interactive classification and super-sampling visualization algorithms, this project significantly enhanced the realism of three-dimensional reconstructions of human body data (Schiemann et al., 1997). This initiative transformed the established pattern of medical visualization and created a digitized three-dimensional anatomical atlas (Ackerman, 1998). The Visible Human Project laid the foundation for using computer image reconstruction techniques to build virtual human models, sparking a global trend in the development of visual human data (Zhang, 2003). With advancements in information acquisition and processing technologies, future digital humans will simulate human body functions and behaviors with increasing accuracy and comprehensiveness. This holds crucial scientific significance as it promotes progress in the field of human body simulation and enhances our understanding of human nature.

Advancing Simulation: Realism and Multidimensional Interaction

As 3D modeling techniques and societal demands continue to evolve, the simulation of digital humans has progressed beyond visual realism and accurate replication. It now encompasses the need to adapt to the real world and engage in interactions within it. After the millennium, the endeavor of designing digital humans has initiated a transition from 'like in form' to 'like in spirit'. As animation technology undergoes successive updates, digital humans have gradually evolved from static poses to free movements, from passive adaptation to active interaction with the environment, and from the separation of form and intelligence to their integration (Wu, 2014). Consequently, people are no longer satisfied with simple 3D reconstructions of the human body. Instead, they are exploring more personalized characters and differentiated modes of expression, imbuing digital humans with richer cultural connotations. This evolution is made possible by updated algorithms and also derived from the shifts in societal aesthetics (Chen, 2018).

Figure 5. Lil Miquela, Virtual Social Media Influencer. Source: medium.com

At the beginning of the 21st century, Artificial intelligence has become more efficient in creating realistic 3D characters, texturing and animating human characters with realistic body language, facial expressions, lip sync and so on. (Singh & Kaur, 2023). Many digital humans exhibit comprehensive character designs, unique personalities, and finely detailed emotional portrayals. These foundational aspects endow digital humans with heightened emotional significance. For instance, Lil Miquela is a virtual influencer created by the American company Brud. She serves as a fashion blogger, model, and singer, amassing a substantial fan base across global social media platforms which disrupts conventional social networking paradigms (Drenten, 2020). With increasing attention and a broadening scope of involvement, Lil Miquela has given rise to a relatively complete virtual KOL (Key Opinion Leader) digital matrix centered around her. Such digital humans are actively engaging in information exchange through social platforms, introducing new research avenues to explore the novel shifts in interpersonal communication in the digital era.

Building Connection: The Evolving Role of Digital Humans in Digital Era

Amidst the trend of the automated and refined development, the essential attributes and connectivity methods of digital humans as users' digital representations still require further conceptual clarification and application guidance.

In 1995, social scientist Sherry Turkle defined digital human avatars as users' expressions of identity on screens in her book "Life on the Screen: Identity in the Age of the Internet" (Turkle, 1995). Digital beings represent users' self-presentation and means of dissemination in digital environments. The visual representation of these digital entities' bodies evokes an embodied visual experience for observers. As the digital world continues to expand, humans require assistance from digital humans to achieve embodied interactive experiences (Xiao et al., 2021). Alongside the ongoing development of societal demands, emerging social technological systems have established a novel and intricate relationship between individuals and digital humans (Freeman, 2020), significantly transforming the ways people engage in online socialization and interaction (Hardey, 2002). Under the vision of the "metaverse", the series of transformations and connections triggered by digital humans have paved the way for new communication modes, relationships, contexts, and spaces within novel social domains.

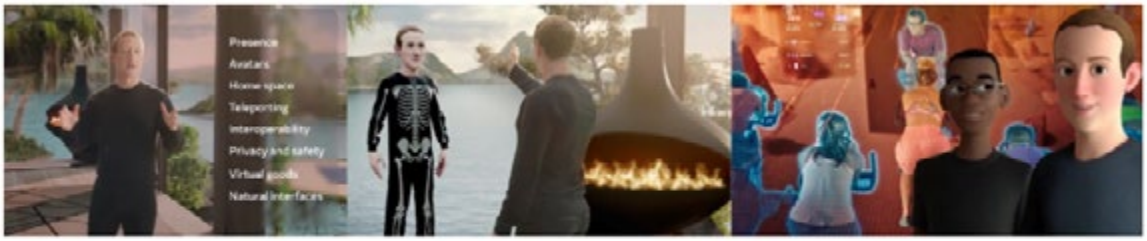

Figure 6. Meta Connect 2021, Zuckerberg demonstrated the use of digital avatars. Source: tech.facebook.com

Conclusion

Across the literature and existing practice, we find that scholars from various disciplines have focused on three overlapping aspects: Digitization, Anthropomorphism and Interactivity.

Digitization

The first dimension of conceptualizing digital humans relates to their existence mode. Combined with the clarification of key concepts in the introduction section of this article, digital humans are virtual embodiments of the participants engaging in the era of digital communication, consisting of high-level behavior, perception, animation and graphic systems. (Magnenat-Thalmann & Thalmann, 2005). At its core, digital humans are presented as virtual interactive imaging systems that involve simulations of physical entities across multiple data dimensions (Jones et al., 2020). The attributes of digitization provide digital humans with the capability for remote interaction, enabling them to be "inhabited" in shared multimedia environments.

Anthropomorphism

Throughout the evolutionary process, the gap between digital humans and real humans is gradually narrowing. Concerning physical appearance, some scholars define digital humans in terms of physical realism, how lifelike they appear or how similar they are to human morphology or behavior (Nowak et al.,2009). From the perspective of participants, digital humans are perceived as virtual entities created through computer graphics technologies, possessing a human-like external appearance that can be accurately recognized (Yuan, 2022). However, merely offering a flat and generic visual presentation is far from satisfactory in digital communication. Nakamura (2002), described a digital human avatar as "a visual digital representation of a self in cyberspace", emphasizing the crucial role of digital humans in enhancing digital communication and fulfilling individuals' need for self-expression. As the most basic attribute of digital humans, anthropomorphism enhances the visual appeal of emerging media, enabling participants to interact with digital humans in a more natural way and building emotional connections (Sestino & D'Angelo, 2023).

Interactivity

The final dimension in defining digital humans pertains to their interactivity, that is one's ability to perform actions and engage in the environment (Huang & Jung, 2022). Given the diverse driving technologies and application scenarios, digital humans vary in their interactive abilities, sensory apparatus and richness. People expect more interactions with digital humans on a daily basis which is reshaping our social experience and challenging the ontological concept of authenticity. (Turkle, 2007; Huang, & Jung, 2022). The "2020 Virtual Digital Human Development White Paper" points out that digital humans possess the ability to express themselves

through language, facial expressions, and body movements, as well as the ability to perceive the external environment and engage in communication and interaction with participants. These abilities enable digital humans to transmit and collect information such as text, audio, and images. On the basis of possessing humanoid characteristics, to some extent, replicating human thought or behavior, and interacting with humans are among the assessment criteria for digital humans.

While researchers have varied in their ways of conceptualizing digital humans, we contend that certain key factors must be incorporated to reach a consensus and promote the ongoing development of digital human research. Based on the preceding discussions, we propose that the definition of digital humans should encompass the following three aspects of attention:
1.Presentation as interactive digital image systems.
2.Visual resemblance to human characteristics, including appearance and physique.
3.Capable of simulating and replicating human behavior to a certain extent, along with the ability to convey information through language, facial expressions, and body movements.

In light of our review, we suggest that both conceptualization and theorizing about digital humans would be more generalizable (Nowak & Fox, 2018) instead of constraining specific disciplines such as computer graphics, industrial simulation, medical anatomy, and others. This shift is essential because digital humans represent both a novel research topic and a means to comprehend the evolution of existing digital communication processes. Such an approach seeks to bridge the currently isolated and fragmented single-disciplinary research and to collectively view them as efforts towards accurately simulating human appearance and behavior.

In conclusion, considering digital humans as a multidimensional media concept holds contemporary significance as it enhances people's engagement with increasingly complex virtual experiences. We eagerly anticipate the continued growth and integration of this research field into everyday life and various industries.

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References

Ackerman, M. J. (1998). The visible human project. Proceedings of the IEEE, 86(3), 504-511. Schiemann, T., Tiede, U., & Höhne, K. H. (1997). Segmentation of the visible human for high-quality volume-based visualization. Medical image analysis, 1(4), 263-270.
Alexander, O., Rogers, M., Lambeth, W., Chiang, M., & Debevec, P. (2009, November). Creating a photoreal digital actor: The digital emily project. In 2009 Conference for Visual Media Production (pp. 176-187). IEEE.
Booch, G. (2018). The history of software engineering. IEEE Software, 35(5), 108-114.
Byung-Chul Han.(2017), Psychopolitics: Neoliberalism and New Technologies of Power[M].Erik Butler trans, Verso.
Chen, F. (2018). Research on virtual avatar design in the Internet era (网络时代下的虚拟化身设计研究) [D]. China Central Academy of Fine Arts.
Cheng, S., Yu, G., Yang, J., & Chen, X. (2022). Virtual Humans: An Experiential Medium -- An Analysis of the Connection Mechanism and Media Attributes of Virtual Humans (虚拟数字人：一种体验性媒介——试析虚拟数字人的连接机制与媒介属性). 新闻界 (07),12-23. doi:10.15897/j.cnki.cn51-1046/g2.2022.07.003.

Demos, G. (2005). My personal history in the early explorations of computer graphics. The Visual Computer, 21(12), 961-978.

Drenten, J., & Brooks, G. (2020). Celebrity 2.0: Lil Miquela and the rise of a virtual star system. Feminist Media Studies, 20(8), 1319-1323.

Fetter, W. A. (1982). A progression of human figures simulated by computer graphics. IEEE Computer Graphics and Applications, 2(09), 9-13.

Fetter, W. A. (1966). "Computer Graphics." Design Quarterly, no. 66/67, pp. 14–23. JSTOR, https://doi.org/10.2307/4047328. Accessed 31 Aug. 2023.

Freeman, G., Zamanifard, S., Maloney, D., & Adkins, A. (2020). My body, my avatar: How people perceive their avatars in social virtual reality. In Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems, 1-8.

Gaboury, J. (2016). Other places of invention: Computer graphics at the University of Utah.

Hardey, M. (2002). Life beyond the screen: embodiment and identity through the internet. The Sociological Review, 50(4), 570-585.

Hong, Y. (2022) Representation and reconstruction of high fidelity virtual digital person (高保真虚拟数字人的表示与重建) [D]. University of Science and Technology of China,2022.DOI:10.27517/d.cnki.gzkju.000779.

Huang, J., & Jung, Y. (2022). Perceived authenticity of virtual characters makes the difference. Frontiers in Virtual Reality, 3, 1033709.

Hussain, M., Nakamura, B., & Marino, J. (2011). Avatar appearance & information credibility in second life®. In Proceedings of the 2011 iConference, 682-683.

Jones, D., Snider, C., Nassehi, A., Yon, J., & Hicks, B. (2020). Characterising the Digital Twin: A systematic literature review. CIRP journal of manufacturing science and technology, 29, 36-52.

Lee, J. Y., & Park, K. H. (2022, December). "I Am a Digital Human": Effectiveness of Using Virtual Influencers as Fashion Brand Endorsers. In International Textile and Apparel Association Annual Conference Proceedings (Vol. 79, No. 1). Iowa State University Digital Press.

Lee, K. M. (2004). Presence, explicated. Communication theory, 14(1), 27-50.

Magnenat-Thalmann, N., & Thalmann, D. (Eds.). (2005). Handbook of virtual humans. John Wiley & Sons.

Nakamura, L. (2002). Cybertypes: Race, ethnicity, and identity on the Internet. New York, NY: Routledge.

Neuman, L. W. (2007). Social research methods, 6/E. Pearson Education India.

Nowak, K. L., & Fox, J. (2018). Avatars and computer-mediated communication: a review of the definitions, uses, and effects of digital representations. Review of Communication Research, 6, 30-53. https://doi.org/10.12840/issn.2255-4165.2018.06.01.015

Nowak, K. L., Hamilton, M. A., & Hammond, C. C. (2009). The effect of image features on judgments of homophily, credibility, and intention to use as avatars in future interactions. Media Psychology, 12, 50-76. doi: 10.1080/15213260802669433.

Negroponte, Nicholas (1995). Being Digital. Vintage Books. ISBN 0-679-43919-6.

Ritter, T., & Pedersen, C. L. (2020). Digitization capability and the digitalization of business models in business-to-business firms: Past, present, and future. Industrial Marketing Management, 86, 180-190.

Schiemann, T., Tiede, U., & Höhne, K. H. (1997). Segmentation of the visible human for high-quality volume-based visualization. Medical image analysis, 1(4), 263-270.

Sestino, A., & D'Angelo, A. (2023). My doctor is an avatar! The effect of anthropomorphism and emotional receptivity on individuals' intention to use digital-based healthcare services. Technological Forecasting and Social Change, 191, 122505.

Singh, H., & Kaur, K. (2023, August). Utilization of Artificial Intelligence for 3D Production Process. In 2023 5th International Conference on Inventive Research in Computing Applications (ICIRCA) (pp. 33-37). IEEE.
Takano, M., & Taka, F. (2022). Fancy avatar identification and behaviors in the virtual world: Preceding avatar customization and succeeding communication. Computers in Human Behavior Reports, 6, 100176.
Turkle, S. (1995). Life on the screen: Identity in the age of the Internet. New York, NY: Simon & Schuster.
Turkle, S. (2007). Authenticity in the age of digital companions. Interact. Stud. 8 (3), 501–517. doi:10.1075/is.8.3.11tur
Wu, J. (2016). The origin of digital humans.1964-2001[M]. Tongji University Press.
Wu, J. (2014). Portrait and Image: On Computer image graphics technology and portrait art (肖与像 : 论计算机图像图形技术与肖像艺术) [C]. 见汪文琪主编 , 建筑与交叉文化国际研讨会会议文集 . 国立台南艺术大学 ,10.30-11.1: 247-254 .
Sandelowski, M. (2023). Visible humans, vanishing bodies, and virtual nursing: Complications of life, presence, place, and identity. In Medical Anthropology (pp. 503-515). Routledge.
Xian, h. (2021). Research on Han Byung-Chul 's aesthetic thought of "digital man"(韩炳哲 " 数字人 " 美学思想研究) [D].Lanzhou University.DOI:10.27204/d.cnki.glzhu.2021.002052.
Xiao, Y., Wu, Y., & Wang, Z. (2021). From mapping to Absorption: An exploration of the technical intention of "immersion" in Embodied interaction（从映射到吸纳：具身交互中 " 沉浸 " 的技术意向探究）. media, 17, 87-90.
Yan, M., Shi, L., Zhang, D., sun, M., Yang, Y., Xiong, W., ... & Liu, B. (2020). Virtual Digital Human Development White Paper; General Team of Artificial Intelligence Industry Alliance and Digital Human Working Committee of Zhong Guan Science Shu Zhi. Artificial Intelligence Industry Alliance: Beijing, China, 3.
Yang, M & Yu, G., Empowerment and "soul": the personalized construction of digital humans (赋能与 " 赋魂 " ： 数字虚拟人的个性化建构) [J]. 编辑之友 ,2022, No.313(09):44-50.DOI:10.13786/j.cnki.cn14-1066/g2.2022.9.006.
Yuan, M. (2022). Aesthetic research of digital humans from the perspective of simulacrum (拟像视角下虚拟数字人审美研究) [D]. Hubei Normal University. DOI:10.27796/d.cnki.ghbsf.000056.
Zhang, S.(2003). Research progress of digital visual human body in China (中国数字化可视人体研究进展) [J]. Science Foundation of China, (01):6-9.DOI:10.16262/j.cnki.1000-8217.2003.01.002.
Zhong, S., Li, S., Lin, Z., Luo, S.& Qin, D. (2002). Digital virtual humans background and significance (数字化虚拟人背景和意义) [J]. 中国基础科学 , (06):14-18.

Designing the future of society: from the participatory scenario perspective

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Abstract

To effectively contribute to social change in the complex and dynamic present, designing for social innovation necessitates a systematic, holistic, and long-term approach to drive social change.Scenarioplanningstands outasatoolcapableoffulfillingthisrequirement. Thisstudy discusses the relationship between foresight and design, explores several participatory scenario planning methods through some cases, and suggests how social innovation design could use participatory scenario planning to cultivate a shared vision.

Author keywords

Foresight; Design for social innovation; Scenarios; Participatory scenario planning

Introduction

There has been a long tradition of thinking the future and future events. People have always been curious about what lies ahead. As an achievable attempt by people to alter the world, design is similarly future-oriented.

Design is considered by Herbert Simon as a creative activity that solves problems. It means the design process is identifying the problem in the present or the past and proposing a solution that allows the problem to be solved or to move towards a better situation. That is problem-oriented design.

Many academics have discovered that many of today's challenges are chaotic, complex, and poorly structured as a result of the development of "wicked problems" (Farrell & Hooker, 2013). It is often that the solution space evolves along with the problem space and the stakeholders involved become more complicated and diverse(Bijl-Brouwer, 2019). Problem-oriented design is insufficient when the issue space is ambiguous and chaotic since there is a great danger of creating unintended side effects that could lead to a disaster (Manzini, 2015). To investigate the issue, we must design from a comprehensive, systemic, and long-term perspective.

This is valid in the design for social innovation in particular. Manzini defines design for social innovation(DSI) as all the activities that professional design could do to activate, sustain, and influence society toward sustainability (Manzini, 2015). Intending to prioritize social connections, sustainability, and local knowledge, DSI places a higher priority on social change and intervention than advances that place a greater emphasis on profitability or efficiency. Manzini emphasizes the significance of a shared vision in social innovation, which may inspire the creativity of various

stakeholders and foster social interaction while guiding design choices. (Amatullo et al., 2021; Manzini, 2015)

In this study, the relationship between foresight and design is explored, along with several types of participatory scenario planning methodologies. It is belived that participatory scenario planning would be effective in DSI to create a shared vision.

Foresight and design

One of the early definitions of foresight was offered by(Coates, 1985), who described it as "a process by which one comes to a comprehensive understanding of the forces that shape the long- term future and that should be taken into account in policy-making, planning, and decision- making." But at first, forecasting was more frequently utilized by futurists or strategic planners to foresee technological advancement. Foresight was accepted and swiftly spread after a future- focused strategic planning effort in which academics adopted the term as an alternative to predicting (Martin, 2010). Although each of these notions has unique qualities, (Cuhls, 2003) suggested that planning, foresight, and even forecasting have many similarities. In actuality, all three of them overlap and are frequently used in the same sentence. Over decades, the term "foresight" gained popularity and is used frequently by academics, researchers, policymakers, consultants, and others worldwide. Designers are also included. Future thinking in design has given rise to many new design directions, such as speculative design, design fiction, strategic design, and others.

Tony Fry also mentions in his article on Design Intelligence that the ability to presuppose is the essence of design competence... The extent to which design becomes a full-fledged cognitive act in itself determines the ontology (and subjectivity) of the designer, but it remains crucial to recognize that all humans can design. The exercise of design competence is inextricably linked to the ability to shape and change one's own and others' worlds(Willis, 2005).

Both fields (design and foresight) involve systematic efforts to make sense of uncertain futures by using scenarios as a common tool for imagining, inspiring, and communicating desirable directions.

The growing collaboration makes a lot of sense given that generic frameworks that foresight and design use to carry out their work are quite similar(Hines & Zindato, 2016).

The Double Diamond is a visual representation of the design process. It describes the four steps taken in any design and innovation project (Figure 1). It can be seen that the overall process can be divided into two phases. The first diamond helps people understand what the problem is. The second diamond encourages people to give different answers to the clearly defined problem, seeking inspiration and co-designing with a range of different people(The Double Diamond - Design Council, n.d.).

Figure 1 The Double Diamond by the Design Council

For the generic foresight framework, we have chosen a foresight framework from Bishop and Hines's study, which has six steps: framing, scanning, forecasting, visioning, planning, and acting(Bishop & Hines, 2012). The six activities can also be grouped into two phases: mapping and influencing. Mapping is aimed at constructing alternative futures, and influencing is about taking action to shape the future(Hines & Zindato, 2016).

Figure 2 A foresight framework

The first diamond of design, with discovery and defining

steps, is similar to the mapping phase of foresight with its framing, scanning, and forecasting steps. Similarly, the second diamond is similar to the influencing phase of foresight with its visioning, planning, and acting steps. Scenarios, which originally referred to the plot summary of a stage production, film script, or television program, are diagrams representing some aspect of the future. Scenarios are explanations of potential outcomes and sequences of events that enable individuals to transition from the present to the future. Early scenarios were used in public decision-making and the military, as well as later made a way into company planning (Bradfield et al., 2005). This concept has a wide range of applications, from global models to user scenarios (such as in the design of human-computer interactions(Carroll, 2003)). Scenarios are frequently built as a combination of a future vision and a plan for achieving that future from the present, in which several goals for the future are outlined.

There are similarities and differences in when and how scenarios are used in design and foresight. In foresight, scenarios are applied at the macro level (a whole system), presenting a variety of future alternatives, generally in the form of storytelling and reporting, with the outcome being strategies, policies, initiatives, etc. In design, they are applied on a micro-scale (focused on a specific theme, a product or a service), they present feasible solutions and are materialized by design solutions/prototypes or maps(Hines & Zindato, 2016).

Overall, the difference between futurists' and designers' use of scenarios can be seen as the difference between scenario planning, which analyzes systems from a macro perspective, and scenario construction, which is more specific to creating stories with possibilities from a micro perspective.

As the two fields learn from each other, the use of scenarios in the design process expands that be used in all phases within design process and transfers the emphasis from the design object to the communication and interaction process. It could be exploring problems context, building a common vision, generating new concepts, supporting decision-making.

Participatory scenario planning

Another similarity between these two fields is that both have been influenced by participatory thinking and have new developments in methodology. And scenarios-the tools they share-seem to be a natural combination with participatory thinking.

In fact, Participatory Scenario Planning (PSP) has become a new development in scenario planning, and be used across multiple disciplines. Participatory Scenario Planning (PSP) is a procedure in which participants, frequently with the help of a researcher, engage in a highly collaborative process and take the initiative at some or all stages of a scenario production process to look into potential futures.

PSP is a transdisciplinary area, and other academic fields have contributed knowledge to its growth.

Four scenarios (Figure 3) that were reasonable and appealing to many stakeholders were produced by ecological scientists using participatory scenario planning to investigate potential strategies to promote human-wildlife cohabitation (Jiren et al., 2021). (López-Rodríguez et al., 2023)have created and used a visual tool in a PSP process for a national park to encourage direct communication and reflection among many stakeholders and to bring various conservation strategies to life (Figure 4). In a series of citizen-participatory low-carbon energy visioning workshops in Suita City, (Uwasu et al., 2020) introduced a new participatory scenario design process in which participants took on the roles of hypothetical future

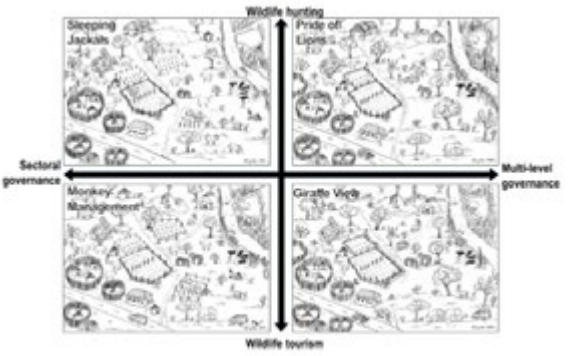

Figure 3

generations to engage in decision-making (Figure 5).

According to (Ratti & Claudel, 2016) a participatory approach to speculative scenarios encourages group imagination, experimentation, and the development of the most ideal future. This is exactly the force needed to drive social change in social innovation design.

Indeed, the field of social innovation is also using scenarios to explore new futures, like the CITY-ECO-LAB that Mancini mentioned in his book which asked six households to use "what if..." statements to imagine how their lives would change if they started to reduce their energy and water use(Manzini, 2015). One benefit of this is that it creates direct, rich, and open scenarios that help with comprehension and communication. Nevertheless, the disadvantages are also evident; the main among them is the absence of clear boundary conditions and key drivers, which limits further development into potential futures.

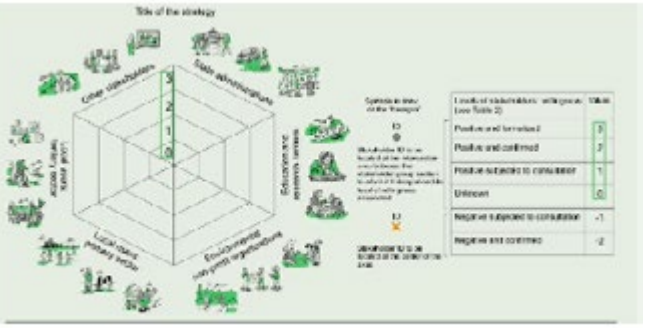

Figure 4

Figure 5

As previously stated, design may learn some approaches from foresight. Macro perspectives, clear problem boundaries, trend analysis, and key drivers are what futurists are good at. The benefit of this is that the essential drivers are highlighted, which increases the credibility and consistency of the generated scenarios and facilitates the following formulation of strategic decisions in many circumstances. While at a later stage of development, it could use various methods of design, so that a little bit of possible future can be seen and touched on the basis of reality.

PSP needs to be open and rich, while also taking into account the fact that implementation and impact generation need to be clearly bounded by regulating and driving factors, otherwise it would be no different from science fiction, given the complexity and uncertainty of the problems faced in design for social innovation (Buehring & Bishop, 2020). Local knowledge is necessary for social innovation as well, and participatory scenario planning in the community offers the chance to combine scientific and local knowledge, maybe allowing access to social or cultural memory(Mistry et al., 2014; Oteros-Rozas et al., 2015)

Discussion & Limitation

The use of scenarios in design is not new; in fact, the method has been around for quite some time. When used in design practice, boundary conditions and key drivers are often not considered deeply enough because there is a lack of a systematic and logical way to think about how complicated the problem is. Rich scenarios are produced as a result; but they lack support for subsequent implementation and development. Therefore, we raise the possibility that PSP could be used as a new strategy for social innovation by bringing together several fields that use scenario planning.

The paper's limitation is that it merely analyzes this method's potential from the literature and there is no evidence of feasibility from practice yet; this will be the focus of our further investigation. We are currently

running a workshop in a village to test the use of participatory scenario planning to promote social innovation. We hope that this approach will lead to some new developments in design for social innovation.

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References

Amatullo M., Boyer B., May J., & Shea A. (2021). Design for Social Innovation: Case Studies from Around the World (1st ed.). Routledge. https://doi.org/10.4324/9781003021360

Bijl-Brouwer M. (2019). Problem Framing Expertise in Public and Social Innovation. She Ji: The Journal of Design, Economics, and Innovation, 5(1), 29–43. https://doi.org/10.1016/j.sheji.2019.01.003

Bishop P. C., & Hines A. (2012). Teaching about the Future. Palgrave Macmillan UK. https://doi.org/10.1057/9781137020703

Bradfield R., Wright G., Burt G., Cairns G., & Van Der Heijden K. (2005). The origins and evolution of scenario techniques in long range business planning. Futures, 37(8), 795–812. Q2.

Buehring J., & Bishop P. C. (2020). Foresight and design: New support for strategic decision making. She Ji: The Journal of Design, Economics, and Innovation, 6(3), 408–432. https://doi.org/10.1016/j.sheji.2020.07.002

Carroll J. M. (2003). Scenario-Based Design. In Making Use: Scenario-Based Design of Human- Computer Interactions (pp. 45–70). MIT Press. https://ieeexplore.ieee.org/document/6281870

Coates, J. F. (1985). Foresight in federal government policy making. Futures Research Quarterly, 1(2), 29–53.

Cuhls K. (2003). From forecasting to foresight processes?new participative foresight activities in Germany. Journal of Forecasting, 22(2–3), 93–111. Q3. https://doi.org/10.1002/for.848

Farrell R., & Hooker C. (2013). Design, science and wicked problems. Design Studies, 34(6), 681– 705. Q2. https://doi.org/10.1016/j.destud.2013.05.001

Hines A., & Zindato D. (2016). Designing Foresight and Foresighting Design: Opportunities for Learning and Collaboration via Scenarios. World Futures Review, 8(4), 180–192. https://doi.org/10.1177/1946756716672477

Jiren T. S., Riechers M., Kansky R., & Fischer J. (2021). Participatory scenario planning to facilitate human–wildlife coexistence. Conservation Biology, 35(6), 1957–1965. Q1. https://doi.org/10.1111/cobi.13725

López-Rodríguez M. D., Oteros-Rozas E., Ruiz-Mallén I., March H., Horcea-Milcu A.-I., Heras M., Cebrián-Piqueras M. Á., Andrade R., Lo V., & Piñeiro C. (2023). Visualizing stakeholders' willingness for collective action in participatory scenario planning. https://doi.org/10.5751/ES-14101-280205

Manzini E. (2015). Design, when everybody designs: An introduction to design for social innovation. MIT press.

Martin B. R. (2010). The origins of the concept of 'foresight' in science and technology: An insider's perspective. Technological Forecasting and Social Change, 77(9), 1438–1447. Q1. https://doi.org/10.1016/j.techfore.2010.06.009

Mistry J., Tschirhart C., Verwer C., Glastra R., Davis O., Jafferally D., Haynes L., Benjamin R., Albert G., Xavier R., Bovolo I., & Berardi A. (2014). Our common future? Cross-scalar scenario analysis for social–ecological sustainability of the Guiana Shield, South America. Environmental Science & Policy, 44, 126–148. Q1. https://doi.org/10.1016/j.envsci.2014.05.007

Oteros-Rozas E., Martín-López B., Daw T. M., Bohensky E. L., Butler J. R. A., Hill R., Martin-Ortega J., Quinlan A., Ravera F., Ruiz-Mallén I., Thyresson M., Mistry J., Palomo I., Peterson G. D., Plieninger T., Waylen K. A., Beach D. M., Bohnet I. C., Hamann M., ... Vilardy S. P. (2015). Participatory scenario planning in place-based social-ecological research: Insights and experiences from 23 case studies. Ecology and Society, 20(4). Q1. https://www.jstor.org/

stable/26270296
Ratti C., & Claudel M. (2016). The city of tomorrow: Sensors, networks, hackers, and the future of urban life. Yale University Press.
The Double Diamond—Design Council. (n.d.). Retrieved November 17, 2023, from https://www.designcouncil.org.uk/our-resources/the-double-diamond/
Uwasu M., Kishita Y., Hara K., & Nomaguchi Y. (2020). Citizen-Participatory Scenario Design Methodology with Future Design Approach: A Case Study of Visioning of a Low-Carbon Society in Suita City, Japan. Sustainability, 12(11), Article 11. Q3. https://doi.org/10.3390/su12114746
Willis A.-M. (2005). Scenarios, Futures and Design. Design Philosophy Papers, 3(1), 1–7. https://doi.org/10.2752/144871305X13966254124077

Perceived Value of Design Thinking tools and Future of Design Education: A Case Study of Xi'an Jiaotong-Liverpool University

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Abstract

Design Thinking is gaining popularity in teaching practice. Despite the literature review showing a high degree of interest in the topic, there is a gap concerning how university students of design disciplines perceive Design Thinking (DT) tools in their learning experience. This article provides insights on this question by sharing the results of a survey conducted at Xi'an Jiaotong-Liverpool University as a case study. The findings indicate room for improvement in teaching, as the research identified the most challenging design tasks perceived by the students and the reasons why these tasks are challenging. The article will discuss the relationship between creative confidence and perceived difficulties in design stages, tasks, and DT tools. The findings supported by the literature review suggest that DT might be an insufficient methodology for creative achievements. The article will contribute to the track Foresight Plan by indicating a direction for future research that will allow us better adapt design education and support students' needs in current and future design challenges.

Author keywords

Design Thinking tools, Design Education, Design Process, Students' Perception

Introduction

Design educators more and more often reference and apply Design Thinking in their teaching practice (Dell'Era et al., 2020; Micheli, 2019). Xi'an Jiaotong-Liverpool University (XJTLU) is not an exception. This article will present the students' learning experience at the Design School at XJTLU as a case study. Design thinking is a holistic approach to innovation that gained popularity in the business environment thanks to its universality and it allows anyone seeking innovation to practice it (Dell'Era et al., 2020). Various authors and schools described the Design Thinking model as a tool for business innovation. The article "Comparative Framework of Models of Design Thinking Process" (2020) highlights the following models as the most representative: the one described by Tim Brown (2008, 2009) for IDEO, the version developed by the Institute of Design at Stanford (2010), the model by Liedtka (2015) for the Darden Business School, and Lockwood (2009) for the Design Management Institute. Despite differences in how the process is described, it is commonly organized into stages that lead to innovation (Silva et al., 2020). Each stage has some tools facilitating the process, helping the design team progress and achieve results. Examples include such tools as "Persona", 'Empathy Map", "User Journey", and more. In this article, Design Thinking tools are at the focus of the study. Despite the popularity of Design Thinking among design educators, the current literature review has identified a gap concerning how design students at universities perceive Design Thinking tools. The research on Web of Science using the keywords "design thinking", "perception", and "design students" in the publication years 2019-2023 in the field of Educational

research revealed 828 results. However, only 16 were related to the mentioned question in one way or another. Similar research in Google Scholar showed 20k results, with few related in some way to the research question. Those relevant research pieces assess Design Thinking and its impact on students' creativity in various fields. For instance, the use of Design Thinking by architecture students (Taneri & Dogan, 2021), engineering students (Clark et al., 2020; Rodriguez et al., 2020; Xu et al., 2023), science students(Noh & Hyeok, 2021), Design Thinking taught in STEM education (Li et al., 2019), entrepreneurial education (Lynch, 2021; Sarooghi, 2019), and in health professions (McLaughlin et al., 2019; Farrar, 2020; Park et al, 2022; Padagas, 2021), or by the school-level students (Ladachart et al., 2022; Rao 2020; Latorre-Cosculluela, 2020, Varanasi, 2023). Several articles discuss Design Thinking from teachers' perspectives (Baran & AlZoubi, 2023; Bressler & Annetta, 2022; Gunter & Kenny, 2021; Retna, 2019; Woo & Sil, 2021). Overall, it shows a high degree of interest in the topic. Interestingly, there are no studies analyzing design students' perceived value and efficiency of Design Thinking and its tools in their learning experience, even though it is very typical to practice it. That is why there is a need to collect feedback from this methodology's direct recipients to fill the knowledge gap and potentially find room for improvements. This project aimed at contributing to filling the gap using XJTLU as a case study.

The research followed the Human-Centered Design approach (Norman, 1986 and 2010) and conducted primary research targeting UG and PG students of the Design School at XJTLU to get insights on the question. In particular, this article shares the results of a survey that collected data on students' perception of the Design Thinking tools in learning experiences at XJTLU and future jobs. The collected results will form the grounding for proposing more integrity and coordination in teaching and applying these tools at XJTLU. In the following paragraphs, the author will guide the reader through the methodology and discuss the results and conclusions.

Methodology

To answer the research question of how design students perceive the value of Design Thinking and its tools in their learning experience, the author organized the research process following the Human-Centered Design approach. It means that the author placed the users (of the design tools) at the core of the research in order to identify their needs in the learning experience to find room for improvements in teaching. The users in this research were UG and PG students of the Design School at XJTLU. The Design School has four Departments: Industrial Design, Architecture, Civil Engineering, and Urban Planning. It was assumed that the Department of Industrial Design students would provide most of the data for this research. The Department of Industrial Design practices project-based learning, which means that almost all the modules, both taught modules and studio-based, require students to produce a design project, mainly following the Human- Centered Design approach. However, if interpreting the design process as planning and as "the culture of the project" (Julier, 2022, p. 213), we can expect many similarities in perception, interpretation, and application of the design methodologies by all the Departments mentioned above. Thus, the author prepared a survey published online to collect the data. The survey included bibliographic, multiple-choice, and open-ended questions, with a total of 25 questions. The survey was chosen as a medium as it helped obtain a holistic picture of how the Design School students perceive Design Thinking as part of their learning experience.

As mentioned in the introduction paragraph, Design Thinking is characterized by dividing the design process into stages that lead the design process toward innovation. Table 1 shows a comparative framework of models of the Design Thinking process (Silva et al., 2020):

These models are designed to serve businesses. In the educational environment, it may vary as teachers organize

Table 1. Comparative framework of models of Design Thinking process. Source: Silva et al., 2020.

Design Thinking Model	Stages of innovation process			
	Needs finding	Concept generation	Concept validation	Concept development
IDEO	Inspiration	Ideation	Ideation	-
d.school	Empathize and Define	Ideation	Prototype and Test	-
Darden School	What is	What if	What wows	What works
IBM	Observe	Reflect	Make	-
Continuum	Discover deep insights	Create	Make it real: prototype and test	Deploy
DMI	Understand and Observe	Conceptualize	Validate	Implement

the design process concerning the expected learning outcomes or other factors that may transform the model in one way or another. The other difference is that students' works would typically reach the level of models and prototypes, which implies that the learning process would generally stop at the "Concept validation" stage. Keeping in mind these considerations as well as the local experience in the School, in preparation for the survey, the author focused the research on the following design phases:

Table 2. Design phases used in the survey. Source: author.

Design Thinking Model	Stages of innovation process			
-	Needs finding	Concept generation	Concept validation	Concept development
XJTLU Design School	Secondary Research and Primary Research (User Needs)	Ideation	Testing (User Feedback)	-

The survey preparation involved several steps: writing the research plan, creating the list of questions, seeking approval from the University Ethics Committee, and publishing the survey online.

Considering the research question, the author hypothesized that the students might depreciate the value of the Design Thinking tools due to a lack of confidence in understanding the meaning and purpose of such tools and, thus, in conducting design activities. Therefore, the purpose was to test this hypothesis through multiple-choice questions where students could select from answers depicting different degrees of their knowledge and confidence in relation to the design stage. In addition, the survey included questions where students needed to write lists of design tools related to a specific design stage or task (e.g., identifying user needs or generating ideas). Additional questions asked whether the students appreciate the value of such design methodologies in developing their projects in the university or future jobs. Ultimately, the expected result was to identify the design phase/activity where students feel most and less confident about what they should do, how, and why.

The invitations to participate were distributed throughout internal University channels (e.g., emails, internal Learning and Teaching platform). The participation was anonymous, and the collected data was stored online and on a private device under a password.

The author chose content analysis to analyze data collected via the survey. The analysis of the multiple-choice questions allowed observing quantitative dynamics in answers. In particular, the purpose was to quantify the occurrence of certain answers (e.g., degrees of confidence in relation to the design phase or activity). Open-ended questions aimed at exploring students' opinions that may go beyond the hypothesis.
In the next paragraph, the author will report and discuss the survey results.

Results

The total number of respondents was 47, all non-native English speakers: UG and PG students from the Design School. Students had to express their degree of confidence in relation to the design stages, as mentioned in the Methodology paragraph. Also, they had to name some design tools and methods they usually use in those stages. There were identical options they could choose as an answer for each design phase, starting from the most confident to the less confident
option. The hypothesis was that students might depreciate the value of the Design Thinking tools due to a lack of confidence in understanding the meaning and purpose of such tools and, thus, in conducting design activities. However, the results show that students feel confident about the design tools as a part of the design process. The summary percentage of answers showing students' confidence is:
Secondary Research – 80% of the respondents reported that they know what to do in this design phase,
Primary Research – 78%,
Ideation – 72%,
Testing – 70%.
When naming the tools, students would often write "internet", "interview", "software", and other generic words. Nonetheless, they have provided quite a long list of tools that cannot be reported here due to constraints
38 different design tools for Secondary Research, § 20 for Primary Research,
35 for Ideation
9 for Testing.
From these numbers, we can see that students would approach "Secondary research" and "Ideation" with a greater variety of design tools and methods. At the same time, "Testing" is only limited to 9 design tools.
The students were also given a list to pick the design tools they had heard about and know them. The list was built based on the design tools frequently taught by the Department of Industrial Design colleagues. Design tools reported as most familiar were (descending popularity):
Mind Map (85% of the respondents), § Interview (81%),
Brainstorm (81%).
Many other tools, including some popular design tools such as "Empathy Map", "Affinity Diagram" and "Analogous Inspiration" received little recognition (below 20%).
One of the expected results of this study was to identify the design phase or activity where students feel most and less confident in terms of what they should do, how, and why. When answering the relevant question, students reported as most challenging design tasks the following:
"Collecting data from users" (43% of the respondents), § "Synthesizing the findings into a clear picture" (43%), § "Coming up with interesting ideas" (49%),
"Proceed from 'thinking' and 'discussing' to acting and developing the project" (43%), Mentioning "I don't know how to start" and "lack of relevant examples" as reasons for their difficulties. Other design tasks in the survey that received fewer points were "research on the Internet", "finding books/articles", "identifying users/target audience", "explaining my findings to others", and "collaborating and communicating with peers". In the next

paragraph, we will further discuss the results in relation to the previous studies, mention the limitations of the Research, and indicate future work.

Discussion and conclusions

The research on students' opinions of our Design School has identified four groups of findings that can be discussed in this paragraph:

The four most challenging design tasks as perceived by the students;

Reasons for why these tasks are challenging as perceived by the students; § The overall degree of confidence in relation to each design stage;

Students' vocabulary concerning the design tools and design stages.

As explained in the methodology paragraph, the survey was organized according to the following design stages: Secondary Research, Primary Research (User Needs), Ideation, and Testing (User Feedback). Students had to respond to various questions reflecting their degree of confidence in each design stage, their knowledge about the design tools suitable to solve relevant design tasks or the difficulties they meet throughout the learning process.

The research identified the four most challenging design tasks as perceived by the students: collecting data from users, synthesizing the findings into a clear picture, coming up with interesting ideas, proceed from thinking to developing the project. Students pointed out that a lack of understanding of how to begin the task and the lack of examples are the key reasons for their challenges.

We can infer that the knowledge related to the design tools should be organized according to the design stages and steps and presented to the students in a structured, visually intuitive, interactive manner that would allow them to easily configure the toolset for every design task, such as, e.g., ideation. The efforts of teachers in assisting students should be placed at the beginning of each task and supported with examples. The importance of introducing design steps as a vital part of the learning process is supported by Taneri and Dogan (2021) in their study on the perception of the design process by architecture students. In particular, they found that one of the reasons why students feel frustrated with learning at a school how to design was due to the focus of the design studio on designing products rather than learning design steps or processes. Kavousi, Miller, and Alexander (2019), in their article "Modelling Metacognition in Design Thinking and Design Making," refer to the work of Powers (2017), stating that the open-ended nature of design can "make its learning confusing and frustrating, especially for design students, which in turn, can reduce their motivation and willingness to engage". They argue that metacognition can help students overcome this problem, especially in the ideation phase.

On the other hand, in their famous book, David and Tom Kelley state that confidence is the factor that supports creative thought and helps turn ideas into reality (2013). Beghetto, Karwowski, and Reiter-Palmon's (2021) work studies the relationship between creative confidence and creative behavior. Their findings show modest correlations between creative confidence and creative achievements. Similarly, the survey results conducted in our Design School support these findings: students reported quite a high degree of confidence and, at the same time, challenges in ideation and moving "from thinking to action" and realizing their projects. The same study by Beghetto et al. argues that the willingness to take intellectual risks enhances the link between creative confidence and creative behavior. Thus, we can observe that the research on the success factors in creativity continues and proposes different strategies, besides Design Thinking, to stabilize creative achievements, e.g., through metacognition or willingness to take intellectual risks. Such direction as exploring methods and strategies to support students in ideation and project realization could be taken for further research.

Design Thinking is a well-recognized methodology for developing creative confidence, and we as teachers

often refer to that and its facilitating design tools when organizing the educational process. Students identified "collecting data from users" as challenging, and the overall perceived confidence did not help them in this task. Interestingly, students did not mention "identifying users" as challenging. Again, we can observe a perceived obstacle between thinking and making, which supports the idea of the necessity of further research on the strategies that lead toward creative behavior and achievements.

The difficulty factors may be inferred as follows:

Lack of accessibility to the relevant users,

Lack of confidence prevents students from interacting with the users.

To facilitate collecting data from users, the School could employ research and industry collaborations with strategically relevant stakeholders to engage them in the design projects to provide situational expert feedback on the matter. The universities often receive a critique that the skills students obtain during their studies need to match the expectations of the industry. To address this issue, and not only, XJTLU launched a new educational model called Syntegrative Education that implies a strong collaboration between the academy and industry to develop educational programs. Standing at the very beginning of this process, we can envision how to apply this educational model to the design discipline. For instance, we could engage our partners from industry, culture, etc., to develop design briefs and, therefore, closely collaborate on the different stages of the design process. One of such stages relates to collecting data from users, and the "users" could be the industrial partners and their clients. Through the continuous feedback from the industry, we can faster adapt to the constantly changing technological, economic, and market demands and support students with structured and regulated access to the users and knowledge.

Eventually, let us discuss this research's final group of findings on students' vocabulary concerning the design tools and stages. As was mentioned in the introduction, design educators more and more often reference and apply Design Thinking in their teaching practice (Dell'Era et al., 2020; Micheli, 2018). In parallel, design models, methods, and tools have multiplied significantly in quantity in recent decades. Some websites have open-access resources dedicated to design process and facilitating tools, for example,www.interaction- design.org, www. designcouncil.org.uk, dschool.stanford.edu,

designkit.org, servicedesigntools.org, thisisservicedesigndoing.com.

The first formula of the creative process was proposed in 1926 by Graham Wallas, who emphasized that an idea comes unexpectedly but only after preparation and focused thinking of a problem (Wallas, 2014, republished). Starting from there, design researchers focused on enhancing the efficiency of thinking. The interest increased with the world's growing complexity, where simple drawing and model-making techniques were not enough to address wicked problems, and more models started to appear (Jones, 1992 (second edition from the 70s); Buchanan, 1992; Norman, 2010). By 2004, in the work of Dubberly Hugh, "How do you Design? A compendium of Models.", we can find over 80 design process models. Today, many Ph.D. dissertations in Design disciplines have as outcomes new design methodologies, tools, canvases, and more. Educators adapt the existing methods and develop new ones that would better fit their needs in teaching. It is relatively common for the same concept or principle to use different words for its description and naming. Such a plurality of names of the design tools may result in poor memory in learning them, which can be of interest for further research. Learning the students' vocabulary could be helpful in teaching activities and the development of teaching materials. It may be worth developing a resource for students, such as a manual or a website, that would organize the existing design tools according to the principles of their use and application in each design stage and thus shift the focus from the tools' names to the working principle, e.g., "analytical tools."

To sum up, based on the conducted literature review, the survey, and the analysis, the author would like to write

down the three directions for further research that would positively contribute to the design education:
1. Research new/other methodologies and strategies to implement in teaching and enhance creative behavior and achievements.
2. Explore opportunities for engaging University partners, such as industrial partners, in collaboration on the design projects to support the educational process with expert feedback and better adapt to constant technological and economic changes and market demands.
3. Build a vocabulary and systemize the design tools according to their working principle and the relevant design stage to improve learnability.
In his article "Changing Design Education for the 21 Century," Don Norman discusses skills required for different challenges addressed by design. He mentions Human-Centered Design and DT tools, teamwork, management, and leadership as the most necessary. Through thorough research, as described in the three points above, we hope to develop an approach to learning these complex skills and making steps toward future education in design.

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References
Baran, E., AlZoubi, D. (2023). Design thinking in teacher education: Morphing preservice teachers' mindsets and conceptualizations. Journal Of Research On Technology In Education.
Beghetto, R. A., Karwowski, M., & Reiter-Palmon, R. (2021). Intellectual risk taking: A moderating link between creative confidence and creative behavior? Psychology of Aesthetics, Creativity, and the Arts, 15(4), 637.
Bressler, D. M., Annetta, L. A. (2022). Using game design to increase teachers' familiarity with design thinking. International Journal Of Technology And Design Education, 32 (2).
Brown, T. (2008). Design Thinking. Harvard Business Review, v. 86 (6).
Brown, T. (2009). Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation. New York: HarperCollins, 2009.
Buchanan, R. (1992). Wicked Problems in Design Thinking, Design Issues, no. 8(2): 5-21. https://doi.org/10.2307/1511637
Buchanan, R. (2019). Systems thinking and design thinking: The search for principles in the world we are making. She Ji: The Journal of Design, Economics, and Innovation, 5(2), 85-104.
Clark, Renee M.; Stabryla, Lisa M.; Gilbertson, Leanne M. (2020). Sustainability coursework: student perspectives and reflections on design thinking. International Journal Of Sustainability In Higher Education, vol. 21 (3), 593-611.
Dell'Era, C., Magistretti, S., Cautela, C., Verganti, R., Zurlo, F. (2020). Four kinds of design thinking: From ideating to making, engaging, and criticizing. Creativity and Innovation Management, vol. 29 (2). https://doi.org/10.1111/caim.12353
Dubberly, H. (2004). How do you Design? A compendium of Models. Dubberly Hugh Design Office. Last accessed on 21 January 2022. https://issuu.com/ciphermak/docs/how_do_u_design_design_process/141
Farrar, E. J. (2020). Implementing a Design Thinking Project in a Biomedical Instrumentation Course. IEEE Transactions On Education, 63 (4).

Gunter, G. A., Kenny, R. F. (2021). Using Design Thinking and Formative Assessment to Create an Experience Economy in Online Classrooms. Journal Of Formative Design In Learning, 5 (2).
Jones, C.J. (1992). Design Methods, 2nd Edition. Wiley. ISBN: 978-0-471-28496-3. https://www.wiley.com/en-us/9780471284963
Julier, G. (2022). Design culture as critical practice. In C. Mareis, M. Greiner-Petter, & M. Renner (Eds.), Critical by Design? Genealogies, Practices, Positions (pp. 212-229). (Design; Vol. 57). Transcript Verlag. https://doi.org/10.1515/9783839461044-013
Kavousi, S., Miller, P. A., & Alexander, P. A. (2020). Modeling metacognition in design thinking and design making. International Journal of Technology and Design Education, 30, 709-735.
Kelley, D. M. & Kelley, T. (2013). Creative Confidence: Unleashing the Creative Potential Within Us All.
Ladachart, L., Cholsin, J., Kwanpet, S., Teerapanpong, R., Dessi, A., Phuangsuwan, L., Phothong, W. (2022). Ninth-grade students' perceptions on the design-thinking mindset in the context of reverse engineering. International Journal Of Technology And Design Education, 32 (5).
Latorre-Cosculluela, C., Vazquez-Toledo, S., Rodriguez-Martinez, A., Liesa-Orus, M. (2020). Design Thinking: Creativity and Critical Thinking in College. Revista Electronica De Investigacion Educativa, 22.
Li, Y., Schoenfeld, A. H., diSessa, A. A., Graesser, A. C., Benson, L. C., English, L. D., & Duschl, R. A. (2019). Design and design thinking in STEM education.Journal for STEM Education Research, 2, 93-104.
Liedtka, J. (2015). Perspective: Linking Design Thinking with Innovation Outcomes through Cognitive Bias Reduction. Journal of Product Innovation Management, [s. l.], v. 32, n. 6, p. 925–938.
Lockwood, T. (2009). Design Thinking: integrating innovation, customer experience, and brand value. 3rd. ed. [s.l.] : Allworth Press.
Lynch, M., Kamovich, U., Longva, K. K., & Steinert, M. (2021). Combining technology and entrepreneurial education through design thinking: Students' reflections on the learning process. Technological Forecasting and Social Change, 164, 119689.
McLaughlin, J. E., Wolcott, M. D. Hubbard, D., Umstead, K., Rider, T. R. (2019). A qualitative review of the design thinking framework in health professions education. Bmc Medical Education, 19.
Meyer, M. W., & Norman, D. (2020). Changing design education for the 21st century. She Ji: The Journal of Design, Economics, and Innovation, 6(1), 13-49.
Michieli, P. et al. (2019). Doing Design Thinking: Conceptual Review, Synthesis, and Research Agenda. Journal of Product Innovation Management, [s. l.], v. 36, n. 2, p. 124–148. Powers, M.N. (2017). Self-regulated design learning: A foundation and framework for teaching and learning design. London: Routledge.
Noh, H., Hyeok, C. J. (2021). A Study on the Creative Environment of Design Thinking Program for Science Gifted Students. Journal of Science Education for the Gifted, 13 (2), 56-74.
Norman, D., ed. (1986). User Centered System Design: New Perspectives on Human-computer Interaction. CRC Press, 1st Edition. ISBN-13: 978-0898598728.
Norman, D. (2010). Living with Complexity. MIT Press. ISBN: 9780262014861.
Padagas, R. C. (2021). Design Thinking in a Professional Nursing Course - Its Effectiveness and
Unearthed Lessons. Revista Romaneasca Pentru Educatie Multidimensionala, 13 (2).
Park, M., Giap, T., Jang, I., Jeong, M., Kim, J. (2022). Listening to patients' voices: Applying the design-thinking method for teaching person-centered care to nursing students. Nursing Forum, 57 (1).
Rao, H., Puranam, P., Singh, J. (2021). Does Design Thinking Training Really Increase Creativity? Results from an Experiment with Middle-School Students. Innovation. Organization and Management, 24, (2), 315-332. https://doi.org/10.1080/14479338.2021.1897468

Retna, K. S. (2019). Thinking about "design thinking": A study of teacher experiences. In Teachers' Perceptions, Experience and Learning (pp. 4-18). Routledge.
Rodriguez, S. L. Doran, E. E. Friedensen, R. E., Martinez-Podolsky, E., Hengesteg, P. S. (2020). Inclusion & Marginalization: How Perceptions of Design Thinking Pedagogy Influence Computer, Electrical, and Software Engineering Identity. International Journal Of Education In Mathematics Science And Technology, 8 (4), 304-317.
Sarooghi, H., Sunny, S., Hornsby, J., & Fernhaber, S. (2019). Design thinking and entrepreneurship education: Where are we, and what are the possibilities?.Journal of Small Business Management, 57, 78-93.
Silva, G. D. E., Zancul, E., Oliveira, M. (2020). Comparative framework of models of Design Thinking process. Conference proceedings XXVII SIMPOSIO DE ENGENHARIA DE PRODUÇÃO. Varanasi, R. A., Yan, S., Toprani, D., & Borge, M. (2023). Making Design Practices Visible to Young Learners. arXiv preprint arXiv:2307.07638.
Taneri, B. & Dogan, F. (2021). How to learn to be creative in design: Architecture students' perceptions of design, design process, design learning, and their transformations throughout their education. Thinking Skills and Creativity. https://doi.org/10.1016/j.tsc.2020.100781
Varanasi, R. A., Yan, S., Toprani, D., & Borge, M. (2023). Making Design Practices Visible to Young Learners. Preprint:2307.07638.
Xu, W., Chen, J., Lou, Y.; Chen, H. (2023). Impacts of maker education-design thinking integration on knowledge, creative tendencies, and perceptions of the engineering profession. International Journal Of Technology And Design Education.
Wallas, G. (2014). The Art of Thought (republished). Solis Press. ISBN-10: 1910146056.
Woo, N.C., Sil, K.J. (2021). Exploring Changes in Perception and Attitude of Pre-Service Teachers Through Analysis of Reflective Activity in Design Thinking-Based Instruction. The Journal of Korean Teacher Education, 38 (2).

How artificial intelligence could reduce inequalities in human society

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Abstract

Unequal social systems have always existed in human society since human appearance. With the development of the times, some unequal systems have either died or continued their existence in different forms. This paper starts from the roots of the inequality system, and studies the causes of inequality system from the aspects of science and morality and why the combination of design and artificial intelligence technology is beneficial eliminate or reduce the inequality in human society.

Author keywords

Artificial Intelligence; social equality; human morality; technology; Design

Introduction

Some views hold that an important reason for the inequality system of human society is that the demand for basic living resources, such as water, food, and energy, is not fully met, and human beings need to maintain a socialized way of living to ensure the existence of the population. However, the limitation of productivity causes that each individual in the group is not likely to have sufficient resources. The absolute average redistribution of living resources cannot guarantee the existence of the group, so sometimes the necessary inequality guarantees the existence and smooth operation of the population. However, artificial intelligence is different from any tool invented by humans in the past. by using AI, the development of productivity can no longer limit the human body's own capabilities. Obviously, the increase in productivity will undoubtedly bring more living resources to human beings. In addition, artificial intelligence can completely replace the attributes of human work in some aspects and also make some traditional inequalities and exploitative systems has no meaning of existence. This paper is divided into three parts. First, we talk about the causes of social inequality and the role that technology and morality play in it. Second, we talk about the relationship between technology and morality. Third, we discuss the combination of design and artificial intelligence and its impact.

The social inequalities

Equality is the basic feature of modern society, a vital measure of human progress, and a cherished ideal. It signifies that despite individual differences, all members deserve fair treatment and opportunities. Society must recognize everyone's equal humanity and social status, ensuring uniform care and respect for their survival and growth. This embodies the essence of modern societal equality. Although the value pursuit of "equality" has

existed since ancient times, the connotation of equality is not eternal. According to Friedrich Engels, the meaning of equality is constantly changing with the development of history (Marx & Engels, 1871/1883). Currently, this concept of Equality in the modern sense has become something natural and self-evident.

The Origins of Inequality Social System

In the natural state, there is no mind interaction between people, and they do not affect each other in their respective worlds. In Rousseau's work Discourse on the Origin and Basis of Inequality Among Men, there is such a point of view that from the time a person needs the help of others, it is beneficial to feel that he has two people's food. From then on, equality between people does not exist (Jean-Jacques Rousseau, 1712). And this view can also find evidence support in the study of history. Researchers at Washington State University and 13 other institutions have found that the arc of prehistory bends towards economic inequality.

Through Rousseau's views and historical research, we seem could think that social inequality stems from human needs for more and a stable source of living materials or wealth, and that one manifestation of this demand is the degree of the complexity of human society keep increasing. The origins of social inequality are complex. On the other hand, the smooth operation of the system requires group members to adhere to a common code of conduct. Morality as a code of conduct can play a role in maintaining the system. The level of morality also affects the views of group members on inequalities. From this we can see that the two elements of technology and morality are closely related to social inequalities.

Social inequality and Technology

In the previous section we analyzed the causes of social inequality, and in this part we explored what is the role of technology in the development of social inequality systems. When the technology practitioners shouted "make the world a better place," did the world really get better? The international non-governmental organization Oxfam, published on January 18, 2016, stated that the world's richest 1% of the population has more wealth than the remaining 99%, and in 2010 the world's half of the world's poorest 3.6 billion people It is equivalent to the wealth of the richest 388 people, 159 in 2012, 80 in 2014, and 62 in 2015⋯ (Oxfam Briefing paper, 2016). However, when wealth is accumulating, is the share of each person's share fair? The famous physicist Hawking warned in October 2015: "The outcome will depend on how things are distributed. Everyone can enjoy a life of luxurious leisure if the machine-produced wealth is shared, or most people can end up miserably poor if the machine-owners successfully lobby against wealth redistribution." (Bolton & Doug, 2015)

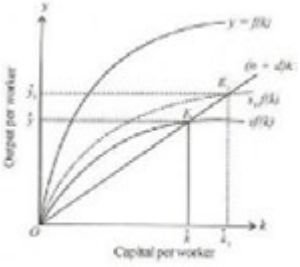

Figure 1. Solow-Swan model

So, is technology really a demon that exacerbates poverty? Economists do believe that technology plays an important role in getting rid of poverty. In the well-known Solow-Swan model of macroeconomics, the rate of technological progress is an important factor in economic development. The higher the productivity, the faster the economy develops.

The advancement of science and technology has also brought about an increase in Total social wealth and improvement. The living conditions of human beings. The United Nations released the Millennium Development Goals Report 2015 in July 2015. It shows That the number of people living in extreme poverty has dropped from 1.9 billion in 1990 to 836 million in 2015, and the number of extremely poor people has been halved. The under-five mortality rate has fallen by more than half and the maternal mortality rate Has fallen by 45%. In 2015, 91% of

the world's population had access to improved drinking water sources, which was 76% in 1999 (United Nations, 2015). In addition to the various types of data we can read in various reports, in fact, many techniques teams are working to improve the lives of people in underdeveloped areas and reduce various types of social inequality. At present, 1.4 billion people around the world do not have access to electricity, and the GravityLight team invented the electric light generated by gravity, which cost less than five dollars. In 2015, Panasonic launched a portable solar cell for poor areas. Team Solight launched the more lightweight SolarPuff this year, a folding solar light. There is no network in poverty-stricken areas, and the Google Balloon Project will release nitrogen balloons with precision instruments such as solar cells, network receivers, and height controllers, bringing network connectivity to poor areas, enabling people to use the network more Affordable. reduce the negative impact of information inequality.

Figure 2. SolarPuff and Google Loon Project

Obviously, social inequality has existed before technology emerged. There are many reasons for social inequality, eliminating inequality can't only relying on technological advancement alone. Bringing these cutting-edge scientific research to the places most needed in the world is more meaningful.

Social inequality and Morality

In fact, social inequality is not just a matter of resources and wealth. As mentioned above, the increase in the total amount of resource wealth alone will reduce social inequality, most of times because of the unequal redistribution system which increase the degree of social inequality. In addition to the material progress like science, technology and economic progress, social progress is also related to people's inner world. In short, it is people's perception and practice of morality. Morality can play a positive and negative role in social inequity, but it should be noted that eliminating or reducing social inequality is a complex problem, relying solely on the power of morality cannot accomplish this arduous task. The power of science and technology cannot be ignored when solving this huge problem. Guang Zhong, a politician in China during the Spring and Autumn Period, said: "Up her barns solid and know etiquette, well fed, well bred." (Guang Zhong, 2009) When people do not need to worry about basic food and clothing, the moral level of society can be improved accordingly. Therefore, we have reason to believe that with the development of technology and morality, social inequality can be reduced.

Technology and Morality, two elements closely related to social inequalities

The unique significance of technology for humans

"Relying on tools" awareness is produced by breakthrough (Jane Goodall Institute, 2013). It brings the directivity progress for tools and human body structure change, make the human body structure adaptation tools and culture. The separation of humans from other primates is the separation of the sense of tool behavior. The consciousness of "relying on tools" produces directional changes in the structure of the human body, gradually forming the structure of erect humans and modern people. That is to say, the: "relying on tool or technology" has made human beings human. In addition, "Relying on tools" awareness of human has great significance for the artificial intelligence industry. Artificial intelligence has great potential, which makes it possible to greatly improve productivity and bring a better life to human beings. On the other hand, the powerful potential of artificial intelligence is also daunting. Concerning the dangers of artificial intelligence is also increasing day by day. However, because of the existence of "Relying on tools" awareness, we have reason to believe that human beings will not give up or stop developing because of the dangers at hand. Instead, because artificial intelligence

is a powerful tool, human beings will overcome various difficulties to promote, and keep developing the artificial intelligence industry.

Why human morality is unique

There are many opinions that morality is not unique to humans, because a large number of altruistic or mutual help behaviors can be observed in other animal groups other than humans. They believe that morality is the mutually beneficial behavior that originated from these social animals or human ancestors. Fundamentally, the essence of these mutually beneficial behaviors It is for each Animal individual to have more opportunities for survival and reproduction, and when we extend these behaviors to humans we call it morality.

Behaviorally speaking, the altruistic behavior in animal groups is more biased towards a survival strategy. It is sporadic, and there is no persistence in the process of evolution, but human altruism adds cultural factors in addition to purely beneficial considerations, such as the consideration of "good" and "evil" and the judgment of ethical behavior in the same social group clearly have roughly the same standards, and from now and past, both in the Eastern and in the Western culture. There are praise for self-sacrificing behavior.

How technology and morality affect each other Scientific activities are not a "pure" activity process involving only scientific facts and scientific goals, but a rich moral connotation. The moral principles, norms and concepts formed in scientific activities have greatly improved and enriched the human morality system. In some sub-sectors, the advancement and promotion of the moral system by scientific and technological progress cannot be ignored, for example, in the medical world, although the original Hippocratic Oath is no longer used, it has no legal effect, but as a spiritual contract recognized by the medical community, The Hippocratic Oath still has an impact on the modern vow. It can be seen that the development of science and technology not only promotes the emergence of other social professional ethics, but also forms all of its own professional ethics, which greatly expands the research field of morality. The values of humanitarianism should also be taken into account when doing scientific research. Only then can science and technology not become purely technical problems, but can also be given more intrinsic value, reflecting human dignity. Science is guiding the advancement of society, and the development and advancement of science and technology requires sufficient ethical and moral incentives.

By understanding the interrelationship between technology and morality, we have reason to believe that like any advanced technology in the past, artificial intelligence as a representative of the current advanced technology will also greatly promote the development of productivity, and the resulting social changes will lead to an improvement in the moral system. From this point of view, relying on artificial intelligence to reduce social inequalities is possible.

Artificial Intelligence and design

What is artificial intelligence technology?

Artificial intelligence, often abbreviated as AI. the word is made of two words. The word artificial is easy to understand and is defined in the dictionary as used or produced by a human and especially social or political agency. However, the intelligence is indeed more complicated. Here we use the definition from "Mainstream Science on Intelligence" (1994), "A very general mental capability that, among other things, depending the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and Learn from experience. It is not only book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings—" catching on," "making sense" of things, or

"Figuring out" what to do." (Gottfredson & Linda S, 1994) So, in simple terms, AI is a program or machine created by humans that can do the above.

How artificial intelligence can affect design process and productivity?
If we want to explore how AI can affect the design working process, we have to analyze both of the advantages and disadvantage of AI. Firstly, artificial intelligence, as software running on hardware, is tireless; it can work continuously 24 hours a day. At the same time, compared to humans, AI is more precise in its work, and its processing speed for data far exceeds the capabilities of humans. Therefore, artificial intelligence can bring significant improvements in design efficiency and productivity. Additionally, AI's powerful data collection and processing capabilities give it another advantage, the possibility of global optimization. In simple terms, the application of artificial intelligence can greatly enhance productivity, help us make design decisions faster and better, assist various disciplines in better development, and directly or indirectly make our lives better.

However, everything has two sides. Like any technological innovation in history, the development of artificial intelligence has brought fear to many people and has also generated a lot of opposition. Stephen Hawking said: "The development of full artificial intelligence could spell the end of the human race." (Rory Cellan-Jones, 2014) Automation equipment is directly responsible for the continued increase in unemployment, it is undeniable that the widespread use of computer-controlled devices is one of the reasons for the continued increase in the number of unemployed. In this regard, Erik Brynjolfsson and Andrew McAfee believe that the development of digital technology has weakened the close link between GDP and employment (Erik Brynjolfsson & Andrew McAfee, 2012). Specifically, the arrival of the AI era has brought about not only new design workflows and new modes of thinking but also an impact on the labor force involved in real-life design and production. The automation and computational processes brought by artificial intelligence are poised to replace a significant amount of repetitive and mechanical labor. This could potentially lead to a severe polarization in future employment structures, exacerbating societal inequality.

In summary, the development of artificial intelligence is a double-edged sword. While it can enhance design efficiency, optimize design outcomes, and improve societal productivity, it also carries certain risks from a societal perspective.

Why designer should embrace artificial intelligence?
By analyzing the advantage and disadvantages of AI, we could take the advantages of AI and potentially avoid the disadvantages. If we keep the eye on the use of AI in Design field, it do brings significant benefits. From the perspective of creativity generation, AI can serve as a valuable tool for designers to boost their creativity, which could extend the imagination of human brain; from the perspective of efficiency and productivity, AI can automate repetitive and time-consuming assignments; from the perspective of prototyping and testing, AI can assist in creating digital prototypes and conducting simulations, enabling designers to test and refine their ideas before committing to physical production. This reduces the risk of wasting time and resources; from the perspective of competitive advantage, embracing AI can give designers a competitive edge in their field. As AI becomes increasingly prevalent in various industries, designer who a proficient in AI tools and techniques are in high demand. As Landon Winner said, "Technologies are not directly aids to human. Activity, but also powerful forces acting to reshape that activity and its meaning." (Langdon Winner, 2010) The most important thing is how we take the advantage of the AI tool.

In conclusion, embracing AI can empower designers to be more creative, efficient, and informed their work, ultimately leading to better design outcomes and a competitive edge in the rapidly evolving design landscape.

Why design should be integrated with artificial intelligence?
Humans' unique "relying on tools" awareness makes us different from other species, and in addition to physical tools, tools in the sense of thought also play an important role. Modern design originated from the Arts and Crafts Movement in the 19th century. In the long process of design development, design has gradually expanded from the scope of arts and crafts to become an important thinking tool for human beings to recognize and transform the world. Zhou Zhi, a professor at Tsinghua University, said that the ultimate point of design is not just formal aesthetics, but is constantly enriched and expanded with the development of the times(Zhou Zhi, 2019). So we can see that new design disciplines such as innovative design, discursive design, and social design continue to emerge. The purpose of design has changed from simply "making things" to "solving problems" in a broader sense, and designers are a group of people who rely on this tool of thought to carry out practical activities.

Wang Yangming, a Chinese thinker of the Ming Dynasty, put forward the idea of "the unity of knowledge and action", believing that the unity of thought and action can enable people to gain moral wisdom (Jiang Yishan, 2019). Therefore, in order to achieve the ambitious goal of solving or reducing social inequality, it is necessary to closely combine the physical tool of "artificial intelligence" with the thinking tool of "design".

Conclusion
In the first chapter, we first explored the unique "relying on tools" awareness of human beings, explaining why humans can stand out from other animals that also use tools. Secondly, we explore the unique moral system of human beings, and the relationship between morality and technology, sometimes they play a negative role to each other, sometimes they promote each other's development. In the second chapter, we focus on social inequality and explore the origins of inequality. From the source, the social inequality originates from the needs of the early human population for more living materials or wealth with stable source. With the development of science and technology, social productivity and human living conditions are constantly improving, social structure is constantly changing, and the moral system is constantly challenging and adapting to the development of the times. In the third chapter, we analyze the working principle of artificial intelligence, its advantages and how will it beneficial design. At the same time, the social crisis that the technological revolution may bring also cannot be underestimated, but we can see solutions to crisis is exist, and governments and civil society are constantly striving to eliminate the negative effects of the technological revolution.

In general, the "relying on tool" awareness engraved in human genes makes it unlikely that we will reject the advancement of technology and the development of the times, and with artificial intelligence beginning to take place of human to take more labor and intellectual work, human beings can get enough time, energy and resources to engage in design, a future-oriented innovation activities. In this process, the social moral system will continue to self-adjust, and some social inequalities that are developed by the inadequacy of the times and material resources will gradually disappear. Therefore, we have reason to believe that with the development and application of artificial intelligence, social inequality will be reduced, and humanity will usher in a better future.

References

Selected Works of Marx and Engels, Vol. 3, Beijing: People's Publishing House, 1995, p. 447. d.
Jean-Jacques Rousseau, Discourse on the Origin and Basis of Inequality Among Men,1712
Oxfam Briefing paper, An economy for the 1%, January 18 2016, https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/bp210-economy-one-percent-tax-havens-180116-en_0.pdf
Bolton, Doug, Stephen Hawking says robots could make us all rich and free, Independent, October 9 2015, https://www.independent.co.uk/life-style/gadgets-and-tech/stephen-hawking-says-robots-could-make-us-all-rich-and-free-but-were-more-likely-to-end-up-poor-and-a6688431.html
United Nations, The Millennium Development Goals Report 2015, July 2015, http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20 (July%201). Pdf
Guang Zhong, Guanzi, 26 BCE 2.0 Technology and Morality, two elements closely related to social inequalities
"Tool use, hunting & other discoveries". The Jane Goodall Institute. Retrieved August 1, 2013. http://www.janegoodall.org/chimpanzees/tool-use-hunting-other-discoveries
Gottfredson, Linda S. "Mainstream Science on Intelligence", December 13 1994, http://www1.udel.edu/educ/gottfredson/reprints/1997mainstream.pdf
Rory Cellan-Jones, Stephen Hawking warns artificial intelligence could end mankind, December 2 2014, https://www.bbc.com/news/technology-30290540
Erik Brynjolfsson, Andrew McAfee. Race Against the Machine. Digital Frontier Press. January 23, 2012
Paul Mantoux. The Industrial Revolution in The Eighteenth Century: An Outline of the Beginnings of the Modern Factory System in England. London: Routledge, 2006. P403-408.
Langdon Winner. "The Whale and the Reactor: A Search for Limits in an Age of High Technology", University of Chicago Press, 2010, p6.
Zhou Zhi. (2019). On Interdisciplinary Characteristics of Design Discipline from the Perspective of Category, Path and Orientation--Discuss with Brother Zhu Shuai. Journal of Nanjing Arts Institute（Fine Arts & Design）(01),143-148.
Jiang Yishan. (2019). Wang Yangming's Thought of "Unity of Knowledge and Action" and Its Contemporary Enlightenment (Master's thesis, Central China Normal University). http://kns-cnki-net-443.webvpn.cafa.edu.cn/kcms2/article/abstract?v=32zMbNrZv2BHcNx1WK0- tNx9DriGmhgbND7y2NaiAVAz4aKUrohHevlFOw17LdRcksANpNylXUC7dAmlWacyfbB0RBvHELhtVX4BJ51qG_wEypPcTcxM58LXvG9FYxHfaoq2AOkNQtg=&uniplatform=NZKPT&language=CHS

Fashion Futuring: Fashion Curation as a Critical Medium1

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Abstract

In a time of uncertainty and once-in-a-century change, thinking about and critiquing the future sustainability of fashion is intimately connected to our daily lives. Fashion curation serves as a critical platform to address the future of fashion, analysing the cultural values ingrained within it and utilising them to drive the conception of innovative fashion ideas. This involves the amalgamation of imaginative strategies, critical reflection, and proposing solutions to issues pertaining to aesthetics, society, politics, environment, and philosophy. Critical and discursive curation of fashion, as a means of producing knowledge, generates discourse while visually showcasing and advertising fashion culture. This approach captures the viewers' interest, allowing them to observe, experience, engage, and participate in dialogue. Furthermore, in the context of fashion in a globalised culture, the evaluation of the fashion system's relevance, local and national identities, fashion education, and industry carries substantial significance in museum fashion curation. Therefore, this paper presents a fundamental literature review of the academic progression of home and international fashion curation.

Author keywords

Museums; materiality and culture; fashion curation; sustainability; technological innovation; foresight.

I. History of dress, fashion and cultural studies

Roland Barthes's The Popular System: Semiotics and Dress Symbols decodes the language of dress in popular magazines using linguistic and semiotic research methods. Simmel's The Philosophy of Fashion examines the role of fashion in defining class identity in capitalist society. British scholar Elizabeth Wilson's Dressing to Dream also explores the relationship between dress and society. "Fashion and Modernity" is a significant

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contribution to the field of fashion studies. In his book "The Culture of Clothing," French historian Daniel Roche extensively explores the history of dress in Enlightenment-era Paris, delving into the rise of consumerism and style-focused dress culture. Additionally, costume historian Lou Taylor's "Establishing Dress History" (Studies in Design, 2002) traces the history of costume displays, emphasizing that the primary aim of museum exhibitions featuring fashion is to ensure accurate portrayal, scholarly analysis, and careful interpretation of historical contexts. Agnes Rocamora and Anneke Smelik's 'The Enlightenment of Fashion: A Guide to Key Theorists' provides an objective examination and categorization of notable fashion theorists and their work. 'Fashion Cultures: Theories, Explorations and Analysis' is a collection of essays authored by Stella Bruzzi and Pamela Church Gibson, first published in 2000. It offers a comprehensive insight into a wide range of fashion theorists, from those concerned with high-end fashion to those analyzing fashion in broader contexts such as popular

culture; The book amalgamates theoretical research on space, consumption, gender and the body politic within contemporary fashion culture; it examines catwalks, malls, fashion photography, cinema screens, and art museums;James Lavelle and Amy de la Haye's "A Brief History of Clothing and Fashion" offers a factual account of clothing and fashion origins beginning with the Roman period and continuing up to present day. Dick Hebdige's "Hidden in Bright Lights" is an additional resource that can be used to expand on these topics. Images and Objects in Popular Culture employs semiotics, popular culture theory, and postmodernism as theoretical frameworks to analyze the production and consumption of popular images in visual culture via popular objects and cultural phenomena. In Fashionable Bodies: Fashion, Clothing and Modern Social Theory, Joanne Entwistle examines the relationship between fashion and the body by combining sociological theories with the body;Lauterich's Guide to Fashion Research, edited by Eugenia Paulicelli, Veronica Manlow, and Elizabeth Wissinger, offers a wide-ranging, interdisciplinary set of research essays regarding fashion across the globe. This volume examines fashion's disciplinary boundaries, covering its history, theory, and practice, as well as its relationship to the body, identity, the fashion industry, globalisation, and media such as literature, magazines, television, and film. Research materials on fashion also comprise The Art and Criticism of Fashion by Adam Geczy and Vicki Karaminas; Fashion and Modernism by Louise Wallenberg and Andrea Kollnitz; and Fashion and Materiality - Cultural Practices in a Global Context, an anthology edited by Huck Jez and Viola Hoffman. The book Fashion and Materiality - Cultural Practices in a Global Context by Huck Jez and Viola Hoffman explores the relationship between fashion as material culture on a global scale and its impact on society. It provides an in-depth analysis of the issues related to this subject. Besides, Fashionology: An Introduction to Fashion Studies by Yuniya Kawamura is also a significant reference for further understanding this topic.

II. Research on clothing and fashion museolog

Julia Petrov's monograph, 'Fashion, History, Museums', explores the development of historical costume exhibitions in museums during the twentieth century. It offers a critical analysis of trends in museum fashion exhibition practices over the past century, and discusses the variations between historical fashions showcased in museum exhibitions in the United Kingdom and North America. The book provides a theoretical framework for the study of historical costume exhibitions in the history and curation of museum exhibitions.Morre Marco Pecorari's essay in 'Beyond the Museum' challenges the predominance of physical costumes in fashion exhibitions, offering a new approach to fashion curatorial practices and discourses. The book 'Fashion and the Museum' by Marie Riegels Melchior and Birgitta Svensson further explores this topic. Theory and Practice presents research conducted by scholars and fashion curators regarding the reasons for the rise of fashion within museums in the twenty-first century, and the significance of fashion for museum organizations. The authors explore the shift in research focus from clothing to fashion in museology resulting from fashion's influence on museums. The author examines the change from fashion museology to fashion museology resulting from fashion's integration into museums. It is argued that fashion museology represents a "new museology" with significant importance;n Chapter 5 of Stella Bruzzi and Pamela Church Gibson's Theories, Explorations and Analyses of Fashion Culture, Fiona Anderson's article examines multiple exhibitions at the V&A, the Judith Clark Costume Gallery and the Atlantis Gallery in the UK. These investigations serve as case studies for Anderson's exploration of the museum as a fashion medium;Fiona Anderson's article, 'The Museum as a Fashion Medium,' delves into the methodological and critical approaches to fashion as a medium by taking case studies from the V&A Museum, Judith Clarke's Costume Gallery, and Hussein Chalayan's exhibition at the Atlantis Gallery in the UK. The article specifically focuses on the effects of 'new' fashion history and 'new' museology on the presentation and study of fashion during the 1990s. Professor John Potvin's 'Fashion and the Museum of Art' is also included. The article examines

the Giorgio Armani retrospective hosted at the Guggenheim Museum in New York in 2000, using it as a case study to explore how a prominent living designer like Giorgio Armani has established himself in the fashion world. This study examines how a prominent designer can organise a major solo exhibition by funding a museum, while also critiquing the impact on the cultural, conceptual, and scholarly principles established by the Museum of Modern Art; A particular focus of Daniel Roche's The Culture of Costume is the museum's fashion history, and there are several other relevant documentary works, including Valerie Steele's The Quality of Museums.

Steele's Museum Quality text is of particular note. The Rise of Fashion Exhibitions explores the history of museum fashion exhibitions, examines factors behind the current increase in such exhibitions, and addresses related issues including corporate sponsorship and curatorial independence.

III. Fashion Curatorial Research

Amy de la Haye and Judith Clark's study, Fashion Exhibitions around 1971, centres on the Victoria and Albert Museum's influential exhibition Fashion: Selected Works of Cecil Beaton, and traces the evolution of fashion exhibition curation and presentation in and around 1971. Annamari Vanska and Hazel Clark's work, Fashion Curating, further explores this topic. Critical Practices in and out of the Museum collates a collection of academic essays investigating the present condition of fashion and fashion exhibitions as a means of critical contemplation, study, and analysis of fashion culture. It argues that "critical fashion curation as a mode of knowledge production" has emerged. Dr. Nadia Buick of Queensland University of Technology, in her 2012 Doctoral thesis 'Constructing Fashion Curatorship', blends an exploration of the art field with the examination of fashion curatorship. Theoretical and Historical Perspectives', she links the definition of curatorship in the art field to the multiple facets of curatorship in the field of fashion, and proposes a study of a third model of 'part-time fashion curatorship', in addition to institutional and independent curators, as well as a theoretical and historical discourse on fashion curatorship, and models of fashion curatorship and their collaboration with museums, and a detailed description of the author's own practice of fashion curatorship;There are several journal articles on the topic, such as Valerie Steele's 'A fashion museum is more than just a bag of clothes'. Steele argues that clothing is a crucial object of knowledge and that specific exhibition criticisms do not imply fashion museums are subservient to commercial gains. Moreover, she emphasises that fashion museums play a vital role in the historical and aesthetic development of fashion. Sarah Scaturro's essay, 'Curating Clothing/Exhibiting Fashion,' examines changes in fashion curation over time, with a focus on the impact of electronics and media on fashion display. The essay also critically evaluates the relationship between fashion and popular literature, music, film, and television in the context of museum exhibitions;"Image, Touch, and Heterotopia in Fashion Curatorship" is the seventh chapter in Chapter 2 of Lauterich's Guide to Fashion Research. The chapter explores the advancement of fashion exhibitions and their curatorial modes in the 21st century, utilizing six exhibitions from the Metropolitan Museum of Art's Costume Institute and the Antwerp Fashion Museum as subjects. The examination of the development of exhibitions and their curatorial modes is carried out through six exhibitions at the Costume Institute of the Metropolitan Museum of Art and the Fashion Museum Antwerp. The authors assert that the exhibition design serves as the medium, enabling the museum as a "heterogeneous space" to connect the viewer to the exhibition's narrative, thereby creating an immersive experience. The authors also emphasize the significance of interdisciplinary collaborative curatorial approaches in fashion curation. Hazel Clark's book "Curating and Exhibiting" examines the objective discourse surrounding "the end of fashion" in the context of post-2000 fashion trends. Additionally, the question of whether fashion is modern is explored extensively throughout the work. Drawing on the "Anti-Fashion" exhibition, the book argues for a shift towards the curatorial

and dematerialised aspects of fashion;Thomas Walter Dietz's Fashion Curating briefly describes the history and theory of fashion curation, analyzing the practice as well. The author argues that further research and discussion regarding fashion curation should take place on a national level. The author argues that the development of fashion curating can be divided into three historical phases, primarily based on the establishment of the Fashion Museum. The first period encompasses the development, transformation, and dissemination of curatorial practice before the Second World War until the end of the 1950s. The second period spans from the 1960s to the 1990s of the 20th century, and the third period begins at the end of the 20th century. However, the paper's chronological division is primarily centred on the establishment and progression of fashion museums, with no initial focus on the curatorial examination of fashion exhibits.

There are no Chinese monographs on fashion curation.In her article, "Narrative Strategy and Situational Experience of Fashion Curatorship," Lu Ying delves into the essential importance of exhibition display and fashion communication in regards to fashion curation. Through the examination of fashion exhibition cases, Ying explores the narrative of fashion curatorship and the situational experience resulting from spatial design. However, the article neglects to discuss the curation process and solely focuses on the commercial brand fashion exhibition as the research case, leading to a biased viewpoint. On the other hand, Chen Yuanyi's "The Evolution and Future of Museum Fashion Exhibitions" examines the growth of museum fashion exhibitions and their cultural and social significance from the perspective of fashion communication. Cao Shuai's master's dissertation "An Investigation into the Collaborative Relationship between the American Museum of Clothing and Enterprises" examines the concept and nature of the American Museum of Clothing, the interconnection between the Museum of Clothing and Enterprises, and discusses the Museum of Clothing's development, and concludes with recommendations for promoting development of Chinese clothing museums and improving enterprise partnerships. However, the statement in the article that suggests the emergence of independent curators specialising in costume in American museums in the 1980s, according to the authors, is inaccurate;Zhang Huiwen's master's thesis, "The Evolution of China's Modern Costume Exhibition and Revelation", examines the history of modern costume exhibitions in China. The thesis analyses the growth of these exhibitions in tandem with changes in Chinese society, particularly during the reform and opening up period. However, the article primarily focuses on costume performances, with comparatively minimal attention given to exhibition content. Shadong Qing's master's thesis, titled "Planning for the Content of Chinese Fashion Museums," outlines a collaborative effort between institutions and Greenland Group enterprises to create a fashion museum project. It encompasses research, practical concepts, and exhibition content planning. The paper primarily presents data statistics and charts, but lacks theoretical depth. Wang Haoran and Li Xinhua's paper, entitled "Digital Fashion Curation: An Exploration of its Role in Constructing and Disseminating Clothing Brand Culture", investigates the fashion industry's utilization of digital fashion curation to construct and disseminate clothing brand culture.In addition, the study examines the development of digital fashion curation; Shi Yajuan's article "Exploration of Digital Fashion Curatorship in the Cultural Construction and Communication of Fashion Brands" published in Art and Design Research opens a philosophical discussion on the themes of "time" and "continuity" in the Metropolitan Museum of Art's 2020 fashion exhibition "About Time: Fashion and Continuity". Fashion and Extension exhibition held at the Metropolitan Museum of Art in 2020 discusses the intrinsic connection between fashion and time, arguing that transience, periodicity, and novelty are essential characteristics of fashion. The author asserts that it is these characteristics that determine that extension is the way of existence, novelty is the way of manifestation, and imitation is the way of representation.

References

Annamari Vanska,Hazel Clark,M.(2017)Fashion Curating:Critical Practice In the Museum and Beyond,Bloomsbury Visual Arts.
Amy de la Haye,Judith Clark,M.(2014)Exhibiting Fashion:Before and After 1971,Yale University Press.
Huck Jez,Viola Hoffman,M.(2019)Fashion and Materiality:Cultural Practice in a Global Context,Bloomsbury Publishing.
Calvin Hui.M.(2021)The Art of Useless Fashion,Media,And Consumer Culture In Contemporary China,Columbia University Press.
Nicola White,Ian Griffiths.M.(2000)The Fashion Business:Theory,Practice,Image,Berg Editorial offices.
Valerie Steele,J.(2016)Museum Quality:The Rise of the Fashion Exhibition,Claire Regnault. NadiaBuick.Framing,D.(2012)Fashion Curtion:A theoretical,historical and practical perspective,Queenaland Unliversity of Technology.

Eco-design Pedagogical Model and Academic Practices Based on the Krebs Cycle of Creativity

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Abstract
Throughout history, the discipline of design has redefined the relationship between people and environment repeatedly. The concept of eco-design goes far beyond functionality or speculativity in this era. With the emergence of new type of ecology design, the models and prototypes of eco-design have been gradually emphasized. This paper focuses on the "Krebs Cycle of Creativity" proposed by Prof. Neri Oxman at MIT Media Lab, as a way to understand eco-design in this age. Using the Krebs Cycle of Creativity as a framework, the author iterates a new model for eco-design pedagogy, as well as explores the experimental path of implementation in specific courses in the Design for Crisis and Ecology program at the School of Design at the China Central Academy of Fine Arts (CAFA).

Author keywords
Design Model; Design Methods; Eco-design Pedagogy; Cross discipline.

Introduction

The world is increasingly moving towards complexity and systematicness. Since the term "ecology design" (eco-design)was officially coined in 1996, from Fuller's systematic management of the earth to Papanek's green design; from McHale's diagnosis of the earth's resources to the circular design in "From Cradle to Cradle"; and from the Whole Earth Catalog's advocacy of self-sufficient lifestyles to the ecological cybernetic theory of cross-species futures, all of them are attempting to redefine over and over again the complex relationship between human beings and the environment. In the past 10 years, the emerging eco-designhas been characterized by the following features: (1) interdisciplinary and cross-scale (2) complexity and (3) resilience facing change. Eco-design, like "more and more design and biology, focuses on the flow of information, on network participants at different levels and exchanges information to balance the stability of the whole system". Eco-design's "process of scaling up and scaling down" of issues at different scales often goes beyond the realm of functional or discursive design. New forms of eco-design research are already emerging at universities and institutions of many kinds around the world, including the Mediated Matter at the MIT Media Lab, the Biodesign and Material Futures Program at the University of the Arts London, GeoDesign at the Design Academy in Eindhoven, and Risk and Resilience at the Harvard University Graduate School of Design. The Material Ecology, developed by Prof. Neri Oxman, director of "Mediated Matter", investigates the intersection of computational design, biomaterials and architectural engineering; "GeoDesign", which develops innovative develops innovative tools to investigate industrial resources and address issues of environmental responsibility and inequality through interventionist materials, technologies and discourses.

Does the new eco-design have clear design prototypes and principles to make the design approach more traceable? Looking back at history, a large number of design diagrams have emerged since the second half of the 20th century to visualize the thinking process and improve collaboration. Examples include Bela H. Banathy's "Double Diamond Model", L.J March's "Cyclic Model", and Richard Buchanan's "Four Orders of Design", which are widely used in many design senarios. In 2009, speculative designers Anthony Dunne and Fiona Raby proposed the "A/B Manifesto", which shifts design from a problem-solving paradigm to a critical and inquisitive one, emphasizing the differences between the past, present, and future of design in the post-industrial, pan-digital era, using 21 juxtaposed positions. This paper examines the Krebs Cycle of Creativity explain the process of complementary change between disciplines from a metabolic perspective. The author of the model, Prof. Neri Oxman previously teaching at MIT Media Lab, refers to her ecological practice as "material ecology": "It is an emerging field of design that refers to the relationship between products, buildings, systems, and their environments. "Using the Krebs Cycle of Creativity as a framework, this paper iterates the design principles of the "new" ecology design, and explores the experimental paths for operationalizing the design principles using specific courses as case studies.

Krebs Cycle of Creativity

Neri Oxman, a designer with a background in architecture, medicine, and engineering, serving as professor at the MIT Media Lab, first proposed the "Krebs Cycle of Creativity" (KCC) in 2016 in the Journal of Design and Science (JoDS), founded by the MIT Media Lab. KCC is a framework that views the fields of art, science, engineering, and design as synergistic forms of thinking and creating, where the inputs of one field become the outputs of the other. Oxman thus posits an anti-disciplinary hypothesis: knowledge is no longer attributed to or produced within disciplinary boundaries, but is fully entangled, with one field triggering (re)evolution in another; a person or project can reside in more than one field.

KCC is derived from the Krebs Cycle (tricarboxylic acid cycle), which was proposed by the British biochemist Krebs in 1937 later won the Nobel Prize in Medicine in 1953. The Krebs Cycle describes the metabolism and chemical reactions of organisms inhabiting an oxygenated environment. In this analogy, the four modes of human creativity - science, engineering, design, and art - replace the carbon compounds of the Krebs Cycle. On the other hand, the KCC is an extension of the design thinking diagram proposed by Gropius and John Maeda. Walter Gropius' 1922 schematic of the Bauhaus curriculum, which represented the different trajectories as a loop, thus hinting at the school's mission to bring together students from different disciplines to transform art, design, and society. In 2007, John Maeda, former director of the MIT media lab, created an diagram based on the Rich Gold Matrix, which divides the graph into four quadrants, each of which interprets and acts on the world from a unique perspective: science, engineering, design, and art.

Figure 1. Krebs Cycle of Creativity. KCC I, KCC II, and KCC III.

KCC generates intellectual energy in the transition from one domain to another. Science explains and predicts the world around us, turning information into knowledge; engineering applies scientific knowledge to the development of solutions to empirical problems, turning knowledge into utility; and design produces solutions that maximize functionality and maximize utility. solutions that maximize functionality and add to the human experience, translating utility into behavior; and art questions human behavior to create

awareness of the world around us, translating behavior into new perceptions of information, re-presenting the data that started the scientific cycle. The vertical axis of the first generation of the Krebs Cycle of Creativity (KCC I) runs from the sky to the earth, from theory (or philosophy) to application (or economics). KCC II explains, predicts, changes, and perceives the domains of the world, each of which is defined by a unit associated with it. In order for design objects, structures, and interventions to inform and influence the natural ecology, designers must be able to see and create the world in the ways it is seen and in the units that construct them. KCC III combines the first two iterations into an ideal map of interdisciplinary design practice, with an unobstructed transition between the domains articulated by KCC I and KCC II.

Oxman argues that since the emergence of the concept of "anti-disciplinarity," we have stepped into a new "age of entanglement." "Knowledge can no longer be attributed to or produced within disciplinary boundaries, but is completely entangled." Oxman gives four different interpretations to the KCC: clock, microscope, compass or gyroscope. First, the KCC can be thought of as a two-way clock, where time can stand still, bend, or jump. Second, the four fields in the KCC can be seen as the four objective lenses of a microscope through which the world is viewed and acted upon. Third, the KCC can be used as a compass to travel from north to south or east to west. From "information" generated by science and art in the "perception" hemisphere to "utility" generated by design and engineering in the "production" hemisphere. ". Finally, the KCC acts as a gyroscope to measure or maintain creative direction.

"One of the great strengths of the KCC is that it can be extended to the entire MIT community, embarked at different stations by scientists and artists already working in the four fields." Oxman called it "a holistic approach to design that views all environments, built, natural, and biological, as a whole and assumes that the physical construction of any design is an integral part of our ecology. A practicing materials ecologist will therefore engage multiple disciplines such as computational design, digital fabrication, synthetic biology, the environment, and the materials themselves as inseparable and harmonized design dimensions. "

Pedagogical Model of Eco-design based on the Krebs Cycle of Creativity

Based on the interdisciplinarity and flexibility of KCC, the author have evolved a more specific model of Eco-design for the academic scenarios of the School of Design (D-school) at CAFA. The model was validated in the five-year academic systems of the program Design for Crisis and Ecology at D-school. The model is used in cross-disciplinary design education, centered on eco-design. It could be interpreted from multiple perspectives, splited and combined.

The eco-design pedagogical model can be divided into three parts. The first part is the four quadrants of southeast, northwest, and north, each quadrant is "a shift" of design. The second part is the α-axis and the β-axis, which are the criteria for designing from process to values and for designing a project-based system, respectively. The third part is a three-layered circle from the outside to the inside, called "cell membrane", "cytoplasm", and "nucleus", with the interdisciplinary fields involved in the cell membrane, the seven criteria for design evaluation in the cytoplasm, and different mediums and scales of expression of the design in the nucleus.

The Four Shifts of Eco-design

From Design for Objects to Design for Hyper-objects

Figure 2. Pedagogical model of Eco-design based on the Krebs Cycle of Creativity.

"Hyper-objects" refers to the complexity of things becoming a mesh, where all living and non-living things are bound together. Single objects are no longer exists. This section explores topics such as geopolitics, resource innovation, carbon neutrality, climate refugees and other "geo-ecological" topics.

From Design for Human Beijing to Design for Life

It refers to a focus on a wider range of life forms as one of the ways to ensure sustainable development for future human well-being, emphasizing "interspecies" responsibilities, including animals, plants, microorganisms, bacteria, and other life forms other than human beings. Topics explored include life intelligence, pandemics, species diversity, ecological footprints and other "community of life" issues.

From Design for Consumption to Design for Crisis

It refers to a greater focus on "crisis awareness" rather than "consumption awareness", and how to deal with

crises such as extreme weather, pollution, the spread of pandemics, food security, inequality, etc. becomes the underlying design issue. Crisis design issues such as tipping points, limits to growth, sustainable development, and risk societies are explored.

From Design for Experience to Design for Post-Carbon Era

It refers to the carbon emissions in the agricultural, industrial and service industry as the primary object of concern, rather than the human-centered experience. Low-carbon and green consumption habits will force the reform of the whole industrial chain. Explore the use of ecology as a "climate currency" in the supply chain, labor force, soil arrangement, food miles, and so on.

From Process to Value

In the α-axis, the design process is not about giving an answer from a discipline, nor is it a process of asking a question to solving a problem, but rather a process of identifying a problem and throwing out a vision. In the first half of the α-axis, multiple disciplines are combined and different media are chosen to express them. In the "cytoplasmic" section, the design process resulted in seven evaluation criteria: scientific research, strategy and vision, big data narrative, cross-discipline innovations, technological and material innovations, physical production, planning and impact. Each criterion involves the ability to utilize cross-disciplinary skills, which are reflected in the "Cell Membrane" section. For example, scientific research requires the integration of knowledge in climatology, biology, life sciences, geography, ecology, etc.; cross-discipline and techno-materials innovation involves knowledge of materials science, artificial intelligence, synthetic biology, etc.; curation and influence involve knowledge of communication, psychology, and other fields. In the second half of the α-axis, designers need to find an "alternative future" using the capabilities of the "comprehensive designer" to design for life, the planet and resources in an era of transition from an industrial civilization to an ecological civilization.

Project-based design criteria

The β-axis explores the criteria for project-based ecodesign, juxtaposing with Oxman's "Nine Commandments for a Materials Ecology" and Dunn and Raby's "A/B Manifesto". Nevertheless the contexts in which these three standards emerged are not the same. "Nine Commandments" are centered on "material ecology", with application scenarios for new design practices, namely Nature as Client; System over Object; Growth over Assembly; Integration over Segregation; Technology over Typology. They are all expansions of the nature-centered principle. The Nine Commandments have been developed and revised in contrasting design contexts before and after the advent of digital computing and the biological century. This is similar to the context in which the A/B Manifesto was brought up in 2009. Anthony Dunne and Fiona Raby, the authors of Speculative Design, reflect on the differences between the past, present, and future of design in the post-industrial, pan-digital era, with defining design as a paradigm shift from problem-solving to criticality and inquiry. The criteria for eco-design, on the other hand, proposes a series of principles for project-based eco-design that echo both of the previous two, specifically: Longtermism over short-term interest; Experimental research over Information-gathering research; New tool development over available tool employment; Resilient over settled; Speculative over proven; Layered over single dimension; Open over answered.

Academic Case Studies of Eco-Design

This section will present case studies of different types of courses based on pedagogical models. Since 2019, the

Table 1. Table caption should be placed above the table.

Nine Commandments for a Materials Ecology	A/B Manifesto	Criteria of Design for Crisis and Ecology
Nature as Client ; Growth over Assembly ; Integration over Segregation ; Non-Human-Centered Design ; Difference over Repetition ; Decay over Disposal ; Activist Design ; System over Object ; Technology over Typology ;	affirmative vs. critical ; Problem solving vs. problem finding ; Design as process vs. design as medium; Provides answers vs. asks questions; in the service of shareholders vs. in the service of society; for how the world is vs. for how the world could be; science fiction vs. social fiction; futures vs. alternative worlds ; fictional functions vs. functional fictions; change the world to suit us vs. change the us to suit the world; narratives of production anti-art vs. narratives of consumption applied art ; research for design applications vs. research through design implications; design for production vs. design for debate; fun vs. satire; concept design vs. conceptual design ; consumer vs. citizen ; makes us buy vs. makes us think ; innovation vs. provocation ; ergonomics vs. rhetoric;	Longtermism over short-term interest; Resilient over settled; Layered over single dimension; Open over answered; Speculative over proven; New tool development over available tool employment; Experimental research over information-gathering research;

Crisis and Ecological Design Direction of D-school CAFA has launched a series of interdisciplinary and innovative courses, including the following features: (1) taken by students from different professional backgrounds; (2) inviting interdisciplinary faculty teams; (3) requiring students to learn the technical skills on their own; and (4) completing work in a short period of time.

The series of courses fall into different quadrants of the model, with topics entangled. Since the teaching reform of the D-school CAFA, the sophomore and junior years have implemented a small open-loop system, that is the courses of this two years can be chosen by each other. Offered in the second year is an 8-week, 96-hour integrated design course. Offered in the third year is a 4-week, 48-hour professional and technical methods course. The number of students enrolled in each course is less than 20, with most of them have taken courses in graphic design, digital media, social design, art and technology, fashion design, and jewelry design. So the students' mindsets and design skills are quite diverse. The course Responsive Environment is offered in the second year in the hope that when design students are first introduced to design projects, they will gain a more "holistic" understanding of design and methodology, rather than getting bogged down in the details of technology and application. The couses Zooetic and Climate Currency is offered in the third year to introduce more interdisciplinary technical methods and open up the possibility of interdisciplinary collaboration and innovation. At the same time, in response to anti-disciplinary barriers in D-school, each course can be taken independently, so that even students who have never taken courses in the field of Crisis and Ecological Design can gain the ability to utilize "eco-design model".

Course Case 1: Climate Currency Project

The Climate Currency Program was open in 2021 and 2022, with the two-year theme of "The Vision of Food" and "Sustainable Food Innovation in Xinjiang Province", both of which are centered on food design. In response to national food security issues and food system transformation strategies, this course uses food as a thread to guide students through research to understand how food connects human activities and ecosystems, individual experiences and collective cultures, economic systems and climate crises. Works presented include, but are not limited to, research papers, community co-construction, tool design innovations, packaging innovations, branding innovations, interactive installations, performances and videos, and immersion experiences. As an example, Sustainable Xinjiang Food Design course, offered in 2022, ran as a joint course between the CAFA and the Xinjiang Arts University. The research targeted local food specialties of Xinjiang as the main research line. The subject is divided into four units: Food and Everything; Ecology and Crisis; Community and City; Vision and Empowerment.

Climate Currency, like other course, has set up task books at different stages, in order to ensure that student work can be completed in a clear and specific way. For example, Task 1 of the project involved having a favorite dish chosen and made into a recipe, including a short descriptive essay, the food's ingredients, preparation, and nutritional content; Task 2 was a map of the food's spatial and temporal spectrum, an ecological trajectory, and a map of the food's carbon and water footprints; Task 3 was to ask questions about the food they had chosen. Students asked over sixty questions, such as how will sea level rise threaten our three meals a day? How can food be used to engineer interspecies relationships? How can we address food safety and nutrition? There are several interesting aspects of the project. First, the teacher brings the ingredients for the "future" food to the classroom, and the students work together to make it. Secondly, in the second half of the lesson, the teacher led the students to print out the previous knowledge points, cases and literature, and constructed a knowledge map of food design through collage, which triggered the students' active summarization and thinking.

The difficulty of this course is, on the one hand, how to concretize the national macro policies related to food and propose design solutions that are cutting-edge, experimental and practical; on the other hand, how to reconcile the locality of the topic with the universality of the solution. Therefore, many policy-oriented reports are interspersed in the project. Secondly, a seminar was organized, with the participation of guests from diverse backgrounds, such as the Chief Agronomist of Xinjiang Department of Agriculture and Rural Affairs, the President of the E-Commerce Association of Urumqi Economic Card Development Zone, and the Research Institute of Agricultural Product Processing of Xinjiang Academy of Agricultural Reclamation. Scholars and experts from other areas were also invited to discuss the process, including Harvard University scholars, WWF food program directors, food designers, the Food Foundation, and food waste disposal companies.

Course Case 2: Zooetics

The Zooetics Course has been offered several times. Zooetics - MicroLab in 2021, for an example, focuses on innovations at the intersection of design and synthetic biology. Through interdisciplinary creation and research in design and life sciences, students will consider the microcosm, which is usually overlooked, as a starting point for thinking about how human beings perceive life, ecology, and ethics in the post-genetic era. The course is divided into four parts: Wet Lab, Dry Lab, Ethics Lab and Generation Lab, which lead students to cultivate microorganisms, understand the latest trends in synthetic biology, as well as collect natural data as a basis for creating computer-generated art, encouraging students to utilize a blend of different materials and media for their creations.

The mission statement in the project is challenging for the students. One type of task was to complete an biology experiment. For example, Task 1 was to complete a research paper on a microorganism of interest of their own and to be creative in your experiment; Task 2 was to complete a research paper on environmental microorganisms, i.e., to collect microorganisms from the living environment using culture media. These are

called "wet labs". In dry labs, students were required to complete "experiments" using computers. For example, Task 3 is to conduct a "generative code design" using the genetic sequences of organisms; Task 4 is to research and propose a direction for research in a genetic database of organisms. Of course, students do not need to fully master each part of the project, and they need to choose the most interesting method and medium to express their final work.

The difficulty of this topic is how to understand and familiarize themselves with synthetic biology techniques, life science knowledge, metacellular automata, and other high-threshold scientific knowledge and principles in a short period of time. Therefore, in the first half of the course, a PhD in synthetic biology from Peking University was invited to teach the working methods in the "wet lab", and lectures and tutorials were also invited from art and mechanical engineering programs from MIT, as well as professor from Harvard, MIT and Upenn to give critics to their projects.

Course Case 3: Responsive Environment

The Responsive Environments course was open several times between 2020 and 2023, with topics such as oceans, respiration, and climate, etc. In this paper, we take the Responsive Environments – Marine Augmentation course opened in 2020 as an example. The course focuses on the ocean crisis, training students to narrow down research topics on a broad ecological theme, to propose unique ideas, and to propose a comprehensive project.

The teaching objectives of this course are: firstly, to cultivate students' crisis awareness and experimental research ability; secondly, to respond to the crisis of China as a great marine country by decelerating the recurring ocean crisis and repairing the earth's environment through cross-disciplinary innovation, and to cultivate students' ability of comprehensive; thirdly, to analyze and magnify the natural crisis through the medium of design and to propose practical eco-design and restorative design solutions, so as to cultivate students' social influence and sense of ecological responsibility.

The four parts of the course are: Ecological Landscape, Crisis Design, Parametric Nature, and Ecological Curation. In the first part of Ecological Landscape, two tasks are set up, namely "Marine Ecology Report" and "White Dolphin Survival Report". Students need to transform the report into a perceptible problem, as well as convert the abstract big data and research report into "perceptible data". In the Parametric Nature section, for another example, students simulated the effects of environmental changes on white dolphins with the help of Google Earth, grasshopper, processing, Arduino.

The difficulty of the course is how to visualize abstract and grand ecological problems and translate scientific research into visual solutions. Since it is offered in the second year, the course is accompanied by a technical teacher to address the use of design tools. The course also invited nearly 10 experts from various fields, including environmental experts from WWF, UCL Biodesign researchers, scholars from MIT, experts in AI, curators, scientists in biosynthetics, etc. The project also made use of the platform of the Shenzhen-Hong Kong Biennale to exhibit the research results in a series and invited experts such as marine biologist and engineers from Institute of Ecology and Environment to have an in-depth discussion.

Conclusion

The Krebs Cycle of Creativity provides designers with a flexible coordinate system for dealing with entangled issues and helps to construct interdisciplinary cognitive systems. The Eco-design Pedagogical Model is designed

Table 2. The structure of the three course in Design for Crisis and Ecology program D-school CAFA

	Climate Currency Course	Responsive Environment Course	Zooetics Course
Course Unit	Food and Everything; Ecology and Crisis; Community and City; Vision and Empowerment;	Ecology Landscape; Crisis Design; Parametric Nature; Ecology Curation;	Wet Lab; Dry Lab; Ethics Lab; Generation Lab;
Cross-discipline	Food systems, ecology, global history, anthropology, nutrition, economics, data visualization;	Ecology, Biology, Synthetic Biomaterials, Geography, Geology, Life Sciences, Pathology;	Microbiology, synthetics, climatology, ecology, computer science, futurology
Course objective	-Responding to national issues; -Research on locality and landedness; -Impact on local/consumer issues;	-Focusing on issues from macro to micro; -Comprehensive design capabilities;	-Interdisciplinary experiments; -Microcosmic view of problems.
Difficulties	Concretizing intangible national policies, cutting-edge, experimental and practical; reconciling the cutting-edge with the local;	How to visualize abstract and grand ecological issues and translate scientific research into visual and pictorial perceptible solutions	Understand and familiarize yourself in a short period of time with synthetic biology techniques, life science knowledge, metacellular automata, and other high-threshold scientific knowledge and principles
Teaching Form	-Methodology and Theory Lectures -Reading and speaking One-on-one tutoring -Community and local co-creation	-Methodology and Theory Lectures -Technical workshops -One-on-one counseling	-Methods and Theory Lecture ; Experimental Workshops -Readings and presentations -One-on-one tutoring
Work Media	Product Design, New Material Design, Artificial Intelligence Design, System Design, Landscape Design, Industry Chain Design, Game Design, Installation, Instruction Manual, Experimental Performance	New material design, installation, sculpture, discursive design, games,	Biomaterials, Clothing, Jewelry, Data Visualization, Installation, Documentary, Book, Discursive Design, Video
Course Extension	-Exhibition "Planet Planet at the Table" -Exhibition "Third Nature at the Table" -Exhibition "Food Testing Ground" -Exhibition "Xinjiang Biennale"-"New Food". -Teaching material "Sustainable Food Design	-2050 Ocean Conference -Shenzhen-Hong Kong Biennale Youth Panel	-Translation of Biodesign -Translation of the book "Bioart". -Translation of Material Ecology

to help students to position, research and innovate in a broader context during the learning process. The model and the courses have received a lot of feedback: some universities and social organizations think that the courses are cutting-edge, with advanced medium, and provocative angles. However, there are also the question of the lack of practicality. At the same time, the design of the courses is a huge challenge for both students and instructors. For students, they need to invest a lot of energy to digest the design methodology and technical knowledge in a short period of time, which requires high quality of students themselves. For the instructors, they are required to have interdisciplinary knowledge system, strong resource allocation ability and a large amount of knowledge reserves. Due to the limited number of times the courses has been open and the diversity of topics, these eco-design course needs to study the effective path to be copied and promoted. In addition, the courses are still short-term results, and it may be more effective if they can form a cyclical and continuous research. Both the Krebs Cycle of Creativity and the Eco-design Pedagogical Model are still in the early stages of validation, and need to be constructed by scholars and experts from diverse backgrounds. This article hopes to intrigue more prototypes of new eco-design methods as well as pedagogical pratices.

References

Antonelli, P. (2008). Design and the elastic mind. The Museum of Modern Art, New York.

Dubberly, H. (2008). ON MODELINGDesign in the age of biology. Interactions, 15(5), 35–41. https://doi.org/10.1145/1390085.1390092

Ginsberg, A. D., & Chieza, N. (2018b). Editorial: Other Biological futures. Journal of Design and Science. https://doi.org/10.21428/566868b5

Li, Y., Fu, X. (2021).Back to Practice: The Postmodernist Turn in Design Thinking. Zhuangshi(03),33-37. doi:10.16272/j.cnki.cn11-1392/j.2021.03.016.

Cross, N. (2021). Engineering Design Methods: Strategies for Product design. http://elibrary.unpas.ac.id/index.php?p=show_detail&id=17843

Buchanan, R. (1992). Wicked problems in design thinking. Design Issues, 8(2), 5. https://doi.org/10.2307/1511637

Dunne, A., & Raby, F. (2013). Speculative everything: Design, Fiction, and Social Dreaming. MIT Press.

Oxman, N., Ortiz, C., Gramazio, F., & Kohler, M. (2015). Material ecology. Computer Aided Design, 60, 1–2. https://doi.org/10.1016/j.cad.2014.05.009

Antonelli, P. (2020). Neri Oxman: Material Ecology.

Oxman, N. (2016). Age of entanglement. Journal of Design and Science. https://doi.org/10.21428/7e0583ad

Jing, S.(2022). Four-dimensional transformation of food design in the post-carbon era. Journal of Nanjing Arts Institute(Fine Arts & Design), 05, 198-203.

Antonelli, P., & Tannir, A. (2019). Broken nature: Design Takes on Human Survival. National Geographic Books.

Study on Elderly Mobility in the Digital Age — Research Report Based on 835 Elderly Residents from 7 Communities in Beijing

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Abstract

Since the 21st century, the aging population has been increasing, and the declining cognitive abilities of the elderly have prevented them from enjoying the convenience brought by the development of smart technologies, leading to negative emotions among the elderly. How to care for the elderly through design means and thus improve their quality of life will become a key factor in societal development.

Ride-hailing services have become a common mode of transportation in cities, but currently, only a minority of the elderly use these services. This research report focuses on elderly residents in Beijing, surveying 835 elderly individuals from 7 communities and 3 ride-hailing service companies to investigate the issues related to elderly people using ride-hailing services. Factors affecting the willingness of the elderly to use ride-hailing services were analyzed from three perspectives: ride-hailing policy relevance to the elderly, basic characteristics of the elderly population, and the elderly-friendliness of ride-hailing service technology. The study found that the implementation of policies relevant to elderly-friendly ride-hailing, the physical condition and education level of the elderly, and the elderly-friendliness of ride-hailing services were the three main influencing factors. In the recommendations section, it is suggested to increase the coverage and utilization of ride-hailing policies, enhance the elderly-friendliness of ride-hailing service design, and improve the user experience for elderly passengers. Furthermore, efforts should be made to expand the reach of digital literacy training for the elderly, enhancing their digital skills to help them establish a sense of self-identity and social belonging.

This research report deeply analyzes the challenges faced by the elderly in using ride-hailing services, addresses barriers to service adoption, and through design means, cares for the elderly, creating an elderly-friendly transportation model that encourages the elderly to venture out of their homes and actively participate in social life.

Keywords: Aging, Digital Technology, Elderly Travel, Ride-Hailing, Age-Friendly Design

Mobility Challenges for Urban Elderly in the Digital Age

Mobility is an integral aspect of elderly individuals' lives in urban settings. Data reveals that 35% of urban elderly residents travel distances of 3 to 5 kilometers on a daily basis, indicating a demand for medium to long-distance transportation. However, a majority of elderly individuals still opt for traditional modes of transportation, such as walking. The main reason for their reluctance to use ride-hailing services is the barriers they encounter in accessing these services. Among elderly individuals who have attempted to use a smartphone to request a ride,

only 20% can do so independently. Additionally, physical limitations prevent elderly individuals from enjoying the convenience offered by ride-hailing services [1]. Given these challenges, our research team has chosen ride-hailing services as the focal point of investigation. Through research, we aim to identify the obstacles faced by the elderly when using ride-hailing services, analyze the factors affecting their utilization of these services based on survey data, and subsequently provide recommendations for making ride-hailing services more elderly-friendly, thereby enhancing the quality of their travel experiences.

Our research team conducted interviews with 835 elderly residents from seven communities in Beijing to gain insights into the motivations and challenges faced by the elderly when using ride-hailing services. The research encompassed basic information and usage patterns among elderly residents, characteristics of elderly users of ride-hailing companies, and an examination of ride-hailing service policies.

The Development Dilemma of Ride-Hailing Services for Elderly Residents in Beijing

Policy Dilemma: The policy framework for ride-hailing services for elderly individuals needs improvement.

Beijing has initiated the "Smart Elderly Assistance" campaign, and as of May 2023, 430 taxi pick-up stations across the city have been upgraded and transformed. These upgraded taxi pick-up stations now feature QR codes for elderly passengers to conveniently call nearby taxis using WeChat [2], as shown in Figure 1.

Figure 1 Implementation Status of Policies Related to Elderly Ride-Hailing Services.

Through on-site investigations, it was observed that there are few "Heartwarming Stations" in the vicinity of the communities, which many elderly individuals are not particularly aware of in their daily lives. The research team conducted random interviews with 10 elderly individuals and found that only two of them were aware of the existence of "Heartwarming Stations." Most elderly individuals are not familiar with services such as "One-Click Ride" designed to assist elderly travel, and they are unsure about how to access such travel policy benefits. Elderly individuals have limited channels for accessing information, and it is crucial for various government departments and enterprises to promote these new social welfare policies among the elderly community. This will raise awareness and ensure that elderly individuals enjoy improved travel services.

individual Challenges: Characteristics and Issues of Interviewed Elderly Individuals' Mobility

In terms of the characteristics of elderly mobility, the significant decline in sensory capabilities such as vision, hearing, and touch poses substantial challenges for elderly individuals [3]. This often results in a relatively singular purpose for elderly travel. Through collaboration with Didi Chuxing, the research team obtained relevant data. Platform data indicates that elderly users have an average trip distance of approximately 7 kilometers, with primary destinations being residential neighborhoods, shopping malls, and markets. Furthermore, the utilization rate of "Didi Senior Version" is not high. Among the interviewed elderly individuals, the majority (74%) still prefer hailing taxis on the roadside. Currently, the majority of elderly individuals using ride-hailing services still rely on their children or friends for assistance in booking rides, accounting for 84%, as shown in Figure 2.

Additionally, the research team investigated the motivations behind elderly individuals' choice of ride-hailing

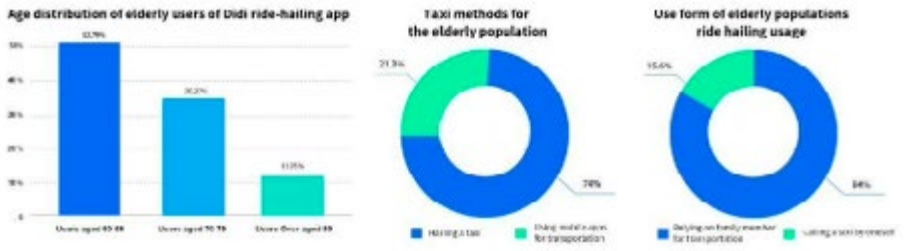


Figure 2 Data Related to Elderly Users of Ride-Hailing Software.

services. Among elderly individuals willing to use ride-hailing services, comfort and convenience are the two main factors, as depicted in Figure 3. For those elderly individuals who are unwilling to use ride-hailing services, two significant factors are their lack of familiarity with ride-hailing apps and economic constraints.

From the data above, on the one hand, ride-hailing services have greatly facilitated elderly travel, but on the other hand, software usability barriers have limited elderly individuals from using ride-hailing services.

Figure 3 Survey of Motivations for Elderly People Using Ride-Hailing Services.

Technological Challenges: Analysis of Age-Friendly Design Issues in Ride-Hailing Services

Based on the differences in elderly residents' willingness to use ride-hailing services obtained in this research, they can be classified into the following three groups, as shown in Figure 4.

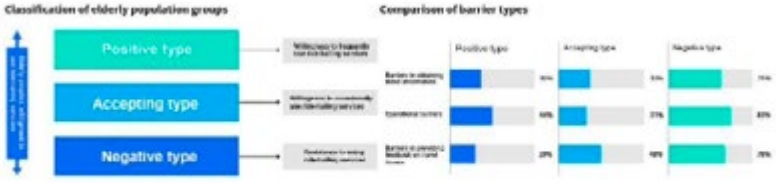


Figure 4 Classification of Elderly Interviewees' Willingness to Use and the Percentage of Different Types of Barriers Data.

Most elderly individuals encounter barriers in information retrieval when using ride-hailing services. Information barriers are divided into recognition information barriers and comprehension information barriers. The data indicates that, in terms of recognition information barriers, "difficulty in reading visual information" and "difficulty in hearing voice information" are the two predominant issues. In the context of comprehension information barriers, the focus lies on difficulties in understanding specialized transportation terminology. In the case of "difficulty in understanding travel information," negative-oriented elderly individuals outnumber positive-oriented and accepting-oriented elderly individuals. "Slow interface operation" and "interface misoperation"

are the primary issues faced by elderly individuals when using ride-hailing services. Accepting-oriented elderly individuals significantly outnumber positive-oriented and positive-oriented elderly individuals in both of these problems, as shown in Figure 5.

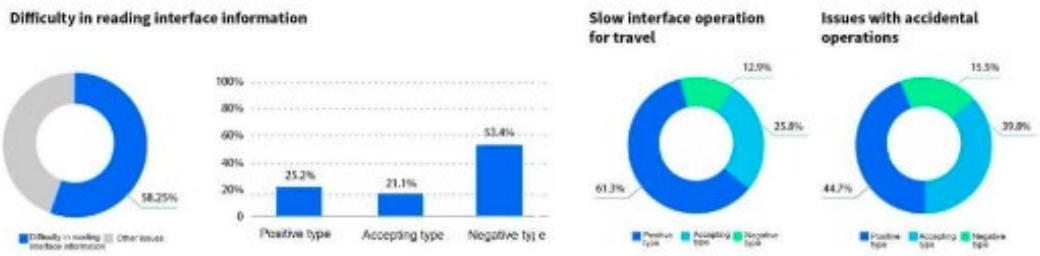


Figure 5 Percentage of Ride-Hailing Service Usage Barriers Among Interviewed Elderly Individuals.

Information retrieval barriers affect the willingness of elderly individuals to travel and the acceptance of ride-hailing services. These barriers make most elderly individuals unwilling to engage with emerging technology and create distrust, including in smart technologies like ride-hailing services. Consequently, this impacts elderly individuals' willingness to use ride-hailing services.

Factors Influencing Elderly Use of Ride-Hailing Services

Based on the data obtained from the research, further analysis of the factors influencing the use of ride-hailing services by elderly individuals can be categorized into three aspects: policy, personal, and technological, as shown in Figure 6.

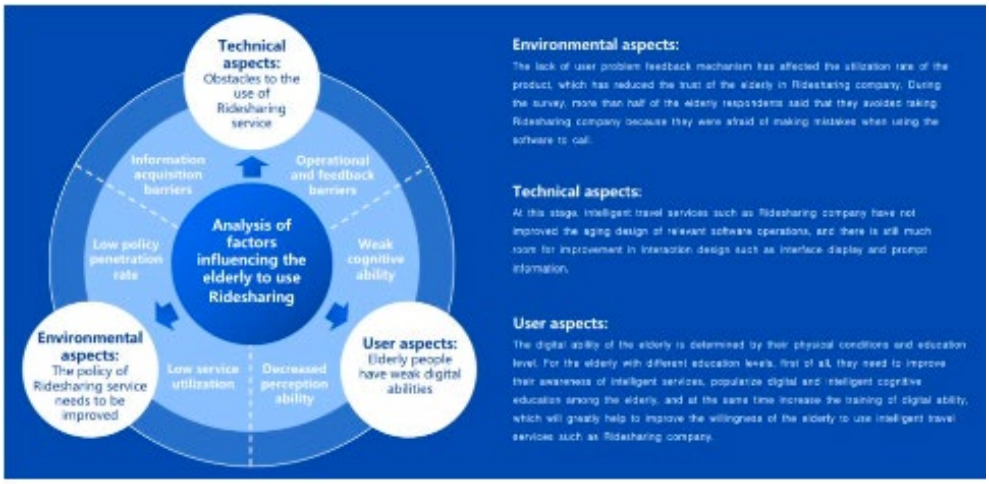


Figure 6 Analysis of Factors Affecting Elderly Individuals' Use of Ride-Hailing Services.

Policy Aspect: Efficiency Constraints in Ride-Hailing Services Impact Usage Intent Through interviews, it was concluded that relevant policies suffer from issues such as low coverage of taxi pick-up stations, low utilization rates, and high prices. The low coverage of pick-up stations is primarily attributed to extended collaboration periods and high construction costs. The irrational planning of stations and their distant locations from residential

areas are key factors contributing to low utilization rates. Inadequate implementation and difficulty in obtaining subsidies for elderly travel by the government have also reduced the willingness of the elderly to use ride-hailing services.

Individual Aspect: Physical Health and Education Level Affect Usage Intent

Elderly individuals' willingness to use ride-hailing services is correlated with their physical condition and level of education. On one hand, the decline in physical health and cognitive abilities among the elderly, coupled with difficulties in reading interfaces and comprehending information, diminishes the overall ride-hailing experience. On the other hand, higher levels of education among the elderly result in fewer barriers to using smart technology products like ride-hailing services and a higher willingness to use them. Additionally, high prices can lower the enthusiasm of the elderly population to use ride-hailing services.

Technological Aspect: Cognitive and Usage Barriers Pose Safety Risks

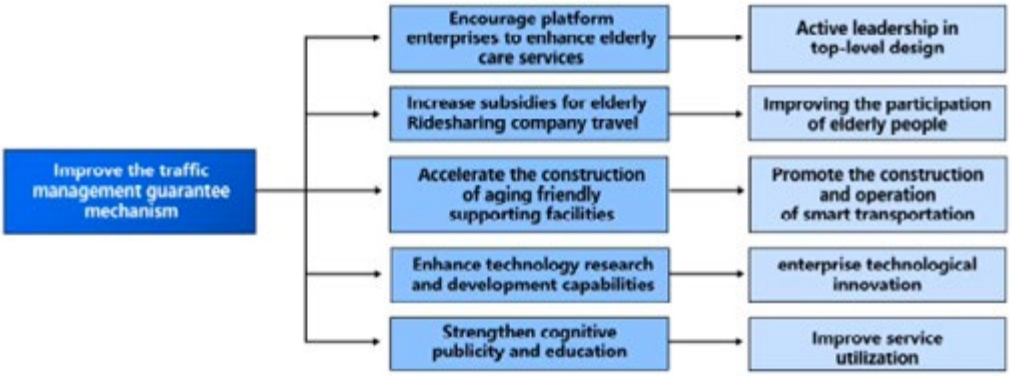
The design of ride-hailing software often necessitates assistance from others for many elderly individuals, reducing their willingness to use such services. Furthermore, frequent software updates make it challenging for the elderly to keep up with these changes. During the research, over half of the interviewed elderly individuals expressed fears of making errors when using the

software to request a ride, and difficulties in finding the ride-hailing interface after software updates were common issues.

Strategies to Promote Elderly Use of Ride-Hailing Services

Policy Level: Government and Business Collaboration for Innovation

Through communication with the transportation management department of the Beijing municipal government and surveys conducted in seven communities, the research team has proposed policy development recommendations, as shown in Figure 7.



Firstly, relevant government departments at all levels should increase subsidies for elderly travel through policy incentives, encouraging companies to improve the quality of ride-hailing services. Additionally, regulatory bodies should guide ride-hailing platforms in enhancing the "One-Click Ride" functionality. Furthermore, relevant authorities should work towards establishing a legal framework for ride-hailing services that aligns with the national context. Lastly, there is a need for strengthened awareness campaigns and educational initiatives that allow the elderly to experience cognitive scenarios through approaches they find engaging. Personal Level: Enhance Digital Technology Awareness and Promote Elderly Digital Empowerment

At the household level, children should provide economic support, technical assistance, emotional support,

and tool support to enable digital engagement and enhance the participation of the elderly in digital life. On an individual level, encouraging elderly individuals to participate in community activities and digital literacy training can help them gain a sense of digital inclusion and value creation, as shown in Figure 8.

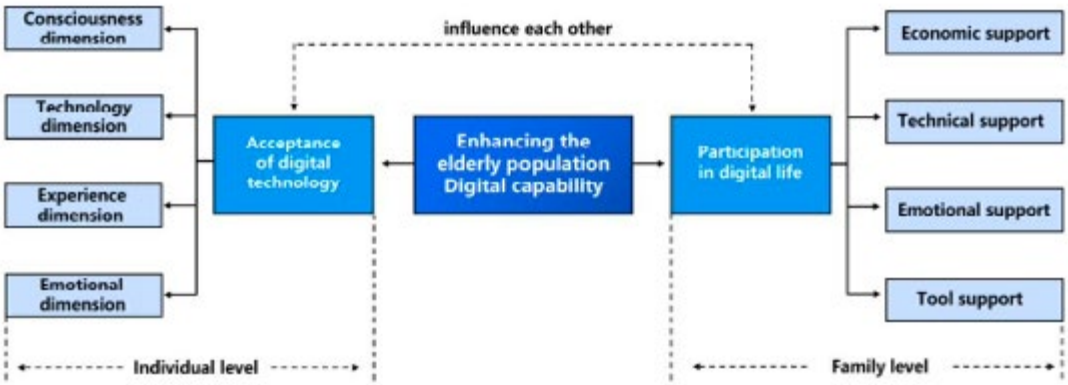


Figure 8 Recommendations for Improving Digital Literacy Among the Elderly Population.

Figure 8 Recommendations for Improving Digital Literacy Among the Elderly Population.

Usage Level: Focusing on Convenience to Improve Age-Friendly Ride-Hailing Service The research team interviewed elderly individuals in the community and engaged with ride-hailing companies such as Didi and Cao Cao to understand the pain points of elderly users. They constructed a model for an age-friendly ride-hailing service system, as shown in Figure 9.

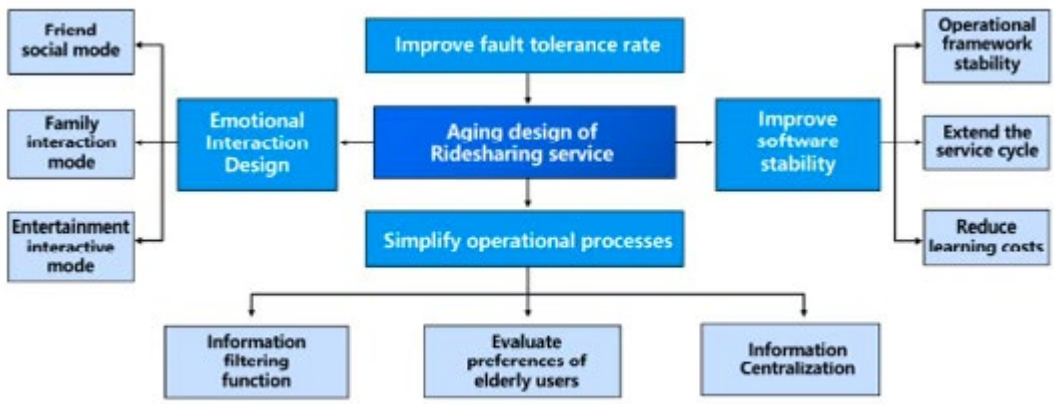


Figure 9 Age-Friendly Design Model for Ride-Hailing Services.

Firstly, in terms of software stability, the system should maintain the stability of operational logic, increase fault tolerance, and reduce the learning curve. Secondly, in the ride-hailing software process, there should be information filtering to assess the information preferences of elderly users and refine critical operation interfaces. Concerning the user experience of ride-hailing, ride-hailing platforms should enhance communication between elderly users and their friends and provide driver training for serving elderly passengers, such as offering

assistance with boarding and disembarking and providing exclusive guides for elderly passengers. Furthermore, the report suggests addressing operational errors from both the user and customer service sides through a "multi-level confirmation" approach. The research report, by analyzing the factors affecting elderly ride-hailing, provides reasonable development recommendations for ride-hailing services, offering a better travel experience for the elderly and highlighting its significance, as depicted in Figure 10.

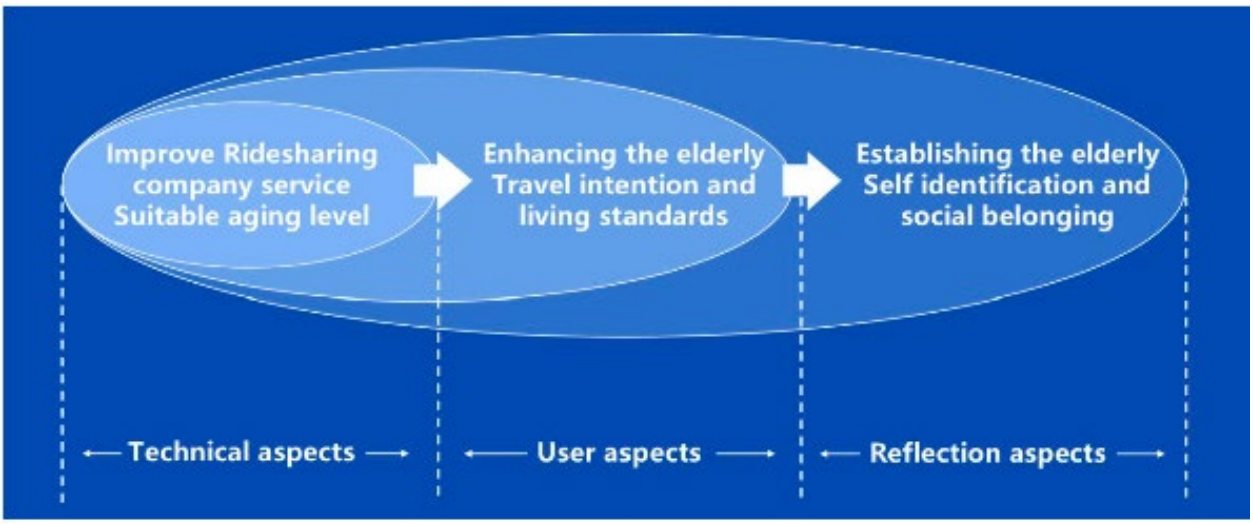


Figure 10 Building the Significance of Age-Friendly Design in Ride-Hailing Services.

Conclusion

Based on the data obtained through the research, the investigative team found that ride-hailing services have yet to establish a comprehensive age-friendly management system and have overlooked the usage requirements of elderly users in their software user experience design. The research report, through on-site investigations and interviews, identified the barriers faced by elderly individuals when using ride-hailing services and collected relevant data on their attitudes towards using such services. It analyzed the factors influencing the use of ride-hailing services by elderly individuals, providing development recommendations for age-friendly design in ride-hailing services from three aspects: ride-hailing policies, the elderly population, and age-friendly design in ride-hailing. These recommendations aim to address issues faced by elderly users of smart products, offering the elderly a better travel experience.

References

Wang Shenyuan. (2021). Sounding the Call to Action for Elderly Work in the New Era. China Social Work, (32), 30-31.

Hu Qiulei. (2019). Research on Permit Mechanism in the Regulation of Ride-Hailing (Mas ter's thesis, Shanghai Jiao Tong University). https://kns.cnki.net/KCMS/detail/detail.as px?dbname=CMFD202001&filename=1020805231.nh

Liu Hanhui & Li Huijie. (2021). Cognitive Neuroscience of Aging: Current Research and Future Prospects. China Science: Life Sciences, 51(06), 743-763.

Wang Yuzhuo & Liao Qidi. (2018). Research on Urban New Assistive Public Transportation and Planning Decision

Model. In Proceedings of the 2018 China Urban Planning Annual Conference (06 Urban Transportation Planning) (pp. 879-888). China Architecture & Building Press.
Zhang Weiwei, Liu Minghui & Wang Yun. (2022). Inclusivity in the Digital Age: Research on the Design of Aging-Related Smart Products from a Design Ethics Perspective. Decoration, (05), 46-51. doi:10.16272/j.cnki.cn11-1392/j.2022.05.025.

Designing Healthcare Services for Longevity

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Abstract
Adults 85+ years and older have become the fastest growing global population, representing a new paradigm of longevity economics, service innovation, and experience-driven business. In summer 2023, the authors conducted a study to identify longevity-related challenges and frame questions in the context of healthcare services. The two-month study, which consisted in the planning and implementation of a 3-hour co-creation workshop to explore longevity-related needs of healthcare services and 1 post-workshop survey to capture insights, was a collaboration between an academic research institute in the US and a government-level design research center in Asia. The research proposes a new framework to assist in a longevity-informed design process: the 4Es (ensure, evolve, empower, and enjoy) framework. This framework is based on 35 expert interviews (Anonymous, et al., 2023), from which we derived 12 keywords associated with longevity and aging: health, family, mobility, care, home, communication, trust, community, risk, investment, education, and future. We applied the framework in the creation of an ideation toolkit for the co-creation workshop, consisting of 12 Design for Longevity (D4L) cards and 4 participatory posters. We recruited 27 participants from the healthcare industry, including three categories: 1) healthcare service providers, such as doctors, nurses, and pharmaceutical leadership teams, 2) healthcare service recipients, such as patients and their families, and 3) workshop facilitators including UX and UI designers. Overall, the study was beneficial to healthcare services for longevity. Two key learnings are demonstrated from the study: 1) By providing a series of accessible verb-based questions, the 4Es framework helped facilitate conversation and ideation among diverse participants and 2) Touching and sharing the D4L cards and posters enabled participants to discuss abstract concepts and complicated topics more easily.

Keywords
Design for longevity; service design; healthcare; design process; longevity economics

Introduction

Most developed countries are already in a stage of a super-aging society (World Health Organization, 2022). Our society is transforming to adapt to multi-generational and inter- generational cultures, workforces, and other environments. Due to established economic structures, advancing technologies, better education and medical systems, and stable social infrastructures, people can live longer and want to live healthier to maintain a good quality of life.

As a result, the demands of longevity economics have led to a paradigm shift, especially service- and experience-driven business strategies. Consequently, an interest in designing healthcare services for longevity has emerged across various industries and academia. Our project was a 2- month multi-disciplinary research initiative among data scientists, an industrial designer, and interaction designers from University Research Lab A, University Research Lab B, and Research Institute, a government-level organization that promotes design for social impact and service innovation. Our goal was to identify critical research questions concerning healthcare services for longevity by using the proposed keywords and 4Es (ensure, evolve, empower, and enjoy) framework applied in

12 Design for Longevity (D4L) cards and 4 participatory posters (figure 1). We recruited 27 participants, including healthcare service providers (doctors, nurses, and pharmaceutical leadership) and service recipients (users and their family members), conducted a 3-hour co-creation workshop, and designed a post-workshop survey to capture participant's reactions and responses.

Literature reviews and case studies

Longevity economics

In the era of an aging society and the fourth industrial revolution (Schwab, 2016), our economic structure has shifted dramatically from a product-centered model and mass-production focus to a more service- and experience-driven approach that considers longevity and sustainability. Golden (2022) notes that our society has changed from the traditional 3 stages (born, earn, and retire) to multiple stages, and this change directly affects our social infrastructure systems. Golden's five-quarter (5Q) framework demonstrates that people's age represents not only several years, but also— implicitly and explicitly —a life stage. Anonymous (2019; 2017) proposed the 8,000-day framework, which looks at the expected 8,000 days of retirement as "four retirements": manage ambiguity, make big decisions, manage complexity, and live solo. By centering the 4 retirements, longevity economics can influence how we rebuild and shape healthcare services for future AgeTech cities, where human aspects and emotions are integrated into making critical decisions and cultivating sustainable behavior and mindsets (Etkin, 2021).

Figure 1. Original poster design paired with 12 D4L cards from co-creation workshop.

Design for Longevity (D4L)

Design for Longevity (D4L) has been an emerging idea that influences us not only financially and economically but also technically and socially. Since we are in a multigenerational environment, people have started to focus on agism issues across many industries and organizations, including education, culture, and policies. Customers have become more sophisticated as their needs have changed (Anonymous, et al., 2023). Instead of manufacturing more products, in the context of D4L, we need to consider more service-oriented experiences that tie to the desirability of people and social impact (Anonymous, et al., 2023). For example, MIT AgeLab proposed a D4L studio to envision longevity services and journeys to shift the roles and responsibilities of financial advisors to those of longevity coaches (Anonymous, et al., 2023). D4L is a cross-disciplinary domain that has academic value and industrial potential to be applied in many arenas, including healthcare. In this study, we applied the frameworks developed as part of the D4L studio to conduct an experiment on healthcare services.

Research methods and 4Es framework

The 2-month research project included four key steps: scope the research area, design applied assets for the 4Es framework, conduct a co-creation workshop, have participants complete a survey, and analyze survey data (Figure 2). Step 1 included research into challenges related to longevity and consisted of 35 expert interviews (Anonymous, et al., 2023). Interviews were analyzed using ATLAS.ti, a computer-assisted qualitative data analysis software, to come up with 12 keywords and the 4E framework. In step 2, authors developed a toolkit to be used in the workshop: the D4L cards, 4 participatory posters, and a survey to document participants' backgrounds, demographic information, and perceptions of longevity and service design, including the relevancy of the

keywords in the healthcare sector. Step 3 involved conducting the 3-hour workshop, which concluded with participants filling out the survey. And in the final step, we analyzed the survey results.

We recruited 27 participants from three expertise areas: healthcare service providers, healthcare service recipients, and workshop facilitators with expertise in design. Doctors (n=2), nurses (n=3), and pharmaceutical leadership (n=7) are defined as healthcare service providers. Users (n=7) and their families (n=4) belong to healthcare service recipients. The rest of the participants and designers are included as facilitators (n=4). Participants were grouped into 6 diverse teams.

The posters (Figure 3) were created to emulate the design process: 1) Define audience: Who is your D4L persona? Participants used this poster to create a persona. 2) Clarify objectives: What values are relevant to D4L? Participants ranked keywords by importance in relation to their persona. 3) Identify design opportunities: When and where can D4L integrate with healthcare services? Participants used the four probing questions from the 4Es framework to brainstorm healthcare services for their persona. 4) Visualize concepts: Why does longevity matter to healthcare services? On this board, participants storyboarded their final idea. Throughout the workshop, participants used the 12 D4L cards as a supporting tool to enable them to have more constructive, meaningful, and engaging discussion (Figure 4).

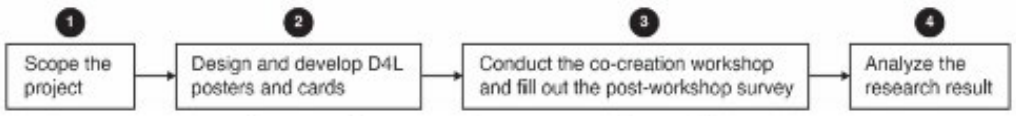

Figure 2. The research process consists of four steps.

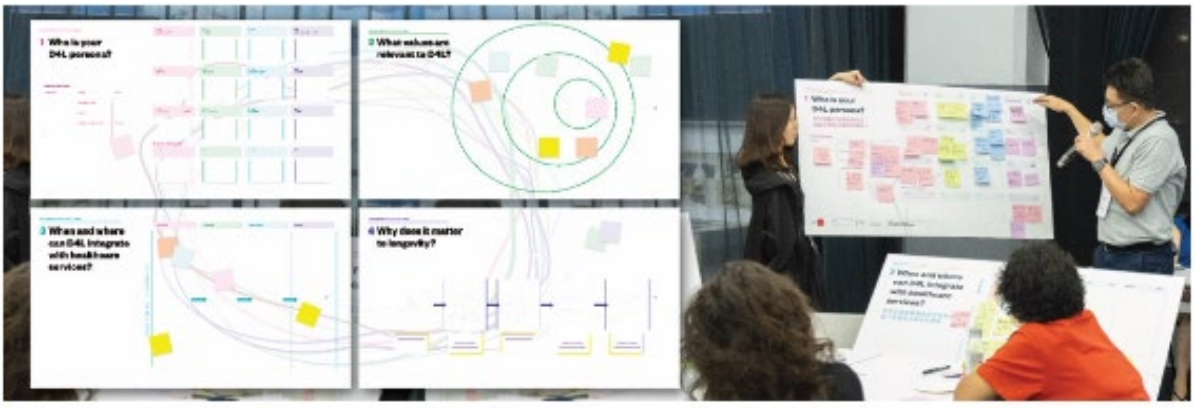

Figure 3. The 4 posters are used to identify research questions in healthcare services for longevity.

The 4Es framework is a tool to help people brainstorm concepts and ideas for products, platforms, and services that address issues of longevity. There are four stages to the framework: ensure, evolve, empower, and enjoy. Each stage offers a question to guide participants to think more dimensionally about the challenges and

Figure 4. The 12 D4L cards combined with 4 posters help explore healthcare services for longevity.

opportunities of longevity. (Table 1).

Table 1. The 4Es framework explanation, guiding questions, keywords, and examples.

4Es	Ensure	Evolve	Empower	Enjoy
Explanation	Foundation	Transformation	Extension	Outcome
Guiding questions	What do you need to **ensure**? What is basic to your future wellbeing?	What needs to **evolve** with you? What transforms with you over time?	What can **empower** you? How can you extend your impact?	What do you **enjoy**? What outcomes do you benefit from?
Associated Keywords	*Mobility, Home, Community*	*Education, Health, Family*	*Future, Investment, Risk*	*Trust, Care, Communication*
Examples	***Mobility*** is imperative for an independent lifestyle. The design of automotive safety features can ensure mobility into later ages.	***Education*** services need to accommodate changing social and professional needs and be relevant and stimulating to seniors.	Designed systems need to minimize ***risk*** and help people's daily behavior make positive social impact.	Products and platforms that allow us to demonstrate **care** for each other and the environment.

The workshop ended with a 5-minute presentation from each group to share their 1) D4L persona, 2) D4L-relevant values, 3) D4L-integrated healthcare services, and 4) their expanded understanding of longevity. Most teams were interested in exploring long-term healthcare services such as coming up with human-centered approaches to

take care of dialysis patients or people with diabetes. Figure 5 demonstrates a participant using the 4 posters, combined with 12 D4L cards, as an effective inspirational tool to develop and communicate their scenario.

Figure 5. Participants used 4 posters to facilitate the discussion about healthcare services for longevity.

Research result

Analysis of D4L cards and keywords

One of our research goals was to determine if the 12 keywords, visuals, and proactive questions on each of the D4L cards were relevant to longevity concerns in healthcare, as well as if the set itself could serve as a conversation facilitation tool. As part of our survey, we asked participants to rank the keywords from 1 to 10 based on their importance in the context of longevity. The ranking result from top to bottom showed (the value in parentheses is the average number, n=25): health (1.48), family (3.68), mobility (5.04), care (5.16), home (5.44), communication (6.4), trust (6.92), community (7.6), risk (8.4), investment (8.92), education (9.04), and future (10). Unsurprisingly, aligning with the participants' backgrounds, health was the most important factor. Family was second, followed closely by mobility, care, and home. Interestingly, the more abstract words, like future and investment, were ranked lowest. Participants also contributed other keywords—happiness, financial wellbeing, physiological and psychological health, meaningful and delightful lifestyle, companionship, sharing, learning, active, and being alone— to help co-build the D4L cards' content.

Analysis of co-creation workshop experience

The following survey results (n=27) can help us not only better future design workshops, but also receive feedback on D4L cards and posters. Overall, more than half of the participants (88.9%) were satisfied with the co-creation workshop experience. This workshop and discussion helped most participants (83.1%) paint a picture of what a healthy lifestyle looks like and helped the majority of participants (92.5%) understand the importance of considering needs from multiple dimensions and how to use a design process to envision future scenarios (88.9%). Most importantly, it helped most of them (85.2%) identify innovation opportunities from different aspects. Figure 6 demonstrates that 4 posters combined with 12 D4L cards are effective and useful tools for most (77.7%) participants.

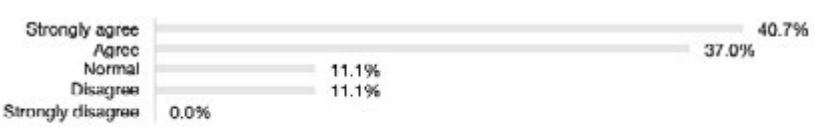

Figure 6. Results from 27 participants to survey question, "Using 4 posters with 12 D4L cards unlocked my creative thinking during the team discussion and enhanced the level of comprehensiveness of the topics."

Discussion and next step

Complexities of the term "longevity"

From the in-person workshop observation and post-workshop survey, we found that perceptions of longevity varied among participants. This could be because of different East-West cultural interpretations of the term "longevity", or due to experiential differences between healthcare service providers, healthcare service recipients, and workshop facilitators. It could also be because concepts of longevity and D4L are still relevantly new, with limited exposure in the field of service design and social innovation. Therefore, as demographic trends continue to shift, it is critical to continue to develop design methods around longevity within healthcare and beyond.

Future uses for a longevity toolkit and co-creation workshop

With the success of applying the 4Es framework and D4L cards in this study, what are other research areas that could benefit from a similar longevity workshop? We are considering public transportation systems, corporate organizational structures, educational services, AI-relevant ethical issues, and other complicated and systemic socio-technological challenges. As a next step, the 4Es framework and D4L cards can be considered as experimental materials. We aim to extend the applications of both by applying them to various research areas to build a more comprehensive and impactful toolkit for longevity and service design.

Strongly agree Agree Normal Disagree Strongly disagree

Conclusion

The development of Design for Longevity (D4L) tools for healthcare service design

The purpose of the workshop was to explore longevity-related challenges in healthcare services. We created the posters and D4L cards, based on the 4Es framework, to facilitate conversation and ideation. We tested these artifacts in the co-creation workshop to help participants (doctors, nurses, users, and designers) brainstorm and identify untapped opportunities for the redesign of healthcare services across levels of individuals, communities, and countries. Having synthesized the data captured from the survey result, poster information, and observation notes, we demonstrated that the 4Es framework, posters, and D4L cards foster open-ended conversations concerning complicated, private, sensitive, and challenging healthcare services. This is because the 4Es framework was designed with 4 relatable questions to inspire participants to quickly build mind-maps related to longevity. And the physical artifacts—the posters and cards—were designed to make abstract or complex concepts tangible, and therefore easier to work with. We concluded that the 4Es framework, posters, and D4L cards, raised participants' curiosity, enhanced their engagement level, and enabled them to have constructive discussions around healthcare services even though they were from very diverse backgrounds.

References

Anonymous (2017). The Longevity Economy: Unlocking the World's Fastest-Growing, Most Misunderstood Market (First edition). PublicAffairs.

Anonymous (2019). Planning for 8,000 Days of Retirement: Advisor Value in Today's Longevity Economy. Investments & Wealth Institute.

Etkin, K. (2021). The AgeTech Revolution: A Book about the Intersection of Aging and Technology. New Degree Press.

Golden, S. (2022). Stage (Not Age): How to Understand and Serve People Over 60--the Fastest Growing, Most Dynamic Market in the World. Harvard Business Review Press.

Anonymous, Balmuth, A., de Weck, O., & Ochsendorf, J. (2023, August 22). Design Artifacts and Gaming Transform Financial Planning Services: Multifaceted Experimental Design Research. International Design Conference (IDC)

and IDSA Education Symposium. https://www.internationaldesignconference.com/
Anonymous, de Weck, O. L., Lee, C., Klopfer, E., & Ochsendorf, J. (2023). Co-create Financial Planning Services for an Aging Population: Designers' Perspectives. Proceedings of the Design Society, 3, 947–956. https://doi.org/10.1017/pds.2023.95
Anonymous, de Weck, O. L., Lee, C. & Klopfer, E. (2023). Macro-Trend Study Under Service System: Preliminary Research in Service Innovation and Emerging Technology. In U. Z. A. Hamid & M. Suoheimo (Eds.), Service Design for Emerging Technologies Product Development (Vol. 29, pp. 45–72). Springer International Publishing. https://doi.org/10.1007/978-3-031-29306-1_4
Anonymous, de Weck, O. L., Lee, C., Klopfer, E., & Ochsendorf, J. (2023). Service Design in Action: Transformation, Consideration, and System Thinking. Proceedings of the Design Society, 3, 3145–3154. https://doi.org/10.1017/pds.2023.315
Schwab, K. (2016). The Fourth Industrial Revolution (First U.S. edition). Crown Business.
World Health Organization. (2022, October 1). Ageing and health. https://www.who.int/news- room/fact-sheets/detail/ageing-and-health

Envisioning narrative scenarios for alternative futures: heuristic cards and design tools for critical design

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Abstract

Critical design serves as a practice method that holds greater significance in today's rapidly evolving technological landscape and accelerated social transformation. This article presents a collection of heuristic cards and design toolkits for critical design, aiming to provide valuable resources, guidance, and assistance to practitioners in creating narrative scenarios during the concept generation phase. We have identified a four-step creative process, established eight case-oriented content segments, and developed a guided design framework. Content segmentation of the design case was performed to extract 60 main cards, and 20 side cards were extracted from philosophical, scenario and character archetypes. The design toolset includes the canvas and content template. Following initial testing, the potential of the card set and toolkit to enhance the efficiency, completeness, and quality of initial design proposals has been successfully demonstrated.

Author keywords

Critical Design; Card-based Design Tools; Narrative Scenarios; Archetypes; Design Framework

Introduction

The continuous expansion of the design discipline in breadth and depth has led to the development of design from tangible fields such as industrial design to more intangible design domains (speculative design (Dunne and Raby, 2013), design fiction (Bruce, 2005; Lindley and Coulton, 2015), transitional design (Irwin, 2015), etc.) (Angheloiu et al., 2020). Among them, speculative design, design fiction, and critical design, as practical methods, focus on proposing "carefully designed problems" instead of problem-solving (Dunne and Raby, 2013). Critical design emphasizes ethical aspects, reveals hidden agendas, and explores alternative values (Bardzell et al., 2012). Such practices use fictional objects to explore future scenarios, stimulate imagination, and debate implications of emerging technologies (Felt et al., 2009; Heidingsfelder et al., 2019). Therefore, in today's fast-paced tech development and social transformation, critical design has become increasingly significant in terms of real-world impacts.

In other design fields (aging design (Wang et al., 2021), design education (Kheirandish et al., 2020), HCI (De Ruyck et al., 2023), food design (Lee et al., 2020), etc.), heuristic design tools or card-based design tools (Haritaipan, 2019) are often used to stimulate creativity, encourage communication among groups, and provide rich resources for design. These tools have been proven to prevent repetitive work and inspire creativity in the most effective areas. However, in critical design, such tools are limited due to its emerging nature and interdisciplinary traits.

Elliott's design landscape (Anon, n.d.) divides design into a spectrum: art (unconstrained) on the left and strategy (constrained) on the right. Art is personal and creative, while strategy relies on tools and frameworks. Critical design, in the middle, combines both, and practitioners retain both artistic thinking and self-expression in their creative habits while projecting their perspectives onto issues such as potential futures, technological meanings, and socio-culture. The development of scenario narratives is a complex task requiring substantial expertise and resources (Burnam-Fink, 2015). Developing heuristic card sets and design tools for critical design requires considering its general process, providing rich content, and building a guided framework. It should also incorporate practitioners' creative habits and artistic thinking (Whitaker, 2016), allowing for dialogue and review. By combining both aspects, we aim to fill the current lack of relevant tools in the field.

This paper outlines the general creative process of critical design, sets up case content segments, and develops a guided design framework. We extract the main and side cards, forming guided canvas and content template. The proposed tools are then validated through testing, resulting in enhanced efficiency, completeness, and quality in initial design creations.

2. The Guided Design Framework on Creative Process and Content Structure:

2.1 General Creative Process of Critical Design

Critical designers challenge norms, legitimizing and problematizing different design approaches (Malpass, 2013). Methods include speculative design (Forlano, 2019), design fiction (Dunne and Raby, 2013), and discursive design (Fordyce, 2021). We aim to optimize Lutz's (Lutz, 2023) speculative design process, merging last two stages into a four-step strategy:

Step 1: Identify "Signals" of Emerging Technologies and Trends: Recognize peripheral technologies and cultural trends, looking for "weak signals" in emerging technologies and experimental applications.

Step 2: Conceptualize Future Artifacts: Envision future Artifacts using design tools.

Step 3: Storify: Design a diegetic artifact addressing future challenges. Ensure its form and function convey a compelling story, inspiring audience imagination.

Step 4: Sharing to Spark Discussion: Facilitate easy interpretation and encourage feedback on personal preferences, potential impact, and alternative concepts.

2.2 The Content Structure of Critical Design

It has been recognized for quite some time that narrative is one of the primary modes of knowing for humans(Milojević and Inayatullah, 2015). Examining the content structure of critical design can offer valuable insights from existing cases and improve the comprehensiveness of design proposals. Using Ramos' categorization (Ramos et al., 2019), this study refines and formalizes the structure, yielding the following content segments (Table 1).

Table 1. The Content Structure of Critical Design with 6 content segments

Segments	Summary	Explanation
1-Definition	Overall Design Description	A comprehensive view of the designer's actions, context, and outcomes, including environment, participants, methods, and achievements. Similar to an abstract and design explanation.
2-Background	Background &Perspective	The social, technological, economic, ecological, and political contexts of the design, along with the designer's personal experiences or knowledge system. Also includes critical issues identified from the designer's perspective.
3-What	Design Type &Content	Examples of the type of artificial object, product, business action, artwork, vision, or conceptual innovation in the design.
4-Why	Design Issues	Specific problems, confusions, or pain points addressed by the design. These issues can be seen as smaller topics within a larger context.
5-How	Specific Methods	The techniques, innovative methods, tools, and channels employed by the designer in creating the design, as well as how the various design elements are integrated using a specific structure and approach.
6-So What	Design-Induced Responses	An exploration of the future benefits (positive) or risks (negative) that the design aims to trigger, initiating a discussion on its potential impacts.

2.3 The Guided Design Framework for Critical Design

The guided design framework for critical design consists of two parts. First, align the process with content segments to facilitate the reconstruction of design case content within each process: (i) "Identify Signals" with "Background", which pertains to the process of uncovering signals from the design context. (ii) "Conceptualize Future Artefacts" with "Definition" and "What", indicating the determination of the specific definition and type of future products. (iii) "Storify" with "Why" and "How", focusing on the solution scenario within the design problem space. (iv) "Share to Spark Discussion" with "So What". aiming to elicit responses while maintaining inter-subjectivity and openness and implies the author's preconception of the anticipated impact (Figure 1). Second, explore relationships among segments and logical connections among steps to further the understanding of the processes: (i) "Background" and "Issue" form set-A, where the former precedes the latter. (ii) "Definition" and "What" form set-B, representing the relationship between the signified and the signifier. (iii) "Why" and "How" form set-C, establishing a question and answer relationship. (iv) "So What" form set-D, encompassing future benefits (positive) and risks (negative). Product conceptualization and storytelling are a mutually promoting process, needing contemplative space and external stimuli for users to refine concepts and enhance proposal completeness. This inspired us when we were developing the cards (Figure 1).

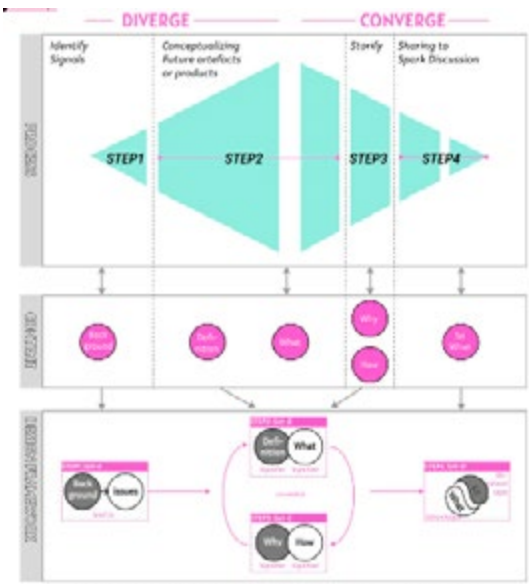

Fig. 1 The guided Design Framework for Critical Design

3. Critical design-oriented heuristic cards and design tools development

3.1 Card Composition and Extraction Process

Main card: Main cards, derived from case studies, are used throughout the process (Step 1-Step 4). Jakobsone (Jakobsone, 2019) argues studying existing design projects can liberate designers' methods. The extraction process involves four steps: acquiring sources, segmenting,reorganizing content, and designing main cards. First, relevant cases are selected, scored, and ranked from 111 case studies. Second, content is segmented according to "Definition- Background-What-Why-How-So what". Then, according to rules in Section 2.2, content corresponding to the 4 design process is converted into 4 Sets: Set-A (front: background, back: Issues; 1 card), Set-B (front: Definition, back: What; 1 card), Set-C (front: Why, back: How; 1 card), Set-D(front: So what, back: Advantage/Disadvantage; 2 cards). Finally, 60 cards are obtained, providing valuable design content resources for practitioners (Figure 2).

Side card: Side cards, sourced from literature research, enhance design proposals and facilitate a leap in thinking during artifact conceptualization and story development (Step 2-Step 3). The side card extraction process involves acquiring sources, extracting content, and designing side cards. The side card is composed of three types: philosophical archetypes (P.A.), scenario archetypes (S.A.), and character archetypes (C.A.), providing abstract materials for artifact storytelling. Content is sourced from futurology and scenario planning literature. This content is either derived from previous research findings obtained through grounded theory in film-oriented studies (Fergnani and Song, 2020), adapted from important theoretical frameworks in the expected field (Dator and Dator, 2019), or quoted from previous summaries (Gregory and Laverty, 2022). For example, philosophical archetypes include 'The Ship of Theseus', 'The Brain in a Vat', 'The God Paradox', etc., which are classic philosophical topics; scenario archetypes include 'Continuous Growth', 'Collapse', 'Stabilized', 'Coming back', and 'Transformation', which are further improvements on general scenario archetypes; character archetypes include 'Achilles', 'Circe', 'Romeo & Juliet', etc., which are representative story protagonists. These contents are eventually made into three types of cards, totaling 20 cards (Figure 2).

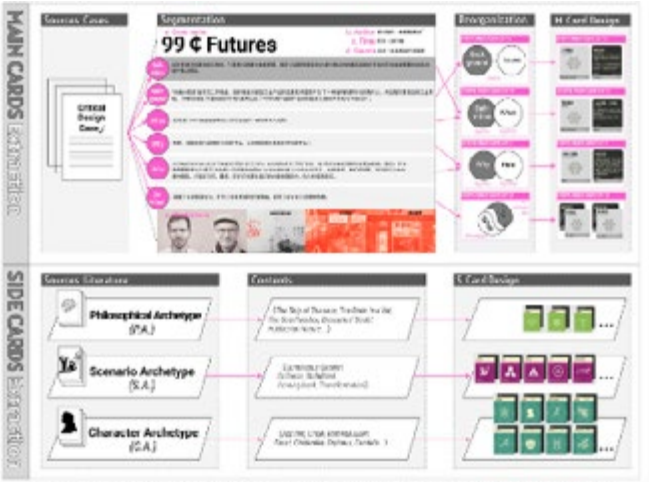

Fig. 2 Main cards (top half) side cards (bottom half) extraction process and card design

3.2 The Canvas, Guided Processes, and the content template

The canvas is a platform for positioning main and side cards (Li and Zhao, 2021), based on the guided design framework. By strategically placing cards, a preliminary design plan can be formed easily. Side cards (P.A., S.A., and C.A.), located in the center, provide space for thought and facilitate adjustments to main cards, enabling creativity and optimization. Blank areas can be used to record insights, leading to a comprehensive concept and design. Figure 4 is a template for critical design content. After completing the canvas, participants transfer the card content and inspired ideas to the template, forming a complete design. The template's bottom requires visual materials, such as AI-generated illustrations. In summary, the canvas serves as a main platform for design and creativity (for teams and individuals), while the content template represents the transcription and standardization of canvas outcomes. Using the canvas, main and side cards, and the content template, a quick initial concept draft for critical design can be created.

4. Application

We held a workshop to evaluate the proposed tool's effectiveness. 14 participants from the Department of Information Art and Design at Tsinghua University, including postdoctoral fellows, Ph.D. students, and master's students, attended. They used a critical design toolkit pre- placed on Figma's online whiteboard to work in small groups and complete tasks. The workshop had five groups, each with 2-3 people, and the testing process took about 1 hour (excluding facilitator's guidance time). The workshop focuses on creative generation. It begins with an introduction to main/side cards, canvas, and templates. Participants then follow a guidance process, starting with identifying background issues, envisioning product concepts, narrativizing the product, and considering potential impacts. They can choose from pre-made cards or modify them. Upon conclusion of the canvas development (which could be done simultaneously), participants were required to fill into the template and use 'Dream Studio' to generate illustrations. The Definition was further refined, with an aim to encapsulate the essence of the plan in a single sentence.

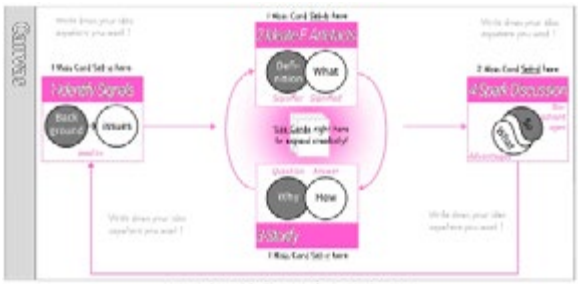

Fig. 3 The Guided Canvas for Critical Design

Fig. 4 The Content templates for critical design

Fig. 5 Proposals for some of the groups in the workshop (Left: The robot of the great compassionate universe; Middle: Gene Technology Copyright Store; Right: Experience Exchange)

The results (Figure 5) showed that the critical design proposal was completed by all groups. We observed three key benefits of using the tool. First, it enhances creative efficiency, as all groups finished the task in under an hour, demonstrating its novice-friendliness. Second, the tool improves the completeness of initial proposals, as its structurization compels participants to consider all design aspects, fostering continuous improvement. Third, the tool raises the quality of works, especially given the tool's integration of critical design spirit, the open-ended forms of "inventive problem making" (Michael, 2012), and provision of self-review space, aligning with artistic thinking (Whitaker, 2016) and facilitating proposal evolution.

5. Conclusion, limitation and future avenues

This article outlines the creative process of critical design, consisting of 4 steps and 8 content segments. It also introduces a design framework. Then, the initial extraction of 60 main cards and 20 sub-cards was carried out, and the canvas, content templates were formed. The Application showed improvements in the efficiency, completeness, and quality of initial creations. Limitations and future directions include diversifying the medium, accommodating more practitioners, incorporating new content, and developing more Chinese character prototypes or historical propositions.

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References

Angheloiu, C., Sheldrick, L., Tennant, M. and Chaudhuri, G. (2020). 'Future tense: Harnessing design futures methods to facilitate young people's exploration of transformative change for sustainability'. World Futures Review, 12(1): 104–122.

Anon. 'Mapping Speculative Design - EPMID'. Available at: https://www.epmid.com/Mapping- Speculative-Design [Accessed September 18, 2023].

Bardzell, S., Bardzell, J., Forlizzi, J., Zimmerman, J. and Antanitis, J. (2012). 'Critical design and critical theory: the challenge of designing for provocation'. In Proceedings of the Designing Interactive Systems Conference. DIS '12. New York, NY, USA: Association for

Computing Machinery, pp. 288–297. Bruce, S. (2005). 'Shaping Things'.

Burnam-Fink, M. (2015). 'Creating narrative scenarios: Science fiction prototyping at Emerge'. Futures, 70: 48–55.

Dator, J. and Dator, J. (2019). 'Alternative futures at the Manoa School'. Jim Dator: A Noticer in Time: Selected work, 1967-2018: 37–54.

De Ruyck, O., Conradie, P., Van Hove, S., All, A., Baccarne, B., De Marez, L. and Saldien, J. (2023). 'HCCI tool: a lens to support industrial designers during the conceptualisation of smart products'. International Journal of Technology and Design Education, 33(5): 1991–2017.

Dunne, A. and Raby, F. (2013). 'Speculative Everything: Design, Fiction and Social Dreaming'. Felt, U., Fochler, M., Müller, A. and Strassnig, M. (2009). 'Unruly ethics: on the difficulties of a bottom-up approach to ethics in the field of genomics'. Public Understanding of

Science, 18(3): 354–371.

Fergnani, A. and Song, Z. (2020). 'The six scenario archetypes framework: A systematic

investigation of science fiction films set in the future'. Futures, 124: 102645.

Fordyce, S. (2021). 'Discursive Design: Critical, Speculative, and Alternative Things, By Bruce and Stephanie Tharp: Cambridge, MA: MIT Press, 2018, 632pp. 311 Color Illustrations. ISBN

9780262038980. $39.95/\pounds 32.00.'

Forlano, L. (2019). 'Cars and contemporary communications| Stabilizing/destabilizing the

driverless city: Speculative futures and autonomous vehicles'. International Journal of

Communication, 13: 28.

Gregory, M.R. and Laverty, M.J. (2022). 'Frog and Toad at the Academy: Gareth B. Matthews on

how children's literature goes philosophical'. Policy Futures in Education, 20(3): 297–

315.
Haritaipan, L. (2019). 'Towards the Creation of Creativity Tools for Real-practice: A Review of 112 Design Tools in the Market'. The Design Journal, 22(4): 529–539.
Heidingsfelder, M.L., Bitter, F. and Ullrich, R. (2019). 'Debate through design. Incorporating contrary views on new and emerging technologies'. The Design Journal, 22(sup1): 723–735.
Irwin, T. (2015). 'Transition Design: A Proposal for a New Area of Design Practice, Study, and Research'. Design and Culture, 7(2): 229–246.
Jakobsone, L. (2019). 'Critical Design as a Resource. Adopting the Critical Mind-Set'. The Design Journal, 22(5): 561–580.
Kheirandish, S., Funk, M., Wensveen, S., Verkerk, M. and Rauterberg, M. (2020). 'HuValue: a tool to support design students in considering human values in their design'. International Journal of Technology and Design Education, 30: 1015–1041.
Lee, Y., Breuer, C. and Schifferstein, H.N. (2020). 'Supporting food design processes: Development of food design cards'. International Journal of Design, 14(2): 51–64.
Li, T. and Zhao, D. (2021). 'Mood Board Tool on High-level Semantics Visual Representation to Favor Creative Design'. In International Conference on Applied Human Factors and Ergonomics. Springer, pp. 408–419.
Lindley, J. and Coulton, P. (2015). 'Back to the future: 10 years of design fiction'. In Proceedings of the 2015 British HCI conference. pp. 210–211.
Lutz, D. (2023). 'Future Thieving #2 — Speculative design methods and tools'. Medium. Available at: https://uxdesign.cc/future-thieving-2-speculative-design-methods-tools-45b655096d95 [Accessed September 17, 2023].
Michael, M. (2012). '"What are we busy doing?" Engaging the idiot'. Science, Technology, & Human Values, 37(5): 528–554.
Milojević, I. and Inayatullah, S. (2015). 'Narrative foresight'. Futures, 73: 151–162.
Ramos, J., Sweeney, J.A., Peach, K. and Smith, L. (2019). 'Our futures: by the people, for the people'.
Wang, T., Xiao, D., Dong, Y. and Goossens, R.H. (2021). 'Development of a design strategy for playful products of older adults'. The Design Journal, 24(4): 525–545.
Whitaker, A. (2016). Art thinking: How to carve out creative space in a world of schedules, budgets, and bosses. Harper Business.

Picturing A Utopian Countryside: The Rural Settlement Recomposition Framed by the Urban-rural Continuum

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Abstract
It has become the mission of contemporary Chinese cities to break the long-standing dichotomy between urban and rural areas and establish a harmonious urban-rural human settlement full of love. Coincidentally with the idea, the urban-rural continuum defines this stable state of urban-rural integration. This article takes the urban-rural continuum as a theoretical derivation, aiming to depict a harmonious and cohesive future rural life picture. By interpreting the enlightenments of the urban-rural continuum, the article puts forward the idea of reshaping rural settlements based on the framework under the urban-rural continuum. The article proposes three prototypes of the future urban-rural settlements revived from the local culture and fully transformed to build a utopian urban-rural community full of warmth and care.

Author keywords
Social equality; The urban-rural continuum; Settlement recomposition; Rural revitalization; Utopia; Countryside

Introduction

The United Nations' 2030 Sustainable Development Goals Agenda—issues such as poverty, social inequality, climate change, and environmental degradation—pose challenges to the development of human societies worldwide (Persaud & Dagher, 2021). In contemporary China, people's demand for a better life contrasts sharply with the unbalanced and insufficient rural development. "Chinese modernization" has brought rural revitalization to a new orientation (L. Wang, 2021). Eliminating social inequality, healing and transforming rural areas with Chinese characteristics, and creating a new type of rural community full of harmony, tolerance, environmental friendliness, equality, and justice has become the mission of the times for Chinese designers. For this reason, the urban-rural continuum uses historical laws to repair the unbalanced urban-rural gap, trying to build an urban-rural community that transcends history and reality, and provides a path for creating an ideal community that blends rural and urban features in the future.

The blurred urban-rural boundaries resulting from the urban-rural mutual stimulation

Urbanization has led to the disappearance of the boundaries between urban and rural areas, and the urban-rural dual structure is disintegrating. Terry McGee, a scholar from University of British Columbia, named this regional urbanization phenomenon in rural areas with the Indonesian compound word Desakota (McGee, 1998; Ginsburg, Koppel, & McGee, 1991), which means "village (Desa)-city (Kota)."

Such an urban-rural mixed state, similar to Desakota, has also appeared in Chinese cities' urban-rural border under the rapid urbanization process. The city's high-speed absorption of the countryside does not fully cover the quality of upgrading rural settlements, and therefore there emerge urban villages—residential areas that are enclosed by the city but retain rural essence in terms of social nature (See Figure 1a). The vast rich-poor gulf makes these areas lag far behind the surrounding urban development and gradually decline into urban slums (Zhang & Zhao, 2007).

However, the impact of the urban-rural boundary is not a one-way expansion from the city to the countryside but also the phenomenon of reverse penetration from the countryside to the city. In response to the necessary intervention in the global ecological and food crisis, the city begins reclamation and recultivation and re-exported agricultural land to the city, forming a blend of the urban-rural landscape at the city's peripheries (See Figure 1b). The countryside is a pure land for contemporary recall of Chinese traditional history and culture, and it has also been gifted as a spiritual home for people to escape from urban life, pursue differences and individuality, and return to nature (Y. Wang & Li, 2016). The boundary between the city and the countryside is becoming increasingly blurred, and the urban and the rural will eventually move towards a post-urbanization equilibrium (Westlund, 2014). The new societal structure has resulted in a new spatial logic (Bolchover & Lin, 2013). The changing urban-rural relationship is redefining the architecture, planning, and design related to rural issues.

China's urban-rural continuum, not only a mix status but an invisible connection network

Figure 1 The epitomes of the urban-rural blending in Chinese cities. Source: Internet http://inews.ifeng.com/50472359/news.shtml?&back#imgnum=1, https://www.hangzhou.gov.cn/art/2023/3/28/art_1229633756_59077260.html

The urban-rural continuum became "Chinese Desakota," which scholars proposed to explain the concept of China's urban-rural development structure. It is considered a model neither rural nor urban but a combination of the two, a state of mixed rural and urban areas with indistinguishable boundaries (Guldin, 2001).

In addition, as early as the 1930s, American scholar William Skinner described the urban-rural continuum of Chinese rural society as a borderless but economically and functionally interconnecting city and village (Skinner & Baker, 1977). This connection reveals the urban-rural unity of traditional clans, kinship, and blood ties. At each town level, there were yamen (government), zumiao (ancestral hall), xuegong (school), and temples, uniting urban and rural areas in a top-down and bottom-up manner. These institutions were public and geographically coupled with the market towns.

Skinner put forward a theoretical model for the standard market hierarchy in China's rural areas by investigating the traditional rural areas in China and described the structural state of the urban-rural continuum combined

with the theory of polycentric places. A basic stable hexagon represents a small rural community with 18 villages evenly distributed around a central standard market town. Superior conditions can turn the standard market town into a more advanced intermediate and even central market town, with its accordingly-upgraded service scope and level. At the same time, adjacent market towns have different market days and activities to facilitate people choosing optional dates to take different life activities, invisibly forming another marketing structure (See Figure 2a) (Skinner, 1964).

Based on the principle model, the formation of villages and market communities is restricted by transportation costs and distances under different topographical conditions (Skinner, 1965). Two distribution patterns were drawn—planar (plain) with relatively fewer restrictions and linear (mountain) with relatively more restrictions, further affecting the overall spatial form of the urban-rural continuum structure (See Figure 2b). In plain areas, where the environmental conditions are relatively loose, rural settlements spread out based on the surface, and each settlement occupies a relatively average area of agricultural land. In contrast, settlement distribution in mountainous areas is the opposite, with a strip distribution based on valleys. Additionally, due to the influence of the cultivated land area, the distance between settlements is relatively large.

However, some scholars questioned Skinner's theory, believing that each region in his theory was too isolated and inconsistent with historical reality, and tried to revise his conclusions (Rozman, 1976; Rozelle, Huang, & Benziger, 2003; Sands & Myers, 1986). For us, the inspiration for Skinner's theory lies in its fundamental logic of emerging from the village to convey the method of community organization.

The ideal design method transforming the urban-rural continuum

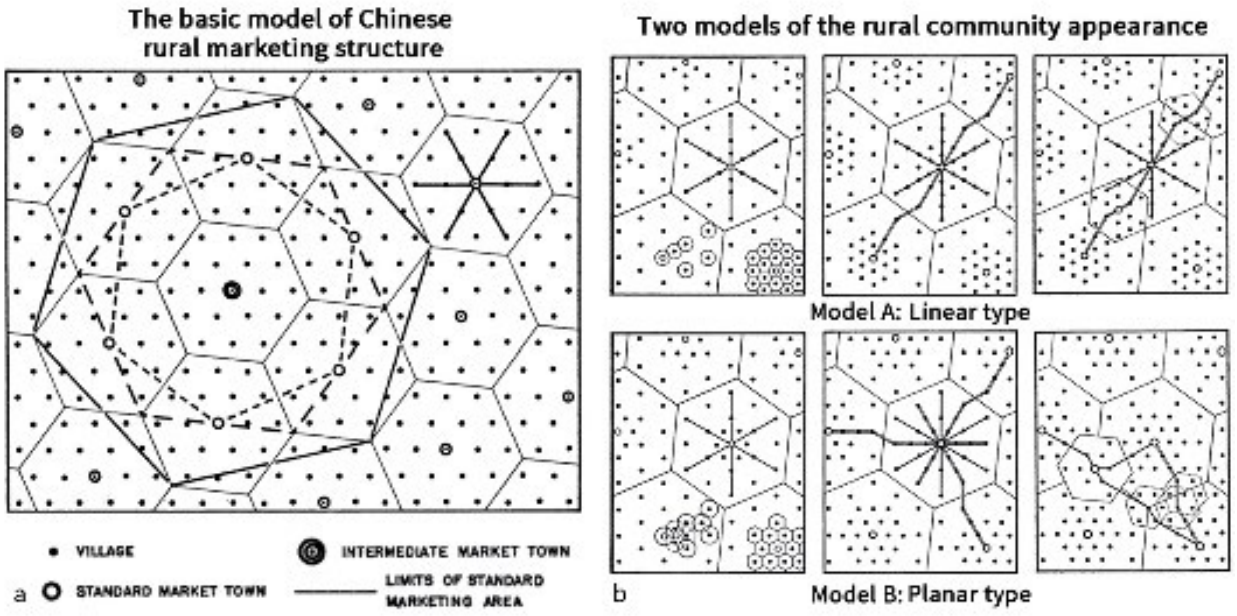

Figure 2 The models drawn from William Skinner's theory on the urban-rural continuum. Source: G William Skinner (1964,1985)

The urban-rural continuum theory is no longer a simple description of history, and it shows us an orderly intermingling relationship between the city and the village, an ideal utopian rural community organization framework, originating from the logic of the natural formation of human settlements (see Figure 3).

Skinner's theory shows that the scale of rural settlements in line with the anthropological laws is the basis for

forming urban-rural stability and maintaining the healthy growth of villages. Although Skinner uses a hexagon as an ideal form to express, the scale of the hexagon model is different in actual geographical conditions, and the degree of population densification varies greatly. The relative distance between settlements and cultivated land area impacts the population. The four km walking distance becomes the yardstick for measuring the area of each community, whose distance can be bear to reach the market within one hour's walk.

The mutual dependence relationship between settlements helps to form a stable urban-rural continuum. In Skinner's theory, this interdependent relationship is reflected through "going to the market." Blood ties, beliefs, and ideological needs break down boundaries and link villages and market towns. The urban-rural continuum emphasizes not a single village but considers the whole influence between settlements. It activates each settlement from the roles of villages in the network from the perspectives of function, location, and scale. This connection is a continuous bidirectional exchange of elements through complementarity rather than a one-way flow of elements.

The settlement development is inseparable from the guarantee of transportation conditions. Skinner's theory emphasizes that transportation conditions determine whether a settlement can develop into a higher-level community form. Only villages with high transportation accessibility and low costs can provide the primary conditions for the healthy growth of settlements.

Village connections are centered on communal architecture. Skinner's theory shows that markets, ancestral halls, yamen, academic palaces, and temples were integrated with the will of governance and the high solidarity degree of social beliefs. The commonality they share is the physical embodiment of the spiritual unity of the villagers.

Morphological proposals to the utopian countryside image

When urban and rural landscapes blend, rural residents are equal to the urban, the way of life and work changes,

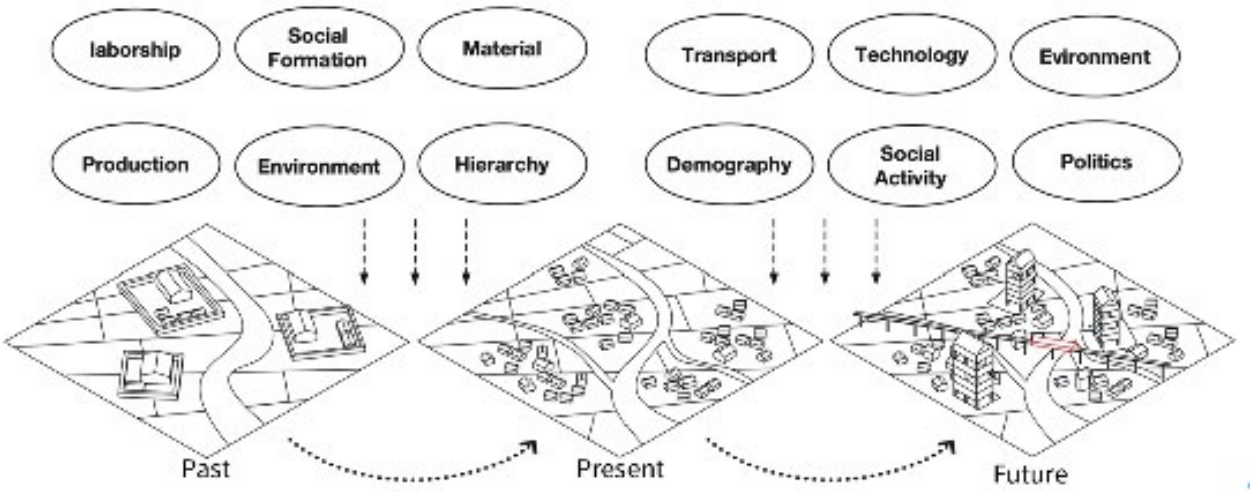

Figure 3 The transformation interpretation of the rural settlements. Source: Mao Lin (the first author)

people are no longer obsessed with urban agglomeration, the Internet removes geographical restrictions, and the countryside has complete living facilities, what will the countryside appear? In this regard, we propose three representative urban-rural continuum prototypes to describe the future rural landscape.

Plain Type – Scattered Settlements – Linpan settlements in Pidu, Chengdu, Sichuan

Linpan, a traditional residential form in which houses coexist with trees, is a typical settlement unit in the Chengdu Plain. The Dujiangyan irrigation system brought rich water resources to the Chengdu Plain, giving

the land a relatively uniform distribution of scattered settlements under the flat geographical advantage. However, this scattered feature has contradicted contemporary suburban planning, causing a conflict between traditional style and centralized housing construction in Chengdu (Lin, 2021). Because the composition of Linpan accommodates natural elements, the salvation of the Linpan settlement is a response to the ecological crisis.

In this regard, to protect the cultivated land, we propose to establish an outside-in urban-rural continuum with the extension of the elevated monorail line, an environmental-friendly and avant-garde transportation tool, from the train station as the skeleton. Targeted densification of settlements is carried out around the stations, with the new set-up of various public buildings that meet the needs of rural residents and urban users. Dilapidated homesteads are upgraded to increase the residential density to meet the population of nostalgia. The picture presents a new type of community with both rural and urban characteristics (See Figure 4).

Mountain type – Agglomeration Settlements –Hakka settlements in Huiyang, Guangdong

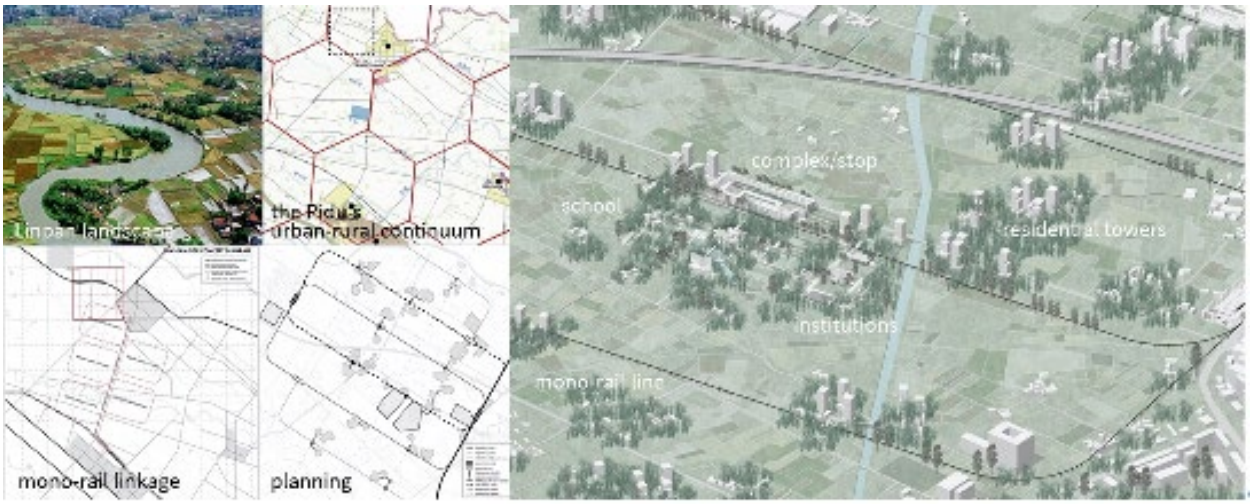

Figure 4 The human settlement design of Linpan. Source: Mao Lin (the first author)

The mix of urban and rural areas in the coastal areas of Guangdong has become an ordinary cityscape. Different historical migrants group lived there, leaving their traditional agglomeration villages full of this area and causing the place a hybrid architectural vision. Due to the hilly and irregular terrain, traditional settlements, Tulou, Weiwu, and other Hakka traditional dwellings are intertwined with the cityscape (Meriggi, 2018).

Given the compact state of the urban-rural mix, we propose a rural upgrading model from the inside out by enhancing the basic service infrastructure. The village space to improve land use efficiency is densified by using typology as the architectural design method to consolidate the connection of the inside traditional public buildings, which forms a new type of rural community with a perfect communal architecture medium as the framework by enhancing the endogenous power of the village (See Figure 5).

Abnormity Types – Agglomeration Settlements – Taobao villages in Kandun, Zhejiang

Kandun Town is located in Cixi, a city near to Hangzhou Bay, where the government is rebuilding the area to

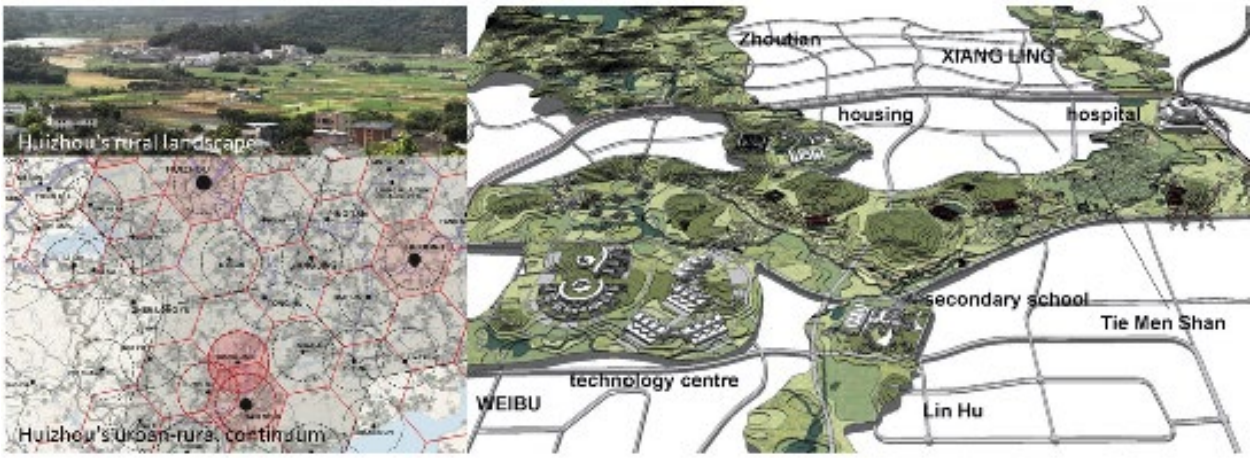

Figure 5 The human settlement design of Hakka settlement area. Source: Meriggi (2018, 2017)

support the economic strip from Shanghai to Hangzhou. The area forms linear rural settlements distributed along the artificial canal perpendicular to the coastline. In recent years, online e-commerce has become the pillar of the rural economy, and the small-scale cottage industry has been a main local characteristic from history to present (Fang, 2006). Filled with urban activities, Kandun has highlighted the characteristics of urbanization in villages. Kandun's geographical environment and industrial needs lead to an urban-rural continuum solution tailored to local conditions to reconcile urban planning in construction. We took the planned train station as the core, used the growth of the strip system to extend from the built-up space to the farmland, and transformed the low-level residential buildings into a supplement to the future high-density built-up area. Commercial space in the lower corridor was set up to provide joint production to accommodate overflow orders from cottage workshops. The strip space is the skeleton to compound the public space, which is the core of reorganizing the community groups (See Figure 6) (Meriggi, Chen, & Chu, 2022).

Conclusion

The urban-rural continuum theory expounds on the anthropological logic of traditional Chinese rural communities' organizational structure, revealing the secrets of the close connection between villages and urban

Figure 6 The human settlement design of Kandun Taobao villages. Retrieved from Xiao Chu (the second author)

settlements. It is not only an explanation of the law of historical development but also a utopian prototype for the future spatial form framework of rural settlements; it expresses a mixed state of urban and rural areas and an orderly connection between urban and rural hierarchy.

The specific recommendations of the UN-Habitat's final draft of the Strategic Plan 2020-2025 for reducing spatial inequality and poverty in the urban-rural continuum are to enhance access to essential services, sustainable transportation, and public space, increase housing security, and consider long-term settlement growth and regeneration (UN-HABITAT, 2018), which coincides with the spiritual connotation shown in the ideal rural picture proposed under the framework of the urban-rural continuum. The urban-rural continuum provides a reference for the new design of a rural community in China. It reflects the past human settlements' trauma and transcendence of reality.

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References

Persaud, N., & Dagher, R. (2021). The united nations: 2030 sustainable development goals agenda. In The role of monitoring and evaluation in the UN 2030 SDGs agenda (pp. 1-41). Cham: Springer International Publishing.

Wang, L. (2021). Zhongguoshi xiandaihua jinchengzhong de xiangcun zhenxing yu lunli chongjian [Rural revitalization and ethical reconstruction in the proces of Chinese-style modernization]. Zhongguo shehui kexue(12), 89-109+201. https://kns.cnki.net/kcms2/article/abstract?v=3uoqIhG8C44YLTlOAiTRKibYlV5Vjs7iJTKGjg9uTdeTsOI_ra5_XU7wCeT-urfy_DpysMdavhXhmHWDh3idKJszC0j8A3Wo&uniplatform=NZKPT

McGee, T. G. (1998). Five decades of urbanization in Southeast Asia: A personal encounter. In Urban development in Asia: Retrospect and prospect (pp. 55-91). Hongkong: Hong Kong Institute of Asia-Pacific Studies.

Ginsburg, N. S., Koppel, B., & McGee, T. G. (1991). The extended metropolis: Settlement transition is Asia. Honolulu: University of Hawaii Press.

Zhang, J., & Zhao, W. (2007). Eryuan guizhi huanjingzhong chengzhongcun fazhan jiqi yiyi de fenxi [City village in dual-system environment: Development and significance]. Chengshi guihua(01), 63-67. DOI:10.3321/j.issn:1002-1329.2007.01.009

Wang, Y., & Li, G. (2016). Xiangcun shuaibai yu fuxing zhi bian [Decline and revitalization of countryside]. Guihuashi, 32(12), 142-147. DOI:10.3969/j.issn.1006-0022.2016.12.023

Westlund, H. (2014). Urban futures in planning, policy and regional science: Are we entering a post-urban world? Built Environment, 40(4), 447-457. https://doi.org/10.2148/benv.40.4.447

Bolchover, J., & Lin, J. (2013). Rural urban framework: Transforming the Chinese countryside. Basel: Birkhäuser Verlag GmbH.

Guldin, G. (2001). What's a peasant to do? Village becoming town in southwestern China. Boulder and Oxford: Westview Press.

Skinner, G. W., & Baker, H. D. (1977). The city in late imperial China. Redwood City: Stanford University Press.

Skinner, G. W. (1964). Marketing and social structure in rural China, Part I. The Journal of Asian Studies, 24(1), 3-43. https://doi.org/10.2307/2050412

Skinner, G. W. (1965). Marketing and social structure in rural China Part II. The Journal of Asian Studies, 24(2), 195-228. https://doi.org/10.2307/2050562

Rozman, G. (1976). G. William Skinner's review of urban networks in Ching China and Tokugawa Japan. The Journal of Asian Studies, 35(2), 363-364. https://doi.org/10.2307/2054031

Rozelle, S., Huang, J., & Benziger, V. (2003). Continuity and change in China's rural periodic markets. The China Journal(49), 89-115. https://doi.org/10.2307/3182196

Sands, B., & Myers, R. H. (1986). The spatial approach to Chinese history: a test. The Journal of Asian Studies, 45(4), 721-743. https://doi.org/10.2307/2056084

Lin, M. (2021). The future city in rural Chengdu plain: Checking the planning under the urban-rural continuum. (PhD). Politecnico di Milano, Milano. Retrieved from https://www.politesi.polimi.it/handle/10589/178059?mode=simple Available from Biblioteche e Archivi, Politecnico di Milano POLITesi database.

Meriggi, M. (2018). L'architettura del continuo urbano-rurale in Cina: insediamenti Hakka nel Guangdong orientale [The architecture of the urban-rural continuum in China: Hakka settlements in eastern Guangdong]. Boves: Araba Fenice.

Meriggi, M. (2017). Chinese urban-rural continuum as framework for the Green City of the future in east Pearl River Delta. Paper presented at the S. ARCH 2017-Sustainable Architecture. The 4th International Conference on Architecture and Built Environment, Hongkong. https://re.public.polimi.it/handle/11311/1033178

Fang, B. (2006). Shili changjie Kandun [Kandun: Ten miles' long street]. Beijing: Xinhua Chubanshe.

Meriggi, M., Chen, K., & Chu, X. (2022). City Region-Ningbo e il paesaggio operazionale dei villaggi Taobao. Stato dell'arte e alternative possibili di nuove forme di insediamento [City Region-Ningbo and the Taobao village operational landscape. State of the art and possible alternatives of new forms of settlement]. Memorie Geografiche 21, 31-41. https://re.public.polimi.it/handle/11311/1226762

UN-HABITAT. (2018). Final Draft Strategic Plan 2020-2025 (HSP/CPR/71/10). Retrieved from https://unhabitat.org/sites/default/files/documents/2019-05/strategic_plan_2020-2025.pdf

Towards a Resilient Future: Improving living Street resilience in Small and Medium-Sized Towns in the Jiangnan Region, China, Based on Soft Systems Methodology

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Abstract

In an era of escalating global uncertainties, forward-thinking concepts such as resilient cities, smart communities, and shared streets have garnered substantial attention in urban development. However, research and practical exploration of these concepts have mainly concentrated on mega-cities, such as China's bustling metropolises of Beijing, Shanghai, Guangzhou, and Shenzhen. The immense developmental potential inherent in small and medium-sized towns, particularly those nestled in China's Jiangnan region, often endowed with unique natural landscapes and rich historical heritage, has regrettably remained inadequately acknowledged. Despite their rapid growth in recent years, the spatial configurations of these towns demand urgent rectification and improvement. There needs to be more than the prevailing focus on physical level refurbishments, rooted in the past, to align with contemporary and future demands.

Recently, guided by many policies, the revitalization of streets has gained more attention in urban renewal endeavors. Among these, living streets, intricately linked with the well-being of residents, bear particular relevance. However, living streets tend to be ignored compared to the well-acknowledged emphasis on historic streets. This paper, guided by resilience principles, takes the case of living streets in Yixing, Jiangsu Province, China, as an illustrative example through a comprehensive on-site investigation dissecting four issues. At the macro level, the existing renovations need more comprehensive consideration. Meso perspective, revealing the uneven distribution of space-time utilization in neighborhoods. Micro level, ignoring human-scale considerations catering to diverse population segments. Temporal dimension: lacking flexible spaces to adapt to changes. Delving into how the living streets can attain a "resilient balance" amidst a complex urban system involving multi-stakeholders, this paper applies Checkland's Soft Systems Methodology, an integrated approach encompassing socio-economic and environmental factors, to analyze the soft issues pertinent to resilience within living streets. It ultimately forges a systematic approach for enhancing the resilience of living streets in small and medium-sized towns. At the macro level, aligning with urban development objectives. Meso dimension, applying intelligent technologies to calibrate street space allocations. Micro-level, implementing participatory workshops to harmonize the demands of diverse stakeholders. Moving to the temporal dimension, planning a phased renewal plan. These innovative strategies offer actionable design guidelines, preparing a forward-looking agenda for future uncertainties.

Author keywords
Small and Medium-Sized Towns; living Streets; resilience Concepts; Soft Systems Methodology.

Introduction

Living street refers to streets primarily serving residents by providing housing, small to medium-sized life-service businesses, and public service facilities as their main functions along the route(Bain, Gray, & Rodgers, 2012). Scholars have explored living streets' humanization, regional characteristics, and spatial vitality(Huang and Dai 2009). However, there needs to be more comprehensive research on how living streets, particularly those in smaller towns, can become more adaptable to dynamic changes and enhance their resilience to drive urban development. Furthermore, there needs to be more exploration into future demands and trends driven by new technologies.

Renewing living streets in small to medium-sized towns is crucial in achieving high-quality urban and economic development. Yixing, located at the geographical center of Shanghai, Ningbo, and Hangzhou, is a historic and culturally significant city in China and one of the most economically robust county-level cities(Zhu, 2003). The living streets in Yixing represent the challenges and characteristics of living streets in the Jiangnan region's small to medium-sized towns. Therefore, this study uses a case study of Yixing's main urban living streets. Through on-site research and problem identification, it aims to improve resilience in living streets under the guidance of resilience concepts and the Soft Systems Methodology (SSM).

Resilience, Living Streets and Soft Systems Methodology

Urban Resilience and Resilience of Living Streets

In today's increasingly unstable world, urban resilience has gained significant attention. It is defined as "the ability of urban systems and their residents to maintain normal functioning under various shocks and pressures, actively adapt, and transition towards sustainable development"(Meerow, Newell, & Stults, 2016). However, resilience issues in living streets have received relatively less recognition. Building upon the dimensions of urban resilience research and considering the time dimension, this paper attempts to establish resilience objectives for livable streets, overcoming the limitations of a singular spatial scale (Figure 1).

Living street resilience in different scale	Key Feature	Target	Temporal Dimension
Macro Level: Urban Resilience	Robustness, Risk management, Redundancy, Relative stability	Climate change, Environmental shifts, Economic downturns, Long-term technological developments	Pre-renewal: the present and future development directions
Meso Level: Neighborhood Equilibrium	Self-organization, Agility, Efficiency, Collaboration	Tidal traffic, Microclimate disruptions, Sudden events, Extreme weather, Community planning adjustments.	Current phase: spatial adaptability to activities across seasons
Micro Level: living Street Flexibility	Adaptability, Diversity, Fairness, Modularity	Non-routine Activities, Conflicts among users, Temporary occupations, Random events, seasonal variations	Post-renewal: Assess transformation impacts for the next phase

Figure 1. Multi-level Resilience Objectives of Living Streets.

Soft Systems Methodology (SSM) in the study of resilience in living streets

Resilience concepts offer the advantage of harmonizing multi-level contradictions in living streets. However,

the term "resilience" is multifaceted and vague, lacking a well-defined guiding framework for its application in improving street space environments. Therefore, based on identifying resilience objectives, this paper employs the Soft Systems Methodology (SSM) to analyze multiple influencing factors. SSM, developed by British scholar Peter Checkland in the early 1970s, aims to address ambiguous, human-related issues and possesses flexibility, adaptability, and scientific rigor when dealing with complex social problems(Checkland, 2000).

Application of SSM in the analysis of resilience systems in living streets

This research employs on-site inspection, questionnaire surveys, expert symposium and in-depth interviews to collect and organize information on the status of 83 living streets, user needs, and planning objectives within the research scope. Subsequently, following the seven steps of the Soft Systems Methodology dissected the issues and ultimately constructed a conceptual model.

Perception and Expression of Problem Situations

Macro level, lack alignment with multi-level urban development objectives.

Meso level, uneven distribution of temporal and spatial utilization of street in neighborhoods

Micro level, Lack consideration for humanization, especially for vulnerable groups.

Temporal dimension, lack flexible development space oriented towards the future.

Root definition of resilience system in living streets

Following the steps of SSM, the root definition was clarified by analyzing the six CATWOE elements to determine what should be done in the problem context of insufficient resilience in living streets in small and medium-sized towns (Table 1).

Table 1. CATWOE root definition.

CATWOE Elements	Customer (C)	Actor (A)	Transformation (T)	Worldview (W)	Owner (O)	Environment (E)
Description	Residents, tourists, local government, and other stakeholders.	Urban planners, community and government representatives, non-profit organizations, etc.	Enhance the resilience of living street in terms of space, operations and other aspects, based on an analysis of the demands of multiple stakeholders.	Resilient city objectives, environmental sustainability, preservation of local cultural characteristics, etc.	Government and relevant planning departments.	The social, cultural, and economic environment of the city, external factors such as climate change and global development trends.

Conceptual model of resilience enhancement in living streets

Based on the previously proposed resilience goals model for living streets and the specific element analysis derived from the root definition, a conceptual model for enhancing resilience in the spatial environment of living streets was constructed (Figure 2).

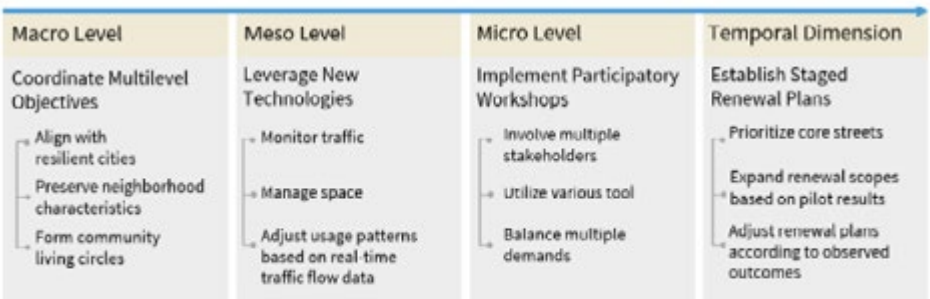

Figure 2. Conceptual model of living street resilience in small and medium-sized towns

Macro-Level: Coordinating resilience objectives across multiple aspects

Living streets are part of the overall urban system, connecting neighborhoods and cities at the higher level and focusing on the interaction between people and space at the lower level. Therefore, the resilience objectives of living streets need to be coordinated with goals at three progressive levels(Sharifi, 2019). It is crucial to align with current and future resilient city development goals, reserve space for adjustments and preserve cultural heritage. For instance, "Four Streets Eight Alleys" in Yixing holds cherished memories for residents and should integrate traditional functions with new ones. Living streets should be coordinated with the planning of community life circles to create convenient living environments.

Meso-Level: Using smart technology to adjust the allocation of various functional zones in street

New technologies like big data, IoT, and autonomous vehicles provide opportunities for creating more flexible streets(Riggs, 2018). In the context of intelligent streets, online controls can complement and optimize onsite processes, enabling dynamic management around the clock and reducing labor. Intelligent connectivity platforms and AI sensing technology allow real-time monitoring of street capacity, traffic congestion, and parking space usage. This data can be used to make targeted real-time adjustments to speed limits, space usage patterns, lane directions, and quantities. Control essential pedestrian zones while flexibly adjusting others. Integrating resilience and sharing concepts with evolving technology can enable living streets to better adapt to the fast-paced lifestyles and the emerging trends that may arise in the future.

Micro-Level: Participatory Workshops coordinating diverse demands

Amid the prevailing trend of demand-driven urban renewal, numerous grassroots initiatives have underscored the pivotal role of public engagement throughout the process(Dell'Anna & Dell'Ovo, 2022). In the age of data, various technologies have facilitated information collection. Participatory workshops can effectively harmonize the demands of various stakeholders, utilizing both traditional and digital tools. Virtual Reality (VR) technology can create immersive experiential scenarios to assess the impact of transformations, subsequently allowing for direct adjustments to street spaces based on specific issues or indirect alterations through urban furniture(Ahmed & Rani, 2018).

Temporal dimension: Implementing phased update strategies

Segmenting the plan into parts allows for alterations to different streets or locations during different periods. Phased updates by region are more likely to be accepted by the community. Streets with significant problems and high demand should be prioritized for renovation, as their improvements carry more excellent value and influence. Their exemplary role can facilitate the smooth progress of long-term development. Strategic adjustments can be made as necessary by evaluating the results of initial pilot area updates, and the scope of updates can be expanded. This approach minimizes redundancy during the updating process.

Conclusion

In the current context of challenges and opportunities, the inherent issue of insufficient resilience in livable streets has brought about a chain of problems, including reduced urban vitality, limited adaptability, inability to meet the multi-tiered demand. We aim to identify resilience objectives across multiple levels and seek a balance among diverse stakeholder demands. Proposing a forward-looking guide combining rigidity and flexibility, integrating traditional and new technologies, and unifying long-term and short-term goals. This vision is directed towards fostering more resilient, living streets, ultimately driving the enhancement of urban resilience.

This study can provide valuable insights for addressing the potential emergence of various ambiguous issues in future cities. It encourages urban areas to contemplate transformation amidst changing circumstances, transcending traditional development models and striving to construct urban systems that are more sustainable,

resilient, and adaptive.

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References

Ahmed, S. H., & Rani, S. (2018). A hybrid approach, Smart Street use case and future aspects for Internet of Things in smart cities. Future Generation Computer Systems, 79, 941-951.

Bain, L., Gray, B., & Rodgers, D. (2012). Living streets: Strategies for crafting public space: John Wiley & Sons.

Checkland, P. (2000). Systems thinking, systems practice: includes a 30-year retrospective. Journal-Operational Research Society, 51(5), 647-647.

Dell'Anna, F., & Dell'Ovo, M. (2022). A stakeholder-based approach managing conflictual values in urban design processes. The case of an open prison in Barcelona. Land use policy, 114, 105934.

Meerow, S., Newell, J. P., & Stults, M. (2016). Defining urban resilience: A review. Landscape and Urban Planning, 147, 38-49.

Riggs, W. (2018). Technology, civic engagement and street science: hacking the future of participatory street design in the era of self-driving cars. Paper presented at the Proceedings of the 19th Annual International Conference on Digital Government Research: Governance in the Data Age.

Sharifi, A. (2019). Resilient urban forms: A review of literature on streets and street networks. Building and Environment, 147, 171-187. doi:10.1016/j.buildenv.2018.09.040

Huang, D., & Dai, D. (2019). The Influence of Constituent Elements of Living Streets on Vibrancy: A Case Study of Typical Streets in Shenzhen. Chinese Landscape Architecture, 35(9), 89.

Zhu, L. (2003). Research on Road Network Planning in Small and Medium-sized Cities in the Jiangnan Water Network Area. (Master's thesis). Tongji University.

Knowledge Graph Analysis of Traditional Village Cultural Heritage Research

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Abstract

This paper aims to analyze the history and hot frontiers of traditional village cultural heritage research. This study takes 6225 Chinese literatures and 7538 foreign literatures collected by CNKI and Web of Science from 1998 to 2023 as the research objects, and uses Citespace software to analyze the knowledge map from the dimensions of research overview, research process, research authors and publishing institutions, and keyword development path. This paper discusses and analyzes the research results of traditional village cultural heritage at home and abroad, and summarizes and prospects the research direction.

Author keywords

Foresight Plan;Traditional Village;Cultural Heritage;Knowledge Graph;Citespace

Introduction

The traditional village used to be the main place for people to engage in various production activities. It is the cultural carrier and symbol of agricultural civilization. The cultural heritage connects the historical memory and folk culture of the place, and breeds the local culture. Nowadays, with the rapid development of industrialization and urbanization in various countries of the world, the villages on which people once depended are facing problems such as continuous decline and separation of old and new areas.

Traditional villages have become a topic of concern around the world, and relevant research literature has also increased year by year.

With the development of information visualization, more and more academics use scientific knowledge maps for research. In 2005, mapping knowledge domains began to be used in academic research in China.Scientific knowledge map is an image that shows the development process and structural relationship of scientific knowledge based on knowledge domain. In the face of a large number of documents, the use of software tools to visualize the literature data will improve the efficiency of learning and research, and the conclusion will be more accurate. Therefore, this study will use Citespace as a tool of bibliometric analysis to analyze the knowledge map of traditional village cultural heritage, construct a visual knowledge map, grasp the research status and progress of traditional village cultural heritage as a whole, and carry out research review and prospect, so as to provide reference for the follow-up research of traditional village cultural heritage.

Research Methodology and Literature Data Collection

Knowledge Graph is a fast way to present data in today's big data era. At present, the tools commonly used in academic circles to draw graphs are Citespace ,SPSS , Ucinet ,VOSviewer and so on. This article mainly uses Citespace software (V6.2.R4 (64-bit)) to extract network maps and timeline maps of researchers and publishing

institutions for visual analysis.

First, Chinese literature and English literature were collected from China National Knowledge Infrastructure(CNKI) and Web of Science. Searched by 'subject' with 'all years' as the time span. Due to the different appellations of traditional villages in China, ' 传统村 落 ', ' 古村落 ' or ' 传统聚落 ' are selected as the search terms, and ' 文化遗产 ' is added as the search term to search the process. Unrelated items such as conference notices, conference drafts, newspaper reports, and results introductions were deleted. A total of 6225 articles were obtained. Each article contains information such as author, institution, keyword, abstract, and publication date. In the collection of English literature, the source of literature is limited to all the literature in the 'Web of Science Core Collection '. The combination of ' traditional village ' + ' cultural heritage ' or ' ancient village ' + ' cultural heritage ' or ' traditional settlement ' + ' cultural heritage ' was used for retrieval, and ' theme ' was used as the retrieval approach. The retrieval time of the literature was ' all years ', and a total of 7538 articles were obtained.

Subsequently, 6225 Chinese literature and 7538 foreign literature valid samples were transferred.

Research Overview

Overview of overseas research

As shown in Figure 1, the research on the cultural heritage of foreign traditional villages has been published since 1998, until 2017, it continued to grow slowly, and the number of publications increased rapidly after 2017. Overall, foreign related research is generally greater than domestic research.

From the source of international journals, Sustainability is the most published journal abroad, with 185 articles, followed by Journal of Ethnobiology And Ethnomedicien.Foreign traditional village cultural heritage research areas involve China, the United States, Japan, Italy and other places (Figure 1.), of which the volume of Chinese traditional villages is the largest, followed by the United States. From the keywords of foreign literature, the content of foreign traditional village research includes ' land use ', ' climate change ', ' thermal comfort ' and ' traditional ecological knowledge '.

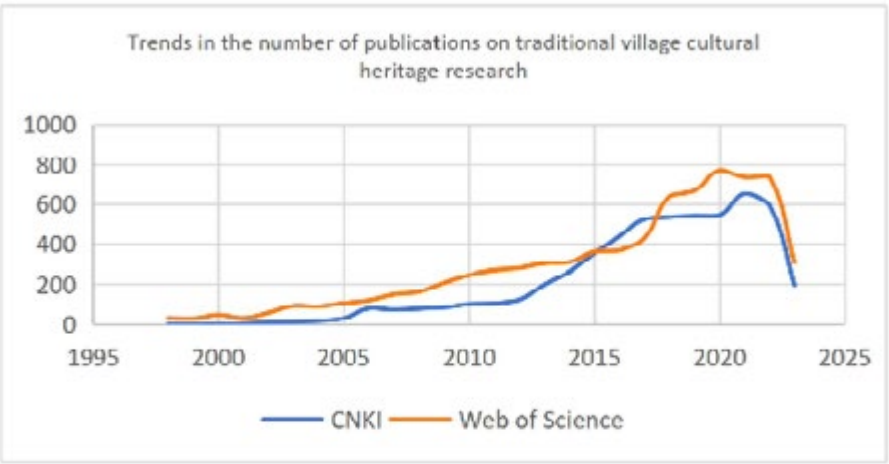

Figure 1. Trends in the number of papers published on traditional village cultural heritage research

Overview of domestic research

Research history

From the perspective of domestic literature as a whole (Figure 1.), the number of documents issued by traditional

village cultural heritage in China has increased steadily, especially after 2012, the number of documents issued has increased significantly until 2017, and the growth rate has slowed down. So far, it has shown an increasing trend (as of August 2023) and reached its peak in 2021. The research stage of traditional village cultural heritage in China can be divided into three stages :

1 Emerging and starting stage (1998-2012)

From the policy point of view, in 2006, the first professional cultural forum on the theme of protecting ancient villages was held. Under the initiative of Mr. Feng Jicai, all walks of life launched an investigation and collation of the cultural heritage of traditional villages, and the literature on the cultural heritage of traditional villages subsequently increased significantly ; in 2008, the " Regulations on the Protection of Famous Towns and Villages of Historical and Cultural Cities " was issued to promote the systematization, standardization and legalization of cultural towns and villages ; at this stage, a total of 646 traditional villages were included in the first batch of traditional villages. The guiding documents issued by have laid the foundation for policy support for the next stage of literature 's explosive growth.

From the perspective of academic research, compared with foreign research on the cultural heritage of traditional villages, China is in its infancy, with a total of 728 articles published between 1998 and 2012. In the 1980 s, China 's academic circles began to shift from traditional dwellings to the study of traditional villages. The research contents involved ' ancient villages '(古村落), ' settlement protection and development '(聚落保护与 发展), ' rural tourism '(乡村旅游), ' ancient village renovation '(古村整治)and ' human settlement environment construction '(人居环境建设). 'Ancient village ' is a very vague concept, and traditional villages are not equivalent to ancient villages in the general sense.Later, ' traditional village ' has a clear definition : it refers to the ancient architectural community with the value and overall inheritance of traditional culture and national culture. At this stage, the scope of research topics on traditional village cultural heritage is relatively narrow, mainly focusing on topics such as protection planning and development strategy. In addition, under the policy of ' protecting ancient towns, building new areas, developing economy and opening up tourism ' proposed by Ruan Yisan, Wang Yuan, Wang Yinyin,Han Fei and others explored the evolution of village forms under the influence of rural tourism.

At this stage, the national policy level has issued many guiding documents, which provide policy support for the next step to better promote the development of traditional villages. The academic research focuses on ancient villages, settlement protection and development, rural tourism, ancient village renovation and human settlement environment construction. The research methods at this stage are relatively simple, mainly based on field research, in-depth interviews and case analysis as the main qualitative research methods.

2 Rapid growth stage (2013-2017)

From the perspective of policy release, in 2013, the Ministry of Housing and Urban-Rural Development issued the "Basic Requirements for the Preparation of Traditional Village Protection and Development Plans (Trial)" and announced a list of 915 second-batch traditional villages; in 2014, the Ministry of Housing and Urban-Rural Development issued the "Guiding Opinions on Effectively Strengthening the Protection of Traditional Villages in China" and announced the list of 994 third batch of traditional villages; in 2015, the Ministry of Housing and Urban-Rural Development issued a notice on the protection of traditional Chinese villages. In 2016, a list of 1598 fourth batches of traditional villages was determined. The successive releases of relevant policies showed that the state attached great importance to the research work of traditional village cultural heritage at this stage.

From the perspective of academic research, there were 1750 documents published in 2013-2017, which was more than twice the previous stage, and the number of documents had increased significantly. At this stage,

domestic scholars introduced multi-angles such as religious culture, cultural ecology, and landscape genes to study the cultural heritage of traditional villages. The keywords included ' digitization ' (数字化)' activation '(活化), ' landscape gene '(景观基因) ' organicity ' (有机性), and the research areas involve ' Guangdong Province ', ' Anhui Province ', and ' ethnic minority areas '. Combined with the literature, the research methods of this period included the trend of combining qualitative and quantitative research methods.

The release of national policies had promoted the development of research, so the number of documents at this stage showed explosive growth, and the research content had enriched the historical, cultural, scientific and other diversified content on the basis of traditional rural protection. The study area involved ethnic minority areas; in terms of research methods, the traditional qualitative analysis had been transformed into quantitative analysis using tools such as remote sensing, GIS, and digital models.

3 In-depth development stage (2018-present)

From the perspective of policy release, in 2018, the CPC Central Committee promulgated the " Opinions of the State Council on Implementing the Rural Revitalization Strategy " and the " Rural Revitalization Strategic Plan (2018-2022) " to provide policy support for rural development and protection. Subsequently, a large number of scholars participated in the research, and the number of publications reached a peak in 2021. At this stage, the Ministry of Housing and Urban-Rural Development and other departments announced the fifth and sixth batch of national traditional village lists, a total of 8155, which provided a rich reference sample for scholars ' research on traditional village cultural heritage.

From the perspective of academic research, there has been 3856 articles published since 2018. The first two stages had laid a solid theoretical foundation for this stage with the support of national policies and the participation of the whole population. The research hot topics at this stage added local landscapes, heritage protection, and rural revitalization. The research topics focus on the 'integration of culture and tourism in traditional villages'(传统 村落的文旅融合), 'the optimization and renewal of traditional landscapes'(传统景观的优化 更新), and 'the application of digital technology in cultural heritage'(数字技术在文化遗产中 的运用). The research content has changed from the previous horizontal expansion to the vertical deepening of different elements of the same sample. There are also innovations in research methods. For example, Li Bohua et al., using space syntax and cognitive image theory, combined with field research data, interpreted the internal relationship between spatial morphological characteristics and spatial cognition in Qinchuan Village. Based on Heritage Impact Assessments (HIAs), Xiao Hongwei et al. expounded the relevance and coupling between heritage impact assessment and traditional village cultural landscape protection, and proposed the significance and value of applying heritage impact assessment to traditional village cultural landscape protection.

The academic research content of this stage has changed from the previous horizontal expansion to the vertical deepening of the total factor ; the scope of research has shifted from the spatial pattern and morphological evolution of traditional villages to the endogenous culture of more in-depth traditional villages ; the research methods are more diverse, involving quantitative research methods such as spatial syntax, impact assessment, digital model technology, and even qualitative and quantitative mixed research methods.

Analysis of researchers and cooperative networks and publishing institutions

The author is the main body of scientific research. Through the analysis of the structural characteristics of the author and his cooperation network, the core author group and its cooperation relationship in this field can be reflected. The number and size of nodes in the figure represent the co-occurrence frequency of the core author group. The lines and thickness reflect the author 's cooperative relationship and cooperation intensity. They

together form the knowledge map of the author group and the cooperative network.In the figure (Figure 2.), it can be seen that a total of 258 nodes and 19 links appear, and the network density is 0.0023.From the frequency point of view, the authors with the highest number of occurrences are Liu Peilin, Feng Jicai and Deng Yunyuan, and the number of publications has reached more than 10, which are 25, 11 and 10 respectively, followed by Li Bohua, Zhang Jie and Dou Yindi.The node connection reflects the cooperative relationship between the authors. From the diagram, it can be seen that the research on the cultural heritage of traditional villages has initially formed two core research teams, that is, the research team with Liu Peilin, Deng Yunyuan, Dou Yindi, Li Bohua as the core, and the research team with Sun Zhiguo, Xiong Wanzhen and Liu Hong as the core (Figure 2.). From the perspective of cooperation intensity, there is a certain degree of cooperation among the issuing agencies in China, but the research differences between the teams are large, and the cooperation intensity is very weak.

The number of papers issued by scientific research institutions shows their achievements and investment in this research field. Through Citespace software, the research status and actual contribution of the publishing institutions to the cultural heritage of traditional villages were analyzed, and the cooperation map of the publishing institutions was obtained. It can be seen from the figure (Figure 3.) that the research on the cultural heritage of traditional villages is mainly concentrated in colleges and universities. The university with the largest cumulative number of publications is Xi 'an University of Architecture and Technology, with a number of 202 articles. Followed by South China University of Technology, Taiyuan University of Technology, Kunming University of Science and Technology. At present, most colleges and universities explore the sustainable development of traditional villages from the perspective of cultural protection and optimization. Due to regional differences, most universities adopt the principle of proximity when selecting samples, and explore different paths for the protection of cultural heritage in different regions. The research team of South China University of Technology pays close attention to the way of traditional village activationand the texture of landscape formation. In recent years, Hengyang Normal University has made great progress in the fields of digital protection and application of traditional villages, landscape gene mining and so on.

Keywords development path analysis

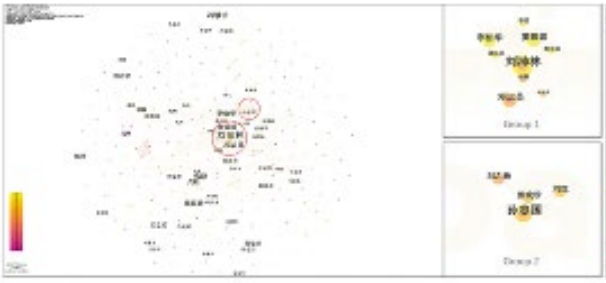

Figure 2. Co-occurrence knowledge map of traditional village cultural heritage research institutions

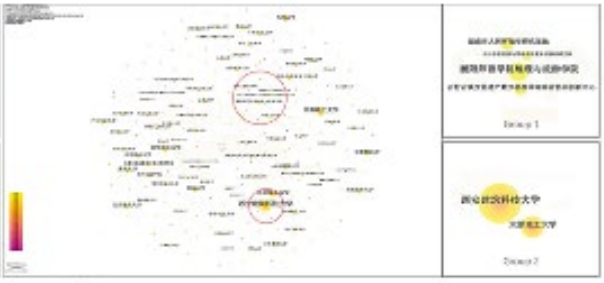

Figure 3. Knowledge map of co-occurrence of authors of traditional village cultural heritage research

The time-line cluster map was generated by Citespace software (Figure 4.) . We can see that the keyword co-occurrence map of traditional village cultural heritage research is roughly developed in eight directions, which are Traditional Villages, Ancient Villages, Traditional Settlements, Preservation, Rural Revitalization, Cultural Heritage, Traditional Dwellings, and Renovation.

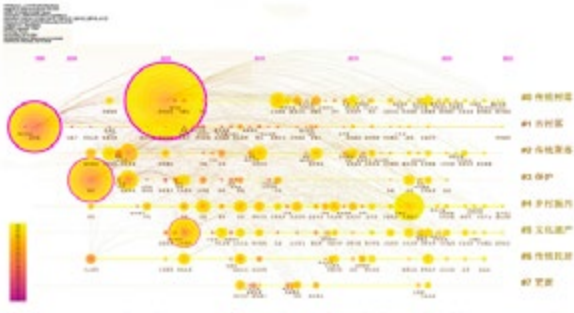

Figure 4. Time-line cluster map of keywords in raditional village cultural heritage research

Conclusion

This paper uses Citespace software to visually analyze 6225 Chinese literatures and 7538 English literatures on traditional village cultural heritage research from 1998 to 2023 in CNKI and Web of Science databases, and draws the following conclusions:

1. From the perspective of the number of publications, the number of publications on the research literature of traditional village cultural heritage at home and abroad is increasing year by year. The domestic traditional village cultural heritage has experienced three stages: the initial stage (1998-2012), the rapid growth stage (2013-2017), and the in-depth development stage (2018-present). From the perspective of the annual number of publications, it can be explained that the time distribution of the number of publications on the research literature of traditional village cultural heritage in China reflects the positive relationship with the national policy orientation to a certain extent.

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3. From the perspective of keyword co-occurrence map, the research on traditional village cultural heritage in China mainly focuses on eight aspects: ' traditional village ', ' ancient village ', ' traditional settlement ', ' protection ', ' rural revitalization ', ' cultural heritage ', ' traditional residence ' and ' renewal '. With the change of social environment, China has paid more and more attention to ' living inheritance ', ' cultural integration ' and ' renewal design ' in recent years. The research content and hot spots have been closely following the national policy, from the initial research on ancient villages and tourism to the development of multi-field and multi-disciplinary research. On the whole, all research directions will return to the same goal of protection and development of these sites.

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References

Chen, Y.,Chen, C.M., Liu, Z.Y., Hu, Z., & Wang, X.W.(2015). The methodological function of CiteSpace knowledge map. Scientific Research, 2, 242-253. doi:10.16192/j.cnki.1003-2053.2015.02.009.

Tang, N., & Yang, Y.(2021). Summary of the International Symposium on the 15th Anniversary of the Publication of the 'Xitang Declaration' for the Protection of Traditional Villages. Folk Culture Forum, 6,124-128. doi:10.16814/j.cnki.1008-7214.2021.06.021.

Feng, J.C.(2013). The Dilemma and Outlet of Traditional Villages - Also Talking about Traditional Villages as Another Type of Cultural Heritage. Folk Culture Forum, 1, 7-12. doi:10.16814/j.cnki.1008-7214.2013.01.002.

Hu, Y.,Chen, S.,Cao, W.,& Cao, C.(2014). The concept and cultural connotation of traditional villages. Urban

Development Research, 1, 10-13.
Wang, Y.C. et al.(2006). Value Evaluation and Sustainable Utilization Model of Traditional Villages in Suburbs of Beijing: A Case Study of Traditional Villages in Mentougou District of Beijing. Geographical Science, 6, 735-742.
He, F.(2012). Study on the evolution mechanism and adaptability of spatial morphology of traditional villages of Han nationality in southern Hunan (Doctoral dissertation, Hunan University).
Wang, Y.(2010). Study on the Urbanization Process of Rural Tourism Destinations in Urban Fringe Areas - A Case Study of Sanshenghua Township, Chengdu. Urban Development Research, 12, 135-138.
Wang, Y.Y.(2010). Research on the evolution of villages to small towns under the influence of tourism (Master's thesis). Kunming University of Science and Technology.
Han, F.(2008). Study on the transformation of villages in Shanghai under the background of rural tourism (Master's thesis). Shanghai Jiaotong University.
Wei, Y.C.(2017). Research on the public space form of traditional villages of ethnic minorities in Guangxi (Doctoral dissertation, South China University of Technology).
Zhai, Z.Y. et al.(2017). Landscape gene identification of traditional village cultural heritage in Shaanxi. Geographical Science Progress, 9, 1067-1080.
Yuan, Y.(2014). Research on the protection and renewal of traditional villages and towns based on organicity (Doctoral dissertation, South China University of Technology).
Wu, J. (2019). Study on spatial environmental protection and renewal of Songxi Village in Pujiang under the background of cultural and tourism integration (Master's thesis, Zhejiang University of Technology).
Liang, L. F. (2019). Research on the protection of traditional village buildings and the renewal design of green buildings in southern Hebei (Master's thesis, Hebei University of Engineering).
Liu, P. L., & Deng, Y. (2017). Digital Protection: A New Approach to the Protection of Historical and Cultural Villages and Towns. Journal of Peking University (Philosophy and Social Sciences Edition), 6, 104-110.
Wu, Q. (2019). Digital experience design for cultural heritage. Decoration, 1, 12-15. doi:10.16272/j.cnki.cn11-1392/j.2019.01.005.
Xiao, F. (2019). Folklore Tradition and Rural Revitalization.Journal of Southwest University for Nationalities (Humanities and Social Sciences Edition),5, 28-36.
Chen, C.,et al.(2018). Cognition of traditional village spatial form based on space syntax-Taking Qinchuan Village in Hangzhou as an example. Economic Geography, 10, 234-240. doi:10.15957/j.cnki.jjdl.2018.10.028.
Xiao, H. W., & Wang, F. F.(2021). Impact Assessment of Cultural Landscape Development of Traditional Villages Based on HIAs. Urban Architecture, 22, 170-173. doi:10.19892/j.cnki.csjz.2021.22.37.
Duan, F.(2020). Examining the protection and development of traditional villages in Shaanxi under the background of rural revitalization - taking Zhangfeng Village as an example. Housing and Real Estate, 27, 218-219.
Guo, X. N. (2022). Post-activation evaluation and case study of traditional villages in Guangzhou based on GIS (Master's thesis, South China University of Technology).
Zhao, Y.Q.(2022). Type division of traditional villages in Southwest China (Doctoral dissertation, South China University).
Zheng, W.W., & Liu, P.L.(2016). Digital protection of traditional villages of 'Retaining Homesickness.' Jiangxi Social Sciences, 10, 246-251.
Yun, H. et al.(2015). Research on the identification and extraction methods of traditional settlement landscape genes. Geographical Sciences, 12, 1518-1524. doi:10.13249/j.cnki.sgs.2015.12.004.

Future of Textile：Sustainable Design via ChatGPT

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Abstract

This short paper will forecast the role of ChatGPT in promoting sustainable design in the textile industry and its ensuing benefits. Research on ChatGPT in the textile industry could focus on how this artificial intelligence (AI) tool can be used to optimize material selection, improve resource efficiency, foster a circular economy, and inspire design innovation. For instance, it will help enterprises optimize the production process, assess and improve environmental, social and economic impacts across the supply chain. Overall, the future of textile will become more environmentally friendly, efficient and ethical, and AI tools such as ChatGPT will play an important role in it's sustainable design practices.

Keywords

ChatGPT; textile; sustainable design; trend analysis

Introduction

The expansion of textile industry, over the past few decades, has brought serious environmental issues such as water pollution and consumption, chemical usage, and greenhouse gas emissions. With the increasing concern for environmental issues, the textile industry, while significantly contributing to the global economy, pays more attention to sustainable development. The ultimate goal of sustainable development is to balance the needs of society, the economy, and the environment, which means the practice of meeting the needs of the present without compromising future generations to meet their own needs. To be specific, the sustainable design of textile denotes the adoption of comprehensive strategies and methods in the production process of textiles and clothing, aiming to minimize negative impacts on the environment and society, and promote the sustainable utilization of resources and social responsibility. In the long term, textile enterprises must adopt more environmentally friendly production and processing methods to reduce resource consumption and waste generation. At the same time, consumer demand for sustainable textiles will also increase, driving the development of the sustainable textile industry.

ChatGPT's role in fostering sustainable design

ChatGPT is an advanced language generation model developed by OpenAI, which has three noteworthy features that show it's sustainable potential. Firstly, it can integrate resources to generate plans or suggestions. By drawing from a broad knowledge base acquired from diverse web sources, it formulates pertinent and contextually aware responses. Secondly, it exhibits a capacity for analysing and understanding subtle differences. Harnessing its mastery over language, ChatGPT maintains the contextual thread in conversations, interpreting complexities and nuances that many other models struggle with. This enables it to provide relevant responses and engage in

authentic, meaningful interactions. Lastly, it can provide data predictions and gain insight into trends. Through patterns inferred from extensive training data, it can anticipate possible directions in dialogue or predict likely outcomes, increasing the utility of its interactive capability.

ChatGPT's role in fostering sustainable design can be summarized in three core aspects: material selection and usage, design principles and strategies guidance, as well as environmental impact assessment.

Material selection and usage

The textile industry consists of a highly complex and massive supply chain, which includes multiple stages of production, raw material sources, and distribution networks. The supply chain begins from sourcing and gathering raw materials, such as cotton, silk, linen, and wool. This production involves harvesting and processing the raw materials, which then can be turned into yarn, fabrics, and textiles through spinning, weaving, dyeing, knitting, and finishing.

As a result, selection of raw materials is a key aspect of sustainable design, manufacturers are actively seeking new ways to produce textiles sustainably – making use of renewable materials and energy sources, reducing their impact on the environment. Through its understanding of material selection and robust knowledge base, ChatGPT can recommend sustainable materials for enterprises, such as organic cotton, recycled fibers, or biodegradable materials, as well as chemicals and dyes used to produce the aesthetic look of the product. It can also suggest optimal fiber blends that enhance durability and longevity, leading to greater resource efficiency.

Design principles and strategies guidance

In addition to optimizing material selection, enterprises also need to consider the environmental, social and economic impacts of their processes at each stage, including resource efficiency, product life cycle, circular economy, and so on. For example, during the raw material extraction and production stages, enormous amounts of water resource will be consumed. Furthermore, synthetic materials made from petroleum-based sources, such as nylon, polyester and acrylic, will create additional pollutants and cause water pollution, soil erosion and air pollution. ChatGPT contributes to the formulation of design strategies that prioritize circular economy principles, offering creative ideas and innovative techniques for textile and fashion design.

By facilitating the development of recycling and upcycling initiatives, as well as extending product life cycles, ChatGPT ensures that sustainability is woven into the design process from the outset. For instance, ChatGPT can suggest ways of reclaiming the waste and converting it in to viable materials through advanced techniques. It can also help enterprises to reduce water usage in their manufacturing processes and design processes that are more viable in the long run, by suggesting and evaluating different ways of efficient use of resources and water. Moreover, ChatGPT can assist designers in envisioning innovative approaches that support circular economy principles. By facilitating the development of recycling and upcycling processes in textile production, as well as offering creative ideas for garment design that prioritize reuse and extend product life cycles, it can help inspire designers to create with long-term sustainability in mind.

Environmental impact assessment

ChatGPT's ability to analyze data and provide insights helps designers and manufacturers evaluate the environmental consequences of their choices. Reviewing the entire supply chain by ChatGPT, enterprises can analyze performance and identify areas of improvement while meeting their sustainability goals. On the one hand, the textile industry's supply chain can be assessed, monitored and improved through various models, such as the Environmental Impact Matrix or the SocialFingerprint system. The former is a tool that used to assess and improve the environmental, social and economic impacts throughout the supply chain. It helps to identify potential issues and offer solutions effectively. The latter is another tool that operates similar function. This tool not only helps improve the sustainability of textile production, but also helps increase transparency,

accountability.

On the other hand, ChatGPT can identify subtle changes in the data, such as anomalies in the production line or a decrease in ower usage, and alert technicians to take quick action. This can help prevent time wasted and production disrupted, making operations in the textile industry more efficient and sustainable. Furthermore, it can identify bottlenecks at specific stage of the production line, raise optimization solution, and predictive maintenance and real-time tracking.

Conclusion

Overall, ChatGPT combines resource integration, subtle difference understanding, and data prediction to provide a text-based data interactive solution for textile industry. Firstly, ChatGPT's robust knowledge base and context-aware suggestions aid in the selection of sustainable materials, promoting resource efficiency and the use of eco-friendly alternatives. Secondly, it's ability to guide design principles and strategies ensures that sustainability is an integral part of the design process. In addition, it's data-driven insights help designers and manufacturers assess the environmental impact of their choices, enabling them to minimize waste and reduce pollution. Additionally, the AI's capacity to stay abreast of global trends in sustainability allows industry stakeholders to remain informed and competitive.

ChatGPT provides a clear path towards a more sustainable future of textile, by optimizing material selection, encouraging a circular economy, and advancing resources efficiency. It will be a vital tool for driving the textile industry towards a more sustainable, intelligentized, and responsible future.

References

Moorhouse, D., & Moorhouse, D. (2017). Sustainable design: circular economy in fashion and textiles. The Design Journal, 20(sup1), S1948-S1959.

Hauschild, C., & Coll, A. (2023). The Influence of Technologies in Increasing Transparency in Textile Supply Chains. Logistics, 7(3), 55.

Rathore, B. (2023). Integration of Artificial Intelligence& It's Practices in Apparel Industry. ugc approved research journals in india| UGC Newly Added Journals|(IJNMS), 10(1), 25-37.

Rathore, B. (2023). Future of textile: Sustainable manufacturing & prediction via chatgpt. Eduzone: International Peer Reviewed/Refereed Multidisciplinary Journal, 12(1), 52-62.

Grose, L. (2009). Sustainable textiles: life cycle and environmental impact. Blackburn RS (EcL), Woodhead, Cambridge, UK, 33-60.

Muthu, S. S. (2020). Assessing the environmental impact of textiles and the clothing supply chain. Woodhead publishing.

Exploring the transformation from tradition to 'living tradition' within Textiles

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Abstract

A general opinion holds that 'the modern' is the opposite of 'the traditional'. The term non-traditional is employed here as if modernity and tradition are merely opposing concepts in terms of time. In this paper I investigate the dichotomy between the traditional and the non-traditional, as well as the continuation of 'living traditions' by looking at the evolving history of Qipao (Chinese traditional women's garment) and Interview analysis based on the innovative use of traditional decorative motifs by traditional craftspeople. This paper offers theoretical exploration and interview data to support the ongoing revival of traditional crafts in both western and Chinese culture.

The development of textile craft and traditional modes of making (and the traditional motifs used) have faced a challenge within modern culture. The underlying significance of traditional patterns have arguably been lost along with the related craft skills. Therefore, certain modifications are required to fit within modern culture and contribute to the revival of tradition. What can be done to allow aspects of these "disappearing" traditions to become once more 'living traditions'? Such an endeavour will require the participation of designers, traditional craftspeople, and government agencies, which many have begun to explore the possibilities for transformation at various levels.

Author keywords

traditional; non-traditional; transformation; textiles

Introduction

If 'tradition' is only defined as, or associated with, the past (Yang, 2007), then the opposite of tradition, non-tradition, means 'modern'. Gyekey (1997) argues that tradition and modernity are not in conflict but rather that opposition comes from an incorrect interpretation of tradition, which sociologists and anthropologists regard as being resistant to change and related to a vision of the past. In anthropological studies, the term 'tradition' is frequently linked to depressing notions of 'disappearance', 'vanishing,' or 'residual' phenomena (Varutti, 2015) and, as such, has been considered a barrier to innovation. However, some scholars believe traditions are inherited and can be changed to fit the times (Hobsbawm, 1983; Eicher & Sumberg, 1995, quoted in Yang, 2007). They also have certain forms, including beliefs and norms, that can be passed down from generation to generation (Gyekey, 1997) or could then be seen as a 'living tradition'. Tradition should be a socio-cultural practice that 'assigns temporal meaning ' (Shoham, 2011), providing a possibility for ongoing exploration and expansion (Petruzzelli & Albino, 2012). Wall (2015) further defines this model of passing on a tradition whose meaning changes with time and acknowledges the various inheritors' differing interpretations of it as a 'living tradition'.

In brief, the way to determine whether non-tradition is a living tradition or modern, is to analyse whether it is an

'inheritance', based on the preservation of traditional materials and processes, and whether the definition of tradition is static (Beckstein, 2017). Hills argues that a practice or belief that lasts for at least three generations is considered a tradition (Fleischacker,1994). Therefore, some of the adjustments made to traditions by the present generation in order to meet current personal, social or institutional needs (Yang,2007) may not evolve into a 'tradition'. I define such adjustments as 'non- traditional'. This non-traditional is manifested in the adaptation of the various elements involved in the production process of traditional crafts, including production, content, technology, and concept.

These dichotomies between traditional and non-traditional give a theoretical foundation for the revitalization of traditional crafts from their origins, whilst offering the potential to turn traditional crafts into 'living traditional crafts' that are more suited to our modern society. This paper, which is part of my PhD research, focuses on a theoretical perspective and the analysis of some interviews I conducted with masters in the provinces of Guangxi and Guizhou. It takes an interdisciplinary approach to traditional crafts and explores possibilities for the development of traditional crafts.

The traditional and non-traditional dichotomy within Qipao as a case study

Active or reactive social change causes non-traditional transformation. Liu (2017) noted the non-traditional nature of the Qipao is due to the influence of the modern movement and the adaptation to mainstream Western fashion. By the late 1910s, and inspired by societal change (Cox, 2019), women began to reject typical gender roles that had been given to them in the past. The Qipao developed as a non-traditional style that hid differences between genders (Zhuang,1921; Huang,1921, cited in Liu, 2017). The fabric design of the Qipao was influenced by Western art trends and the interaction between Eastern and Western culture, which led to a transfer from the programmed tradition of the Qing Dynasty (Zhang et al., 2022).

When the reign of the Qing dynasty ended, animal motifs, symbolising power and status, were incompatible with the Republican ideology of freedom and democracy and were therefore used much less frequently. Western decorative arts contributed Qipao fabric motifs turn auspicious symbolic meanings into decorative aesthetics and use geometric and floral designs (Cox, 2019; Huang, 2015), shifting to colourful fabrics and imitating Western garment construction (Liu, 2017). We could draw the conclusion from this that cross-cultural communication and learning can also make something non-traditional. According to Deleuze and Guattari (2016), some authors write in non-native languages to remove cultural boundaries and achieve a deconstruction of cultural domination and forms of authority through the de-territorialisation of language. The same process has been applied to the craft field. By incorporating motifs, resources, and experiences from other languages, one could reconsider how art language is currently expressed and create something new and valued in different cultural contexts (Veiteberg, 2005). Bhabha (2012) declares that the hybridisation of two distinct species is a form of cultural progress. Hybrids in cultural forms could also be manifested in the process of craft making, where different species are understood as different cultures, and this hybridisation expands the space for the creation of craft practices. On the other hand, hybridisation can also occur within craft making. Craft art's own definition refers to a traditional Western dichotomy: between hand and intellect, body and spirit, object and meaning (Weimarck,2003, cited in Veiteberg, 2005). In terms of object and meaning, anthropologist Michael Thompson (2017) classifies the value of objects as "durable and transient", but he argues that the value of things can be transformed under certain conditions, from losing value to reusing it to get it back. In brief, the role of cross-territory, cross-cultural interaction based on the local culture is regarded as breaking down authority while extending the original cultural composition, according to French theorists Deleuze and Guattari and the post-colonial theoretician Bhabha. This could be seen in the Qipao's cross-cultural development and the following example of Mr. Pan's cross-disciplinary creations that

integrate modern design with traditional dyeing.

Traditional crafts need to be transformed due to changing lifestyles and new manufacturing methods in modern time (Kolay, 2016; Lin & Watada, 2009; Yang et al., 2018). Currently, although traditional textile craft and design are frequently associated with luxury handmade products, symbolising high standards and complex techniques, in other cases, time-consuming handmade textile production remains incompatible with the low-cost, high-efficiency production demanded by mass production (Ebert et al.2016) , which caused the market for a large number of traditional handicrafts to be replaced by other mass-produced items(Yang et al., 2018).

In China, craft activities are positioned under the Culture-related Industry Policy Framework. The State Council of China listed 629 traditional crafts and arts as national intangible cultural heritage in 2021, including 84 dyeing and weaving crafts like embroidery, hand printing and dyeing, and brocade weaving. This emphasises the value of traditional crafts but also the challenges of post-20th-century craft production.

Methodology

I am using qualitative research methods in my research. Rather than relying on a single data source, I will collect data from several sources, including field observations, semi-structured interviews, and photography. My analysis draws on the theoretical perspective outlined in my literature review above in the introduction, but also on epistemological approaches that consider research to be an iterative spiral-like process rather than a linear process carried out in progressive cumulative stages. This means that analysis is not a separate and subsequent stage of the research that takes place after the gathering of data, but an ongoing process that informs the design and conduct of research as it goes forward. Hence, data gathering, and analysis will be ongoing, and will be put in close conversations with the research questions.

Discussion and conclusion

The research questions that guide this paper are:

•Has the meaning and usage of decorative motifs from the late 19th century to the early 20th century continued within Chinese textiles? If so, is there a role for decorative motifs in current creative practice?

•What role do these textile motifs still play in Chinese culture? What is their modern purpose? What has been lost in their modern development, and why are traditional craftspeople still making them? Could such textile motifs be considered or potentially become a 'living tradition'?

The target groups of this part of my research are traditional craft makers who have been involved in or are in the process of reviving craft in China. To make the research data comparable, I defined the following conditions for participant recruitment. I interviewed traditional craftspeople with more than ten years of experience in traditional craft-making, whose income comes mainly (more than ninety percent) from direct sales of their products, i.e., from traditional craft. All my interviewees are based in southwest China.

Preliminary data of such interviews indicate that all three interviewees have innovated modern applications of traditional motifs, but only to varying degrees and in different forms, and have retained tradition in differing proportions.

Ms Jiang who is engaged in the traditional craft of paper-cutting for generations mentions that she uses traditional motifs that have been passed down from her ancestors, such as the Hmong heroine figures Maoxi Wu and Xiumei Zhang and the story of Mother Butterfly. However, she also creates new motifs according to market demands and the needs of the embroiderers. She thinks traditional patterns should be combined with contemporary designs to increase sales. She would like a designer to collaborate with, because of her limited education in this area. She indicates that to lower the cost and be able to sell more products, she cut some of the

processes involved in the traditional way of making them. The evidence from this study suggests that she actively draws from traditional motifs and crafts due to the development of modern demand and to meet the challenge from the influence of mass production, which could be described as the transformation from pure tradition to a living tradition. However, it is still essential to consider what is lost in this shortening of the making process. I will explore this aspect in a further study.

The tension between traditional and modern is showed in an anecdote told to me by Ms Jiang in which a young girl started her apprenticeship but only lasted three days due to her uncertainty about the future development of traditional crafts in modern societies. This also speaks of the challenges posed to knowledge.

The line of intergenerational knowledge transmission, apprenticeship, etc., is on the verge of breaking down, eventually leading to such knowledge's disappearance. Mr Pan mentioned that there are very few traditional apprenticeships still available to young people and that the traditional crafts he currently carries out are taught on a paid basis. This kind of transformation can be defined as non-traditional, as the participants only concentrate for a short period, and there is no particular answer as to whether what has been learnt can be applied in everyday life afterward. I am planning to research these topics further by conducting future interviews with participants paid to learn traditional crafts. In general, therefore, it seems that the mode and form of passing on the traditional craft have transformed. The reason for it, in Mr Pan's view, is that in a modern economic society, teaching traditional crafts must be profitable and economically relevant to take place. We can conclude that traditions need to be adapted to contemporary society to be sustainable, thus becoming a living tradition. The current study found the necessity to make transformations from traditional to a living tradition. However, many primary and secondary schools in China have taken measures to incorporate elements of intangible cultural heritage to pass on traditional crafts. I consider the incorporation of intangible cultural heritage in schools as an approach to adapting traditional apprenticeship to modern society in its rights, which could last for a relatively long period. But there is still a long way to go in exploring ways to pass on traditional crafts.

Ms Jinhua further mentioned that the main reason for motif innovation is a change in taste in the mainstream consumer population. She believes that we need to conduct innovation on traditional elements of the motifs to create new designs, adjusting the colours of the pattern to be more muted and to improve the comfort and breathability of the fabric.

Mr Pan has a deeper understanding of how traditions can be applied to innovation because he was formally trained in design at an undergraduate and postgraduate level. He believes that combining tradition and modernity does not mean applying directly traditional motifs to new forms, as many traditional craftspeople may think, such as the transformation from garments to bags. He believes that the format should not constrain the continuation of tradition to copy the traditional motifs completely. He disagrees with traditional craftspeople painting batiks only with traditional motifs, and he believes that being overly influenced by a sense of responsibility to pass on tradition would lead to being unable to innovate.

Mr Pan believes that traditional craftspeople should first selectively discard traditional elements and then allow other disciplines, such as painting and design, even chemistry, to intervene and engage in inter-professional and inter-disciplinary innovative manufacturing. He mentioned," In addition to applying the patterns directly to our clothes and bags, we are also expanding it to a new way of thinking and intervening in the traditional industry. We are not stuck in the old ways. We are adapting and evolving. "We can conclude that this is the role of cross-disciplinary interaction in breaking down traditional stereotypes while expanding the original cultural composition and transforming traditional motifs into 'living traditions.'

In this paper, I have started a theoretical exploration of the notion of "tradition," highlighting some initial elements that could help the revitalization of traditional crafts. Having clarified the terms "tradition," "non-

tradition," and "living tradition," I then analysed the transcripts of three Chinese interviewees in the light of theory, exploring how these terms are used. Analysing the practices of traditional craftspeople who carry out innovative practices of traditional motifs shows a positive outlook for revival and an example of a tradition transforming into a living tradition. Future research is needed that includes more practice, and more in-depth interviews are required in order to delve deeper into the process of transformation from traditions into living traditions, where the specific contributions of traditional craftspeople to the innovation of traditional craft techniques and motifs could be identified and left as heritage to future generations, thus becoming a truly living tradition.

References

Arthur, L. (1992). Keeping Glasgow in stitches. Mainstream.

Bao, M. (2004). Records of Modern Chinese Women's Clothing. Donghua University Press.

Beckstein, M. (2017). The concept of a living tradition. European Journal of Social Theory, 20(4), 491–510. https://doi.org/10.1177/1368431016668185

Bhabha, H. K. (1994). The location of culture. Routledge.

Bray, F. (1997). Fabric of power: The Canonical Meaning of Women's Work. In Technology and gender: fabrics of power in late Imperial China (pp. 183–185). University Of California Press.

China Intangible Cultural Heritage Network. (2021). China's National List of the Representative Intangible Cultural Heritage. Www.ihchina.cn. https://www.ihchina.cn/project.html

Cox, A. (2019.). The Qipao: Defining Modern Women in the First Half of the 20th Century. Undergraduate honors thesis]. University of Kansas.

Deleuze, G., & Guattari, F. (2016). Kafka: toward a minor literature. University Of Minnesota Press.

Ebert, C., Harlow, M., Andersson Strand, E., & Bjerregaard, L. (2016). Traditional Textile Craft – an Intangible Cultural Heritage? Centre for Textile Research, University of Copenhagen. https://ctr.hum.ku.dk/conferences/2014/e-book_traditional_textile_crafts.pdf

Fleischacker, S. (1994). The ethics of culture. Cornell University Press.

Fong, G. S. (2004). Female Hands: Embroidery as a Knowledge Field in Women's Everyday Life in Late Imperial and Early Republican China. Late Imperial China, 25(1), 1–58. https://doi.org/10.1353/late.2004.0007

Forstner, K. (2012). Women's Group-based Work and Rural Gender Relations in the Southern Peruvian Andes. Bulletin of Latin American Research, 32(1), 46–60. https://doi.org/10.1111/j.1470-9856.2011.00693.x

Greenhalgh, P. (2003). The persistence of craft: the applied arts today. Rutgers University Press.

Gyekye, K. (1997). Tradition and modernity. In Tradition and modernity: philosophical reflections on the African experience (pp. 217–272). Oxford University Press.

Halper, V., & Douglas, D. (Eds.). (2009). Choosing craft: The artist's viewpoint. University of North Carolina Press.

Hinsch, B. (2011). Women in early imperial China. Rowman & Littlefield Publisher.

Huang, Q. (2015). Fashioning Modernity and Qipao in Republican Shanghai (1910s-1930s).

Hunter, C. (2020). Threads of life: a history of the world through the eye of a needle. Sceptre.

Kapur, H., & Mittar, S. (2014). Design intervention & craft revival. International Journal of scientific and research publications, 4(10), 1-5.

Kelly, L. (2018). MEMORY CODE: the secrets of stonehenge, easter island and other ancient monuments. Pegasus Books.

Kikuchi, Y., & Imanishi, H. (2022). The Sustainability of Crafts: Shifting the Paradigm of "Traditional Crafts". The Twelfth International Convention of Asia Scholars (ICAS 12), 269–274. https://doi.org/10.5117/9789048557820/

ICAS.2022.033
Kolay, S. (2016). Cultural Heritage Preservation of Traditional Indian Art through Virtual New- media. Procedia - Social and Behavioral Sciences, 225, 309–320. https://doi.org/10.1016/j.sbspro.2016.06.030
LaFleur, E. M. (2003). Inside Chinese Embroidery. Austin.
Lee, M. (2020). Embroidery in China. In Chan, S.-W. (2020). The Routledge encyclopedia of traditional Chinese culture (pp. 287– 290). Routledge.
Le Mare, A. (2012). "Show the world to women and they can do it": Southern Fair Trade Enterprises as agents of empowerment. Gender & Development, 20(1), 95–109. https://doi.org/10.1080/13552074.2012.663608
LIN, L.-C., & WATADA, J. (2009). Old is New : A Case Study of Traditional Craft Revitalization from Kansei Perspective. Kansei Engineering International Journal, 9(1), 29–38. https://doi.org/10.5057/kei.9.29
Liu, Y. (2017). Westernization and the consistent popularity of the Republican qipao. International Journal of Fashion Studies, 4(2), 211–224. https://doi.org/10.1386/infs.4.2.211_1
Movono, A., & Dahles, H. (2017). Female empowerment and tourism: A focus on businesses in a Fijian village. Asia Pacific Journal of Tourism Research, 22(6), 681–692. https://doi.org/10.1080/10941665.2017.1308397
Parker, R. (2019). The subversive stitch: embroidery and the making of the feminine. Bloomsbury Visual Arts. (Original work published 1984)
Petruzzelli, A. M., & Albino, V. (2012). When tradition turns into innovation: How firms can create and appropriate value through tradition. Chandos Publ.
Shoham, H. (2011). Rethinking Tradition: From Ontological Reality to Assigned Temporal Meaning. European Journal of Sociology, 52(2), 313–340. https://doi.org/10.1017/S0003975611000129
Thompson, M. (2017). Rubbish theory: the creation and destruction of value. Pluto Press.
Tung, F.W. (2012). Weaving with rush: Exploring craft-design collaborations in revitalizing a local craft. International Journal of Design, 6(3), 71-84.
Varutti, M. (2015). Crafting heritage: Artisans and the making of Indigenous heritage in contemporary Taiwan. International Journal of Heritage Studies, 21(10), 1036–1049. https://doi.org/10.1080/13527258.2015.1050055
Veiteberg, J. (2005). Craft in Transition. Bergen National Academy of the Arts.
Wall, S. (2015). Political Morality and the Authority of Tradition. Journal of Political Philosophy, 24(2), 137–161. https://doi.org/10.1111/jopp.12058
Yang, C.C. (2007). The meanings of qipao as traditional dress: Chinese and Taiwanese perspectives (p. 7037553) [Doctor of Philosophy, Iowa State University, Digital Repository]. https://doi.org/10.31274/rtd-180813- 16820
Yang, Y., Shafi, M., Song, X., & Yang, R. (2018). Preservation of Cultural Heritage Embodied in Traditional Crafts in the Developing Countries. A Case Study of Pakistani Handicraft Industry. Sustainability, 10(5), 1336. https://doi.org/10.3390/su10051336
Zhang, J., Zhang, Y., & Cui, R. (2022). Cultural Interaction: The Transformation of Textile design for Traditional Cheongsam in the Republic of China. Fibres & Textiles in Eastern Europe, 30(6), 19–26. https://doi.org/10.2478/ftee-2022-0049

The Design-Driven Symbiotic Innovation of Plants' New Roles under the Sustainable Dialogue - Take Phytoshpere as an Example

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Abstract

Enormous human activities and the continuous expansion of man-made environments poses unprecedented challenges to the sustainability of the plant world and, ultimately, the human world. As an irreplaceable part of nature, plants are increasingly being presented in various artificial environments. Inspired by Pollan's theory of plant intelligence for survival and reproduction motivation, we argue the necessity to reconsider a self-consistent interactive system centered on plant perspective and aims to explore the new role of plants in artificial environments and discuss their survival strategies. The major research methods include secondary research and case study. As an output, we expand the previous idea of the PCI typology under the framework of Design for Sustainability (DFS) (Su & Liu, 2022), and introduce in a practical way the radical but plausible opportunities and possibilities for plants to adapt to, evolve, and achieve sustainable development for their species.

Author keywords

Plant-Computer Interaction; symbiotic design; sustainability; new roles of plants.

Introduction

Conflicts between artificiality and plant territories

Humankind has never ceased to transform and influence nature. Since the industrial revolution, the rapid increase in manufacturing capacity has led to rapid growth in artificialities. Enormous human activities and the expansion of the built environment are continuing, leading to the destruction and encroachment of natural territories on which plants rely for survival.

According to the Food and Agriculture Organization of the United Nations, 12 million hectares of forest are lost yearly, declining at 0.3% per year (FAO, 2020). It poses challenges to both ecology and plant biodiversity. Around three-quarters of the planet's land has been severely altered by human activity (IPBES, 2018). Besides, habitat loss and fragmentation due to urbanization are also increasing the threat of plant species extinction (Aronson et al., 2014; Beninde et al., 2015).

The secondary role of plants

Plants have been used as a natural resource that keep creating value for humans in terms of nutrition, aesthetic experiential and other needs (Aspling, 2016). Human beings have never stopped using plants, but the claims and rights of plants have been more neglected than animals. Plants may be mostly defined as the secondary role in

the current hierarchy of artificial environment (e.g. in the interior space), compared with humans and animals as primary roles. As Marder (2013) uses 'the margin of the margin' to describe our neglect of plants. The main reason may be that humans, as animals, have a vastly different way of being and temporal
dimension from plants, and our arrogance prevents us from appreciating the wisdom of plants and their success (Pollan, 2013). Adequately 'understanding' the plant becomes a prerequisite for this study.

Unexpected intelligence, perception & collective survival strategies of plants

Plants have been seen as passive and primary producers. Nevertheless, several advancements in plant science show that plants are more intricate, sophisticated, and even "smart" than previously known and conduct cerebral behaviour without an actual brain (Pollan, 2013). Mancuso & Viola (2015) find that plants can use electronic and chemical messaging systems for memory and are capable of cognition, communicating, learning and even manipulating other species. Plants are also thought to have different-formed senses, including sight, hearing, taste, smell and touch.

Although individual plants are mostly immobile and fragile, they can interact between species to form plant communities characterized by 'distributed computing', 'swarming behaviour', and 'iteration'. 'Stress Gradient Hypothesis' demonstrates that environmental pressure is positively correlated with interspecific facilitation (Maestre et al.,2009). It supports the idea that plant communities show intelligence in response to environmental challenges. For example, some plants, like Arabidopsis thaliana, secrete gases such as ethylene to warn other individuals to activate their defense systems when being attacked by herbivores or insects (Zhang et al., 2012), which exemplifies a collective strategy within the plant species. This makes it possible to exploit inter-plant interactions that contribute to the population flourishing.

A New Perspectives - New Roles of Plants

Despite a variety of exotic survival strategies, the extinction of some species and the sudden drop in vegetation area imply that plant groups are showing difficulty adapting to the rapid environmental changes caused by modern artificial activities. It never has the survival of plants required human intervention and help so urgently. It is worth noting that, as Pollan points out, this kind of help must be provided in the way plants want it to be. As Mancuso (2015) defines intelligence as "the ability to solve problems", plants can be seen as intelligent creatures due to their various survival strategies and effective response to the environment. Thus, an ethical question needs to be answered: When the natural objects they represent are increasingly in conflict with industrialization, do plants, as intelligent lives, have the same equal rights as human beings to pursue the independent and sustainable development of the population? We believe the answer is yes. Because the flourishing of plants is greatly beneficial to the sustainability of people and nature, whether in terms of biological egalitarianism or the importance of biodiversity to human civilization. When we stop treating plants as mere automatons or mindless machines and can instead look at, and even learn from, plant systems on equality, this will change our understanding of life on Earth and help us draw more inspiration from nature to address sustainability challenges. In summary, considering the above-mentioned context, a research question was formulated as: What is the new role of and how do plants adapt to/evolve in a future world where human-centred environments gradually invade their natural territory?

Method

We conducted a three stages method for answering the RQ: 1) Background research (literature review); 2) Prototype development; 3) Insights/theory Building (a retrospective analysis)

Strategies review & Conceptualization

Plant-Computer Interaction (PCI) can be understood as a branch of Animal-Computer Interaction (ACI), which is

a new discipline extending from Human-Computer Interaction (HCI) theory. ACI was prompted by multispecies ethnography (Kirksey et al., 2010) to reflect on the complex relationships and interdependencies between humans and other species. It is considered to enrich the HCI framework in terms of methodological and theoretical aspects and interface solutions (Mancini, 2013). ACI claims to re-think non-human species as "users," which enables us to understand better and build symbiotic relations with other species to create sustainable societies. The recent advances in plant science mentioned above also increase the potential for plants to become users of digital technologies. However, we still find a distinct gap in the discussion of plants compared with animals when discussing the interaction of non- humans with machines.

Some interactive designs have been discussed as the hybrid of integrating plants and machines and have been analyzed and summarized by scholars. Su & Liu (2022) preliminarily defined a PCI typology under the framework of Design for Sustainability (DFS), classifying it into four types: environmental-based sustainable endocyclic systems, sustainable sensory extension, empathetic interactor based on emotional values, and systematical-mutualistic symbiosis. It provides a reference for the designer to study the new coexistence relationship among plants, artificial objects, and people in the context of sustainable development and PCI. However, most research and practice focus on sustainable value from the perspective of human beings. This means that when we ask about the new role and value of plants in todays and future society, the actual result is still pulled back to discuss the added value and function of the new integration of plants and machines to people. For example, although PotPet and MyGreenPet are cases around caring for plants, it is also based on the need to ask for help from human beings or please the owners emotionally. They also cannot be ruled out that it contains the suspicion of preventing human beings from spending more energy to care for the plant. Similarly, some systems that emphasize the symbiosis between plants and humankind mostly consider human comfort, which is why in Vertical Forests, plants are passively arranged in buildings to absorb traffic pollution and noise attacks for people. We can conclude that when looking at the sustainable development issues from the perspective of plants, it is easy to see that the rights and role of plants are not sufficiently valued and responded to. There is also a clear gap in the study of plants as a primary role in the interactive systems framework.

Thus, based on Su and Liu's study (2022) and inspired by Pollan's theory of plant intelligence for survival and reproduction motivation, we argue that it is necessary to upgrade the research phase and to reconsider an interactive system center on plant perspective. In fact, there have been some related preliminary explorations, but we are still waiting for a response to our questions. For example, in Plantas Nómadas, plants are simply used as the secondary role of a circulation system; similarly, Elowan and hortum machina B only address the issue of plant mobility and do not respond to the needs of plants in other ways. Therefore, we introduce the design strategy of speculative design (SD) in order to assist us in developing new explorations. Speculative Design (SD) aims to explore possibilities of future scenarios by reflecting on the problems of today's society (Dunne & Raby, 2013). The significance of SD is that it provides a new perspective to speculate and conceptualize the potential possibilities of the future and develop corresponding design suggestions. SD temporarily abandons problems solving practically and in favor of asking broad social questions. It assists design practitioners in broadening their cognitive dimensions and thinking boundaries, moving beyond short-term goals, and implementing pioneering systems and prototyping designs. In fact, many examples of SD can inspire the conceptualization of this project. For example, the logic of Designs for An Overpopulated Planet: Foragers (Dunne & Raby, 2010) can be understood as: humankind imitating the behaviour of animals through artificial objects. Then this project can offer a reverse construction, that is, plants imitate human behaviour through artificial objects.

Integrating PCI and SD

As mentioned above, PCI theory was adopted as the technical support for the project. The approaches of

speculative design practice may be a helpful guide to enhance and complement the reference value of this typological analysis. As the thought support, SD, based on PCI techniques, guides the project with theme setting and conceptualization methods and idea communication that complements the practical approach of PCI.

As Dunne and Raby (2013) argue, SD focuses on macro issues and challenges that orthodox designs cannot address. Most previous cases seem to be "humans helping plants", but they are still another form of "humans manipulating and using plants." The intervention of the speculative concept offers an excellent opportunity to inquire about what will be the future impact if the issue of artificial spaces affecting plants continues to be ignored.

The SD introduction clearly outlines the project's results and outcomes and the assessed value. Multiple critical practice methods are available to be used, such as Thought Experiments (Dunne &Raby, 2013), that are evaluated as helping designers think through tricky problems. In particular, Counterfactual, as an exciting way of creating another possibility of existence, coincides with the previous idea of plants mastering intelligence beyond our expectations. As with the Floppy Legs, a portable floppy drive designed by Attenborough Design Group, using a strategy of product personification, the creation of an extra-perceptual situation is effective. The What-if scenario is another approach that inspires us to imagine what we could achieve with the development of bio-machine interaction technology. On a more macro level, we can envisage a future in which how will plants survive by interacting with machines when artificial environments have entirely taken over the natural territory. The method helps us clarify the direction of the conceptual building and design practice and the aims of drawing attention to plants by PCI. Consequently, a design assumption was formulated as "Plants can form a community to collaborate and support each other (similar to human societies) when facing the uncertainty of the artificial environment."

Result: The Phytoshpere Project

Project Description

Phytosphere is an experimental, speculative design project that aims to explore the new roles of, strategies and opportunities for plants, as a specie group, in the expansion of artificial environments in the future. It also discusses the possibilities for plants to evolve and form a "social symbiosis" to achieve sustainable development in the face of various unnatural- environmental challenges. The name "phytosphere" stems from a botanical phrase that describes the micro-ecosystems that exist within plants (Yang et al.,2013). In this project, it acts as a metaphor for a new interactive symbiotic relationship among plants or community of plants that are interdependent and mutually improving.

Based on the strategy and technology of PCI, the project depicts a new mechanism that diversified plants can be mutually beneficial to each other, and a new symbiotic system for plant populations. Individually, six representative plants, including chlorella, mimosa, moss and lichen, pinus, uncinata and alocasia,

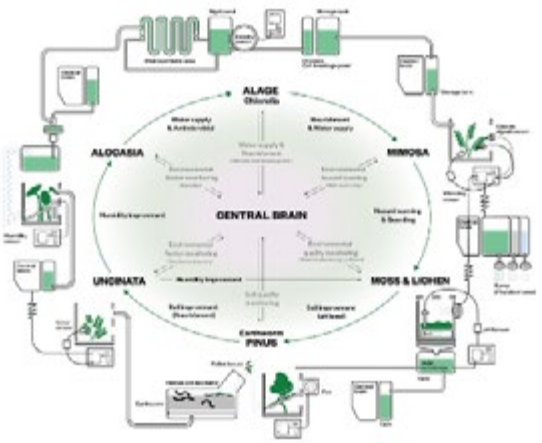

Figure 1. The symbiotic system map of mutual benefit among diversified plants within the Phytosphere project.

are symbiotically fused with machines, forming six plant- machine hybrids, which are controlled and driven by the plant's 'intelligence'. Each plant is given the new ability to take the initiative to explore, optimize its own surrounding environment and develop self-identity. From a community perspective, these different plant species interact with each other through technology to form a self-operating, self-sufficient symbiont which comprises a self-perpetuating system and a micro-ecosphere of plants.

The microsystem starts with Chlorella hybrid, which supplies the whole system with water and a nutrition and organic fertilizer (chlorella cell-breaking fluid). The second hybrid is an environmental vigilante. When mimosa senses an external threat, it controls the machine to spray various phytohormone as alerting. The Moss & Lichen Hybrid uses the acid it produces to help other plants improve their soil environment. For example, when pinus (the next plant) detects that its soil has become alkaline, it notifies the Moss & Lichen Hybrid and requests acid for itself to raise the pH of its own soil. Meanwhile, the humus cultivated by pinus leaves and earthworms provide nutrients for the uncinata. The uncinata is sensitive to environmental factors such as light intensity, they control the humidification and shading of the alocasia and moss and lichen. Finally, the sap secreted from the tips of the alocasia leaves will be collected and processed (e.g. filtered). The processed water will be sent back to the Chlorella Hybrid for use as a plant-derived fungicide and water supply. Please find details of the project in Figure 1.

Innovation and Reflection

The fifth type of PCI: Autonomous evolutionary symbiosis

This project (see figure 2) is an experimental innovation that can be understood as an update of Su and Liu's research (2022) through design practice. We summarize and propose a fifth type of PCI under the DFS framework - Autonomous evolutionary symbiosis, which is defined as plants- intelligent controlled PCI systems that focus on how plants "think" and (directly) benefit themselves by symbiosing with (and supported by) machines, promoting enhanced autonomous capability of plants to interact and high-intensively connect with the outside world. Plants are considered the primary role of the interactive system, empowered by biodata technology to be 'intelligent' and proactive in this type of PCI. The core is an emphasis on considering plant species as equal, intelligent beings and viewing PCI and sustainability, especially in environmental and socio-ethical aspects, from their perspective (rather than the dominant human perspective).

Figure 2. The final prototyping and engineering of the project.

As mentioned earlier, this concept is based on confidence in the plant's

"intelligence" to cope with the environment. Plants can express their needs when controlling machines as primary users and master different capabilities by extending the technology. During the testing, the vital data of plants we collected confirmed that plants benefit from interaction with machines.

Values and Implications: A Mutually Supportive Strategy among Plants

A key innovation of the project is the construction of a mutually improving mechanism of symbiosis, that socially connects different plants based on their biological characteristics, and assisting and supporting plants in information sharing, democratic decision-making and helping each other with interactive technologies. Just as Harari (2014) suggests, large-scale collaboration and collective wisdom based on communication ability may be a key advantage for Homo sapiens, that is, us, to become highly adaptable creatures and stand out in the biological competition. If this holds true, it is also possible for plants to accelerate their speed and efficiency in adapting to new environments by mastering the ability, and to improve the potential for sustainable population development. Although plant species tend to compete in most cases in nature, the facilitation that exists between certain species also attests to this potential. Therefore, in this project, mutual improvement and collaboration become the heart of the symbiotic system that will benefit all plants while each plant satisfies its own needs. As a result, six different plants spontaneously unite to cope with the uncertainty of the artificial environment. It paves the way for a discussion on how plants can present themselves and coexist with artificiality and nature sustainably in the future, thus answering the second key research question.

In this project, plants are the primary role. We discuss the relationship between putting individual plants into the community and accelerating individual evolution in relation to collective competence. In the synergy of the distributed system of plants, this symbiosis shows animal-like mobility and greater adaptability to unnatural environments. As radical speculation, the system simulates a potential direction of plants' collective evolution in a way that tentatively excludes humankind and interprets how to position plants for a new role in this environmental change.

Conclusion

As a response to the trend of biology-human-science integration, the study is seen as an innovative strategy or a solution for the (collective) evolution of plants within the barriers of ever- expanding artificial resources. It also conveys a perception of the similarity and equal symbiotic potential of humans and plants. We discuss the dangerous situation, secondary role and potential new roles of plants. By introducing speculative design, we complement Su and Liu's typological analysis with a project and case study to enrich the theoretical framework of PCI.

We present the design project and demonstrate its feasibility and potential for development. The proposal to consider plants as active and intelligent media and to think from their perspective will not only provide idea on future sustainable development, but also on understanding the role and position of human beings. In the future, we intend to conduct deeper interdisciplinary explorations, such as the deeper integration of PCI with big bio-data and ecological conservation.

References

Appel, H. M., & Cocroft, R. B. (2014). Plants respond to leaf vibrations caused by insect herbivore chewing. Oecologia, 175(4), 1257–1266. https://doi.org/10.1007/s00442-014-2995-6

Aspling, F., Wang, J., & Juhlin, O. (2016). Plant-computer interaction, beauty and dissemination. Proceedings of the Third International Conference on Animal-Computer Interaction, 1–10. https://doi.org/10.1145/2995257.2995393

Baluška, F., & Mancuso, S. (2020). Plants, climate and humans. EMBO Reports, 21(3), e50109. https://doi.

org/10.15252/embr.202050109
Bertness, M. D., & Callaway, R. (1994). Positive interactions in communities. Trends in Ecology & Evolution, 9(5), 191–193. https://doi.org/10.1016/0169-5347(94)90088-4
Clement, C. R. (2003). The Botany of Desire: A Plant's-Eye View of the World. Economic Botany, 57(1), 146–147. https://doi.org/10.1663/0013-0001(2003)057[0146:BR]2.0.CO;2
Dagenais, D., Brisson, J., & Fletcher, T. D. (2018). The role of plants in bioretention systems; does the science underpin current guidance? Ecological Engineering, 120, 532–545. https://doi.org/10.1016/j.ecoleng.2018.07.007
Dunne, A., & Raby, F. (2013). Speculative Everything: Design, Fiction, and Social Dreaming. MIT Press.
FAO. (2020). Global Forest Resources Assessment 2020. FAO. https://doi.org/10.4060/ca8753en
Hahn, M., Park, S., & Oh, S. (2008). Emoti-pot: The Interaction Design of an Affective Flowerpot. International Conference on Advanced Computer Entertainment Technology 2008, 436–436.
Hallé, F., & Lee, D. (2002). In praise of plants. Timber Press.
Harari, Y. N. (2015). Sapiens: A brief history of humankind (J. Purcell & H. Watzman, Trans.; First U.S. edition). HarperCollins Publishers.
He, Q., & Bertness, M. D. (2014). Extreme stresses, niches, and positive species interactions along stress gradients. Ecology, 95(6), 1437–1443. https://doi.org/10.1890/13-2226.1
Hwang, S., Lee, K., & Yeo, W. (2010). My Green Pet: A current-based interactive plant for children. Proceedings of the 9th International Conference on Interaction Design and Children, 210–213. https://doi.org/10.1145/1810543.1810573
Kawakami, A., Tsukada, K., Kambara, K., & Siio, I. (2010). PotPet: Pet-like flowerpot robot. Proceedings of the Fifth International Conference on Tangible, Embedded, and Embodied Interaction, 263–264. https://doi.org/10.1145/1935701.1935755
Kennedy, D. O. (2014). Plants and the Human Brain. OUP USA.
Lin, W. (2018). Research on Symbiotic Design Facing User Experience. 531–534. https://webofproceedings.org/proceedings_series/ESSP/ICEMIT%202018/ICEMIT21114.pdf
Maestre, F. T., Callaway, R. M., Valladares, F., & Lortie, C. J. (2009). Refining the stress-gradient hypothesis for competition and facilitation in plant communities. Journal of Ecology, 97(2), 199–205. https://doi.org/10.1111/j.1365-2745.2008.01476.x
Mancini, C. (2013). Animal-computer interaction (ACI): Changing perspective on HCI, participation and sustainability. CHI '13 Extended Abstracts on Human Factors in Computing Systems, 2227–2236. https://doi.org/10.1145/2468356.2468744
Mancuso, S., & Viola, A. (2015). Brilliant Green: The Surprising History and Science of Plant Intelligence. Island Press.
Marder, M. (2013). Plant-Thinking: A Philosophy of Vegetal Life. Columbia University Press.
McKinney, M. L. (2008). Effects of urbanization on species richness: A review of plants and animals. Urban Ecosystems, 11(2), 161–176. https://doi.org/10.1007/s11252-007-0045-4
Pollan, M. (2013). The intelligent plant. The NEW YORKER, 2013, 93–105.
Sareen, H., Zheng, J., & Maes, P. (2019). Cyborg Botany: Augmented Plants as Sensors, Displays and Actuators. Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems, 1–2. https://doi.org/10.1145/3290607.3311778
Su, H., & Liu, Y. (2022). The Typology of Plant-Computer Interaction Under the Sustainability Dialogue—Take Plant-Smart Furniture as an Example. In C. Stephanidis, M. Antona, & S. Ntoa(Eds.), HCI International 2022 Posters (pp. 375–382). Springer International Publishing. https://doi.org/10.1007/978-3-031-06388-6_50

SuFang, Z., Zhen, Z., HongBin, W., & XiangBo, K. (2012). New discovery about plant defense: Plant- plant communication. Chinese Journal of Plant Ecology, 36(10), 1120–1124.
Yang, T., Chen, Y., Wang, X.-X., & Dai, C.-C. (2013). Plant symbionts: Keys to the phytosphere. Symbiosis, 59(1), 1–14. https://doi.org/10.1007/s13199-012-0190-2
Zhong, Y., Xu, Y., Jing, B., & Wang, X. (2014). Research Advances on Chlorella Cell-breakage Technology. Food research and development, 35(14), 120–124.

Study of Fashion Intelligent Design for Future

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Abstract

A study is being carried out of application of smart textiles design in the future life. Abundant examples from many different fields, such as fashion, products, architecture or even environment were collected. This paper introduces the following several inspirational works that can broaden our thinking in this fields. In the context of the development of the new era, China has entered the era of science and technology information, which is characterized by the use of artificial intelligence technology. It is necessary to integrate the technologies with fashion design to find the focus of design innovation. At the same time, the related processing methods of smart fashion were summarized. It provides a framework for further research in the future. The paper's contribution to the "NARRATIVES OF LOVE — — TOWARDS HEALING, TRANSFORMATION AND TRANSCENDENCE" conference themes.

Author keywords

smart fashion; innovation design; artificial intelligence

Introduction

Nowadays with the continuous development of science and technology, smart fashion and textiles have gradually appeared in our daily life. In the past two decades, there have emerged a plenty of intrigued design works while the multi-disciplinary research has collaborated between science and design. In the direction of fashion design, the paper discusses the fusion mode of artificial intelligence and fashion design, hoping to provide more design ideas, cooperate with intelligent technology, propose design schemes, and actively respond to the times a new challenge. In a study of application of intelligent fashion design for the future, abundant examples from many different fields, such as fashion, products, architecture or even environment were collected. This paper introduces the following several inspirational designs works that up-to-date cases can broaden our thinking in this fields.

Case Study

Interactive dresses

The two interactive dresses entitled (No)where (Now)here, have photoluminescent thread and embedded eye tracking technology made into them that was activated by the glances of spectator. The dresses were made from lightweight super organza that slowly moved about as someone stares at it. When the lights were out, the dresses became illuminated [9]. See Figure 1.

Lumalive

This is the first time that a fashion designer has used Lumalive textiles and it is part of Philips vision for a future where our surroundings and the clothes we wear become more intelligent, and interact with the environment around us. As early as 2005, Philips has developed a light- emitting textile called Lumalive. Beneath the outer fabric is a layered system that contains a flexible array of color light-emitting diodes (LEDs). It can only be seen from the outside when the screen is turned on. The idea was to integrate the flexible array of multi-color LED into the fabric without affecting the softness of the fabric, thus gave life to inert objects. Clothes, pillows, curtains and even interior decorations can all be illuminated by using the new technology. This fabric is very strong and wear-resistant and can be washed. See Figure 2.

Figure 1. Interactive dresses.

Figure 2. Lumalive.

SonUmbra

SonUmbra was a light and sound device with umbrella-like frame of canopy made of electroluminescent fibers. These diffuse luminescent fibers respond to surrounding activities and provide a pattern in the canopy. In the daytime, it provides shade and shelter from the rain. At night it can be illuminated to match the environment and generate electricity from solar energy. See Figure 4.

Blip Electronic Textiles Project

Blip was one of seven pieces series of Electronic Textiles project by Maggie Orth. The textile was changed from monochrome black in the cold state to bright colors in the heated state. Color- changing textiles were a combination of custom electronics, hand-woven electrodes and thermochromic inks that changed color when heated. In these Maggie's works, electronic devices sent a current to the resistance wire woven into the fabric, heating the resistance wire and changing the color of the thermochromic ink. See Figure 3.

Highly conductive e-Textiles

Electronic textiles (e-textiles) involve electronics and interconnections knitted or printed onto or into textiles, which enable the integration of electronic functions and attachments. Components and interconnections are natural to the fabric structure, which decrease the chance to be seen, twisted together or tore apart by the surroundings. Electronics that can be hanged over a vehicle or a tank is achievable using textile fabrics. The ideas for e-textiles have been around for decades, but with increasing commercial focus in the last 30 years. They are of great interest as they have various industrial applications such as health monitoring, sports training data acquisition, tracking the position, and status of soldiers in action, monitoring pilot or truck driver fatigue, and so on. See Figure 5.

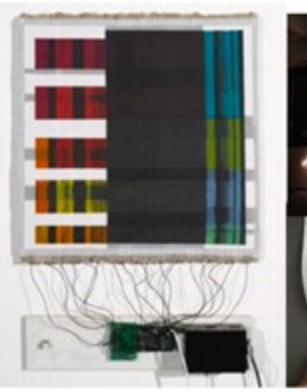

Figure 3. Blip Electronic Textiles.

Figure 4. SonUmbra.

Figure 5. Highly conductive e-Textiles

Integration mode of artificial intelligence and Fashion design

Automatic Operation

When AI technology is integrated into the field of

fashion design, the main development direction is to reduce the difficulty with the help of modern technology, integration of design parameter information, reduce the daily work of designer's stress. For example, many designers today often choose to use software to perform fashion simulation stitching operations. At the same time, it will be set in advance different clothing patterns, store the corresponding data, and then cooperate with the use of machinery chemical equipment for mass automated production. The promotion of this technology in order to allow designers to apply more energy to fashion style, pattern design work, so that the clothing with novelty, more fit the aesthetic demand of the wearers in the new period. In addition, the task in fashion design to use of big data technology can also sum up work experience for analysis the advantages and disadvantages of the design work, find the direction and method to improve the design level. See Table 1.

Virtual fitting

In fact, the virtual fitting function is a new product of the combination of artificial intelligence and clothing design, which represents the effective integration of the two. The feature of this function is that virtual image information can be drawn through information technology to facilitate the audience to experience the upper body effect of various clothes on the Internet, so that the audience can decide whether to buy this dress. This can meet the needs of online

marketing work in the new era, and can broaden the sales scope of clothing. At present, how to do a good job of optimizing the design of relevant functions is a key issue for designers to deeply study, which will directly affect the steady development of the fashion design industry. See Table 1.

Intelligent Prediction

In the process of comprehensively promoting the development and progress of clothing design work, we should correctly predict the future development prospects of the industry, understand the changes in market demand, and adjust the design ideas in advance. In particular, it is necessary to analyze the change law of different design styles. This involves the integration of artificial intelligence technology and clothing design. Through modern technology, data analysis should be carried out to intelligently predict the trend and specific reasons for the changes in people's aesthetic views, find the subsequent direction of clothing design, and occupy the clothing market first. Avoid designing some outdated clothing patterns and styles, resulting in unsalable clothing and waste costs. In addition, many designers in the new era are also studying the use of artificial intelligence technology for personalized customer style preference analysis and prediction, the goal is to tap potential customers.

Table 1. Integration of intelligence fashion

Integration mode	Work of integration	Dedicated software
•Automatic Operation •Virtual fitting •Intelligent Prediction	•Building a Database •Person module data •Model data •Data of fabrics and accessories	•Use of 3D virtual clothing software •3D printing technology and design

design

Work of intelligent fashion design integration

Building a Database

In the actual optimization of the fusion mode of artificial intelligence and clothing design, it is necessary to standardize the work flow, usually the first task is to complete the construction of the database, to do a good job in the classification of data information storage management.

Person module data

Designers to collect people's height, weight and other basic data, the data will be used to build a database, the goal is to complete the construction of the human body model with the help of the database, the real use of virtual technology online fitting. This link involves the construction of the common template of the standard human body model and the non-standard human body template, because each audience will have physical changes in the process of growth and development, and it is impossible to use a single model to complete

the virtual fitting operation. This requires the designer to first analyze what factors will affect the fitting effect, generally including high and low shoulders, flat chest, hips and other key information parameters of the human body, should be used intelligent technology to collect and process information. In addition, to successfully complete the construction of the database, but also with the use of professional software and hardware facilities, the human body information scanning, input into the system.

Model data

When using artificial intelligence technology to design clothing patterns, the data information of existing patterns should be collected, and a special database should be built to facilitate reference to the characteristics of other patterns. After completing the task of making the design drawing, the design drawing is put into the database for information comparison to avoid the problem of duplicate version. At the same time, the different versions are categorized by style. On this basis, and then according to the design time to sort, it is convenient for designers to summarize the general law of version type changes, find out the key reasons for data changes, and then targeted to adjust the clothing design ideas, innovative design schemes.

Data of fabrics and accessories

After the staff has completed the design of the version, it is necessary to think about what kind of fabric is suitable for the production of this clothing style, the sag and feel of different fabrics are different, and the types of clothing suitable for production are also significantly different. Based on this, designers must establish a database of fabrics and accessories in time, and systematically introduce the material characteristics and precautions of different fabrics. Including the weight of the fabric, whether it can be washed and other aspects of the content. See Figure 6.

Figure 6. Work of intelligent fashion design integration

Dedicated software for fashion design

Use of 3D virtual clothing software

Three-dimensional technology is a key technology to be used in the integration of clothing design and artificial intelligence, which can display virtual models of clothing from multiple angles and simulate the effect of real clothing on the body. We should try to install the plug-in of the virtual clothing tool in the production software to convert the plane interface into a three- dimensional interface. Focus on adjusting the clothing size for some wearers with enlarged abdomen, or broad hipbone, scientifically calculate the appropriate height and weight range of different sizes, and observe the actual clothing wearing effect with different sizes with the corresponding model diagram.

3D printing technology fashion design

In the innovative development of intelligent replication design work, to promote the use of 3D printing technology. The principle of the technology is that the special printer is connected to the computer system, and after the input of the parameter information of the design drawing, the solid clothing can be printed out through the special material, which has environmental protection properties and meets the requirements of energy conservation and environmental protection in the new era. This helps to improve the novelty of clothing design work, attract the attention of more audiences, and drive the sustainable and healthy development of the industry.

Conclusion

In the research on the integration of intelligent fashion design, it needs to build on human module data, pattern data, fabric and accessories database. It should be installed special CAD software, three-dimensional virtual clothing software, fabric scanner and so on. It also needs to work on intelligent aided design, innovative style design, collocation design. Complete intelligent information processing on the network, draw plans and stereo models, and improve the design effect. In addition, designers also need to consider the beauty and comfort of clothing, to ensure the adaptability of integration between technologies, but also from the perspective of information security management, to improve the security of information transmission, processing, storage work, and ultimately to comprehensively promote the long- term healthy development of intelligent clothing design technology.

References

Tao, X. (Ed.). (2001). Smart fibres, fabrics and clothing: fundamentals and applications. Elsevier.

Cherenack, K., & Van Pieterson, L. (2012). Smart textiles: Challenges and opportunities. Journal of Applied Physics, 112(9).

Zhao, J., Fu, Y., Xiao, Y., Dong, Y., Wang, X., & Lin, L. (2020). A naturally integrated smart textile for wearable electronics applications. Advanced Materials Technologies, 5(1), 1900781.

Zhu, X. J., Lu, H., & Rätsch, M. (2018). An interactive clothing design and personalized virtual display system. Multimedia tools and applications, 77, 27163-27179.

Sayem, A. S. M., Kennon, R., & Clarke, N. (2010). 3D CAD systems for the clothing industry. International Journal of Fashion Design, Technology and Education, 3(2), 45-53.

Vanderploeg, A., Lee, S. E., & Mamp, M. (2017). The application of 3D printing technology in the fashion industry. International Journal of Fashion Design, Technology and Education, 10(2), 170-179.

Shahrubudin, N., Lee, T. C., & Ramlan, R. J. P. M. (2019). An overview on 3D printing technology: Technological, materials, and applications. Procedia Manufacturing, 35, 1286-1296.

Wang, B. Z., & Chen, Y. (2014). The effect of 3D printing technology on the future fashion design and manufacturing. Applied Mechanics and Materials, 496, 2687-2691.

Power, J., Apeagyei, P. R., & Jefferson, A. M. (2011). Integrating 3D scanning data & textile parameters into virtual clothing. Hometrica Consulting.

Huang, S., & Huang, L. (2022). CLO3D-Based 3D Virtual Fitting Technology of Down Jacket and Simulation Research on Dynamic Effect of Cloth.Wireless Communications and Mobile Computing, 2022.

Liu, W., Yao, T., Yao, C., & Liu, P. (2021, February). Research on Pressure Comfort of Yoga Suit and Optimization Scheme of Pattern Based on CLO 3D Software. In Journal of Physics: Conference Series (Vol. 1790, No. 1, p. 012016). IOP Publishing.

Cultural application and value of traditional lacquer art in modern design

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Abstract

This paper aims to discuss the cultural application and value embodiment of traditional lacquer art in modern design. As an important part of Chinese traditional art, traditional lacquer art has a long history and rich cultural connotation. With the development of the times and the progress of science and technology, traditional lacquer art can also be combined with today's new materials and new technologies to seek a broader space for development. In modern design, traditional lacquer art, with its unique artistic charm and craft value, has gradually become a favorite creative element for artists and designers. This paper illustrates the importance of traditional lacquer art in modern design by elaborating on its historical origin, artistic characteristics, cultural connotation and application cases in modern design. By understanding the unique charm of lacquer and the traditional excellent craftsmanship, combining with the modern design concepts and techniques, this paper also puts forward some prospects for the future application of lacquer in design, with a view to better integrating lacquer into modern design, and providing useful insights into the inheritance and development of traditional lacquer in modern design.

Author keywords

Traditional Lacquer Art; Modern Design; Artistic Characteristics; Cultural Value; New Materials and Technology; Application Embodiment.

1.Historical Origin and Artistic Characteristics of Traditional Lacquer Art

1.1 Historical origin

Traditional lacquer art has a long history in China, which is the treasure of Chinese traditional art. The historical origin of traditional lacquer art can be traced back to the Neolithic Age in ancient China. In archaeological excavations, some Neolithic lacquer ware has been unearthed, which proves that the production of lacquer ware has a very long history in China. According to the latest archaeological discovery, an 8,000-year-old lacquer bow unearthed at the Cross Lake Bridge site in Xiaoshan, Zhejiang province, is the earliest lacquerware ever found in the world. During the Shang Dynasty, the production of lacquerware was already quite developed, which was widely used in the life of nobles and religious ceremonies. In the late Shang Dynasty, the production technology of lacquerware was further developed, and more exquisite and detailed lacquerware works appeared. With the evolution of history, the techniques of lacquerware production were gradually inherited and developed. During the Qin and Han Dynasties, the production of lacquerware reached new heights and became a very important work of art for the nobility and the royal family. Actually, lacquerware production gradually became a specialized profession, and the craftsmen produced numerous exquisite lacquerware works through their traditional skills and experience.

Over time, the art of lacquerware making spread to other countries and regions, such as Japan and Korea. During the Song Dynasty in China, lacquerware production had reached its peak and became popular in the art market at that time. The inheritance and development of traditional lacquerware production techniques has continued to this day, forming a unique artistic style that has has influence and spread in China and other countries and regions.

In general, the traditional lacquer art has a very long historical origin, and after a long period of accumulation and inheritance, the traditional lacquer ware production techniques have gradually developed and perfected, becoming an important part of the traditional Chinese crafts. Lacquer art works are rich and colorful, which have formed a unique craft characteristics and cultural connotations, and has profound inspiration and reference significance for modern design..

1.2 Artistic characteristics

The artistic characteristics of traditional lacquerware are mainly reflected in the following aspects:

Firstly, the unique material: the main material used in traditional lacquerware is the lacquer liquid from the lacquer tree, which is refined and processed through many procedures. The lacquer film formed after the drying of the lacquer sap is characterized by anticorrosion, moisture resistance, acid and alkali resistance, and also strong toughness and durability, which can be used to make all kinds of artifacts, and can be combined with other materials, such as wood, metal, jade and stone. The uniqueness of the traditional lacquer craft is that the lacquer coating process needs to be coated and polished many times to make the surface of the lacquerware achieve the ultimate luster and soft touch, forming a unique natural beauty.

Secondly, exquisite craftsmanship: the production process of traditional lacquerware is very complicated and complex, which requires multiple procedures, including the production of base tires, lacquer coating, carving, color painting, etc.. Every link needs to be carefully operated to ensure the quality and artistic effect of the final work. The production of base tires requires the use of different body materials according to different rendering effects, and the same body materials can also be achieved through different production processes to achieve different shapes, such as wood tires, in terms of wood species can be divided into hardwood and softwood. Hardwood, including cherry, oak, elm, birch, beech, etc., usually higher prices, but the quality is excellent compared to softwood. Softwood, including tung, camphor, pine, cedar, etc., a wide variety of prices can be accepted by most people. In the production process can be divided into mortise and tenon splicing, hand-carved and plank splicing, etc., mainly based on different rendering effect using different production processes. After the tire is made, it is painted and polished many times to make it smooth and solid. The craftsmen need to master the technique of painting and the consistency of the lacquer, and when drying, they need to control the temperature and humidity of the surrounding environment to ensure that the lacquer dries naturally and forms a strong lacquer film. Carving and painting require the craftsmen to be highly skilled and delicate. Traditional lacquerware is very meticulous in its attention to detail, with every detail carefully designed and finely crafted.

Whether it is the treatment of the edges of the lacquerware, the presentation of the decorations, or the embellishment of the decorations, all of them reflect the craftsmen's pursuit of details and the pursuit of aesthetics. The detailing of traditional lacquerware is not only reflected in the decoration on the front, but also in the parts that are not directly displayed, such as the back and the bottom. Craftsmen pay attention to the meticulous treatment of each part, which can present a perfect overall effect.

Thirdly, unique decorative techniques: the decoration of traditional lacquerware adopts a variety of techniques, such as carving lacquer, color painting, inlay and so on. Carving techniques are usually applied to the surface of lacquerware to create various patterns and motifs through carving or relief carving. Painting, on the other hand, creates colorful patterns and colors by using different colors of lacquer, and the painting technique can show vivid

images and delicate color changes. The carving process of traditional lacquerware is very elaborate, which can show delicate texture and three-dimensional sense. In addition, traditional lacquerware often adopts the inlay technique, jewelry, shells, keels and other materials on the surface of the lacquerware to increase the decorative effect and texture.

Traditional lacquer works usually use colorful colors and lines to express artistic emotions. The natural pigments used in the production of lacquerware, such as danstone and vermilion, can present unique luster and vivid colors through special craft techniques. At the same time, the lines of traditional lacquer works are carefully designed and drawn to express the author's feelings and understanding of life, nature and humanities through the smoothness and changes of the lines. In a word, traditional lacquerware expresses the imagery and symbols of traditional culture in artistic techniques, conveying the essence and aesthetic concepts of traditional Chinese culture.

2.Cultural Connotation of Traditional Lacquer ArtSections

Traditional lacquer art also has deep cultural connotations. In traditional Chinese culture, lacquer is regarded as a symbol of nobility and elegance, and a manifestation of power and status. Therefore, lacquer art is not only a handicraft but also a cultural symbol in traditional society.

2.1 Traditional Lacquer Art is closely related to folk culture

Many lacquer works embody folk customs and beliefs, such as lacquer furniture and lacquer sacrificial vessels. Traditional lacquer works are usually presented with delicate lines and gorgeous colors, conveying the author's perception and understanding of life, nature and humanities through unique shapes and forms. Traditional lacquer works are not only on the level of art, but also closely related to life, showing distinctive regional characteristics. Lacquerware works from different regions often reflect the local culture and national characteristics. For example, the lacquer works in the north are mostly characterized by atmosphere and heaviness, while the lacquer works in the south are known for their delicacy and gentleness. The formation of these regional characteristics is closely related to the local history, culture and social background.

2.2 Traditional Lacquer Art Contains Philosophical Ideas

Traditional lacquer art is also rich in philosophical ideas, such as Taoism's "unity of heaven and mankind" and Confucianism's "mediocrity and harmony", etc., which are reflected in the lacquer art works and form a unique aesthetic. Traditional lacquer works are often used in furniture, utensils and other practical everyday objects to integrate art and life. This fusion reflects the ancient Chinese culture's idea of "literature with the road", combining art and practicality, so that people can feel the beauty of art in their daily lives. As a treasure of Chinese traditional culture, traditional lacquer art carries rich historical information, and is an important physical material for the study of ancient Chinese society, culture and living customs, etc. It has precious artistic value.

2.3 Unique Aesthetic Characteristics of Traditional Lacquer Art

Traditional lacquer art has its unique aesthetic characteristics, and there are many varieties, including wooden tires, lacquer pots, lacquer bottles, lacquer plates, lacquer bowls and so on. These vessels have their own characteristics in shape, texture and color. For example, the conch shell and bump gold craft of Han and Tang dynasties, and the stripped and modeled color craft of Ming and Qing dynasties are all important parts of traditional lacquer art. These techniques not only demonstrate the deep cultural heritage of the Chinese nation, but also show the exquisite skills and creativity of the skilled craftsmen of the past generations. The color of

lacquer is deep and glossy, giving people a sense of elegance and solemnity. Its unique texture and texture make lacquerware have a high aesthetic value. Whether it is a living thing or a work of art, traditional lacquer attracts people's attention with its unique artistic charm and has unique aesthetic characteristics.

3.Application and Value Embodiment of Traditional Lacquer Art in Modern Design

3.1 Application of traditional lacquer art in modern design

Traditional lacquer works are not only a kind of art, but also closely related to daily life. Traditional lacquer works are often used in furniture, utensils and other practical daily objects, combining art with daily life. In modern design, traditional lacquer art is widely used in the fields of architectural decoration, interior design, furniture design, product design and artwork production. It injects unique charm and taste into modern design with its exquisite skills, rich cultural connotation and unique artistic expression.

First of all, traditional lacquer art plays an important decorative role in interior design. The use of traditional lacquer techniques and patterns can not only add unique artistic value and ornamental furniture, but also add a unique artistic atmosphere to the interior space. For example, using traditional lacquer techniques on the walls of the restaurant, it can create exquisite lacquer murals, combining traditional cultural elements with modern design to create a unique dining environment. Another example is the application of lacquer tea set in life. Through careful production and lacquer decoration, the lacquer tea set not only fulfills the function of tea, but also enhances the atmosphere of the whole tea culture, so that people can enjoy the beauty of art in the process of tasting tea.

In addition to interior design and furniture design, traditional lacquer is also widely used in the production of artworks, and its unique artistry and exquisite craftsmanship have made it one of the most important means of artwork production. For example, in the manufacture of the screen, the traditional lacquer technique can be used to draw exquisite landscape painting patterns or flower and bird patterns on the surface of the screen, thus making the whole screen a piece of artwork with ornamental value. Besides, traditional lacquer techniques can also be used in ceramics production. For example, painting traditional Chinese patterns on the surface of ceramics, such as cloud patterns, birds and flowers, landscapes, etc., can make the ceramic works become both vivid and interesting, with more artistic sense and cultural connotation.

In addition to the areas mentioned above, traditional lacquer art can also play a role in various fields such as clothing design, jewelry design and handicraft production. In clothing design, traditional lacquer techniques and patterns can add unique artistic elements to fashion, making it more artistic and unique. In jewelry design, traditional lacquer can be combined with modern materials to decorate the surface of jewelry, adding artistic and ornamental qualities to jewelry. In the production of handicrafts, traditional lacquer art can add unique decorative effects to handicrafts, making them more collectible and culturally connotative.

3.2 The value of traditional lacquer art in modern design

Traditional lacquer art is constantly innovating and developing while inheriting the traditional production process, and it incorporates modern aesthetic concepts and artistic techniques on the basis of retaining traditional features, forming a unique artistic style. For example, more abstract and modernist elements have appeared in modern traditional lacquer art works, while combining the application of new materials and new technologies. This is an innovative form, which makes traditional lacquer art have a richer and more diverse expression and a broader space for artistic expression.

The value of traditional lacquer art in modern design mainly includes the following aspects. The first is to

combine traditional lacquer art with modern design to create works with both traditional flavor and modern aesthetics; the second is to use traditional lacquer art as the basis for innovative design to form new forms of design expression.Lacquer art has its own way of application in different fields , which has a high design value. The fusion of traditional lacquer art and modern design can make the works have deep cultural heritage and unique artistic charm. Therefore, the problems and challenges faced by lacquer art in design at present require us to take effective measures to solve them. For example, strengthening the inheritance of skills, expanding market applications, innovative design concepts, etc., so as to promote the sustainable development of lacquer art in modern design.

Conclusion

All in all, traditional lacquer art, as one of the representatives of Chinese traditional crafts, has a long historical origin and unique artistic characteristics. It shows colorful patterns and colors through exquisite craftsmanship and unique decorative techniques, conveying the essence of traditional Chinese culture and aesthetic concepts. This paper analyzes the application scenarios and design value of lacquer art in different fields and points out the problems and challenges faced by lacquer art in design by exploring the history, current situation and future development trend of lacquer art. By deeply exploring the rich connotation of traditional lacquer art and combining traditional lacquer art with modern design, we can better inherit and carry forward this traditional craft, and inject deep cultural connotation and unique artistic charm into modern design. It is hoped that this will help promote the prosperity of the lacquer industry and contribute to the inheritance and promotion of Chinese culture.

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References

Wang Shixiang. Chinese Painting and Decorating Records [M]. Beijing: People's Fine Arts Publishing House, 1983.

Zhang Feilong. Traditional Chinese Lacquer Craft [M]. Hangzhou: China Academy of Art Press, 2010.

Wang Jianwen. Research on the integration of traditional lacquer art and modern product design[J]. Daguan,2022(09):82-84.

Chen Yafei. Research on the Inheritance and Development of Chinese Traditional Lacquer Art[J]. Fine Arts, 2020(07): 60-63.

Wang Shixiang. Research on Chinese Painting Craft [M]. Beijing: Cultural Relics Press, 2017: 34-45.

Zhao Lin. Exploration of aesthetic and practical value of modern lacquer art[J]. Art Appreciation, 2019(11): 29-34.

Chen Xinyu. Discussion on the value of traditional lacquer art and its contemporary application[J]. Tiangong,2022(05):58-60.

Luo Xuemei. Research on the application of traditional lacquer art in modern design[J]. Western Leather,2020,42(07):79.

Experimental study of the morphology of mixed waste fabrics and ceramic residues

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Abstract

Problem To explore feasible solutions to realize the recycling and sustainable application of waste materials in response to the existing problem of large quantities of discarded textile fabrics and ceramic residues accumulating unused. Methods Through the experimental method, we explored the feasible methods of new material modeling from two perspectives: material properties and traditional Chinese fiber craft. Results Two ideas for creating forms that can amplify the advantages of the materials were explored. Conclusion Based on the experimental results and later market research to find four suitable directions for the development of the material, to provide a reference model for future modeling creations in the field of art and design, which can help to realize the recycling of waste fabrics and ceramic residues sustainable use.

Keywords

sustainable design; waste porcelain powder; waste fabrics; mixing experiments; fiber-ceramic composite clays

1 Introduction

Due to the rapid economic development and improvement of living standards, people create a large amount of garbage in their life, which leads to environmental pollution and waste of resources. In the clothing industry, people mass production and consumption of resources, all kinds of clothing edge cutting waste is increasing day by day. Relevant information shows that 46.5% of families have more than 30 pieces of large pieces of waste clothing stored. According to the industry's rough estimate, the renewal cycle of clothing for three years, every three years after the value of more than 200 billion yuan of waste clothing will be eliminated. Similarly, China's ceramic products in the use of the process also produces a large number of waste materials, such as architectural ceramic waste, daily life ceramic waste, etc. [1-3]. However, due to the low profit of the waste ceramic recycling industry, most of the waste ceramics are disposed of in landfills and piles, which causes great pollution to the environment. Therefore, in the face of such a large number of fabrics and ceramics, the study of how to sustainably apply waste materials has become a crucial task for the country at present.

The majority of researchers, artists and designers have carried out in-depth studies on this issue. In the 1980s, ceramic art was created by using fabric as a structural support and dipping it in mud to create ceramic works. The ceramic works created by this technique are commonly known as "paper clay" in the field of ceramics [4]. If this kind of creation method is combined with waste treatment and applied to the future art design field, it will be conducive to the integration of high-value resources and recycling of waste materials. Therefore, the purpose of this paper is to combine the slurry made of waste porcelain powder with waste fabrics to study the possibility of morphological creation. To lay the foundation for future entry into the design market, so as to better realize the integrated sustainable use of waste materials.

2 Experimental results on morphology

2.1 Natural texture

In the course of our experiments, we discovered a number of unexpected textural patterns, and these seemingly accidental effects were in fact based on changes in the fluidity of the mud, the degree of absorption of the fabric, and the morphology of the support. When the combination of fabric and mud is saturated, the new ceramic material looks visually like ordinary fabric, perfectly replicating all the structural details of the fiber fabric. This is due to the fact that the mud soaks into and surrounds each yarn without a trace of excess mud. After firing in a kiln, the fiber portion is reduced to ash by fire, leaving only the ceramic portion to naturally replicate the texture of the fiber fabric. The structure of knitted, woven, nonwoven, jacquard and interlining fabrics is clearly visible when the new ceramic material is exposed to light, as shown in the picture (Fig. 1 / column a).

When there is slightly more slurry than the fabric can handle, a small amount of excess slurry remains on the surface of the less absorbent fabric and forms cracks. The shape of the cracks varies according to the location of the slurry build-up, the fabric structure and the drying rate (Fig. 1 / column b).

When there is more mud than the fabric fibers can absorb, the excess mud flows down the seams of the fabric to the underside of the fabric, where it solidifies against the fabric in an interesting mud texture pattern. This texture changes depending on the material and shape of the support and the flow of the mud. (Fig. 1 / column c).

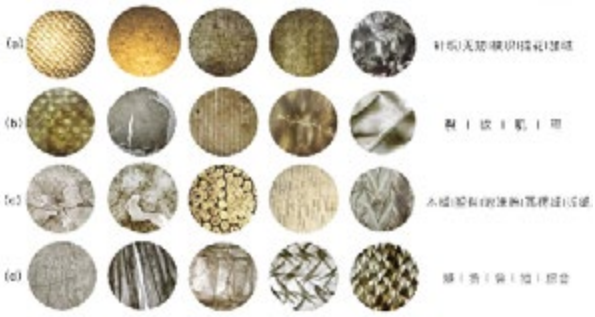

Fig. 1 Effect of natural texture and artificial texture under light

2.2 Artificial Texture

In addition to naturally formed texture, man-made creation forms with rules and regulations are also indispensable. The traditional Chinese fiber craft has a history of thousands of years, and is qualified enough to be the source of creative texture. The author believes that we can draw nutrients from the fiber craft, deconstruct the production idea of the craft, and integrate it into the creation of new material forms. For example, the traditional fabric treatment process is to embroider, sew, fold, fold, draw and so on to create different texture forms on the fabric, and after combining these with the new material, it can produce a lot of light and shadow effects (Fig. 1/d column).

The deconstruction of the tie-dye process into new materials was found to be the most representative creative process during the experiment [8]. Tie-dye is mainly divided into two parts: knotting and dip-dyeing. Imitating the tie-dye process, colored paste is used instead of pigments for dyeing to produce tie-dye-like patterns. These patterns are created by piling up the mud, which ultimately results in regular, slightly raised, and unique mud textures (Fig. 2).

Fig. 2 Physical picture of the texture of the ceramic sample after tie-dyeing

In addition to dyeing, the shapes formed during the tie-dye process can also be used as a source of creativity. It is worth mentioning that the new material preserves these beautiful shapes very well. Since the mud is malleable, it is possible to freeze the instant shapes from the untying process after drying. (Fig. 3)

Fig. 3 Experimental samples of tie-dyed ceramics under light.

3 The development prospect of materials

The experimental investigation of materials should be applied to practice as the fundamental starting point, which is also in line with the core concept of contemporary material art, "starting from the material body, returning to the creation". Through the waste porcelain powder and fabric repeated mixing experimental process, found that the material has the potential in many aspects, in the future applied to a wide range of art and design creation also presents a great deal of when for the nature and feasibility.

3.1 Extend the ceramic art and design field modeling new space

Compared with traditional ceramics, hybrid materials can produce more shapes in a more labor-saving way. Because of the supportive fiber structure, it can be made into any organic form in a wet or semi-wet state. This facilitates artistic creation, extends new space for modeling pottery, sculpture, wall decorations, vessels, etc., and injects vivid elements into contemporary pure pottery creation. In addition, the mixed material modeling advantages, will provide new ideas for the future development of industrial ceramics. Such as sanitary ceramics, architectural ceramics, industrial ceramics and other fields, in the shape of more or less by the limitations of the material process, mixed materials can be more powerful to improve this problem.

3.2 Promoting the development of industries in the field of ultra-light ceramics

The weight of the new ceramic material is much lighter than common ceramics, which is suitable for ceramic areas that are sensitive to the weight of the product, such as ceramic jewelry. At present, some of the ceramic jewelry on the market is heavy and not suitable for consumers to wear for a long time. Although there are new ceramic materials on the market with lighter and stronger characteristics, the material cost is higher and less used. New ceramic materials can solve these problems.

3.3 Enrich the artistic language of light and shadow ceramic products

Hybrid materials ultra-thin, ultra-light, high light transmission properties, suitable for light art ceramics field. Traditional ceramic products are mechanically thinned to achieve the effect of light transmittance, this practice not only restricts the shape of the product, but also limits the final display effect of the product, so that the ceramic products can not improve their own artistic appreciation value. However, our mixed materials not only have good light transmittance, but also have rich and diverse textures. Designers can change the texture of the mixed material by adjusting the adsorption of the clay, the structure of the fabric, the speed of drying, the shape of the support, etc., and can also produce products with more artistic aesthetics through sewing, folding, pleating, embroidery, tie-dyeing, weaving, and other fiber processes. This hybrid material inherits the advantages of ceramics and fibers, and when exposed to light, it exhibits the warmth of ceramics and the unique texture changes of fiber materials, with unique aesthetic characteristics. This aesthetic feature can be used as a new language of expression in ceramics for artistic creation and design applications (Fig. 4).

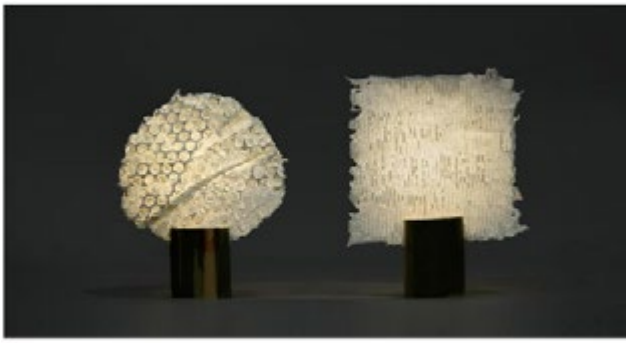

Fig. 4 Application of experimental samples in the design

4 Conclusion

This paper focuses on the possibility of recycling waste fabrics and waste porcelain powder from the perspective of sustainable design, utilizing the thinking of material science. The research results of this paper are as follows:

Based on the material properties, two ideas of form creation that amplify the advantages of the material are explored. First, the natural texture formed by adjusting the consistency of the mud and the material and shape of

the support, highlighting the natural texture effect of the material and the unique aesthetic of light and shadow; second, the deconstruction of the traditional Chinese handicrafts and draw nourishment from them, and the production of handicrafts into the creation of new material forms.

Based on the results of the experiment and the market research, we have found four directions suitable for the development of the material.

Through rethinking and re-innovating the new material, this experiment provides a feasible reference idea for future artistic creation and design application, a new solution for sustainable resource integration and application, and a new thinking paradigm for traditional ceramic craft research.

References:

1. Dong Weixia,Cho Woo Seok,Bao Qifu et al. Research on the application of waste porcelain powder in plum green crackled glaze[J]. Journal of Ceramics,2018,39(02):170-173.
2. Qiu Weizhi,Shen Maorong. Research on recycling of waste porcelain[J]. Chinese Ceramics, 2008, 234(05):46-48.
3. Shang Chaobing. Analysis of the utilization of ceramic industry waste slag [J]. Ceramics, 2005(04):32-34.
4. Farrow C. Paper/Clay[J]. Artists Newsletter, 1987, 20-1.
5. Zhou Luying. Modern Clothing Materials [M]. Beijing: China Textile Press, 2000.
6. Liang Hui'e. The art of garment fabric reconstruction [M]. Beijing:China Textile Press,2008,12.
7. Zhu Songwen,Liu Jingwei. Clothing materials science 5th edition [M]. Beijing:China Textile Press,2015.1.
8. (Japanese) Ando Hiroko. The Complete Guide to Strand Dyeing [M]. Japan:Seibundo Hoshikosha, 2016.
9. Zhou Wu. A preliminary exploration of paper pottery[J]. Chinese Pottery Artist, 2008(04):64-68.
10. Liu X. Experimental research on fiber ceramic composite mud process [D]. China Academy of Art, 2019.

Research on the design of "Trunk Bazaar" for youth groups based on the 4E theory of experience economy

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Abstract

Influenced by the downgrading of consumption, many traditional consumer complexes face difficulties attracting consumers. New types of consumer space have been attracting the attention of young consumers, among which the "boot bazaar" has triggered heated discussions. "Boot Bazaar" is a kind of commercial activity in which car owners spontaneously use the boots of unused vehicles as retail space, but there are still many problems. To cope with the challenges posed by consumers downgrading to traditional commercial spaces, the boot bazaar is used as an example to update its business model and design a set of new commercial spaces that fit the consumption concepts of young groups. This paper adopts the 4E model of experience economy theory, analyses three typical cases, summarizes the elements that can enhance the sense of experience of young consumers, and puts them into the design. At the same time, it is concluded that the change in consumer demand has prompted the change of consumer space; how to enhance the consumer experience of young groups is the focus of designing new consumer space in the future. This paper is dedicated to improving the space planning and business model of the Trunk Bazaar. Also, it plays a specific role in promoting the exploration of new consumer spaces in the future, which aligns with the theme of this conference - the Foresight Plan.

Author keywords

Experience Economy, 4E Model, Boot Bazaar, Consumer Space Transformation

Introduction

Consumption downgrading is generally regarded as a negative and passive consumption phenomenon, and consumer psychology cannot be accurately expressed through consumption downgrading behavior. Consumption downgrading usually manifests as weak consumption capacity and insufficient incentive for residents to consume. (14) Under the sluggish environment of economic downturn, young people reduce their willingness to consume at a high level and lack the motivation to consume. However, the boot bazaars spontaneously established by young people have created a unique consumption atmosphere in a low-cost form, thus becoming a substitute for high-quality consumption places for young people. Therefore, as an informal place for buying and selling activities, the trunk bazaar challenges the traditional large- scale retail industry with its simple, convenient, and flexible trading methods, breaking the inherent trading circle. (13) The rise of boot bazaars means that traditional commercial spaces face a significant dilemma of transforming. Previous research has been carried out on the dilemmas traditional commercial spaces face. Therefore, in the face of the strong impact of online consumption on community physical commerce caused by the rapid development of the digital economy, how to improve the shopping and experience advantages of offline physical stores has become an

urgent topic of research (5). Shoppers tend to enter offline physical commercial spaces for six purposes: to enjoy the aesthetics, to escape routine and boredom, to explore a new product or shop, to enter a state of absorption, to gain new information about the shop and its products, and also as social interactions and relationships. The main design point of commercial space transformation is how consumers experience offline commercial space that online shopping cannot replace. furthermore， Young people are spatial and social agents with
different lifestyle habits than middle-aged people and play an essential role in creating or changing the city landscape (11) . Therefore, paying attention to the consumption characteristics of young consumers and designing commercial space to meet their consumption experience is another crucial design point. The term "experience economy" describes a person perceiving experience when an individual participates in an event either physically or emotionally and comprehends a memorable experience (12). Pine and Gilmore's model distinguishes two experience dimensions: customer participation and connection with the environment. Customer participation may go from passive, with customers not involved in any performance, to active involvement, where customers play critical roles in creating the experience. Along the connection axis, the experience may move from absorptive, occupying the person's attention by bringing the experience into the mind, to immersive, where the person becomes physically or virtually a part of the experience. Consequently, experiences may be classified into four realms:
Entertainment (passive, absorption), educational (active, absorption), aesthetic (passive, Immersion), and escapist (active immersion). (6)From early on, Abbott emphasized the relevance of customer experiences, as "what people desire are not products but satisfying experiences." Pine and Gilmore (1) took up this theme, defining the experience as a distinct economic offering, different from services, goods, and commodities, and suggested the progression of economic value towards the experience economy(3). Research on the experience economy in most fields focuses on increasing consumer experience. Experience economy theoretical models (4E) have been researched in tourism management, hospitality management, digital media, etc.. Hosany and Witham employed it in cruise travel(3)， and Mehmetoglu and Engen in a music festival and museum. (6)However, there is a paucity of research on urban spaces based on the experience economy theory. Jacobs and Appleyard have identified the study of the experience economy in the urban sphere as an essential goal towards better urban living and quality environments. (4) Marjana Johansson and Jerzy Kociatkiewicz explore the intervention of urban festivals in shaping urban space from an experience economy perspective. (4)
These previous studies provide examples of how to use experience economy theory to examine other areas of research and have demonstrated in several cases that satisfying experiences have a significant effect on increasing consumer willingness. Current research on urban space focuses on explaining the significance of experience economy theory for urban planning and development from a macro perspective. To cope with the impact of consumer downgrading on commercial space, this paper fills the research gap in applying experience economy theory in retail space design. In addition, this study also emphasizes the importance of meeting the consumption characteristics of new consumer groups, thus improving the business model structure of the backup bazaar, which is also lacking in the transformation of current commercial spaces.
Therefore, the research content focused on in the article can be summarised as follows: using the experience economy theory as a lens, perfecting the business model and spatial design of the boot bazaar, and exploring new ideas for the transformation of urban commercial space.
The article first conducts field research on three boot bazaars with the theory of the 4E model and then perfects the design of the boot bazaar in Changsha to explore the following issues:
1. How can the trunk bazaar derived from consumption downgrading enhance the sense of experiential consumption for young consumer groups?

2. How can the new consumer space represented by the trunk bazaar become a new direction for transforming traditional consumer space?

The findings of the article not only provide empirical evidence for the improvement of the current boot bazaar but also provide a new theoretical basis for the transformation of traditional commercial space.

Conceptual framework

As the fourth largest economy, after the agricultural, industrial, and service economies——The term "experience economy" describes a person perceiving experience when an individual participates in an event physically or emotionally and comprehends a memorable experience (10). In line with the experience economy logic (Pine & Gilmore, 1999), experiences are co- produced affairs where participants are perceived as active agents, not passive spectators (Ellis & Rossman, 2008). Pine and Gilmore first introduced the concept of the "Experience Economy" and the 4E model - dividing experiences into four key elements: entertainment, education, escapism, and aesthetics, with the intersection of all four areas forming a "sweet spot." A "sweet spot" is formed at the intersection of all four areas. It also explains how experiences can be an engine of economic growth and suggests that economic value should be shifted towards experiential value. (9); Holbrook and Hirschman reveal how consumption fantasies, emotions, and pleasures influence consumer behavior (2)

This paper focuses on the "Trunk Bazaar" from the experience economy perspective, uses the 4E model to explore its characteristics, and improves the "Trunk Bazaar" from the four dimensions of entertainment, educational, escapist, and esthetic.

3.1 Entertainment

Entertainment as an essential form of experience stimulates participants to enter experiential scenarios progressively, but compelling entertainment must capture and occupy the attention of individuals and allow them to participate in it; typical entertainment venues tend to lead participants to a sense of participation and experience through a sense of context and atmosphere: atmosphere is often created through the use of lighting and music; context is often created through the establishment of a theme for the venue based on the unique cultural landscape of the area. An effective theme is simple, compelling, and does not need to be overtly expressed in writing. However, the theme must drive all the design elements and the experience of the staging event, with a unifying storyline that completely engages the target audience.

The leading target group of the bazaar - young consumers show a significant tendency towards memory-rich entertainment products or services, in addition to sensory stimulation through music, stage, lighting, etc., focusing on the theme concept of the bazaar's regional characteristics is also a way to increase the memory points of young consumers.

In this study, the entertainment experience precisely corresponds to the four elements of the Trunk Bazaar's music: stage, lighting, and event theme.

3.2 Educational

Educational experiences enable tourists to increase general and specific skills and knowledge while actively participating in events or activities at a tourism destination(7). In contrast to entertainment experiences, educational activities tend to confer a more positive sense of engagement. How the experience gives participants a sense of engagement in acquiring knowledge is an essential measure of the educational experience dimension; for example, the craft beer-themed tour categorized the source of knowledge acquisition for the participants as twofold: as there are many types of beers introduced into the marketplace, giving knowledge of the product encourages the participants' need to buy it. However, knowledge does not only come from the beer stand but also from interaction and communication with other people(10); in other words, the purpose of the educational

experience is to encourage participants to acquire knowledge both during consumption and socialization and to motivate participants to actively socialize and consume through the experiential sense of knowledge acquisition. Educational experiences require participants to be more active, and young consumers consume them for psychological satisfaction, social interaction, identity, and individuality. Therefore, the article focuses on how to focus on intellectual output in the conception and scenario creation of the bazaar, guiding consumers to participate in the bazaar with a sense of knowledge acquisition and, at the same time, providing them with places where they can get to socialize.

The educational experience in this study precisely corresponds to the three main elements of community interaction, information communication, and social space in the boot bazaar.

3.3 Esthetic

Distinguishing it from the other three dimensions of experience, the aesthetic experience allows the consumer to immerse themselves in the sensation but does not require active participation. Engaging in this experience is to lose themselves in appreciating what they see. For example, Rangson Chirakranont and Sirijit Sunanta's discourse on craft beer tourism discusses how the construction of scenarios can be used to increase the aesthetic experience of the participants, which can be provided using artificial elements that reflect the event's theme. (10) Products or scenarios that are beautiful and unique in appearance tend to capture the attention of the younger demographic. Therefore, a unique aesthetic experience will attract young consumers to participate in it. Bazaars form a unique language system through design, providing consumers with a unique aesthetic experience while forming visual symbols that represent the culture of the bazaar.

The aesthetic experience in this study corresponds to four significant elements: bazaar logo, IP image, stall decoration, and overall style.

3.4 Escapist

The escapist experience is similar to other domains of experience that provide different measures of amusement and relaxation. However, the escapist experience requires high immersion and participation; in contrast to the other dimensions, the escapist experience focuses on encouraging an escapist experience for travelers through real-life scenarios of different lifestyles and societies, where they will be free from their daily lives. (7)The different identities and environments from everyday life give the participants a sense of psychological escape, which greatly satisfies the need for psychological relief for most stressed people.

The boot bazaar provides the consumer with two central identities - buyer and seller - that distinguish him from the everyday and break class. The order and uniqueness of the consumer's everyday life are briefly escaped, and the consumer takes on a new identity and exists in the bazaar. The experience of "buyers" and "sellers" communicating as equals in the bazaar is the main reason the bazaar provides a sufficient understanding of escapism.

In this study, the experience of escapism corresponds to the three main elements of bazaar order, immersion, and participation.

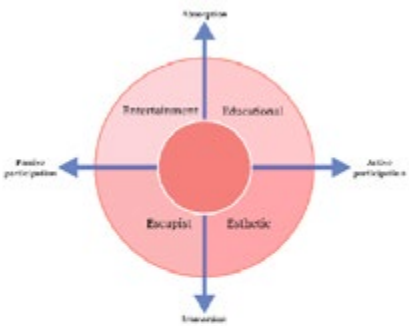

Figure 1. Experience Economy 4e Theory

4. Boot Bazaar Research 4.1 Case Study

Aiming at the existing boot bazaar research, from the four dimensions of entertainment, education, aesthetics, and escape to analyze the specific components of the typical bazaar, to discover the positive elements of each bazaar tends to the "sweet spot," to provide a theoretical basis for the improvement of the boot bazaar.

4.1.1 Wumadu Bazaar

Figure2. Translation of 4e theory in research

Wumadu Bazaar is located in China, Jiangsu, and Nanjing. The area has a long history and
culture and is also the birthplace of Nanjing Trunk Bazaar. Different from other boot fairs, Wumadu Trunk Fair, under the government's decision, tries to build a new IP of the city, which is rich in the cultural characteristics of Nanjing.

According to the theory of the 4E model, Wumadu Trunk Bazaar mainly adopts the experience mode of "Entertainment Experience + Education Experience" to build up the bazaar. From the dimension of entertainment experience, Wumadu Trunk Bazaar tries to attract consumers to participate in the cultural space to experience Jinling culture through lighting and other forms, and the bazaar activities themed on regional culture meet the experience needs of the young group, but it lacks large-scale stage equipment at present; from the dimension of educational experience, Wumadu Trunk Bazaar emphasizes on the experience that consumers can acquire knowledge within the bazaar and has held several events to popularise local culture to give educational experience. Educational experience to organize themed cultures, such as popularising local silk culture and promoting anti-fraud knowledge, enhances consumers' educational experience. However, the bazaar has neglected the importance of aesthetic experience and escape experience for the participants in the 4E model. Coordinating and enhancing the bazaar's overall aesthetic feeling and giving consumers an immersive spatial experience through design is the main problem in constructing the cultural IP of Nanjing Bazaar nowadays.

4.1.2 Square Box Project Bazaar

The Box Project Bazaar is located in Chengdu, Sichuan, China. The bazaar focuses on brand promotion and brand community building and tries to carry out "flash mob" brand marketing in the form of a boot market.

According to the 4E model theory, the analysis of the experience form of the Square Box Project Bazaar shows that the Square Box Project Bazaar focuses on the experience mode of "educational experience + escapist experience" to build the bazaar. From the dimension of escapism experience, the bazaar focuses on the concept of consumers' expression, giving them a sense of participation in a self-constructed lifestyle; from the size of the educational experience, the bazaar emphasizes the combination of design and corresponding product concepts, stimulating consumers to consume after obtaining a sense of knowledge acquisition, to build up a brand image in the target group gradually.

Figure5. Insert a caption below each figure and number all figures.

However, in terms of the four experience dimensions, the Box Project Bazaar still lacks in the dimensions of entertainment experience and aesthetic experience, so how to quickly stimulate consumers' sensory and psychological feelings and attract the target group to participate in the bazaar actively is a problem that needs to be solved urgently.

Figure6. Analysis of the Square Box Project Bazaar

4.2 Comparative analysis

A side-by-side comparative analysis of the above cases yields the following results:

4.3 On-the-ground research

After the case study, the authors conducted focused research on the Dafu Bazaar in Changsha to gain an in-depth understanding of the current situation of boot bazaars and to identify further the problems of boot bazaars at the design and operation levels.

4.3.1 Overview of the research

Located in Changsha, Hunan Province, China, Dafu Bazaar is a typical boot bazaar in the Changsha area and is currently tiny in scale, with about 15-20 stalls per bazaar. The bazaar manager and his team are responsible for constructing and promoting the entire bazaar. Because the bazaar is currently focused on joint activities with large shopping malls, many activities are now located near large shopping malls in the Changsha area. Still, according to feedback from the bazaar's stallholders, the highest returns are generated by the activities at Tongcheng Commercial Plaza, located in the vicinity of the University City in Changsha's Yuelu District.

The stakeholders involved in the Dafu Bazaar are government departments, bazaar managers, stall owners, consumers, event organizers, and online operators. The B-side of the population: Bazaar managers, stall owners, event organizers, and online operators serve the C-side's main population, young consumers, with the assistance and management of the G-side. During the field research, the author conducted interviews with the bazaar manager, stall owners, and consumers, and the discussions were as follows:

The primary manager of the Big Fishing Bazaar, who is also the initiator of the bazaar, is currently facing the central problem of the bazaar's difficulty in attracting customer traffic on a sustainable basis. To solve the problem, the bazaar owner tried to increase the marketing efforts of the bazaar through live broadcasting, but the effect was not significant. Also suffering from unstable customer traffic are the stallholders of the bazaar. Two post-95s stallholders who were starting their businesses expected to gain the opportunity to promote their online shops to consumers by joining the boot bazaar, but the desired results were not achieved. In this regard, a randomly interviewed Post-00s consumer believes that the real purpose of entering the bazaar is not to consume but to socialize.

4.3.2 Survey and Research Summary

After research, it was found that the current process of constructing the Dafu Bazaar is as follows:

(1) With the approval of relevant government departments,

The AE model	Specific elements	Wumaotu Bazaar	Square Box Project Bazaar	Big Fish Bazaar
Entertainment	Music			
	Lighting			
	Stage			
	Theme			
Educational	Community			
	Socializing			
	Information			
Exhibit	Logo			
	Style			
	Decoration			
	Image			
Escape	Participation			
	Sense			
	Order			

-negative factor
- positive factor

Figures. Field research photos

the bazaar manager and the event
organizer agree on the time, theme, and venue of the bazaar; the workers responsible for the operation of the bazaar release the information about the bazaar and recruit bazaar stall holders; the stall holders interested in participating in the activities of the bazaar will prepare their vehicles and products for sale and submit their applications for joining the bazaar to the bazaar manager through the online platform; after the manager completes the selection of the stalls for the bazaar, the activities of the bazaar will be carried out on time (excluding exceptional circumstances such as weather changes, etc.). After the selection of stalls by the bazaar manager, the bazaar will be held on time (excluding exceptional events such as weather changes);
(2) During the bazaar activities, while the stallholders sell their products, the workers in charge of online operations will conduct live broadcasting activities to gain more online exposure.
(3) After the bazaar, the manager will evaluate the event and prepare for the next one.
Dafu Trunk Bazaar has unlocked a new form of the night-time economy in Changsha. Still, how to stimulate the consumption vitality of Changsha to a greater extent has become a significant problem that needs to be solved urgently; in other words, only by attracting potential consumers of the bazaar to the most significant area possible - young groups can we give full play to the role of the economy driven by the boot bazaar, and the following will be an analysis of the bazaar The reasons why it is difficult to attract consumers are analyzed below:
(1) When choosing market stalls, managers often avoid homogenizing market categories and product safety as important considerations while neglecting that an overly monotonous business format can quickly lower consumers' expectations in the bazaar.
(2) The bazaar format ignores the consumption preference of young groups, and the interactive form is often more popular, such as DIY, cat jerking, and so on.
At present, there are many problems with the basic establishment process of the bazaar:
(1) Before the bazaar is launched, the lack of creative themes and information lagging are essential reasons why attracting young people is difficult.
(2) The single format in the bazaar and the confusing visual presentation reduce the consumer experience.
(3) The flexibility of boot bazaars is the main feature distinguishing them from ordinary bazaars. However, the uncertainty of carrying out bazaars (uncertainty of time, location, etc.) also reduces the expectations of young consumer groups to a certain extent.
This shows that increasing the experience of the leading young groups in the bazaar is a crucial issue in fulfilling the economic driving role of the boot bazaar.

Design assumptions

5.1 design strategy
The authors update the Trunk Bazaar from the four dimensions of the 4E theory, proposing a design strategy centered on sharing, creating, unpacking, and viewing.
5.1.1 sharing
Sharing corresponds to the entertainment experience in the 4E theory. The key to enhancing the entertainment experience of young consumers lies in establishing a shared space that can attract young consumers. Enhancing the entertainment experience in 4E mainly plays the role of strengthening consumer attraction. For young consumers, a social environment shared by them and triggering emotional resonance is an important driver to attract them to the bazaar. Therefore, sharing is the first core word of this design strategy.
5.1.2 creation
Creating an educational experience corresponds to the 4E theory. The key to enhancing the educational

experience of young consumers is to satisfy the demand of young consumers for independent creation; the educational experience in the 4E theory requires the active participation of consumers; in other words, the acquisition of knowledge by consumers is not a passive acceptance but a dynamic creation. Therefore, creation is the second core word of this design strategy.

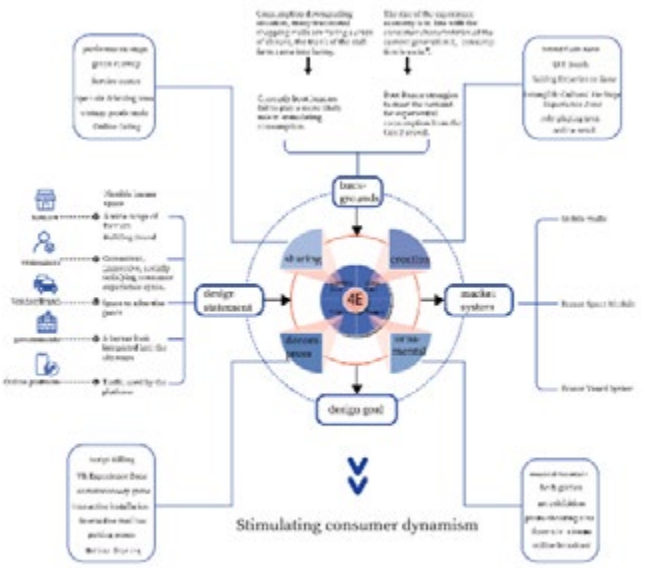

Figure10. Insert a caption below each figure and number all figures.

5.1.3 decompress

Decompression corresponds to the escape experience in the 4E theory. The key to enhancing the experience of escape is to create an atmosphere of decompression. The post-pandemic economic downturn has increased stress in many ways, especially among young people who have difficulty finding employment. To escape from daily life, young consumers spontaneously seek out places where they can relieve stress and immerse themselves briefly. Unwinding is, therefore, the third keyword.

5.1.4 ornamental

Viewing corresponds to the aesthetic experience in the 4E theory. The key to enhancing the aesthetic experience is attracting young consumers' attention through the bazaar's ornamental nature. Nowadays, young consumers pay more attention to aesthetics; enjoying services or spaces that meet their aesthetics is a pleasure and a way to express their personality. Therefore, ornamental is the fourth keyword.

5.2 Business model update 5.2.1 Stakeholder

The design of this study follows the roles of the current bazaar and refines the work of some of the people, as described in the following refinements:

Event organizers are mostly developers of large shopping malls, who are responsible for providing venues close to the malls for the bazaar, and at the same time, need to assist the bazaar in constructing a bazaar image in a fixed and changing area and providing a buffer for the transformation of traditional commercial spaces to new ones; bazaar managers are responsible for the deployment of the bazaar, who determine the theme of the bazaar after consulting with the event organizers, and adjusting the theme and deployment of the bazaar promptly according to the online feedback information from consumers; online operators are responsible for the release of the bazaar information; online operators are responsible for the release of the bazaar information. The bazaar manager determines the theme of the bazaar in consultation with the event organizer but also makes timely adjustments to the music and deployment of the bazaar based on consumer feedback;

At the same time, new roles have been added, such as designers and bazaar managers, to better serve consumers.

Designers are responsible for the design of the bazaar and assist the bazaar manager in completing the formation of the bazaar. Designers design the bazaar according to the theme of the bazaar, including booth design, space use, color matching, etc., to convey the brand image and value of the bazaar and, at the same time, maintain the innovation and competitiveness of the design through market research. Bazaar managers are responsible for offline space construction and order maintenance. They must effectively manage all affairs in a complex

environment while paying attention to details to ensure the smooth running of the activities and enhance consumer satisfaction.

5.2.2 System Map

The perfected backup bazaar system adopts the "online + offline" mode, which builds the online community of the bazaar and guides consumers to the offline bazaar by leveraging the real-time interaction and communication functions of online. The theme of the bazaar is established by analyzing the consumer preferences of the consumer groups through big data and combining the unique regional characteristics. The offline bazaar is built around the keywords "sharing, creating, relieving stress, and viewing." This model requires online platform construction, operating costs, labor costs, and facility construction. However, this model stimulates young consumers' willingness to consume, so the primary source of income for the market comes from consumer fees and sponsorship.

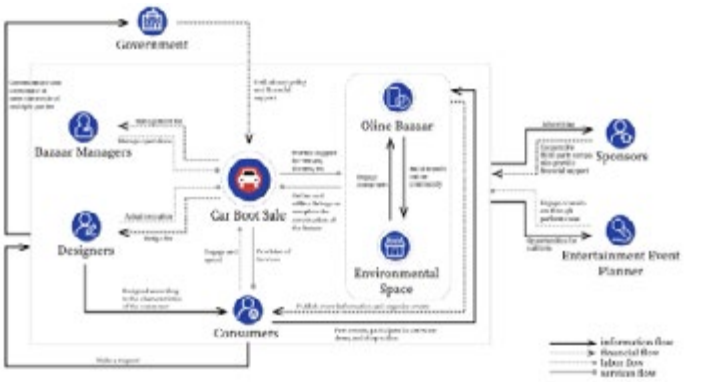

Figure10. System Map

5.3 Design Update Ideas 5.3.1 Space system

Based on the four keywords of "sharing, creating, decompressing, and viewing," the space planning and design has increased the number of interactive installations, brand flash mobs, and role-playing modules; at the same time, it has given full play to the mobility of the Trunk Bazaar and combined it with the regional characteristics to form a systematic and assemblable spatial system.

5.3.2 Online system

Building an online community for the Back Box Bazaar provides a convenient way for Back Box

Bazaar consumers to find people with similar interests, and at the same time, provides the Bazaar with broader exposure and promotion opportunities to enhance brand awareness and influence by establishing a connection with the target. To establish an online community for the bazaar, first of all, it is necessary to set a clear goal based on the needs and interests of the young group; then, it is essential to choose a suitable online platform to convey the core values of the community through sharing and communication; in short, to establish a thriving online community system, it is necessary to always focus on the user, provide valuable content and interactive experience, and actively maintain the activity and development of the community. 5.3.3 Visual system

Constructing the brand visual system of the bazaar is conducive to enhancing brand recognition and image so that consumers can connect with the brand emotionally and cognitively, specifically including the brand logo, font selection, graphic elements, and so on. Establishing a brand vision needs to fully consider the target audience, brand positioning, market environment, and other factors and ensure that the brand's visual elements and core values are consistent to form a coordinated and unified visual style. Through the standardization and consistent application of brand vision, the brand can better communicate and interact with consumers and establish long-term brand loyalty of young consumer groups to Trunk Bazaar.

Conclusion

This study aims to explore how the commercial space in the city under the background of consumption downgrading can be transformed from traditional to build a new type of retail space with integrated consumption and social interaction functions for new consumer groups. Through the study, the authors have a deeper

understanding of achieving experiential consumption in commercial areas. According to the study results, the following points are noted: the requirements of young consumer groups for boot bazaars are more focused on the richness of the industry, the unity of the vision, and the specialty of the theme. Meanwhile, in terms of the four dimensions of the 4E model, the satisfaction of entertainment experience and aesthetic experience can attract the attention of the young consumer group. Still, the group looks forward to the satisfaction of educational expertise and escape experience. In conclusion, the transformation of traditional commercial space to new retail space essentially reflects that the consumption purpose of the leading consumer group is changing from high-quality to experiential.

The results of this study are mainly twofold:

(1) based on studying the four elements of the experience economy theory: entertainment
experience, educational experience, escape experience, and aesthetic experience, the boot bazaars are analyzed and improved. In the research process, the 4E theoretical model of the experience economy theory is used for case analysis. The field research focuses on the trunk bazaar in Changsha to discover and improve the boot bazaar's essential problems and improve it.

(2)Current research on commercial space transformation discusses the interventional role of urban space for urban development and consumer activities. Still, there are fewer studies aiming
at enhancing the experience of consumers. This paper takes the boot market as a model to demonstrate that the transformation of traditional commercial space needs to pay attention to the change in consumer groups. To better meet the needs of new consumers, this paper finds that the new retail space should not only be limited to the design of physical space but also improve its business model structure.

However, there is still room for improvement in this paper, and it remains to be seen whether the results of this study can be replicated in other second- and third-tier cities due to the large number of cities in China and the significant differences in the development of boot bazaars. Future research can gain a deeper understanding of how to optimize the spatial configuration of boot bazaars through follow-up studies. In addition, the insufficient segmentation of consumer groups and the insufficient sample capacity in this article may lead to some errors in the results of the study, and it is necessary to expand the sample and strengthen the quantitative analysis in future studies to provide more comprehensive and scientific research data for the design of new commercial spaces in cities.

The new urban commercial space exemplified by the Trunk Bazaar provides empirical evidence that the consumer population induces the transformation of urban commercial space, and how to successfully realize the change of urban retail space through multi-party collaboration on this basis is the goal of the next stage. At the same time, the attention to the experiential consumption needs of young groups still needs to be strengthened to highlight the purpose of stimulating consumption vitality. Therefore, the future design of urban commercial space needs to promote experiential consumption for in-depth exploration and improve the new urban commercial space system, which can help the urban retail space cope with the transition crisis, seize new development opportunities, and achieve healthy and efficient development.

References

Abbott, L. Quality and Competition: An Essay in Economic Theory; Columbia University Press: New York, NY, USA, 1955.

Holbrook, M. and Hirschman, E. (1982). The experiential aspects of consumption: consumer fantasies, feelings, and fun, Journal of Consumer Research, Vol. 9 No. 2

Hosany, S.; Witham, M. Dimensions of cruisers' experiences, satisfaction, and intention to recommend. J. Travel Res. 2010, 49,351–364.

Johansson, M., & Kociatkiewicz, J. (2011). City festivals: Creativity and control in staged urban experiences. European Urban and Regional Studies, 18(4), 392–405.

Linhui Hu, Jie Fan, Shengjing Luo.(2023).Evaluation of Community Commercial Space Design Experience and Optimization Strategy Based on KANO Model. Buildings,13(7),1760. 10.3390/buildings13071760

Mehmetoglu, M.; Engen, M. Pine and Gilmore's concept of experience economy and its dimensions: An empirical examination in tourism. J. Qual. Assur. Hosp. Tour. 2011, 12, 237– 255.

Oh, H.; Fiore, A.M.; Jeoung, M. Measuring Experience Economy Concepts: Tourism Applications. J. Travel Res. 2007, 46, 119–132

Pine, B.J.; Gilmore, J.H. The experience economy. Harv. Bus. Rev. 1998, 76, 18–23.

Pine, B.J.; Gilmore, J.H. Welcome to the Experience Economy. Harv Bus Rev. 1998 Jul- Aug;76(4):97-105

Rangson Chirakranont, Sirijit Sunanta,(2021).Applications of Experience Economy in Craft Beer Tourism: A Case Study in Thailand's Context. Sustainability,13(18), 10448.

Skelton, T., & Gough, K. V. (2013a). Introduction: Young people's im/mobile urban geographies. Urban Studies, 50(3), 455–466.

Wijaya, S.; King, B.; Nguyen, T.-H.; Morrison, A. International Visitor Dining Experiences: A Conceptual Framework. J. Hosp.Tour. Manag. 2013, 20, 34–42.

Wu Hao.(2023).A study of the emergence and development of boot bazaars in the UK (master's thesis (MSc)). Shanghai Normal University

Zhang Junying,Zou Hong,Luan Bingjiang.(2019).Whether the current China is a consumption upgrade or a consumption downgrade， China Nationalities Expo，2019(11)，116-120

The Evolution of New Media Art Driven by Artificial Intelligence: An Interpretation and Application of Deleuzian Multiplicity

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Abstract

New media art, under the influence of artificial intelligence, manifests an intricate interplay of multiplicity and virtuality, resonating profoundly with Deleuze's Multiplicity. The article explores, from the perspectives of digital technology and algorithmic logic, how new media art achieves a transition from the real to the virtual, thereby constructing a multifaceted, open, and ever-changing ecosystem. The intervention of artificial intelligence further propels this multiplicity; its continuously iterative algorithmic models and generative logic based on real-world data have an intrinsic connection with Deleuze's notion that 'the multiplicity precedes the actual.' This evolutionary process not only expands the expressive means of art but also enriches its connotations and diversities.

Author keywords

Deleuze Philosophy; New Media Art; Artificial Intelligence; Multiplicity; Virtuality.

Introduction

In the ever-evolving landscape of new media art, the intersection of philosophy and technology offers a fertile ground for academic inquiry and artistic innovation. This paper delves into the application of Gilles Deleuze's philosophical concepts, particularly multiplicity and virtuality, in the realm of new media art. With the advent of Artificial Intelligence (AI) as a transformative medium, the paper explores how Deleuze's philosophy not only provides theoretical underpinnings but also enriches the diversity and creativity in new media art. The paper is structured to first elucidate Deleuze's key philosophical ideas, followed by their practical applications in new media art, especially in the context of AI-driven algorithms and data types. We aim to construct a bridge between philosophy and art, offering new perspectives for both theoretical and practical dimensions of new media art.

Deleuze's Multiplicity and the Actual

In Gilles Deleuze's philosophical framework, the notion that "the multiplicity precedes the actual"(la multiplicité précède le réel) serves as a cornerstone. In Deleuze's philosophical system, the term "actual" is commonly used to describe a state of reality or actual existence, in contrast to "virtual." He posits that reality is not a singular, fixed entity but is constituted by a multiplicity of possibilities and potentials. This implies that multiplicity exists as a latent, virtual state, offering generative and transformative possibilities for things and phenomena in the actual world. As an a priori, foundational state, multiplicity provides an open, indeterminate space for the genesis

and transformation of things.

Deleuze further associates multiplicity with virtuality. In his view, multiplicity and virtuality are not isolated concepts but interact and transform each other in a dynamic, non-linear process. Multiplicity, as a complex structure or system, intrinsically contains elements of virtuality, representing a latent, unrealized potential. Virtuality is the product of intensities between differences, determined by the differential relations among concepts, which are themselves constituted by diversity. Together, they form a dynamic, open system. Within this system, virtuality continuously transforms into the actual through various mechanisms and pathways, while the actual constantly generates new virtualities. Therefore, multiplicity provides structure and possibilities for virtuality, and virtuality realizes its latent changes and developments through multiplicity.

New Media Art and Artificial Intelligence (AI)

New Media Art is an art form based on digital or emerging technological platforms such as computer technology, the Internet, and virtual reality. In his seminal work, The Language of New Media, Lev Manovich explicitly outlines five fundamental elements of New Media Art: Numerical Representation, Automation, Modularity, Variability, and Transcoding. These five elements collectively constitute the foundational framework of New Media Art. Unlike traditional artistic mediums like painting and sculpture, New Media Art is characterized primarily by interactivity, multimedia, temporality, and spatiality. This form of art is innovative not only in terms of medium and technology but also in its conceptual, thematic, and expressive diversity.

As a technological medium, AI's application in the field of New Media Art has matured, extending its influence beyond singular art forms to span multiple sub-domains. Specifically, from image generation (Figure 1) and music composition (Figure 2) to interactive art, AI offers unprecedented experiences and creative spaces for both artists and audiences.

Image Generation

Utilizing Generative Adversarial Networks (GANs) and other deep learning algorithms, artists can create works that transcend the boundaries of traditional visual art. These algorithms can autonomously learn and mimic various artistic styles, even generating entirely new visual elements and structures.

Music Composition

AI's application in the music domain is equally noteworthy. For instance, through Recurrent Neural Network (RNN) models, artists can generate complex musical structures and melodies, which are challenging to achieve through traditional music composition methods.

Interactive Art

AI can produce not only static or linear artworks but also highly interactive pieces. These works can adjust and change in real-time based on audience behavior and reactions, thereby offering a novel, dynamic artistic experience.

It is particularly worth mentioning that the advent of advanced algorithms like GANs and deep machine learning has opened up greater possibilities and flexibility for artistic creation. These algorithms not only simulate and extend human creativity but also, in certain cases, generate works that surpass human imagination.

Figure 1. Mario Klingemann's "Memories of Passersby I"

Figure 2. SKYGGE's "HELLO WORD"

The Evolution of Multiplicity in New

Media Art through Deleuze's Philosophy

Virtuality and Multiplicity: The Transition from the Actual to the Virtual

Deleuze's philosophical stance, which emphasizes that "the multiplicity precedes the actual," finds profound resonance in New Media Art. Unlike traditional art forms that are merely displays of material and form, New Media Art transcends these boundaries. Through digital technology and algorithmic logic, it undergoes a transition from the actual to the virtual, thereby constructing a diverse, open, and ever-changing ecosystem. This transformation not only broadens the expressive means of art but also enriches its content and multiplicity, organically aligning with Deleuze's concept of "multiplicity."

AI-Driven Multiplicity in New Media Art

The intervention of AI further amplifies the multiplicity in New Media Art. When AI, as an avant-garde technological medium, is incorporated into New Media Art, the utilization of algorithms and the sourcing of data become pivotal aspects of artistic creation. Specifically, AI continuously acquires an incessant stream of diverse data(Table 1) and employs various algorithmic models (Table 2)for ongoing learning and adaptation. This creates a genuinely automated and perpetually evolving transcoding system for New Media Art. Such continuously iterative AI algorithmic models, along with the accumulating real-world data, form a generative logic that intrinsically aligns with Deleuze's notion that "the multiplicity precedes the actual."

Table 1. Common AI Algorithm Models Used in the Field of Artistic Creation.

Algorithm Model	Primary Application Areas	Description
Generative Adversarial Networks (GANs)	Image/Video Generation	Composed of a generator and a discriminator, the generator creates new images while the discriminator evaluates their resemblance to real images.
Convolutional Neural Networks (CNNs)	Image Recognition/Classification/Style Transfer	Primarily used for image recognition and classification, also applicable for style transfer, i.e., applying one artistic style to another image.
Recurrent Neural Networks (RNNs)	Text/Music Generation	Capable of remembering previous inputs, making them highly suitable for sequence data.
Autoencoders	Data Dimensionality Reduction and Feature Learning	In artistic creation, autoencoders can be used to generate new images with specific features.
Reinforcement Learning	Game and Robot Control, Music and Animation Creation	Primarily used for game and robot control, but artists have also experimented with it for music and animation creation.
K-Means Clustering	Image Segmentation and Color Analysis	In artistic creation, the algorithm can be used for image segmentation and color analysis.
Support Vector Machines (SVM)	Classification and Regression, Feature Extraction	Primarily used for classification and regression, but also applicable for feature extraction in images and audio.
Deep Belief Networks (DBNs)	Image Recognition and Generation/Audio and Text Data Processing	This is an algorithm model used for image recognition and generation, also applicable for audio and text data.
Genetic Algorithms	Optimization and Search/Generation of New Works with Specific Attributes	This algorithm simulates the natural selection process and is used for optimization and search problems. In artistic creation, it can be used to generate new works with specific attributes.

Table 2: Common Data Types for Algorithm Models Used in the Field of Artistic Creation.

Data Type	Primary Application Area	Description
Image Data	Computer Vision	Used for object recognition, style transfer, and art generation.
Text Data	Natural Language Processing	Used for generating poetry, stories, or scripts.
Audio Data	Music Synthesis	Used for music composition, sound design, and audio synthesis.
Time Series Data	Animation, Motion Capture	Used for predictive models such as animation, motion capture, and interactive installations.
3D Model Data	3D Sculpting, Architecture	Used for creating 3D sculptures, architecture, and virtual environments.
Sensor Data	Interactive Art Installations	Used when art pieces respond to environmental factors like light, sound, or movement.
Social Media Data	Sentiment Analysis, Trend Prediction	Used for creating art pieces that make social or political statements.
Geospatial Data	Maps, Location Triggering	Used for art pieces that include maps, location triggering, or geographic environmental information.

Refik Anadol, a Turkish-American New Media artist, has garnered widespread attention for his works grounded in data-driven and machine learning algorithms. His piece "Machine Hallucination" (Figure 3) serves as a quintessential example, demonstrating how AI and big data technologies can integrate multiplicity and virtuality into New Media Art. In "Machine Hallucination," Anadol employs a vast array of publicly available image datasets of New York City. These data originate from diverse perspectives and temporal points, encompassing various social, cultural, and historical contexts, thereby infusing the work with rich multiplicity. Through machine learning algorithms, particularly GANs, Anadol successfully transforms this diverse data into an abstract, dream-like artistic form.

From the perspective of Gilles Deleuze, Anadol's work is not merely a concrete artistic object; it is a multiplex, open, and ever-changing ecosystem. The piece not only

embodies Deleuze's
theoretical viewpoints on multiplicity and virtuality but also, through the utilization of AI and big data technologies, accomplishes a transition from the real to the virtual. This enriches the multiplicity and complexity of New Media Art further.

Compared to other New Media Art pieces based on artificial intelligence, Mario Klingemann's "Memories of Passersby I" (Figure 4) stands out for its distinctiveness, particularly in the realm of "real-time creativity." As the audience gazes at the screen, AI continuously generates unique portraits. These portraits possess both immediacy and ephemerality: each one is singular and never to be repeated once displayed. The work captures and reconstructs the facial features and expressions of passersby through neural network technology, thereby illustrating the fusion of multiplicity and virtuality. This resonates profoundly with Deleuze's philosophy of multiplicity.


Figure 3: Refik Anadol's "Machine Hallucination"


Figure 4: Mario Klingemann's "Memories of Passersby I"

"12Bit Alchemy" (Figure 5) is a new media art work created by Berlin's Waltz Binaire studio in 2017. This piece delves into the perpetual evolution of digital matter and the genesis of novel forms through real-time coding and computer graphics rendering. Viewed through the lens of Gilles Deleuze's philosophy, the work encapsulates the notions of multiplicity and virtuality. It employs algorithms to engender a perpetually mutable and evolving artistic state. This manifestation of diversity and virtuality not only aligns with Deleuze's philosophical tenets but also exemplifies the heterogeneity of new media art in the age of artificial intelligence and algorithmic drive. By employing experimental digital material manipulation, the work disrupts conventional coding practices to generate new physical behaviors. This process of "digital alchemy" resonates with Deleuze's conceptual shift from the actual to the virtual.

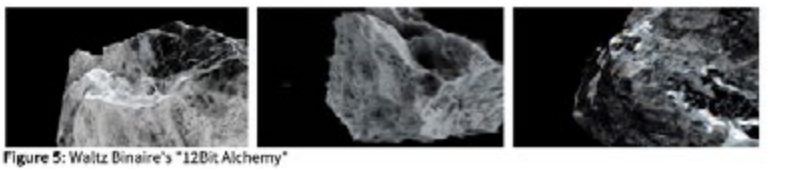
Figure 5: Waltz Binaire's "12Bit Alchemy"

Explanation and Application of Deleuze's Philosophy

Deleuze's philosophical perspective emphasizes the importance of multiplicity and virtuality, which hold particular significance in the realm of New Media Art. Multiplicity, encapsulated in the notion that "multiplicity precedes reality," suggests that before any given reality, there exists a plethora of possibilities. The application of AI in New Media Art serves as a manifestation of this multiplicity. AI algorithms, through data and learning, can generate diverse artistic works, each of which stands as a concrete embodiment of multiplicity. Virtuality extends beyond multiplicity; it is not merely a simulation of reality but transcends it. In New Media Art, AI, through the manipulation of algorithms and data, can create artistic forms that surpass the constraints of reality, epitomizing the concept of virtuality.

In the context of New Media Art creation, the author offers the following reflections on the application of the concepts of multiplicity and virtuality:

Data-Driven Multiplicity:

Artists can utilize AI algorithms to generate a diverse array of artistic works through extensive data. This not only embodies the concept of multiplicity but also imbues the artwork with heightened innovation and diversity.

Algorithmically Generated Virtuality:
Artists can employ intricate algorithmic logic to create artistic forms that transcend reality. For instance, deep learning algorithms for image generation can produce images entirely distinct from the real world.
Cross-Media Multiplicity and Virtuality:
Artists can also maximize the concepts of multiplicity and virtuality through the integration of multiple media, such as combining music, images, and text.
In summary, Deleuze's philosophical perspectives offer a new lens and conceptual framework for New Media Art creation. By applying the concepts of multiplicity and virtuality, New Media Art can not only achieve diversity in form and content but also attain a higher artistic realm.

Conclusion:

This article delves into the application of Deleuze's philosophical in New Media Art, focusing particularly on the core concepts of multiplicity and virtuality. We find that Deleuze's philosophical perspectives not only provide theoretical underpinnings for New Media Art but also foster diversity and innovation in the field. Especially with the advent of Artificial Intelligence, New Media Art exhibits remarkable dynamism in terms of multiplicity and virtuality. Therefore, the primary contribution of this article lies in its construction of a bridge between philosophy and art, offering new perspectives for both the theory and practice of New Media Art.
Despite the beneficial explorations made in the intersection of Deleuze's philosophical and New Media Art, there are some limitations to this study. First, due to constraints in length and depth of research, the theoretical discussion on multiplicity and virtuality is not exhaustive. Second, the article mainly focuses on the application of Artificial Intelligence in New Media Art, without covering other potential technologies and methods. These issues could not only trigger further academic research but also stimulate new thoughts among art creators and technology developers. Overall, the cross-disciplinary study of Deleuze's philosophical and New Media Art is a promising and meaningful field that warrants our continued attention and in-depth exploration.

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References

Deleuze, G. (1994). Difference and repetition. Columbia University Press.
Elgammal, A. (2019). AI is blurring the definition of artist: Advanced algorithms are using machine learning to create art autonomously. American Scientist, 107(1), 18-22.
Goodfellow, I., Pouget-Abadie, J., Mirza, M., Xu, B., Warde-Farley, D., Ozair, S., ... & Bengio, Y. (2014). Generative adversarial nets. Advances in neural information processing systems, 27.
Zourabichvili, F. (2012). Deleuze: A philosophy of the event: Together with the vocabulary of Deleuze. Edinburgh University Press.
Manovich, L. (2002). The language of new media. MIT press.
Colebrook, C. (2020). Understanding deleuze. Routledge.
Holland, E. W. (2013). Deleuze and Guattari's' A thousand plateaus': A reader's guide. A&C Black.
Bogue, R. (2003). Deleuze on music, painting, and the arts (Vol. 3). Psychology Press.

Brun, D. (2016). Gilles Deleuze & Claire Parnet: dialogues. Philosophique, (19).
Zhang Yi. (2017). The Virtualization of Civilization and the Civilization of Virtualization. Philosophical Analysis, 8(4), 30-41.
Mai Yongxiong. (2013). On Deleuze's Ecological Aesthetic Thought: Geophilosophy, Vitalism, and Machinism. Journal of Tsinghua University: Philosophy and Social Sciences Edition, (6), 116- 123.
Yang Kailin. (2003). Deleuze: [Thought-Image] or [Thought = Image] Conditions and Issues. Journal of Literature, History, and Philosophy of National Taiwan University, (59), 337-367.
Wang Xiaoyu. (2018). On Deleuze's Concept of "Latency". China Book Review, 6.
Mai Yongxiong. (2003). Postmodern Wetlands: Deleuze's Philosophical Aesthetics and Contemporaneity. Foreign Theoretical Trends, (7), 38-42.
Bonta, M., & Protevi, J. (2019). Deleuze and geophilosophy: A guide and glossary. Edinburgh University Press.
Lévy, P. (1998). Becoming virtual: Reality in the digital age. Da Capo Press, Incorporated.

Walls as resilient functional interfaces for the last-mile delivery of gated communities in response to the public health crisis

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Abstract

This research focuses on how the wall boundary space can act as an interface for the material distribution system in the context of community closed management. During COVID-19 in China, community isolation made last-mile distribution of supplies problematic, thus placing communities under extreme pressure to prevent epidemics. Through field observations, this study has identified the emergency phenomenon of using wall boundaries as staging areas, a spontaneous community solution for material distribution during the epidemic. This autonomous utilization of space is a prototype for future distributed space systems integrated with emergency situations. Community boundaries are both a barrier to the exchange of materials between inside and outside, as well as a new medium and place. By combining modular devices with the wall boundary space and introducing them into a community material distribution system, the research creates flexible distribution interfaces that enable the flow of material in enclosed scenarios, while being able to provide diversified daily service. The study offers a way to transform unused space under closed community construction into a resilient interface for communities to respond to the public health crisis.

Author keywords

gated community; last mile delivery; public health crisis; wall boundary space.

Introduction

The rise of the e-commerce economy and the spread of internet technology has led to logistics gradually becoming an important part of people's lives. Particularly during a pandemic, urban restrictions on going out made online shopping the main choice of many consumers, and a variety of takeaway, and grocery shopping businesses experienced a surge (Movarrei, R., et al. 2022). Last-mile delivery became an important lifeline to ensure people's basic livelihoods during the epidemic. However, the policy of closed management adopted by Chinese communities during the COVID-19 pandemic became an obstacle to last-mile logistics delivery, making it impossible for community delivery to be completed properly, thus exposing many problems during the epidemic. For example, supplies were left stranded in open spaces outside community gates, prone to lose and spoilage. People shuttled through makeshift delivery ground stalls, exacerbating the pressure on community preparedness. Current research on material distribution mainly focuses on urban management at the macro level, such as urban logistics distribution and emergency logistics system design under emergency scenarios, and lacks research on community space design at the micro level. Community design also rarely considers logistics distribution in emergency scenarios. Therefore, the research hopes to promote a more resilient community design in the future to address the distribution challenges posed by unexpected future public health crises. Taking the closed

community in China as the typical research object, this research will construct a material distribution response strategy based on the special city construction background.

The value of the wall boundary space to intervene in last-mile delivery

The epidemic has seen a dramatic change in the way residential community space is used due to the emergence of the concept of isolation and containment. Many of the formal changes based on the distribution of materials occurred mainly at the boundaries and around the building interfaces.

Public space between inside and outside

The wall boundary space is an important transition interface between the city and the residential closed community (Chen, et al.,2013). It is an important public space located between the internal settlement space and the external urban space. Therefore, the existence of flexible borders is essential to ensure the normal flow of goods distribution services while ensuring the closure of communities. Especially when the community has experienced the closed management period, the wall boundary space has the potential to meet the needs of internal and external material exchange and enhance the resilience of the community.

Compound place to accommodate multiple behaviors

Community boundaries have played a huge role in this epidemic. Different boundary types have distinctive behavioral and functional characteristics that can fit within a range of human behaviors. For instance, during the epidemic, materials distribution detention places near the border space, such as materials detention grounds, materials detention racks, materials detention kiosks, and other diversified forms of material distribution have spontaneously combined with the boundary space. (Figure 1)

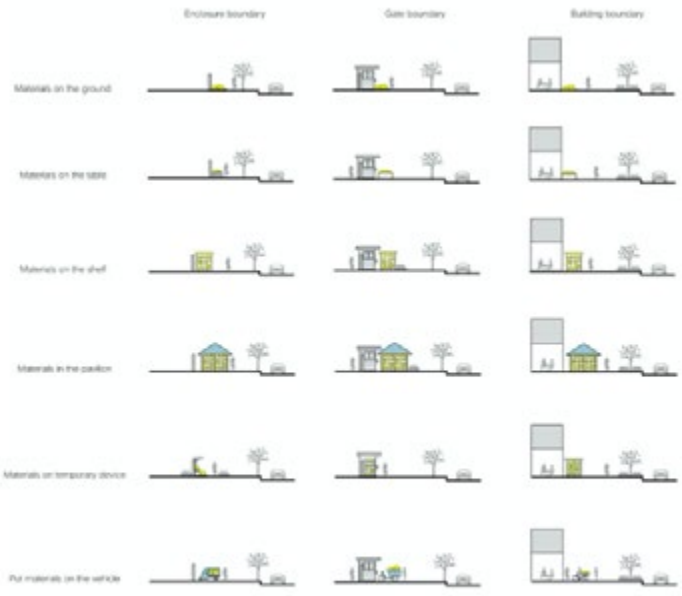

Figure 1. Multiple distribution behaviors near the boundary space of the community.

Redundant urban space resources for emergency

Currently, the boundaries of residential communities are frequently abandoned. This is based on the red line regions specified in the settlement plans, which call for the construction of structures to be situated within the red line areas, leaving the border areas around the red lines frequently in a dilapidated state (Chen, 2019). At the same time, the boundaries of residential areas are distributed throughout the city. It has the ability to be repurposed in order to fully harness the boundary's potential economic and social impacts, giving the material foundation for continued resilient and sustainable community growth.

Design of the wall boundary space as a flexible interface for distribution

Thus, this study proposes to use the wall boundary space of the gated community, which is unique to China, as a place of interaction interface, providing a function of internal and external material exchange in an isolation scenario during the epidemic.

Distribution module based on wall boundary space

The walls of the gated community can behave like cell membranes that may selectively let through people and items. Through the use of modular docking devices linked to the interface, the community can achieve a combination of daily and emergency use for last-mile distribution, leveraging the unused community's wall interface as a mediating field to facilitate the rapid construction of community emergency distribution. In the post-epidemic normalization period, such space can also be expanded into diverse spaces with community social and recreational attributes, transforming emergency interface installations into flexible urban furniture based on residents' needs. (Figure 2)

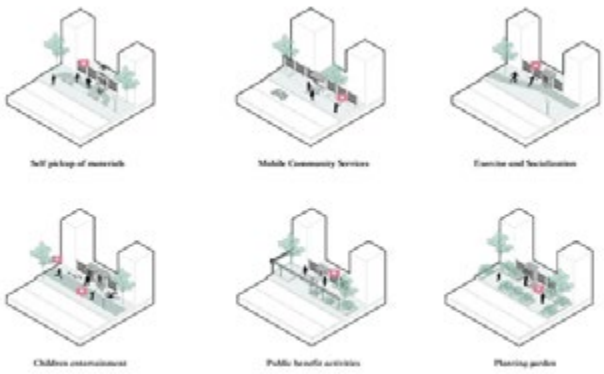

Figure 2. Docking module for enclosure boundary space and function switching.

Online and offline community logistics circle

The boundary space resources between each residential area can be linked and shared, so as to realize its emergency function at the level of the entire urban space system. The community logistics circle based on the interface can also be established, utilizing community services and distribution that are originally active near the interface space, such as second-hand furniture and trouser repair. This enables the diversification and collaboration of the interface space, making the boundary an inclusive and resilient place of the community.

Intermediary field of unmanned distribution

The wall boundary space module also serves as an intermediate interface to facilitate the rapid popularization of unmanned delivery. The wall-boundary module is equipped with a parking platform for docking the UAV. Spatial changes can be quickly realized through the update of prefabricated modules, so as to realize the connection between unmanned logistics and communities through spatial micro-renewal. (Figure 3)

Figure 3. The intermediary interface of future unmanned logistics.

Conclusion

This research has carried out field investigations on the possibility of the wall boundary space as an emergency distribution space under the construction of closed communities in China. It identified the community's spontaneous use of the enclosure boundary space and a range of behavioral changes, pointing out its potential as an emergency material distribution space. Then, the study proposes to realize the flexible use of daily and emergency scenarios through the modular update design of the wall boundary space. It can serve as a place for daily distribution and social activities as well as an emergency space for material distribution and supplies during special periods. At the same time, the wall boundary space can also provide a flexible interface for communities to connect future distribution equipment. Finally, the study hopes that the renewal of enclosure space can be used as an interface for the construction of

resilient communities and promote the resilience of communities to deal with disasters.

References

Movarrei, R., Rezaee Vessal, S., Rezaee Vessal, S. and Aspara, J. (2022) The effect of type of company doing home delivery during a pandemic on consumers' quality perceptions and behavior, International Journal of Physical Distribution & Logistics Management, 52 (11): 1-24.
Chen Simin, Chen Xiaoming, Peng Jian. (2013) The Hidden Wall, Huazhong Architecture, 31 (02): 15-18.
Chen Siyu. (2019) Closed Vs Open: Chinese Access Control Community in the Change of Urban Spatial Structure. Journal of Inner Mongolia University (Philosophy and Social Sciences Edition), 51 (04): 53-61.

The Mushrooms of Plato's Cave

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Cumulus Conference Beijing 2023
November 18th, 2023

"I followed you down a fantastic dream
The dead were alive
The mute, they could sing".
FD'72 Black Mountain

I am an artist and scholar, and feminist theory and ecocriticism informs my studio art practice while my artworks provide additional elements to my theoretical investigations into feminism and ecology (Braidotti, 2019; Mellor, 2013; Plumwood, 1993; Shiva, 2014; Sturgeon, 2016, 2009; Warren, 1997). In my previous projects I focused on Italian culture to reflect on the relationship between female subjectivity and her material existence, the ecocritical approach to visual culture, and the representation of women in cultural productions. In the creative project that I discuss in this paper I adopt an interdisciplinary approach to eco-feminism, new materialism, and drawing to create a visual counternarrative of Plato's Myth of the Cave. In my narrative the protagonist of my redesigned myth is a woman which instead of leaving the material world represented by the cave, as the male protagonist in Plato's myth, creates a deeper connection with it by understanding its underground life populated by fungi.

Objectives:
Plato discusses the Allegory of the Cave in the Republic. This text has been interpreted by thinkers as emblematic of Plato's philosophy and western thinking and its anthropocentric, controlling, and technocratic approach to reality (Heidegger, 2014; Nietzsche, 1994). In my project I intend to transform this myth into an alternative visual narrative where the protagonist of my transformed myth instead of going up, in the direction of the sun and abstract thinking, as the male prisoner in Plato's myth, goes down, underground, in a world populated by fungi, worms and bacteria. This fictional character engages in eco-dialogues and interactions with the beings that she meets: she learns about how understand, interact, and care about them. By doing this she gains knowledge that increases her happiness and resilience. By proposing this narrative, I intend to question current values about social organization based on aggressive competition and exploitation. I do this by visualizing how care and cooperation can benefit both the human being and the environment (Estévez-Saá & Lorenzo Modia, 2020; Sevenhuijsen, 2003; Shiva, 2014, Woodly, 2021). In this artistic project care is intended as an ethical and political practice that has the potential of orienting people to new ways of living, relating, and governing. According to this perspective the ethics of care is a method, a political thought, and an action that moves beyond the liberal approach which situates care as a finite resource to be distributed among individuals, or as a necessarily feminine virtue. Instead, I intend care as a survival strategy, a foundation for political organizing, and a theoretical framework for imagining a world in which humans and non-humans can live and thrive.
Problems:
To visualize this alternative way to imagine human/non-human relationships I decided to reinterpret The Myth of

The Cave according to an eco-feminist narrative. I choose this text because it is representative of western thinking and its way of intending human intelligence and its relationship with environment (Irigaray, 1974). In the myth of the cave Plato narrates about the philosopher's cognitive journey. In the story the philosopher researches the truth by detaching from the sensitive world to contemplate the world of the philosophical abstract ideas. The cave is understood by Plato as a place that is not worthy to be explored and investigated. It is described as dark emptiness, a flat obscurity that the human being wants to leave. The sun, instead, and the external world outside the cave, represents the individual's liberation, overcoming, emancipation from the material world which is opposed to the immaterial incorporeal intellect of traditional intellectual knowledge. In Plato's myth the immaterial intellect and the philosophical thinking capable of abstraction can be learned by the prisoner only by refusing and leaving the sensitive world represented by the cave (Irigaray, 1974). This way of understanding existence presupposes the illusion of the superiority of intellect over the body and it has been adopted during western history to justify the superiority of humans over nature, man over woman, and of Western society over all other people (Shiva, 2014).

Responses:

By using imagination, watercolours, and digital painting I create a visual description where the protagonist of my transformed Plato's myth discovers a way to relate to her material world that challenges traditional western anthropocentric approach to reality. By establishing a dialogue with eco-feminism, post-humanism, new materialism, and ethics of care explored by thinkers such as Vandana Shiva, Rosi Braidotti, Karen Warren, Mary Mellor, Noel Sturgeon, and Val Plumwood, I visualize how nature's agency and creativity provide the protagonist of my myth energies and resources to transform her material existence (Braidotti, 2019; Mellor, 2013; Plumwood, 1993; Shiva, 2014; Sturgeon, 2016, 2009; Warren, 1997). According to the theoretical frameworks that I adopt in my research, the same dynamics of power that created environmental crisis also generated women's and other minorities' marginalization. Women, other minorities, and environment have been understood by traditional western culture as irrelevant, passive, and exploitable, a background for men's actions (Plumwood, 1993). To find solutions to the crises generated by this attitude, we need to reconsider our general way to understand life in a way that privileges care, collaboration, and connections instead of exploitation, competition, and individualism (Woodly, 2021).

To imagine this alternative scenario, I refer to recent research related to fungi by authors such as Merlin Sheldrake and Anna Lowenhaupt Tsing which address how fungi force us to see reality from a different non-anthropocentric perspective (Sheldrake, 2020; Lowenhaupt Tsing, 2021). Fungi are inside and outside us and they generate, preserve, and protect everything that makes possible our existence on this planet. Fungi create an interactive network composed by ninety per cent of the world's plants, they nourish the soil, digest polluted substances, eat rocks, survive in the space, provoke hallucinations, influence human and animal behaviors, and establish metabolic relationships with organism such as trees and animals. By creating underground nets that are used by living beings to exchange information they challenge our understanding of concepts such as intelligence, and identity.

In my project I connect fungi's capability of being interconnected and exchange energies and information with other beings to how the feminist philosopher Rosi Braidotti interprets Spinoza's concept of potentia (Spinoza, 2010; Braidotti, 2019). According to Spinoza, a person's lack of understanding of her relationship with the totality weakens her power and diminishes her ability to impact reality. Contrariwise, a mind that is capable of understanding how its body lives, moves, is connected to other bodies, and interacts with the rest of matter, is a mind that does not succumb to the oppressive narratives of its social environment because it is capable

of relating with the whole by remaining an embodied singularity. The mind that understands the desires and passions that connect her to her collectivity is a mind capable of expressing all its power. This power is called by Spinoza potentia (Burdon, 2022; Tamboukou, 2018). Braidotti connects Spinoza's potentia to feminist discourse and she understands potentia as a vital, creative energy capable of creating change and producing social transformation (Braidotti, 2019, 2019, 2021).

Outcomes:
In my artistic project I visually convey how the protagonist of my story learns from fungi to expand her potentia by connecting to other living beings. In my feminist counter-narrative my protagonist understands the possibilities of her actions and interactions, and she finds energies and strength to transform the reality where she lives. The outcomes of this project constitute of twenty artworks made with watercolors and digital painting.

Methodologies:
These outcomes are obtained by adopting an arts-based research where I engage in a holistic dialogue between artistic practice and theory where theory informs my practice, and my artefacts contribute to develop theoretical investigations related to eco-feminism.

Dissemination
I intend to show my artworks at Coffee Craft Café in Beijing from January 5th to February 28th. Coffee Craft Café is a hybrid space composed by a bar, seating areas, meeting rooms and exhibition spaces. It has been designed by United Units Architects, a practice based in both Beijing and London. CC café plays a significant role in northwest Beijing's cultural landscape. It presents contemporary artists, art, and ideas to local, national, and international audiences by providing an environment for creativity and cultural exchange. It is an easily accessible and welcoming intellectual place for reflection, education, and creativity.

Impact
By producing artworks in addition to a scholarly article, my purpose is to reach and engage with a large academic and non-academic audience. My research is academically rigorous in terms of investigation and publication. At the same time, my artworks are accessible to a non-academic audience. This accessible research output has the advantage of producing and disseminating ideas related to gender equality and environmental issues in a more impactful way than academic language alone.

Collaborations:
I am undertaking this project in collaboration with the Posthumanities Hub at Linköping University in Sweden. The Posthumanities Hub is an incubator of new humanities and more-than-human humanities, and a feminist "collaboratory" for symbiotic art, arts and science networks aiming to build-bridges and create new alliances. It is a testing ground for new shared ideas on how to co-exist, work and think better together in a troubled world.
This project has also been selected for The New York Times Illustration Portfolio Review 2023. As the recipient of this award, I will have the opportunity to meet two art directors of the New York Times which will provide me feedback and advice about how to complete and disseminate my project.

References:
Braidotti, R. (2019). Materialismo Radicale. Maltemi.

Braidotti, R. (2019). Posthuman Knowledge, Polity.
Braidotti, R. (2021). Posthuman Feminism, Polity.
Burdon, G. (2022). On being affected: Desire, passion, and the question of conatus after Spinoza and Deleuze, Trans Inst Br Geogr. 47, pp. 682–694.
Estévez-Saá, M. & Lorenzo-Modia, M. (2020). The Ethics and Aesthetics of Eco-caring, Routledge.
Heidegger, M (2014). Introduction to Metaphysics, Gregory Fried, et al.
Irigaray, L. (1974). Speculum of the Other Woman. Cornell University Press.

Lowenhaupt Tsing , A. (2021). The Mushroom at the End of the World. Princeton University Press.
Mellor, M. (2013). Feminism and Ecology. John Wiley & Sons.
Merchant, C. (2019). The Death of Nature, HarperCollins.
Nietzsche, F. (1994). The Birth of Tragedy: Out of the Spirit of music, Penguin Classic.
Plato (2000). The Republic. Cambridge University Press.
Plumwood, V. (1993). Feminism and the mastery of nature. Routledge.
Sevenhuijsen, S. (2003). Citizenship and the Ethics of Care. Routledge.
Sheldrake, M. (2020). Entangled Life. Random house.
Shiva, V. (2014). The Vandana Shiva Reader. The University Press of Kentucky.
Spinoza (2010). The Ethics, Kessinger Publishing.
Sturgeon, N. (2016). Ecofeminist Natures, Routledge.
Sturgeon, N. (2009). Environmentalism in Popular Culture. The University of Arizona Press.

Tamboukou, M. (2018). The joy of learning: Feminist materialist pedagogies and the freedom of education. Educational Philosophy and theory, 50 (9), pp. 868-877.
Warren, K. (1997). Ecofeminism. Indiana University Press.
Woodly, D. et al. (2021). The politics of care. Critical Exchange, 20 (4) pp. 890-925.

Practical application and research of foresight thinking model in design discipline

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Abstract

With the continuous development of today's society, design, as an open and inclusive discipline, is exerting its great value and energy. Today, design foresight has become an important topic constantly mentioned by design practitioners, innovators, entrepreneurs and opinion leaders in different countries. With the development of science and technology and the continuous development and awakening of human consciousness, it is increasingly important to accurately predict and plan the future development of mankind in the process of globalization. Relying on this background, the far sighted thinking model in the design discipline can provide an efficient, powerful, systematic and scientific framework system to help mankind better understand, predict and solve the challenges from the future. This paper will discuss the concept, advantages and how to apply this thinking model to solve practical problems.

Design discipline is a comprehensive discipline that integrates innovation, problem finding and problem solving, observation and understanding. It not only involves aesthetics, ergonomics, sociology, psychology and other disciplines, but also needs to analyze the dialectical balance between the functionality and feasibility of the design scheme. The design discipline contains the foresight and response to the future development trend. In the design discipline, foresight is a core ability, which requires designers to have keen insight and in-depth understanding of the development of society, technology, culture, environment and human psychology, so as to predict and create design solutions that meet the needs of future development.

Author keywords

Design vision, thinking model, future challenges, core competencies, prediction and planning

Text

The Chinese people's understanding of foresight is unforgettable, and many idioms have been condensed from Chinese history, such as "taking precautions against the rainy day, being born in distress and dying in peace, being farsighted, and having cold lips and teeth." these stories all emphasize the importance of foresight.

Design foresight thinking model is an interdisciplinary method, which integrates the knowledge of design thinking, innovative technology and future speculation. The advantage of this thinking model is that it provides a systematic and scientific framework, which can help human beings better understand and predict the future trends and challenges of human society. By using design thinking and innovative technology and other tools, we can predict and analyze the future from multiple perspectives. This forward-looking way of thinking is conducive to the development of effective strategic deployment and action plans to meet the uncertain challenges in the future.

Design thinking is a unique way of thinking, which can guide people to solve complex problems through creation

and innovation. In this way of thinking, foresight thinking is an important part, which emphasizes the foresight and strategic thinking of the future. Crises are everywhere. The virus in 2020, the war in 2022, the nuclear pollution in 2023, and human life will never be easy. It fulfills an old Chinese saying: "born in misery, died in happiness." human beings need to maintain a state of alertness to better face the future and deal with environmental, food, health, education and other issues.

The core of design foresight thinking model lies in its flexibility and extensibility. It can be adjusted and expanded according to different needs and situations to adapt to various industries and fields.

1. Design foresight in urban planning at home and abroad

1.1 Design foresight in Copenhagen planning, Denmark

The British life magazine monocle rated Copenhagen as one of the world's 20 best cities, which topped the list with factors such as high quality of life and environmental protection. Copenhagen plans to become the world's first carbon neutral city by 2025, reducing carbon dioxide emissions to 0. In this city, more than half of the municipal waste will be recycled, making waste valuable. The government advocates that residents ride and build a perfect public transport system network.

1.2 Design vision in urban planning of Beijing, China

In China, the government also attaches importance to issues related to carbon neutrality. Taking Beijing as an example, the rapid development of bike sharing has made a certain contribution to reducing carbon emissions, and the sharing economy has been brought into full play. However, when shared bicycles entered the market a few years ago, they also caused many social problems, such as affecting the income of the taxi industry, and the confusion of bicycle parking positions led to the blockage of bicycle lanes and sidewalks. This requires the foresight of design thinking to predict the problem in advance and then solve the problem. Now there is a shared bicycle handling profession. By analyzing the locations with large demand for transportation, more shared bicycles are provided to the designated areas.

1.3 Design vision in urban planning of Paris, France

Designers' foresight thinking can be well reflected in their sensitivity to social culture and values. We can understand human desires and needs by observing and interpreting cultural phenomena, and then use design as the main medium to shape and convey these messages. The vision of Paris' urban planning and design is reflected in its architecture and public space design, urban environment and sustainable development. The Paris municipal government encourages and promotes urban greening and builds many parks and gardens. Monet's "sunrise" depicts a "gray city" full of dust and car exhaust, which has become a fresh, green and environmentally friendly city. This design vision is a milestone in the history of urban planning, which has changed the image of Paris.

1.4 Design vision in urban planning of Dalian, China

Coincidentally, the urban greening in Dalian, Liaoning Province, China also relies on the new concept of modern urban planning and design, effectively applies and implements the methodology of the design foresight thinking model, and builds a "Park City". In 2022, the whole city of Dalian will add 112 pocket parks, and build pocket parks in various regions, so that people can enjoy the livable happiness brought by urban greening. Therefore, the concern for environment and sustainable development is also part of the designer's vision. While meeting the current needs, reduce the impact on the environment and build a sustainable design scheme.

1.5 Summary

The design foresight thinking model emphasizes openness and inclusiveness, and encourages interdisciplinary cooperation and innovation. By cooperating with experts and stakeholders in different fields, we can understand

and solve future challenges more comprehensively. The foresight of design is reflected in many aspects of society, from micro to macro, from abstract to concrete, showing the designer's unique views on the future. First of all, designers need to understand and use a variety of design tools and technologies. From traditional Adobe design series and other software to artificial intelligence chatgpt and midjournal and other software, designers can use more and more new tools. When designers begin to carry out user analysis, user portrait, user research, data analysis and processing, prototype design and testing, they can dig the key points and solve the existing problems. Secondly, designers need to have interdisciplinary knowledge and thinking, such as understanding of biology, psychology, computer science, engineering, sociology, logic and other disciplines, and then apply different thinking logic principles and skills to their own design.

2. Application of design foresight thinking model in different fields

The design foresight thinking model emphasizes the uncertainty, unpredictability and strategic thinking of the future. This thinking model can help humans understand the future trends and challenges, so as to prepare for the future. The design foresight thinking model has a wide range of applications, including business, science and technology, science, culture, art and other fields.

2.1 Application of design foresight thinking model in the business field

In the business field, foresight thinking can help enterprises predict future market trends and competition patterns, and specify more effective strategic plans. A successful company may predict that the market demand for a product will increase, and then prepare a production plan in advance to meet the future market demand; According to different competition patterns, we have a good sense of confidentiality, and unexpectedly launch our own company's new products to occupy market share. For example, China's Huawei directly launched the new mobile phone product mate60 series without a new product launch on August 29, 2023, making the competitive landscape more favorable. This is the practical application of foresight thinking in the business field.

2.2 Application of design foresight thinking model in the field of science and technology

In the field of science and technology, foresight thinking can help scientists and technicians predict the future technology trend and development direction. For example, experts in the field of artificial intelligence have begun to predict the development trend of smart cars and smart homes in the future, so they will devote more energy to the research in these fields. For example, Tesla Motors of the United States has launched the autopilot system, which has three levels of basic autopilot BAP, enhanced autopilot EAP and full autopilot FSD. Among them, the FSD full autopilot system can realize the functions of automatic driving on urban roads, identifying traffic lights and parking.

2.3 Application of design foresight thinking model in the field of Science

In the field of science, foresight thinking can help scientists predict future scientific trends and social changes. By predicting the importance of science and sustainable development in the future society, scientists put forward safer environmental protection schemes and scientific development strategies. For example, on August 25, 2023, China's new generation of man-made sun "China circulation No. 3" realized high constraint mode operation for the first time. The breakthrough of these key scientific and technological problems marks the gradual realization of human access to unlimited clean energy.

2.4 Application of design foresight thinking model in the economic field

In the economic field, foresight thinking can help people understand and discover the laws of the economic cycle. As cities in many countries declare bankruptcy, this is a warning to China. It reminds us to face the debt risk and issue more prudent policies to deal with the uncertainty in the future.

2.5 Application of design foresight thinking model in medical field

In the medical field, foresight thinking can help doctors better treat patients. Cardiac resuscitation has always been regarded as an effective first aid method for patients with cardiac arrest. Since 2015, AED automatic external defibrillators have gradually appeared in public places in China. Better help patients grasp the "golden 3 minutes" in the absence of a doctor.

2.6 Summary

Foresight thinking is the concentrated embodiment of human wisdom. It can not only guide individuals to success, but also promote the continuous progress of society. In the history of mankind, many great achievements and progress are derived from the inspiration of far sighted thinking. Therefore, it is of great strategic significance to explore the foresight thinking for social change and development.

3. The role of foresight thinking in social change and development is shown in the following aspects:

3.1 Innovative thinking

Foresight thinking can stimulate people's innovative thinking ability and guide people to find new solutions. This innovative thinking can be applied to science and technology, culture, education and other fields, so as to promote social progress and development. Just as Ms. Tu Youyou, the winner of the 2015 Nobel Prize in medicine, extracted artemisinin to create a new treatment for malaria, and became the preferred drug for anti malaria in the world, benefiting all mankind.

3.2 Forecasting the future

Foresight thinking can help people better predict the future and make response measures in advance. This ability can help decision makers to formulate more scientific and effective policies to meet future opportunities and challenges.

3.3 Leading change

Foresight thinking can lead social change and promote the development of society in a more advanced and better direction. Guided by visionary thinking, people can better grasp the opportunities of the times and promote the realization of social change. Just as the rapid development of artificial intelligence in 2023 has made people aware of the convenience brought by the digital economy and digital city, it is precisely because of the high recognition of human thinking that the whole society has become more united and beautiful.

3.4 Enhance confidence

Foresight thinking can enhance people's confidence and make people more confident in their goals and ideals. This confidence can make people more firm in the face of difficulties and challenges, so as to achieve success.

4. Foresight thinking and development of design discipline

In the design discipline, foresight thinking plays a vital role. It is not only the ability to formulate strategies or predict the future, but also a more far-reaching and grand perspective; A perspective that can transcend the appearance phenomenon and explore the essence and development potential of design discipline. Visionary thinking enables artists, designers and scholars to grasp the development trend of the design discipline calmly, so as to maintain a leading position in the changing design context.

4.1 Foresight thinking and design innovation

Foresight thinking plays a key role in design innovation. Through a visionary perspective, designers can gain insight into new artistic forms and expressions that others cannot perceive. Designers should be at the forefront of the times and integrate novel design concepts and new technologies into their design works. Artists with visionary thinking will not follow the rules, but dare to challenge the existing boundaries of art and design and explore a broader field of design. Just like the teaching reform of the school of design of the Central Academy of

fine arts, it is based on the foresight thinking of Mr. songxiewei, the dean of the school of design, to integrate all disciplines of the school of design, break the barriers between disciplines, and make the design major all inclusive and rejuvenated.

4.2 Foresight thinking and design understanding

In the design discipline, the understanding and appreciation of design need to have foresight thinking. Design is not only the beauty or shock on the surface, but also carries profound social, historical and cultural connotations. Designers with visionary thinking can deeply understand the complexity of design, and through in-depth research, analysis and interpretation, the internal meaning of design works can be clearly transmitted to the public. At the same time, designers can predict and interpret the changes of design trends, so that people can better understand and appreciate design works.

4.3 Foresight thinking and Design Education

Foresight thinking is also indispensable in design education. Design teachers need to have foresight thinking to guide students to explore and understand the deep meaning of design, and stimulate their innovative thinking and critical thinking. Foresight thinking can help design teachers predict and respond to the development trend of the design discipline, so as to timely adjust educational strategies and methods, and ensure that students acquire the most cutting- edge design theory knowledge and skills. Just like the "no future - International Education Forum" opened by the Design Institute of the Central Academy of fine arts on April 1st, 2023, to enable more design students and designers to better understand the global cutting-edge design theoretical knowledge and stimulate more innovative thinking in the process of enriching their minds, which is the original intention of design education.

4.4 Fusion of foresight thinking and design discipline

The integration of foresight thinking and design discipline helps designers grasp the market trend and future direction from a macro perspective. Foresight thinking emphasizes the prediction and strategic thinking of the future, which enables designers to better understand user needs, market dynamics and social development trends. On this basis, designers can use innovative methods and tools to create design works in line with the spirit of the times.

4.5 Specific application of foresight thinking in design discipline

4.5.1 Product design and foresight thinking

Under the guidance of visionary thinking, product designers can predict the future trend of products and user needs, so as to design products more in line with the needs of the market and users. For example, in the field of smart home, designers can use foresight thinking to design products by understanding users' needs for intelligence, comfort and environmental protection. The final product not only has advanced technology, but also can meet the long-term needs of users and achieve sustainable development.

4.5.2 Environmental design and visionary thinking

4.5.3 Interaction design and visionary thinking

Under the guidance of visionary thinking, interaction designers can predict the future interaction mode and user experience. By understanding the development trend of technology and the changes of user behavior, interaction designers can use innovative interaction methods to improve user experience and product value. For example, in the field of virtual reality (VR), interaction designers can develop more natural and convenient interaction methods through in-depth understanding of user needs and technologies, so as to improve users' immersion and satisfaction.

Conclusion

The design discipline foresight thinking model provides us with an efficient thinking framework, which can better help us understand and predict the future trends and challenges. The future is both opportunities and challenges. By using this thinking model to predict, we can specify more efficient and innovative strategies and action guidelines, and this action plan can meet the challenges in all aspects in the future. In the future, we look forward to the continuous development and improvement of this thinking model to provide more accurate and usable predictions and solutions for human beings around the world.

Foresight thinking is a key ability in the design discipline. It not only allows designers to solve current problems, but also creates the possibility to solve future problems. The vision of designers is reflected in their understanding of new tools and technologies, interdisciplinary knowledge reserves and sharp thinking, sensitivity to different social cultures, values and ideologies, and attention to the environment and sustainability. Therefore, the foresight of designers is not only a professional skill, but also a social responsibility. Only designers with these visions can truly create design solutions that meet future needs and make corresponding contributions to human development.

Foresight thinking is of great value in the design discipline. It helps designers, scholars and teachers grasp the development trend of the design discipline and maintain a leading position by providing in-depth insight into design innovation, understanding and education. In order to better cope with the challenges and opportunities in the future design field, we must pay attention to the cultivation and improvement of our foresight thinking ability, and continue to explore, innovate and surpass, so as to promote the sustainable development of the design discipline.

In the future, with the development of science and technology and the continuous change of market demand, foresight thinking will be more widely used in the design discipline. Designers need to constantly cultivate and improve their foresight thinking ability to cope with the changing market environment and social needs. At the same time, by strengthening interdisciplinary cooperation and exchange, designers can expand their horizons and absorb the essence of other fields, and further enhance the practical application effect of foresight thinking in the design discipline.

Environmental designers can predict future urban development and ecosystem changes through foresight thinking. By understanding the needs of urban planning and ecological protection, environmental designers can use the concept and methods of sustainable development to create a more livable urban environment. For example, in urban planning, designers can combine green building and intelligent city technology to create low-carbon and livable urban space to meet the needs of future population.

Acknowledgments

Until today, everyone's behavior has influenced the direction of the entire future. I hope that the analysis of the design foresight thinking model in the article can better enable humans to plan and design their own beautiful future. The paper can help viewers better understand the advocacy of the 2023 Cumulus Association Conference and make their due contributions to the "NARRATIVES OF LOVE ——TOWARDS HEALING, TRANSFORMATION AND TRANSCENDENCE" conference.

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References

Dalian Municipal Government Report, 2022, Dalian City, Liaoning Province, China
China National Nuclear Corporation's "China Circulation Three" has achieved a breakthrough, August 25, 2023, China Science Daily
List of Livable Cities in 2023, Monocle Magazine, UK

A Virtual Exhibition Design Guideline: Coordinating 3D Roaming and Efficiency

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Abstract

More and more virtual exhibitions have chosen to add 3D roaming system to enhance immersion. We assert that excessive pursuit of 3D roaming will affect users' information acquisition efficiency and reduce their experience. In this paper, we critically discussed the paradoxical relationship between 3D roaming and efficiency in the virtual exhibition, and proposed strategies for coordinating 3D roaming and efficiency to comprehensively improve user experience. We created two different forms (3D roaming and 2D webpage) based on the same exhibition content and conducted extensive user study. According to experimental observation and user feedbacks, we concluded several general trends towards coordination. We extracted design guidelines that are conductive to coordinate 3D roaming and efficiency in the virtual exhibition through a focus group (7 experts). Further, we conducted validation experiment and the results proved the effectiveness of our design guidelines.

Author keywords

3D roaming system; virtual exhibition; information acquisition efficiency; user studies; design guidelines.

Introduction

With the development of 3D modeling and rendering technology, many virtual exhibitions choose to construct 3D scenes with roaming system to bring visitors stronger sense of immersion (Carmo & Cláudio, 2013). This form changes the way visitors watch, allowing them to simulate walking, feel spatial relationship, control distance and viewing angle. However, this kind of interaction also lead to a decrease in the efficiency of user information acquisition during the watching process: Being in a part of space, it is not easy for visitors to get a sense of the overall situation; the need to rely on walking makes visitors slowly when trying to get somewhere in the space; the viewing angle causes visitors to adjust frequently to see clearly. All these situations increase the burden on the visitors when acquiring information (Richards & Taylor, 2015), and prevent them from exploring and searching for what they need (Modjeska & Waterworth, 2000). In contrast, the 2D webpage is generally considered to be efficient in obtaining information. If there is a way to maintain 3D roaming while guaranteeing efficiency, the overall user experience (UX) will improve. Therefore, the question that motivates this work is: How to coordinate 3D roaming and efficiency in the virtual exhibition?

Related work

Visiting a virtual exhibition is essentially a media experience rather than a real one (Mintz & Thomas, 1998), in which both authenticity and spatial sensation are lost (Wolf, Reinhardt, & Funk, 2018). With the development of technology, 3D virtual exhibitions are believed to be able to realize the full functionality of physical exhibitions in

the future (Cong & Chen, 2010). Moreover, virtual exhibitions have more responsibilities in conveying information and communicating (Kim, 2018). Zhang provided a way to build virtual exhibitions using the Unity3D engine to improve the passivity of information reception (Zhang, 2022). Elmqvist proposed a navigation technique based on motion constraints to guide users through predefined trips in the environment in order to solve the problem of information overload (Elmqvist, Tudoreanu, & Tsigas, 2008). In addition, according to Kim's research, 2D displays are more effective than 3D in communicating with visitors (Kim & Hong, 2020). Experience and information have always been issues that researchers concern about. With this paper, we intend to comprehensively discuss the relationship between both of them.

Research question

While creating a sense of immersion, 3D roaming system also brings problems of information acquisition efficiency. Therefore, our first research question is: Is the information acquisition efficiency a key factor affecting UX in 3D virtual exhibitions? (RQ1)

How to create a 3D virtual exhibition with better UX is a question worthy of attention and continuous thinking. We asset that coordinating 3D roaming and efficiency is a good point, so our second research question is: What contents or methods may be appropriate to coordinate 3D roaming and efficiency in the virtual exhibition, providing users with immersion while ensuring their information acquisition efficiency? (RQ2)

User study

We conducted a user-centered study in which participants experienced a virtual exhibition while facing both forms of 3D roaming and 2D webpage. It aimed to better understand user needs during the watching process and get qualitative feedback on UX as well as ideas for achieving coordination.

Experiment design

We studied user screen behavior through observation, and further discussed RQ1 and RQ2 through two consecutive interviews.

The first interview based on the observation results, which included visitors' first choice between two forms, choices changing during the watching process and the total watching time, so as to understand the real motives and needs that drove their different screen behavior (RQ1), mainly with the following two questions:

1. Whydoyouchoosetouse3Droaming(2Dwebpage)initially?

2. Why do you switch between the two forms (only use one form/sequentially use both forms) during the watching process?

We obtained further user feedbacks through a semi-structured interviews to collect ideas about coordination concepts that may improve the UX (RQ2) and asked the following questions:

1. Whichformdoyoupreferasthemainformofthevirtualexhibition,3Droamingor2Dwebpage? 2. Whatdoyouthinkaret headvantagesanddisadvantagesof3Droaming?

3. Whatdoyouthinkaretheadvantagesanddisadvantagesof2Dwebpage?

4. Didyoufeelliketheimmersionwasbrokenduringthewatchingprocess?

5. Whatpossibilitiesthatimproveexperiencecouldyouimageforfuture3Dvirtualexhibitions?

Participants

A total of 22 participants (15 females & 7 males) were recruited, aged 20-38 (mean=25, SD=3.93), and 12 of them had relevant experience in visiting virtual exhibitions. We conducted open recruitment through email and social platforms to obtain a more diverse sample of participants. Participants in the experiment received certain financial rewards as compensation.

Settings and apparatus

We deliberately chose a small collage exhibition, which included four different themes, with a total of 43 image works and corresponding text, as it avoided the interference of special preference for presentation forms and too long research time.

Figure 1. Experiment settings (a) the 3D virtual exhibition space, (b) content presentations in 3D exhibition space, (c) the 2D webpage, (d) the split-screen experiment environment.

For the 3D roaming form (https://hongtioops.net/galleryRoaming/), we used Unity3D to build an exhibition space, which was kept moderate in size and complexity, as shown in Figure 1(a). All image works were placed in photo frames and all texts were ensured readability, please refer to Figure 1(b). Participants visited from a first-person perspective, and were allowed roaming freely. In this case, participants used the keyboard and mouse to control movement and viewing angle. For the 2D webpage form (https://hongtioops.net/galleryweb/), we used the JavaScript to build a pure webpage. Information in the menu bar on the left was arranged in a hierarchical manner, and the content area on the right displayed detailed texts and images, as shown in Figure 1(c). Participants could use mouse clicks and scroll wheels to browse and jump through hyperlinks. These two forms were split on the same screen, as shown in Figure 1(d), to ensure that visitors could choose either of them fairly during the watching process.

Procedure

Before the experiment started, each participant filled out a questionnaire with basic information and signed a consent form. The experimental task was to use the computer freely explore the virtual exhibition, facing two forms (3D roaming and 2D webpage) at the same time. Participants adjusted their computers to a state suitable for the experiment under our remote guidance, and then shared screen and sound through online meetings tools. We told them that the two forms were completely consistent in terms of content, and they could choose how to use them all according to their own choices and interests, without any special tasks and requirements. We expressed that we valued their personal exhibition experience. After participants clarified all the premises and were familiar with the operation, the experiment was carried out. We observed their screen behavior in real time remotely.

When all conditions were completed, we invited participants to answer the questions of the semi- structured interview under RQ1 and RQ2 via the online voice system.

Results and analysis

According to the observation results, 15 participants chose 3D roaming form firstly, and all the participants switched between two forms during the watching process.

In the first interviews, we found that participants did not simply switch because of interface juxtaposition or curiosity, but with a clear goal based on their needs. When participants chose 3D roaming, they wanted to get more immersion and spatial experience, but when they needed to get a preliminary understanding of the exhibition content and framework, quickly retrieve information, check whether missing information and observe a clearer picture, they would choose 2D webpage. It was proved that information acquisition constituted an important part of the entire exhibition watching process.

Furthermore, we qualitatively analyzed user feedback according to the questions set in the broad-line interview outline, and found general trends described below. In addition, we also emphasized individual perspectives when

participants' responses were particularly relevant to our research questions:

§ 15 out of 22 participants expressed their preference to 3D roaming, except when they intentionally obtained or backtracked information. Among 7 participants who preferred 2D webpage,3 of them clearly stated that it was because they could find information they wanted more quickly.

§ Participants said they felt better in 3D roaming form as it brought an exhibition atmosphere and they could better observe the details and browse all the works on a wall as a whole. Moreover, they felt more interesting, which made them curious and have a stronger desire for exploration. Most participants felt difficult in reading contents because of viewing angle, spatial perspective, rendering effect. 16 participants feared missing information. 8 participants had feelings of getting lost and didn't know the route of watching. Participants also mentioned that they felt confused about partitions of works in the space.

§ All participants felt 2D webpage more intuitive and clearer, which helped them quickly obtain general contents. 2 participants felt more familiar with 2D webpage. One participant mentioned that he could start browsing from anywhere. However, participants felt bored with 2D webpage because the experience was similar to reading a textbook. They regarded the work as just pictures rather than artworks. Some participants mentioned that 2D webpage was easy to know contents without any mystery and surprise and the logical performance of the exhibition was simple.

§ All participants switched between two forms while watching. 11 participants said it did not break immersion and 5 of them said that having better access to information actually brought more immersion. In addition, 7 participants indicated that their immersion affected by the unsmooth split-screen operation and the sense of immersion would be better in the same interface.

§ Participants hoped to add auxiliary methods in the 3D virtual exhibition to help them obtain information or better view contents. One participant directly said that it would be better to combine 3D roaming with 2D webpage. Some participants would like to have more navigation aids. 3 participants emphasized that they did not want to add too much interaction, because they thought 3D roaming was enough. 6 participants would like to have sharing and communication functions.

In summary, participants expressed interests in the virtual exhibition with 3D roaming, but a better spatial experience could not replace their desire to obtain information quickly. Therefore, it is necessary to coordinate 3D roaming and efficiency in the virtual exhibition, which can better meet user needs in different aspects and improve the overall UX.

Design guidelines

Combined with the experimental observation and interview conclusions, we organized the experimental data and conducted a focus group with 7 experts. We finally proposed 5 generalizable design guidelines. These guidelines are aimed at the 3D virtual exhibition and give suggestions from the perspective of coordinating 3D roaming and efficiency to improve UX.

§ At least provide one way for visitors to get information quickly. Our study showed that in addition to space experience in the 3D virtual exhibition, efficiency is also indispensable. Providing at least one way to quickly obtain information can ensure visitors browse exhibition contents in time when they need.

§ Let visitors have a sense of the overall situation both in space and content. The sense of immersion brought by 3D roaming makes visitors pay more attention to details and parts but loses control of the overall situation, and causes confusion, whether in space or content. Therefore, it is necessary to provide visitors with appropriate hints in both aspects of space and content to help them gain a more overall sense.

§ Provide a more focusable method when users need to view content. When visitors find a work they like, they often want to observe more carefully or obtain more information. At this time, they pay more attention to the content than the form. A method that is easier to focus help visitors read conveniently or see clearly when they need.

§ Provide proper guidance particular in virtual exhibitions that emphasize narrative logic. We found that visitors not only enjoyed roaming freely, but also concerned the connection between the exhibition works and the space, especially in virtual exhibitions that emphasize narrative logic. Complete roaming way may lead to missing information or not being able to understand the narrative line.

§ Do not add new un-captivating interaction. Complicated interactions may result in poor browsing experience and increase study time. However, switching between 3D and 2D during the watching process will not reduce the sense of immersion. Designers should ensure that new methods of interaction added to virtual exhibitions will not let visitors feel burdensome or pointless.

Further experiment

We improved the original 3D roaming version based on the design guidelines, and combined the advantages of both 3D roaming and 2D webpage in an appropriate way. Please refer to Figure2(a) (https://hongtioops.net/GalleryRoamingPlusWebFinal/). We added a map that allowed visitors to identify location and understand partitions of works; a menu bar that helped visitors to browse and retrieve information; cards that displayed clearer contents and provided a way to quickly check information.

Figure 2. Improved version of the 3D virtual exhibition (a) all functions added to coordinate 3D roaming and efficiency, (b) Accessibility hides when not needed.

We tested it with the previous 22 participants and asked them to score the options we raised with the Likert scale. The results are shown in Table1.

Based on the data provided previously, the results of the virtual exhibition satisfaction survey conducted by 22 participants were comprehensively analyzed and summarized. In terms of overall experience, users gave very satisfactory ratings to the final version of the virtual exhibition, with an average score of 4.64, which shows that users are very satisfied with the overall experience of the exhibition. In addition, the standard deviation is low, indicating that users' evaluation of the overall experience is consistent.

Our validation experiment has proven that our design guidelines to coordinate 3D roaming and efficiency are effective. These results provide a valuable reference for us to further improve and optimize the virtual exhibition, helping to create a better user experience and meet user expectations.

Table 1. Acceptance of the improved version which coordinated 3D roaming and efficiency.

Options	Range	Min	Max	Mean	D(X)	SD
You have a better overall experience	1	4	5	4.64	0.231	0.481
You still feel immersed	2	3	5	4.05	0.588	0.767
The map gives you a better understanding of space	3	2	5	4.55	0.884	0.940
Pop-ups help you pay attention to contents better	2	3	5	4.5	0.339	0.583
Lists help you get information quickly	4	1	5	4.18	1.329	1.153
Proper guidance allows you to visit the virtual exhibition better	2	3	5	4.36	0.594	0.771

Conclusion

Although 3D virtual exhibitions have been greatly developed under the impetus of technology, there are still many problems. In this paper, we critically discussed the paradoxical relationship between 3D roaming and efficiency in the virtual exhibition. The necessary conditions for immersion brought by 3D roaming also affect the efficiency of information acquisition during

the watching process. We proposed strategies for coordinating 3D roaming and efficiency to comprehensively improve user experience in the way of combining advantages of 3D roaming and 2D webpage. Through extensive user study, we collected feedbacks in different aspects of use needs and user experience that helped to achieve coordination. As a result of the focus group, we produced 5 generalizable design guidelines that coordinate 3D roaming and efficiency in the virtual exhibition. Our guidelines were proved effective in the further validation experiment.

Our study is meaningful because it helps to understand the different aspects of user needs between experience and efficiency during the watching process, and provides guidelines for designing and planning virtual exhibitions from the perspective of coordinating 3D roaming and efficiency. These guidelines can help researchers rethink the relationship between 3D roaming and efficiency in the virtual exhibition and help designers create 3D virtual exhibitions with better user experience.

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References

Carmo, M. B., & Cláudio, A. P. (2013). 3D Virtual Exhibitions. DESIDOC Journal of Library & Information Technology, 33(3), 222–235. https://doi.org/10.14429/djlit.33.3.4608

Cong, D., & Chen, J. (2010). The situation and trend of development of 3D virtual exhibition. 2010 International Conference on Electronics and Information Engineering, V2-184-V2-190. https://doi.org/10.1109/ICEIE.2010.5559762

Elmqvist, N., Tudoreanu, M. E., & Tsigas, P. (2008). Evaluating motion constraints for 3D wayfinding in immersive and desktop virtual environments. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, 1769–1778. https://doi.org/10.1145/1357054.1357330

Kim, S. (2018). Virtual exhibitions and communication factors. Museum Management and Curatorship, 33(3), 243–260. https://doi.org/10.1080/09647775.2018.1466190

Kim, S., & Hong, S. (2020). How Virtual Exhibition Presentation Affects Visitor Communication and Enjoyment: An Exploration of 2D versus 3D. The Design Journal, 23(5), 677–696. https://doi.org/10.1080/14606925.2020.1806580

Mintz, A., & Thomas, S. (1998). The Virtual and the Real: Media in the Museum. Washington DC: American Association of Museums.

Modjeska, D., & Waterworth, J. (2000). Effects of desktop 3D world design on user navigation and search performance. 2000 IEEE Conference on Information Visualization. An International Conference on Computer Visualization and Graphics, 215–220. https://doi.org/10.1109/IV.2000.859758

Richards, D., & Taylor, M. (2015). A Comparison of learning gains when using a 2D simulation tool versus a 3D virtual world: An experiment to find the right representation involving the Marginal Value Theorem. Computers & Education, 86, 157–171. https://doi.org/10.1016/j.compedu.2015.03.009

Wolf, K., Reinhardt, J., & Funk, M. B. (2018, July 1). Virtual Exhibitions: What do we win and what do we lose? Electronic Visualisation and the Arts. https://doi.org/10.14236/ewic/EVA2018.15

Zhao, J. (2012). Designing Virtual Museum Using Web3D Technology. Physics Procedia, 33, 1596– 1602. https://doi.org/10.1016/j.phpro.2012.05.257

Backcasting for a preferred future: A Review of the Literature

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Abstract

Backcasting offers a systematic approach for envisioning an ideal future, especially in global sustainable development and national ecological civilization construction contexts. This study uses methods like bibliometric analysis, literature review, categorization, and summarization to comprehensively analyze Backcasting research progress and future prospects. Currently, Backcasting research is growing rapidly, led by developed countries in Western Europe and North America, such as Sweden, the Netherlands, the UK, and the US. They focus on areas like energy management, climate change, and urban planning, all aligned with sustainable development. However, a standardized system and application tools are still in early stages and require further investigation and expansion.

Author keywords

Transforming a Preferred Future; Backcasting; bibliometrics; Literature review

1 Introduction

Envisioning the future is a key human skill, but turning these visions into reality is challenging and requires specialized learning and training. Backcasting (Fig.1) is a methodology that effectively transforms future visions into concrete actions, offering a rational perspective for achieving an ideal future(Hao & Gu, 2021). Internationally, Backcasting has gained extensive academic and practical attention since the 1970s when it emerged as a novel approach to futures studies. It involves working backward from a desired future scenario (often 25-50 years ahead) to the present, generating normative policies and distribution plans to reach those goals (Quist & Vergragt, 2006; Robert, 2005; P. Vergragt & Quist, 2011).Backcasting helps us scrutinize the present by asking, "What actions must be taken today for future success?" It strengthens the connection between the present and envisioned future, aiding in human future planning(Hao & Gu, 2021) . Specifically, Backcasting assists government officials, planners, designers and others in breaking free from current constraints and addressing issues like conflicting goals and resource limitations. It enables the creation of long-term sustainable solutions(Carlsson-Kanyama et al., 2013).Compared to visions and scenarios that clarify future directions, Backcasting helps us achieve those visions.

2 Metods

This study conducted a comprehensive review of Backcasting-related research using bibliometrics and literature analysis. Initially, bibliometric techniques were used to analyze publication volume, journal distribution, institutional affiliations, and keyword networks in Backcasting research. Subsequently, pivotal literature was examined in-depth to categorize and summarize principal viewpoints into thematic clusters, revealing research interests and emerging directions. The data source comprised international journal articles from the Web of Science database's SCI, SSCI, and AHCI citation indexes. The study encompassed articles up to December 2022, using "Backcasting" in the "Title" field, yielding 394 articles. After excluding non-journal and non-conference publications, 371 articles remained.

3 Literature publication status

3.1 Annual Publication Volume in Literature

From the perspective of Backcasting's annual publicationqcount, a noticeable positive growth trend is evident over time, with notable spikes in 2007 (13), 2011 (23), and 2021 (38) (Fig.2). Examining the trend of paper quantity growth, it is apparent that over the past decade, research related to Backcasting has gradually gained popularity and broader application. This trend may be attributed to the global emphasis on sustainable development, energy crises, environmental degradation, climate change, and related concerns. However, it is important to note that overall, the volume of literature in this field remains relatively limited, with a total of only 394 publications over a span of 49 years. Even during the period of notable growth from 2011 to 2022, with 11 to 13 years, the average annual publication count was only 25.7 papers. This signifies that Backcasting research has enormous research potential.

3.2 Publication Journals and Institutions

Looking at journal publications, 394 papers on foreign Backcasting research are distributed across 175 journals, averaging 2.25 papers per journal (Fig.3). The top 5 journals (Futures, Journal of Cleaner Production, Sustainability, Technology Forecasting and Social Change, and Energy Policy) collectively account for 33.5% of the total output, with "Futures" leading with 42 papers (10.7% of the total). These journals reflect different aspects of Backcasting research: "Futures" and "Technology Forecasting and Social Change" are key journals in Futures Studies, while "Sustainability" emphasizes sustainability. "Journal of Cleaner Production" and "Energy Policy" relate to energy management and planning, the original context for Backcasting.

Regarding author affiliations, 633 research institutions from 65 countries/regions participated in publishing papers. Western European and North American countries like Sweden, the UK, the US, the Netherlands, Canada, Germany, Australia, Japan, France, and Spain had the highest publication frequencies at the national level (Fig.4). Prominent institutions with 10 or more articles included the Royal Institute of Technology, Delft University of Technology, and others playing a central role in Backcasting research (Fig.5).

4 Current Research Status and Hot Topics

From a keyword analysis (Fig.6, Tab.1), the top 10 frequently mentioned keywords in Backcasting research, besides "Backcasting," are "Sustainability," "Scenarios," "Climate change," "Forecasting," "Sustainable development," "Participatory backcasting," "Futures," "Futures studies," "Stakeholders," and "Governance." Based on this, we draw from related typical literature to explain Backcasting's basic processes, methodology, and application tools.

4.1 Basic Process of Backcasting

Backcasting, as a methodology for envisioning and shaping the future, has been approached by scholars and

organizations across various domains, resulting in diverse operational processes. These processes have been classified, as shown in Tab.2.

In summary, the STD Backcasting approach, the backcasting method proposed by Höjer et al., the SusHouse project, and the method proposed by G. Király et al. all include a separate step of backcasting. In these cases, backcasting represents a specific action of looking from the future to the present, while in other processes, the entire process is referred to as backcasting, which is treated as a noun denoting the method. Moreover, in the mentioned processes, the development of a vision or goal is first established in a separate step, and then, through analysis, assessment, collaboration, and other means, the vision is gradually brought into the present(Haslauer et al., 2012). Although there are currently various application processes for backcasting, they exhibit distinct domain-specific characteristics and have not formed a universal and widely accepted consensus. Moving forward, it is necessary to conduct more macro-level, standardized, and modular process research on backcasting. Further refinements should also be made based on the specific characteristics of the practical application domains.

4.2 Methodology of Backcasting

Backcasting can be defined narrowly as the backcasting steps within methodologies or broadly as the entire methodological system(P. Vergragt & Quist, 2011). Current research on the backcasting methodological system primarily considers backcasting as a distinct step within the methodology and explores its integration with other methods to enhance its utility.

4.2.1Participatory backcasting

Participatory Backcasting, an approach to integrating diverse perspectives and knowledge into scenario development, has gained momentums (Wangel, 2011). It aims to foster consensus, identify conflicts, and enhance scenario and strategy legitimacy. This collaborative and reflective learning method offers advantages over expert-driven processes (Camilleri et al., 2022). It was initially applied in government policy projects in the 1990s, starting with the Dutch Sustainable Technological Development project (P. J. Vergragt, 2005). Since then, its utilization has expanded across various fields, leading to continuous refinement of the methodology.

Carlsson-Kanyama et al. (2008) applied backcasting with local stakeholders from five European cities, effectively stimulating long-term sustainability discussions among participants. Robinson et al. (2011) proposed a participatory second-order backcasting method where participants choose their ideal future and receive feedback, though it might limit explaining goal differences. The study integrated tools, standards, indicators, and stakeholder analysis for complex envisioning and pathway development. Andreotti et al. (2020) envisioned a more sustainable transportation system for Malta (2050) using participatory backcasting methods through stakeholder workshops. This facilitated discussions on transportation forms to mitigate climate change on the island.Camilleri et al. (2022) explored the use of participatory backcasting methods to envision a sustainable future transportation system for Malta (2050) through stakeholder workshops focused on climate change mitigation. However, involving stakeholders in participatory backcasting may have negative outcomes, such as path dependence driven by vested interests and reluctance among participants to assume responsibility as stakeholders(Hisschemöller & Bode, 2011).Wangel (2011) stressed aligning participant selection with research goals, emphasizing that for policy or practice influence, stakeholder involvement promotes investment, social learning, and empowerment. However, for exploring innovative or radical future scenarios, stakeholder participation might be limiting.

4.2.2The integration of backcasting with other methods

In addition to participatory backcasting, studies have explored integrating backcasting with methods like exploratory scenarios, system dynamics, future design, and ecological design. Van Vliet & Kok (2015) combined exploratory scenarios with backcasting to develop robust strategies addressing uncertainties. Their research shows that this approach generates more innovative strategies compared to using exploratory scenarios or

backcasting alone. Mendoza et al. (2017) introduced the BECE framework, combining backcasting and eco-design for the circular economy. Backcasting sets long-term goals, while eco-design helps achieve product and service performance targets for implementing circular economy requirements. Musse et al. (2018) presented a comprehensive approach combining backcasting and system dynamics in the case of urban housing planning for low-income citizens in Florianópolis, Brazil, to support complex decision-making for sustainable development. Emodi et al.(2019) used a combined backcasting and exploratory scenario analysis approach to mitigate greenhouse gas emissions in the Australian electricity sector.Hori et al. (2020) integrated participatory backcasting and multi-objective optimization methods to develop optimal future renewable energy plans, combining mathematical modeling and local stakeholder input. Timilsina et al. (2020) advocated integrating future design methods with backcasting and scenario planning to guide individuals in envisioning their future and considering future generations' perspectives in sustainable development strategies.

4.3 Application tool of Backcasting

Tools act as structured, visual representations of methodologies, expediting professionals' focus on core issues over methodological usage, aiding rapid learning and non-expert adoption. Backcasting presently relies on unstructured thinking, linked to particular domains. While limited in number, efforts to develop backcasting application tools are ongoing.

Quist & Vergragt (2006) outlined a participatory backcasting framework consisting of four toolkit groups: participatory tools and methods, design tools and methods, analytical tools and methods, and management, coordination, and communication tools and methods. These groups serve distinct roles in stakeholder engagement, scenario development, assessment, and process management.Ashina et al. (2012) applied the AIM/Backcasting model, based on backcasting principles, to assess the feasibility and roadmap for achieving a low-carbon society in Japan by 2050. This analysis considered technology roadmaps, CO2 emission trajectories, and energy structure transitions.Kanter et al. (2016) introduced a practical backcasting approach from the ATP initiative, helping countries align their agricultural sectors with SDGs. The beef sector example in Uruguay demonstrates how local tools and expertise integrate with backcasting to set production and environmental targets for transformative policies.Okada et al. (2022) proposed a backcasting-based roadmap design method to facilitate decision-making and planning for a sustainable future. This method involves a two-stage process: defining a sustainable vision and outlining pathways to realize it, utilizing the "Four Arrows Model" as a roadmap template, as shown in Figure 7.

5 Conclusions

Backcasting, a pivotal framework with ideologies, technologies, and methodologies, plays a significant role in global societal progress, and its research is rapidly increasing. Developed nations in Western Europe and North America, including Sweden, the Netherlands, the United Kingdom, and the United States, lead in this field. As Backcasting integrates into various domains, contextualizing and standardizing its procedural aspects for specific application areas is essential. This enhances our understanding of how Backcasting can be effectively applied across different sectors. The development of structured and visual tools embodying Backcasting methodologies is vital for improving operational efficiency and enabling non-experts to utilize Backcasting effectively.

Design is a purposeful creative activity that shapes human society, involving the construction of a better reality, akin to Backcasting. Designers continuously refine their creations against ideal images. Zhang's (2022) "shared vision orientation" and "meaningful strategic intervention" exemplify Backcasting in design by setting visions and implementation. However, design often lacks Backcasting awareness, necessitating research integration. As sustainability and well-being gain importance, there's a need for theoretical guidance on Backcasting and design

integration, sparking research in design studies. This convergence explores design's role in Backcasting and how Backcasting enhances design, boosting general design competence in an era of widespread participation in design(Manzini, 2015).

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References

Andreotti, F., Speelman, E., Van den Meersche, K., & Allinne, C. (2020). Combining participatory games and backcasting to support collective scenario evaluation: An action research approach for sustainable agroforestry landscape management. SUSTAINABILITY SCIENCE, 15(5), 1383–1399. https://doi.org/10.1007/s11625-020-00829-3

Ashina, S., Fujino, J., Masui, T., Ehara, T., & Hibino, G. (2012). A roadmap towards a low-carbon society in Japan using backcasting methodology: Feasible pathways for achieving an 80% reduction in CO2 emissions by 2050. ENERGY POLICY, 41, 584–598. https://doi.org/10.1016/j.enpol.2011.11.020

Camilleri, R., Attard, M., & Hickman, R. (2022). Future Low-Carbon Transport Scenarios: Practice Theory-Based Visioning for Backcasting Studies. SUSTAINABILITY, 14(1). https://doi.org/10.3390/su14010074

Carlsson-Kanyama, A., Carlsen, H., & Dreborg, K. (2013). Barriers in municipal climate change adaptation: Results from case studies using backcasting. FUTURES, 49, 9–21. https://doi.org/10.1016/j.futures.2013.02.008

Carlsson-Kanyama, A., Dreborg, K., Moll, H., & Padovan, D. (2008). Participative backcasting: A tool for involving stakeholders in local sustainability planning. FUTURES, 40(1), 34–46. https://doi.org/10.1016/j.futures.2007.06.001

Emodi, N., Chaiechi, T., & Beg, A. (2019). Are emission reduction policies effective under climate change conditions? A backcasting and exploratory scenario approach using the LEAP-OSeMOSYS Model. APPLIED ENERGY, 236, 1183–1217. https://doi.org/10.1016/j.apenergy.2018.12.045

Hao X, & Gu X. (2021). How to Reasonably Predict Future Education: Enlightenment from Future Research Methods Modern Educational Technology, 31(8), 5–14. https://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2021&filename=XJJS202108002&v=

Haslauer, E., Biberacher, M., & Blaschke, T. (2012). GIS-based Backcasting: An innovative method for parameterisation of sustainable spatial planning and resource management. FUTURES, 44(4), 292–302. https://doi.org/10.1016/j.futures.2011.10.012

Hisschemöller, M., & Bode, R. (2011). Institutionalized knowledge conflict in assessing the possible contributions of H2 to a sustainable energy system for the Netherlands. International Journal of Hydrogen Energy, 36(1), 14–24. https://doi.org/10.1016/j.ijhydene.2010.09.024

Hori, K., Kim, J., Kawase, R., Kimura, M., Matsui, T., & Machimura, T. (2020). Local energy system design support using a renewable energy mix multi-objective optimization model and a co-creative optimization process. RENEWABLE ENERGY, 156, 1278–1291. https://doi.org/10.1016/j.renene.2019.11.089

Kanter, D., Schwoob, M., Baethgen, W., Bervejillo, J., Carriquiry, M., Dobermann, A., Ferraro, B., Lanfranco, B., Mondelli, M., Penengo, C., Saldias, R., Silva, M., & de Lima, J. (2016). Translating the Sustainable Development Goals into action: A participatory backcasting approach for developing national agricultural transformation pathways. GLOBAL FOOD SECURITY-AGRICULTURE POLICY ECONOMICS AND ENVIRONMENT, 10, 71–79. https://doi.org/10.1016/j.gfs.2016.08.002

Manzini, E. (2015). Design, When Everybody Designs: An Introduction to Design for Social Innovation. MIT Press.

Mendoza, J. M. F., Sharmina, M., Gallego-Schmid, A., Heyes, G., & Azapagic, A. (2017). Integrating Backcasting and Eco-Design for the Circular Economy: The BECE Framework. Journal of Industrial Ecology, 21(3), 526–544. https://doi.org/10.1111/jiec.12590

Musse, J., Homrich, A., de Mello, R., & Carvalho, M. (2018). Applying backcasting and system dynamics towards sustainable development: The housing planning case for low-income citizens in Brazil. JOURNAL OF CLEANER PRODUCTION, 193, 97–114. https://doi.org/10.1016/j.jclepro.2018.04.219

Okada, Y., Kishita, Y., Nomaguchi, Y., Yano, T., & Ohtomi, K. (2022). Backcasting-Based Method for Designing Roadmaps to Achieve a Sustainable Future. IEEE Transactions on Engineering Management, 69(1), 168–178. https://doi.org/10.1109/TEM.2020.3008444

Quist, J., & Vergragt, P. (2006). Past and future of backcasting: The shift to stakeholder participation and a proposal for a methodological framework. FUTURES, 38(9), 1027–1045. https://doi.org/10.1016/j.futures.2006.02.010

Robert, M. (2005). Backcasting and econometrics for sustainable planning information technology and individual preferences of travel. JOURNAL OF CLEANER PRODUCTION, 13(8), 841–851. https://doi.org/10.1016/j.jclepro.2003.12.028

Robinson, J., Burch, S., Talwar, S., O'Shea, M., & Walsh, M. (2011). Envisioning sustainability: Recent progress in the use of participatory backcasting approaches for sustainability research. TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE, 78(5), 756–768. https://doi.org/10.1016/j.techfore.2010.12.006

Timilsina, R. R., Nakagawa, Y., & Kotani, K. (2020). Exploring the Possibility of Linking and Incorporating Future Design in Backcasting and Scenario Planning. Sustainability, 12(23), 9907. https://doi.org/10.3390/su12239907

van Vliet, M., & Kok, K. (2015). Combining backcasting and exploratory scenarios to develop robust water strategies in face of uncertain futures. MITIGATION AND ADAPTATION STRATEGIES FOR GLOBAL CHANGE, 20(1), 43–74. https://doi.org/10.1007/s11027-013-9479-6

Vergragt, P. J. (2005). Back-casting for environmental sustainability: From STD and SusHouse towards implementation. In Towards environmental innovation systems (pp. 301–318). Springer.

Vergragt, P., & Quist, J. (2011). Backcasting for sustainability: Introduction to the special issue. TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE, 78(5), 747–755. https://doi.org/10.1016/j.techfore.2011.03.010

Wangel, J. (2011). Exploring social structures and agency in backcasting studies for sustainable development. TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE, 78(5), 872–882. https://doi.org/10.1016/j.techfore.2011.03.007

He R. (2019). History of Industrial Design (TB47-091) Higher Education Presshttp://book.ucdrs.superlib.net/views/specific/2929/bookDetail.jsp?dxNumber=000017938427&d=A55C3557CD4F72632908B91BD8F4B9D4&fenlei=18060405

Zhang L., & Hu W. (2022). Design the Future: Design thinking, method and teaching as a sustainable transformation. Journal of Nanjing University of The Arts (Fine Arts & Design), 6, 42-48+216. https://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CJFD&dbname=CJFDAUTO&filename=NJYS202206026&v=

Appendix

Fig.1 Backcasting

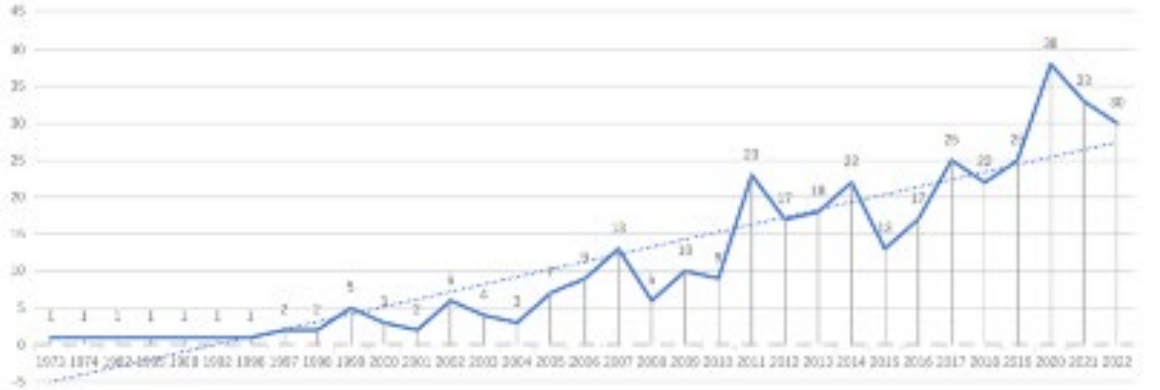

Fig.2 The distribution of annual publication volume of Backcasting research papers

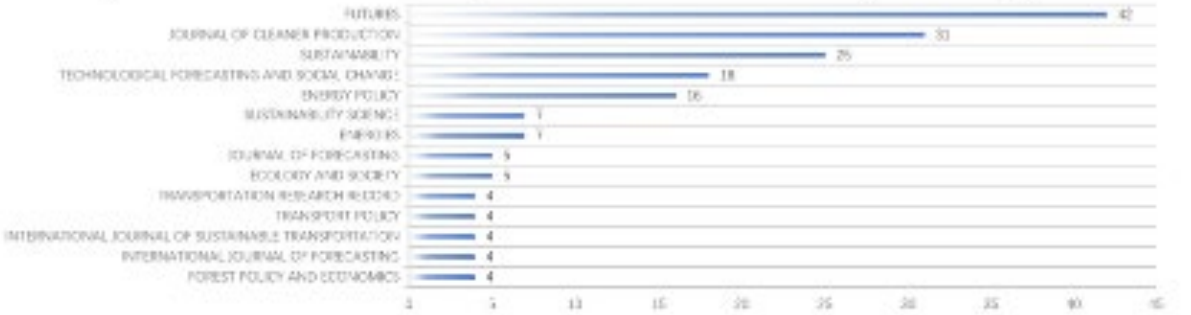

Fig.3 Journals related to Backcasting

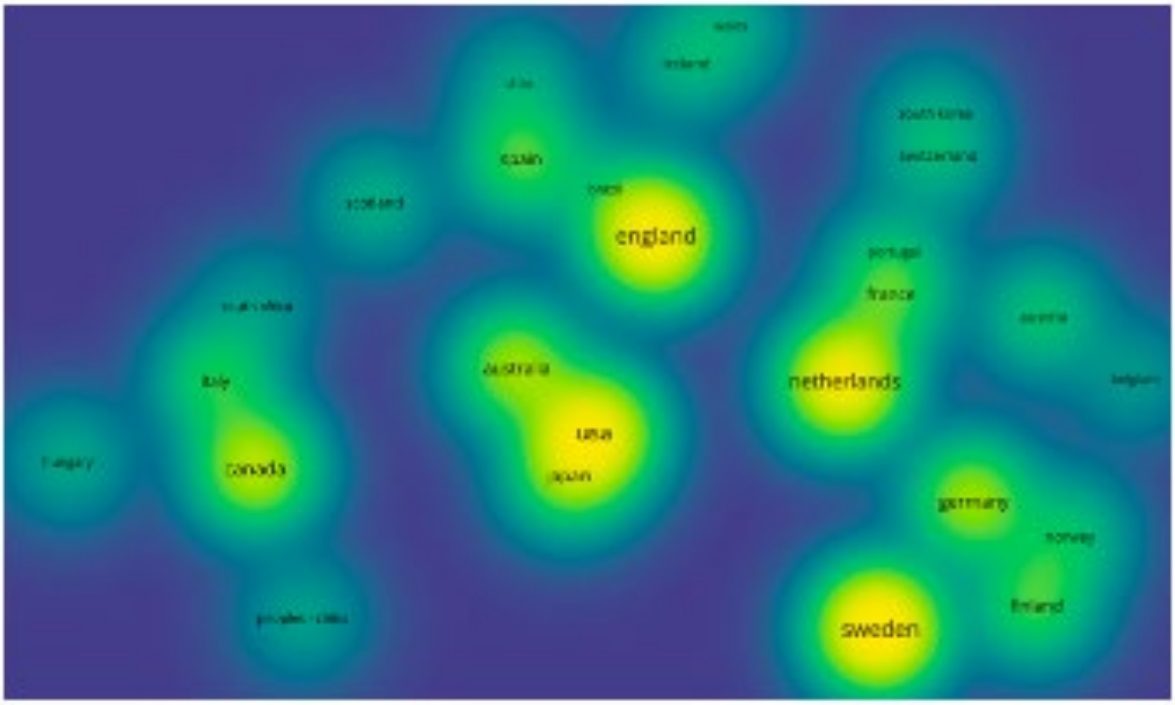

Figure.4 Distribution Map of Countries to Which Backcasting Research Papers Belongs

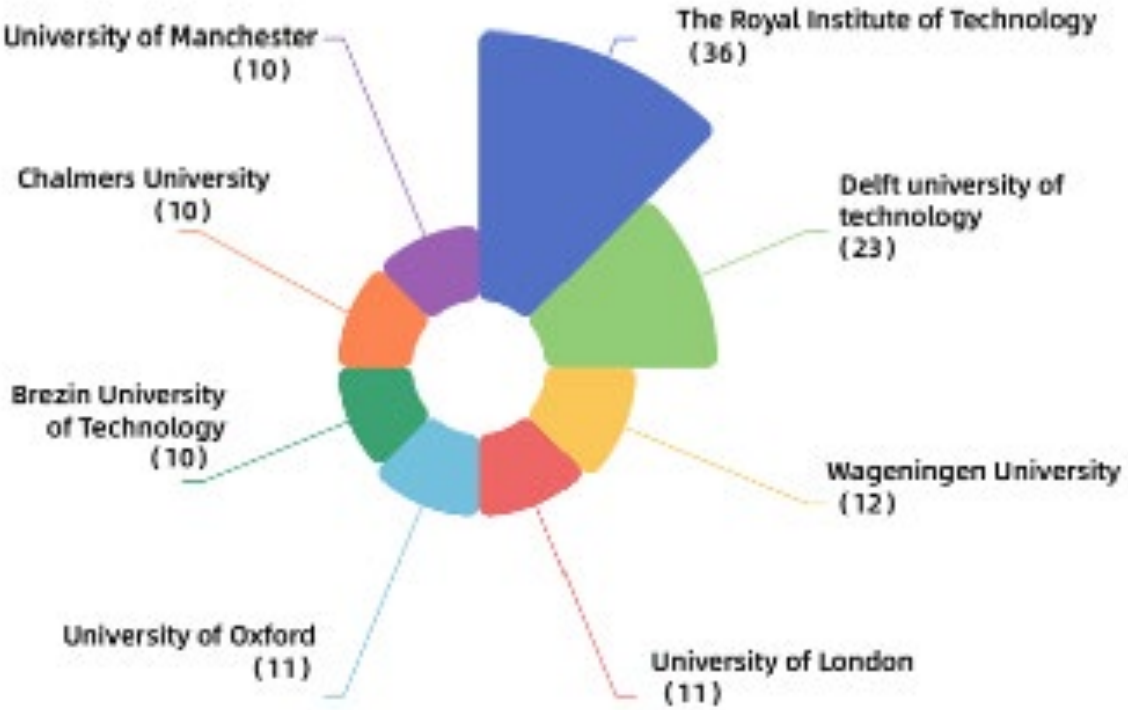

Figure.5 The proportion of research institutions ranked among the top 8 in the frequency of backcasting research papers

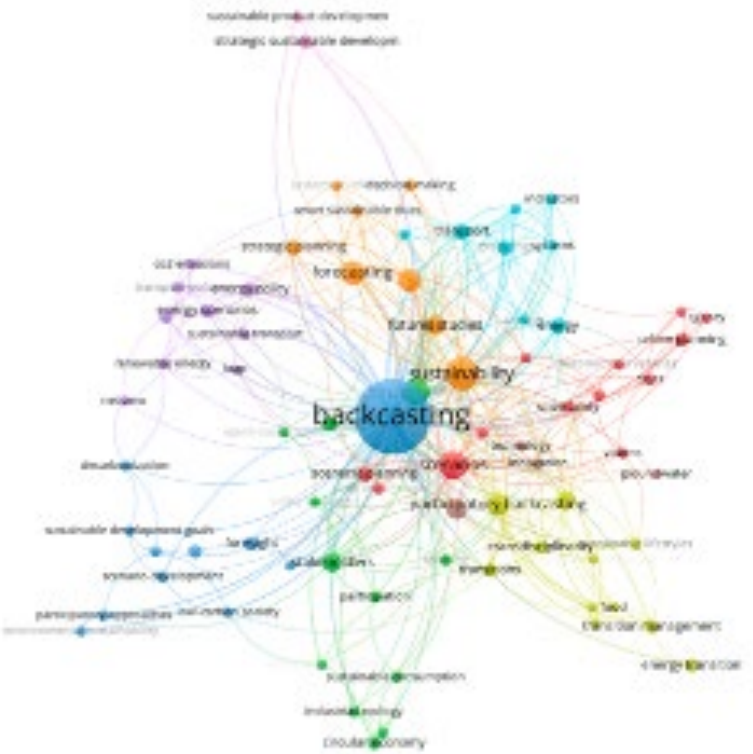

Figure.6 backcasting research keyword co-occurrence graph

Table.1 High frequency keywords for Backcasting research

No.	Keyword	Occurrences	Total link strength
1	Backcasting	154	93
2	Sustainability	32	26
3	Scenarios	23	35
4	Climate change	22	19
5	Forecasting	15	15
6	Sustainable development	15	12
7	Participatory backcasting	14	14
8	Futures	12	19
9	Futures studies	11	16
10	Stakeholders	11	13
11	Governance	10	14
12	Transport	7	16
13	Ecosystem services	7	9
14	Energy	7	9
15	Strategic planning	6	13

Table.2 Basic Process of Backcasting

Name	Author(s)	Procedure
Backcasting approach as proposed by Robinson	Robinson (1990)	1) the definition of future objectives 2) the creation of future scenarios based on an analysis of the present situation 3) socio-economic evaluation of scenarios 4) the assessment of technical feasibility.
The Natural Step backcasting approach	Holmberg (1998), Nattrass and Altomare 1999, Holmberg and Robèrt (2000)	1) definition of sustainability criteria associated with a specific issue 2) analysis of the present situation, as well as present activities and competencies of the company 3) creation of future visions in cooperation with employees 4) development of progress strategies in order to reach an ideal state
STD backcasting approach	Weaver et al. (2000) and Aarts (2000)	1) Strategic problem orientation and definition 2) Develop future vision 3) Backcasting 4) Explore solution options 5) Select among options: set up action plan 6) Set up cooperation agreement-define roles 7) Implement research agenda
Backcasting approach as proposed by Hö jer & Mattsson	Hö jer & Mattsson (2000)	1) the definition of visions and desirable future states 2) the definition and comparison of visions and forecasts 3) scenario building and as a separate step 4) the Backcasting analysis

SusHouse backcasting approach	Vergragt (2000, 2005), Quist et al. (2001a), and Green and Vergragt (2002)	1) Problem Orientation 2) Stakeholder Analysis & Involvement 3) Stakeholder Creativity Workshop 4) Scenario Construction 5) Scenario Assessment 6) Back-casting Workshop & Stakeholder Consultation 7) Realisation and Implementation.
Participatory backcasting	Jaco Quista, Philip Vergragtb (2006)	1) Strategic problem orientation 2) Construction of sustainable future visions or scenarios 3) Backcasting 4) Elaboration, analysis and defining follow-up and (action) agenda 5) Embedding of results and generating follow-up and implementation
GIS-based Backcasting	Eva Haslauer (2012)	1) problem analysis and analysis of the present situation 2) creation of an "optimal future solution" (vision) 3) determination of endogenous and exogenous indicators 4) development of future scenarios including a SWOT analysis, different values (best-case, worst-case scenarios) and integration of stakeholders' interests 5) Leitbild development and further guideline principles and indicators 6) development of a stochastic model in ArcGIS 7) implementation of a Backcasting analysis of the case study on urban sprawl 8) setting up the agenda and milestone scenarios 9) iterative reframing.
Backasting process as proposed by	G. Kira ́ly, Gy¨orgy Pataki,	1) determining the topic 2) determining the method 3) selecting the participants

G. Kira ly et al.	Alexandra K"oves, Ba´ lint Bala´ zs. (2013)	4) briefing 5) backcasting event(s) 6) normative vision 7) backcasting policy steps

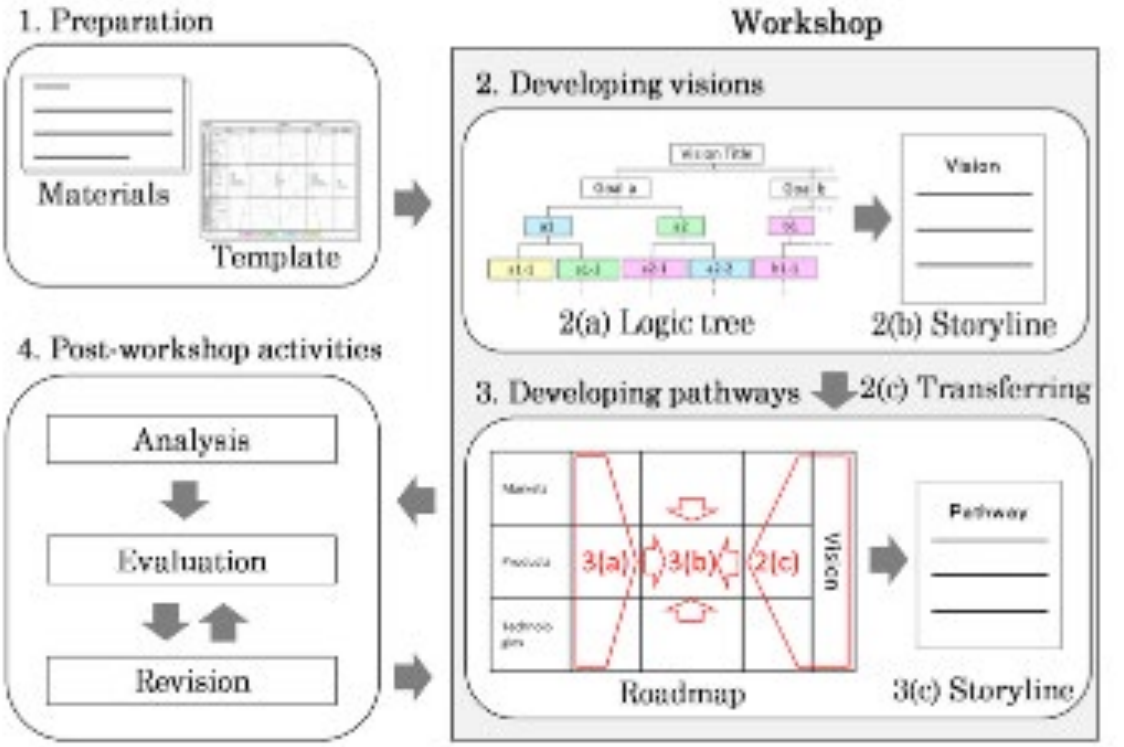

Figure.6 Four Arrows Model: Backcastin-based method for designing roadmaps to achieve a sustainable future

Steps to Well-being: Nurturing Personal, Social and Environmental Well-beings through an Urban Walking Practice

Wellbeing in Design: Cumulus 2023

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Abstract

This image-rich presentation explores the ways in which an evidence-based concept of well- being commissioned by the UK government manifests itself in a community-based urban walking event. Born out of my evolving art practice and as a means to critically explore my enjoyment of walking in the city, in 2016 I invited three friends to join me in walking a circuit of central Osaka, Japan where I was living. What was intended as a one-off event with those three friends has become an annual event open to the public with more than 20 people joining 2023's walk. The walks are semi-scripted, semi-improvised communal performances; our navigation of the urban space is interspersed with game-playing, story-telling, the reading of short texts and other interventions. This presentation first introduces the origins and cultural contexts of the walks before outlining The Five Ways to Well-being, the evidence-based report developed by the New Economics Foundation (NEF) for the UK government's Office for Science. The presentation then explores how those five ways to well-being outlined in the report manifest themselves within the walks themselves. Particular attention is paid to the 2020 event which was held in February of that year as the pandemic was first emerging and when personal, social and other well-beings were being put under extreme duress.

Author keywords

Well-being; Urban walking; psychogeography; pandemic; creative practice; more-than-human

Presentation Format

This presentation is a spoken narrative that makes use of both still- and moving-images. The presentation can be adapted to fit a 15- 30 minute time-slot, and can either stand alone or function within a panel-type event. Follow-up questions and discussion are very much encouraged.

References (selected)

Aked, J., Marks, N., Cordon, C., Thompson, S. (2008) Five ways to well-being, Available from: https://neweconomics.org/2008/10/five-ways-to-wellbeing

Government Office for Science, (2008) Mental Capital and Well-being, ref: 113-08-FO/B, Available from: www.gov.uk/government/collections/mental-capital-and-wellbeing

Richardson, T. (ed.) (2015) Walking Inside Out: Contemporary British Psychogeography, London: Littlefield and Rowman

Smith, P. (2010) Mythogeography: a Guide to Walking Sideways, Axminster: Triarchy Press.
(2020) Walking in a time of virus: thinking with uncertainty as our companion.
Available from: https://www.plymouth.ac.uk/news/pr-opinion/walking-in-a-time-of- virus-2?fbclid=IwAR19FKDB1DOGGfn_pDNewD9Do6f_6I-A_- fVk4SHW5TS1W7tKsRf9rG6xCI
Springgay, S. and Truman, S.E. (2019) Walking Methodologies in a More-than-human World, London: Routledge.
The Pedagogical Impulse, Research-Creation,
Available from: https://thepedagogicalimpulse.com/research-methodologies/
World Health Organisation, (2021) Health Promotion Glossary of Terms, Available from: www.who.int/publications/i/item/9789240038349

Research on the integration trend of emerging application technologies and automotive design

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Abstract

The history of automotive design is one full of innovation and technological progress. From the earliest steam cars to the internal combustion engine cars of the past, to the self-driving electric cars of the future, cars will become smart mobile terminals and even reshape urban space. Automotive design is constantly evolving to adapt to social needs, technological advances, and environmental challenges. Under the impact of emerging application technologies, automotive design thinking and methods are in urgent need of updating and reconstruction. Research on the integration of technology and design will help the rational and effective use of emerging application technologies in automobile design while promoting innovation in the automobile design industry to meet future transportation and travel needs.

By exemplifying some cases with distinctive characteristics, the author me sorted out the development trends of automobile design at present and shortly, focusing on various phenomena in automobile design and even automobile design ecology in the context of emerging application technologies, and tried to explore patterns and raise questions. Through methods such as historical combing, case analysis, trend forecasting, surveys, and interviews, the intersecting content and integration relationship between application technology and automotive design are sorted out and studied, and research samples from several perspectives are formed. At the same time, core issues are discussed in the article.

This article sorts out the development trends of automobile design in a changing environment, provides dialectical thinking on travel design and transportation design for the conference theme "Narrative of Love - Towards Healing, Transformation and Transcendence", and derives the trend that future intelligent car design will be dominated by technology. Present a visionary plan for this area of design. The research aims to consider the opportunities and problems arising from the current integration of technology and design and explore how the two can find appropriate development paths for intelligent car design in the context of emerging application technologies.

Author keywords

Intelligent car design, automotive design trends, technology and automotive design, automotive design reconstruction

Iteration of emerging application technologies drives changes in automotive design

With the popularization of driverless technology, people can gather, eat, work, and live in cars for a long time . Humanity's concept of time and space will be changed; parking lots will become commercial or residential spaces, roads will become narrower, and urban areas will become larger. Large, traffic lights and street signs

will disappear, and cities will be reorganized; as car accident rates decrease, hospitals and the financial and insurance industries will shrink; logistics prices will decrease, and commodity prices will decrease; humans will walk less, and shopping habits will change; cars Using more efficiently, energy and sectors will be redesigned... and this is just the beginning of the AI revolution.

Figure 1: Toyota E-Pattle

1. Development of autonomous driving application technology

Thanks to rapid advances in mobile robotics, combined with faster computers, reliable hardware sensors, and a new generation of artificial intelligence software (deep learning), cars can drive autonomously and safely in unpredictable environments.

In terms of internal automotive hardware, some key technologies and hardware are mentioned, such as AR HUD augmented reality technology head-up display, multi-function large-size display, etc., as well as the use of flagship SoC system-on-chip from chip manufacturers such as Qualcomm and HI Silicon. The main chip of the domain controller. These hardware support data processing capabilities, 5G networks, OTA wireless upgrade technology , and in-vehicle ADAS advanced assisted driving systems.

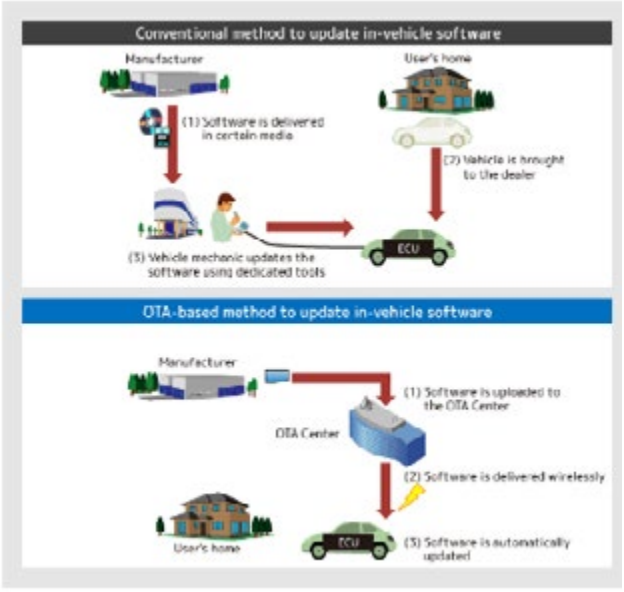

Figure 2: Comparison of car software update

In terms of software, it was mentioned that mid-to-high-end models of luxury brands of traditional car companies no longer are equipped with physical AI assistants, but instead use intelligent voice assistants to interact with vehicle occupants. In addition, some models may choose domain controller main chips from suppliers with better cooperation to reduce costs at the expense of computing power. Some models may directly purchase overall solutions provided by third parties such as Huawei, Samsung Harman, and Fuzhijie.

2. Autonomous driving technology leads to changes in car design trends

The exterior of the car is equipped with many radars, cameras, ultrasonic sensors, and other sensors. Some of them are integrated with the original free space of the vehicle, while others are independent to form new styling features. Graphic display technology suppliers, represented by NVIDIA, have significantly accelerated the development of open-environment autonomous driving by integrating and upgrading AI image recognition hardware and software.

The development of autonomous driving technology has promoted the integration and modularization process of automobile design, making automobile design gradually become intelligent products. At the same time, the shape and language style of the car have also changed accordingly, tending to be simpler and more integrated to cater to the sense of technology and the future.

The evolution of automobile design has shifted from focusing on the integrated interior and exterior style in the past to paying more attention to interior cockpit design under the current intelligentization process.

3. Intelligent car cabin

In the past, car design focused on integrating exterior styling with the interior. Now, with the development of intelligence, design pays more attention to the user's experience and efficiency in the car. Interior design is the key point for direct interaction with people .

3.1 The impact of human-machine interaction on automotive design

In the early days, vehicle control mainly relied on physical buttons, and the concept of a "smart cockpit" only appeared in film and television works, and the "intelligence" of the cockpit was mostly reflected by in-vehicle AI. For example, the Cyber System in the Japanese animation "Cyber Formula" can talk to the driver, complete assisted driving, and learn. It wasn't until 2012 that Tesla released the Model S, which for the first time adopted a cockpit design based on an intelligent connected car system in a mass-produced vehicle. Although some early models adopted multimedia interactive car-computer systems, for more complex human-computer interaction and applications, they still need to use plug-ins such as smartphones.

Figure 3: Li-Auto L9 Interior

Today, the smart cockpit is one of the core functions of the vehicle's electronic and electrical architecture. With the intelligent networked vehicle system as the core, it meets the needs of drivers and passengers for intelligent interaction with multi-channel information inside and outside the vehicle. With the support of chip performance, artificial intelligence algorithms, and Internet of Things technology, smart cockpits continue to improve various intelligent interactive experiences. Mainstream models on the market are also equipped with various smart cockpits according to needs.

In the future, it is expected that the electronic and electrical architecture of the entire vehicle will develop into a strip architecture based on domain fusion, requiring SoC chips to integrate the different requirements of multiple functional domains. The smart cockpit will also evolve into the "third space", applying C-V2X cellular network car networking technology to realize intelligent interaction between the vehicle and other external objects. However, this requires first completing the construction of intelligent transportation systems and improving smart city infrastructure and may also require adjustments to relevant laws and regulations.

3.2 The dissolution of traditional interior design

The impact of factors such as space design, interaction design, and human-centered design care on automobile interior design, as well as the changes in traditional interior design caused by changes in hardware technology. The development of space design and interaction design has transformed automobile interior design from ancillary design matching the mechanical structure to interior space-led design values.

In terms of the development of the design field, automobile design in the 20th century was mainly led by design artists. It was the creative result of an individual or a team and had a professional and complex process. However, with the emergence of professional design software (such as Adobe, Autodesk, Blender, etc.), the process of automotive design has become simpler and more visual, allowing everyone to produce relatively complete projects. This makes automotive designers more like clothing designers, able to demonstrate results using completely virtual designs.

In the future, the popularization of art may lead to a lowering of the professional threshold for design. With the development of NFT and virtual digital art, the interior and exterior styling of cars may be presented through

visual media. This could lead to a cadre of independent car designers who can create designs with a strong personal style under their names or as brands. The interior of the car may relate to reality in the virtual world, with scene and even collection value, like virtual fashion.

4. Automobile body intelligence

The intelligent exterior design of automobiles aims to improve the overall performance, safety, and interaction ability of the vehicle with the environment to create a smarter, safer, and more environmentally friendly travel experience.

4.1 The impact of connectivity on automotive design

To cope with the trend of the Internet of Everything, visual work status display has become very important, so some concept cars integrate interactive screens on the internal and external surfaces. From mechanized buttons to smooth large screens, and then to the integration of screens into smart surfaces, a new simple design style has been formed, which is not only a novel evolution of design, but also the inevitable release of mental stress due to technological progress. The screen displays complex information, and dense information may cause stress to the driver, so a visual work status display helps improve the driver's comfort and sense of security.

4.2 Innovation in Emerging Exterior Designs

Intelligent exterior design often considers the integration of autonomous driving systems into the vehicle, including the clever integration of lidar, cameras, and other sensors to maintain the aesthetics of the overall appearance. Car exterior designs tend to adopt more intelligent design languages to accommodate advanced technologies, including streamlined shapes, dynamic lines, and aerodynamic designs to optimize fuel efficiency and reduce wind resistance. Using LED technology, car exterior designs can achieve interactive lighting effects . These light systems can be used to communicate with other drivers and pedestrians, for example by displaying driving intentions, warning other vehicles, or demonstrating vehicle status.

Figure 4: Xiaomi NERONE designed by Shi Haoxin

Intersection analysis of smart car design and emerging application technologies Artificial intelligence will also challenge the boundaries of traditional human ethics and morality: tens of millions of full-time drivers around the world will face unemployment; the public transportation industry will wither as a whole; the energy and manufacturing industries will be forced to transform; the automobile industry and the insurance industry will be subverted; human beings It may be necessary to sacrifice personal privacy in exchange for travel safety and convenience; how will self-driving cars make decisions when encountering emergencies...

1. Analysis of interaction design methods of cars as intelligent vehicles

The advancement of technology shows that cars are becoming autonomous robots, emphasizing individual self-closed loops. The implementation process of autonomous driving technology mentioned above includes three main parts: perception and positioning, decision planning, and control execution. Perception and recognition capabilities are the basis of the system, and decision planning includes routing, behavioral decision-making, and action planning. Finally, the control execution stage accepts the output trajectory points of the action module and converts them into vehicle acceleration, braking, and steering wheel signals through dynamics calculation to achieve automatic driving. In this process, the interaction between smart cars and individuals and systems is indispensable.

1.1 Interaction between car exterior and slow-moving pedestrians

The interaction between cars and slow-moving pedestrians is mainly divided into two senses, namely vision and hearing. Because during highly intelligent driving, radar and cameras can quickly identify slow-moving pedestrian units, visual warnings can be provided through changes in lighting, changes in the shape of the side lights (daytime running lights), AR projection content, etc. Warning and communication functions for slow units. The propagation efficiency of sound is far less than that of light, and when the car is traveling at a certain speed, the effect of sound prompts is very subtle. However, the General Electric drive of cars will lead to a reduction in the sound of mechanical operation. In many scenarios, pedestrians cannot pay attention. It is like a traditional internal combustion engine vehicle that realizes that there is an electric car driving behind it. In this case, the sudden lane change or stop of the slow-speed unit will increase the risk of collision caused by misjudgment or delayed response of the fast unit.

1.2 Interaction of car exteriors and fast units

During fast driving, the outer surface of the car is an important medium for information transmission and interaction, that is, important information is displayed in the visible area of other drivers and other car cameras outside, which can satisfy most human-machine needs in intelligent transportation. Communicate and communicate. Electric vehicles cancel the air intake design of traditional cars and have large-capacity batteries. Therefore, the closed-air intake grille panel at the front of the car and the taillight panel at the rear can be used as interactive media to display information. At the same time, the lights serve as the trend line and exterior shape. The embellishments make up for the lack of details on the smooth body, forming a new design trend.

1.3 Vehicle-road-machine collaboration in urban systems

As an individual means of transportation, cars are moving toward internal interconnection from bottom to top, which also promotes the development needs of smart roads. In the future, the deployment of overall traffic by road systems will strengthen the interconnection between individuals, the interconnection between systems and individuals, and the transportation system. It will also become an intricate and organically operating ecological whole. This means that every individual vehicle and the smart road must communicate with invisible programs and visible visual signals. The disappearance of traffic lights and signs is not a crude replacement, but an efficient transformation. When roads become clean and tidy, necessary traffic information and interactive instructions will be transferred to moving vehicle units. Integrated display arrays composed of single or multiple mobile units assume the responsibility of the media, and the intelligent exterior surface of the vehicle also emerges.

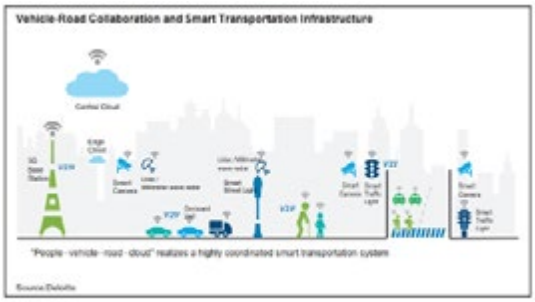

Figure 5: Vehicle-Road-Collaboration scene

2. Analysis of the human-machine symbiosis problem of automobiles as smart mobility products

In future smart transportation, people transform from drivers to passengers served by cars, resulting in the transfer of vehicle control rights. This involves changes in ethical responsibilities. People no longer directly control the car through personal will but gain limited control within specific scenes or areas. Cars are about to become autonomous robots to which we entrust our lives, which means that humans must entrust their lives to them. In this change and transfer of human-machine power, the analysis of the issue of human-machine symbiosis has certain far-sighted significance.

2.1 Compression of control

The rise of technology has the vision of making life better, but people are spending more time addicted to

the virtual world. Regarding Facebook's name change to "Meta" in 2021, Liu Cixin expressed doubts about the concept of the Metaverse, believing that people's life in the invisible world may lead to emptiness and fragmentation, and mentioned that the number of people living in the invisible world exceeds the tangible world. He also emphasized the appeal of the invisible world to people, likening it to a drug-like experience.

There is a divide between those who support technology fanaticism and those who are concerned about the human rights crisis on the question of "for whom technology is for". From this, the author raises an ethical question: Should people hand over power to non-existent objects? In traditional usage scenarios, people have control over items, but in highly intelligent and automated situations, people seem to be unable to intervene in the control of items, resulting in distortion of the power relationship between people and things. Due to the high intelligence of machines, human control over machines may be elevated and reconstructed.

2.2 Transfer of disposal rights

Looking back at the current technological boom, in the process of product design and use, people are more of a guide, and are even overly considerate and caring in the act of "designing". In addition, as individual products, or systems themselves are highly closed and interconnected, there is almost no channel for people to establish pure interaction with items . In the past, people's use, transformation, maintenance, and even dependence on traditional items were all about the balance of power maintained between people and things in coexistence and symbiosis. In addition to the harmony of the relationship, people also have the power to change the shape, characteristics, or uses of the product according to their preferences. This is a controlled disposal power based on the traditional mechanical and physical categories.

Today, this controllability is becoming illusory - Virtual things have transferred the meaning of some physical things, and the corresponding values have also been subverted to a certain extent. The smart cars of the future belong to humans, but they are abstract enough that it is difficult for people to define their cars. In the context of the sharing economy, cars have even become a service beyond human disposal.

Figure 6: 2022 graduation design of the author Shi Haoxin

2.3 Redistribution of rights of way

In smart city transportation, right of way can be mainly classified into two categories: right of way selection and rite of passage. Just like the right-of-way issue in the technologically advanced context involved in the American TV series "Westworld", smart cars can of course match the high-precision positioning service with the smart road system to obtain the best path at a certain moment, that is, time. The shortest option, but the control rights of L5-level vehicle occupants are handed over to road system managers by highly intelligent cars, and the question arises: What kind of vehicle can have the right to occupy a certain road resource? What is the occupancy rate? Everyone hopes to save unnecessary time in traffic, so what is the threshold for enjoying the dividends of efficient traffic? What are the defining criteria? When encountering an emergency, how to reasonably evaluate the traffic priority for special vehicles, what is the threshold for the number of priority vehicles on a road, and whether the matching of hardware and software can achieve the ideal traffic deployment state... These issues are worthy of our consideration and Exploration, and this is not only a practical issue in transportation, but also an ethical issue that subverts human traditional concepts of time and space.

Conclusion

Cars play the role of constructing urban space in future scenarios, first as a private space and secondly as a mobility tool. With the extensive and rapid development of emerging application technologies and smart driving-related technologies, technological iteration has promoted changes in automotive design methods and design trends and has also given rise to new crises and opportunities in the process of cross-integration with smart car design. Through cross-analysis and research on the integration trend of emerging application technologies and automobile design, the author concludes that future smart automobile design will be dominated by technology. At the same time, in the context of design reconstruction, the integration practice of emerging application technologies and automotive design on the production side has promoted the design system's pursuit of functional aesthetics, first principles, and design for the real world. Therefore, automotive design has developed modular, flat, and open design features, and a problem-oriented scenario-based design flow has been formed in the process of pursuing efficiency and experience.

References

Wang Jian, Xu Guoyan, Chen Jingkai, Feng Zongbao. (2019) Introduction to Autonomous Driving Technology, Tsinghua University Press

Hod Lipson, Melba Kurman. (2017) Driverless, Wenhui Press

Jeremy Rifkin. (2020) The Global Green New Deal, CITIC Press Group, p.53-62

Chen Fang, Jacques Terken. (2021) Human-Centered Intelligent Vehicle HMI Design (HMI), China Machine Press

Guy H. Walker, Neville A. Stanton, Paul M. Salmon. (2018) Human Factors in Automotive Engineering and Technology, China Machine Press

Jean Baudrillard. (2014) La Societede Consommation, Nanjing University Press

John Maeda. (2007) The Laws of Simplicity, China Renmin University Press

Ebenezer Howard. (2010) Garden Cities of Tomorrow, The Commercial Press

Antoine Picon. (2023) Smart Cities: A Specialised Intelligence, Huazhong University of Science & Technology Press

Victor J. Papanek. (2020) Design for the Real World, Beijing Daily Press

Wollen Peter & Joe Kerr. (2004) Autopia: Cars and Culture, Reaktion Books

Donald A. Norman. (2013) The Design of Everyday Things, Basic Books

Brendan Cormier. (2019) Cars: Accelerating the Modern World, V&A

Xu Na. (2021) Review of Artificial Intelligence Aided Vehicle Styling Design Methods, Packaging Engineering, 42(18):35-41.

Li Yong, Wu Yinlu. (2020) Trend of Influencing Factors and Feature Design of Exterior Styling for Battery Electric Vehicle, Packaging Engineering, 41(06):72-80.

Zhao Wenxuan. (2015) The Research of the Influence on Styling Caused by the Difference between Electric Cars and Traditional Cars, Jilin University, https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD201502&filename=1015595067.nh

Ouyang Bo, He Yun. (2014) New Energy Car Design Driven by Technology, Art and Users, Packaging Engineering, 35(04):44-47+52.

Wang Bo, Geng Shuochen. (2019) Research on Development Trends of Electric Vehicle Exterior Design, Chinese Journal of Automotive Engineering, 9(04):285-293.

Resilient Cities: Exploring the Transformation and Iteration of Living Spaces from the Perspective of Love and Healing

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Abstract

A resilient city refers to an urban environment capable of reducing losses caused by disasters based on self-governance while possessing the ability to swiftly recover and resume its developmental processes through effective resource allocation. In an era marked by global public health crises, the imperative of resilient growth and self-revival in cities becomes a practical escape route in the face of human survival challenges. Cities are no longer just physical spaces; they are intricate systems comprised of various smaller units, prompting us to reconsider the ecological foundations, lifestyles, production relationships, and the meaning of life upon which human existence depends.

This article, based on research and analysis of three exemplary cases: the Dutch Findhorn Ecovillage, the Chinese Dali Sufang Ark Future Space, and the Green City Chunling Taoranli, delves into the construction of a "human, nature, and society" care system within cities and the cross-domain integration of diverse industries. It explores this from three dimensions: self-care and healing communities, ecological and natural farming, and social care and intergenerational healing. Furthermore, it elucidates how, in the era of trauma, individuals can embark on visionary plans for the transformation and iteration of living spaces, all stemming from the perspectives of love and healing.

Author keywords

Healing Communities; Living Environments; Social Design

Introduction

On May 5, 2023, the World Health Organization declared that the COVID-19 pandemic no longer constituted a "Public Health Emergency of International Concern." As the world gradually transitions into a post-COVID-19 era, a new outbreak of monkeypox has emerged. Global public health has officially entered an era fraught with crises. Concurrently, three looming challenges—geopolitical events, extreme climate conditions, and economic instability—catalyze cities' resilient growth and self-revival. People are reconsidering the ecological foundations, lifestyles, production relationships, and the meaning of life upon which human existence depends.

"At the heart of human societal culture lies 'love'." This article will elucidate how, in an era characterized by trauma, individuals are embarking on a visionary plan for transforming and iteration of living spaces, starting from the perspective of love and healing.

I. Self-Care and Healing Communities

In 1914, Margaret Naumburg founded the "Walden School" in New York City, pioneering innovative artistic activities like painting and art analysis to help children express emotions, problem-solve, and foster self-growth.

It became a crucial early hub for art therapy.

In 1949, Hazelden emerged as the world's first healing community in Minnesota, USA, offering comprehensive addiction recovery, mental health support, rehabilitation, and social assistance programs. Its success inspired the establishment of numerous similar centres, shaping the modern rehabilitation and healing movement.

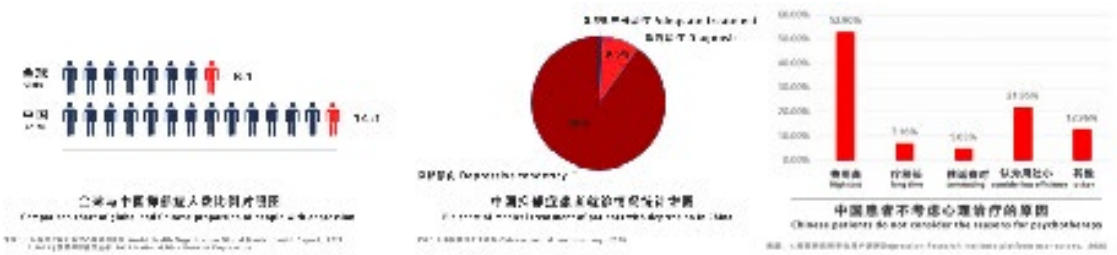

Figure 1. Current situation of Chinese society (Chart made by the author)

In both cases, we witness the continuous need for care across different stages of life, from childhood to adulthood. According to China's latest mental health survey, over 95 million individuals suffer from depression in China, with a treatment rate of less than 10%. Among them, only 0.5% receive adequate treatment. The treatment rate indirectly reflects the low societal acceptance of mental illnesses, high treatment thresholds and costs, and the underdeveloped social care system. Faced with the substantial population of urban mental sub-health individuals, the urgent need for the "deinstitutionalization" of psychiatric and psychological support is evident. Establishing a life care system based on living environments will be the optimal solution for public health issues.[ ](Figure 1)

In the annals of human history, the Dutch pioneered the earliest experiment in sustainable living in 1962 with the establishment of the ecovillage of Findhorn. This village, comprising approximately 500 residents across two districts, champions a holistic, enduring lifestyle encapsulated in the "Fourfold Meaning" concept: personal and spiritual development, social life, ecological conservation, and economic stability. There's a "utopian haven" in China. Nestled in Dali, Yunnan, the Veggie Ark Future Space connects residents through a vegetarian lifestyle, embracing eco-friendly, sustainable living principles and seamlessly integrating organic wellness into daily life. Walking through the community's corridors, one encounters diverse art workshops, meditation rooms, and individuals from various religious backgrounds who congregate here. Amidst the verdant foliage, dedicated practitioners can pursue artistic and spiritual pursuits. The community fervently encourages residents to embark on artistic journeys, including yoga, ceramics, sound bowl therapy, meditation, self-healing practices in martial arts, music therapy, and Thangka healing. This rich tapestry of healing dimensions engenders an unspoken harmony within this bustling community.We can objectively comprehend the underlying logic behind this trend using the pressure formula P = F/S, where P represents pressure, F signifies vertical force (pressure), and S denotes the area under force. (Figure 2)

Figure 2. Community life in Veggie Ark Future Space (Photo taken by the author)

The high-pressure F emanates from the resource and developmental demands of large-scale urban environments characterized by high density. Under objective conditions, the minimum spatial unit required for urban residents' living can be considered as S, the area under force. The external energy pressure exerted on residents is directly proportional to the scale of the urban environment's pressure field and inversely proportional to the minimum spatial unit required for living. In the same spatial unit, the greater the pressure, the higher the external energy pressure, and the lower the energy released within individuals under restraint. Consequently, people tend to flow towards lower-pressure living environments, allowing their bodies to regain resilience and elasticity against external energy pressures. (Figure 3)

P (External Energy Pressure) = F (Pressure of the Living Environment) / S (Minimum Spatial Unit Required for Survival)

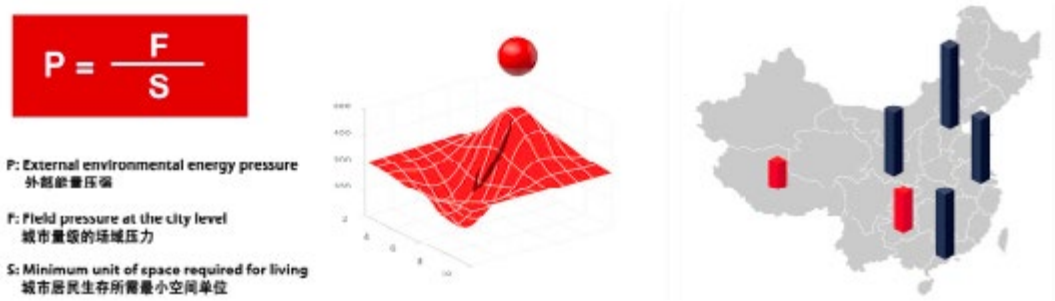

Figure 3. Urban energy difference and people flow diagram (Chart made by the author)

In light of this, we have identified two novel approaches to addressing this phenomenon. First, starting from individual self-care needs, urban planners and implementers can employ design strategies rooted in art therapy to foster community-wide healing. In the living environment, they can construct life care mechanisms that grow naturally, like plants, aiding individuals in recognizing their self-worth and finding healthier lifestyles, thus facilitating the restoration of every visitor within the community. Second, the core of an effective mass healing mechanism lies in the hierarchical differences in external energy pressure. Spatial configurations can be structured based on the distinct attributes of different industries, allowing healing spaces to radiate reasonably within high-pressure cities, catering to low-energy groups.

In summary, from virtual healing mediums to city-level wellness complexes, as public health awareness extends from the physical to the psychological realm, the efficacy of spaces on individuals transcends the practical value of physical areas. Commencing from individual care, catalyzing self-love within individuals is the foundation for significantly enhancing the collective mental health index.

II. Ecological Care and Natural Farming

Kaplan and Kaplan, in their work "The Experience of Nature" (1989), introduced the Attention Restoration Theory (ART), the core idea of which is that engaging with nature helps us mentally recover from states of depletion or cognitive overload. [ ]Ecological care provides another perspective within the framework of life care mechanisms. In urban spaces, gardening can be viewed as a smaller-scale form of forest therapy. Individuals who have the opportunity to reconnect with society, joy, and health through gardening practices and a reconnection with nature in the wilderness can restore their perception of these essential aspects of life.

Self-care and ecological care are often inseparable in a comprehensive life care system. Research indicates that

Findhorn is one of history's most resource-efficient and ecologically friendly human communities. Achievements within the community include eco-homes equipped with solar panels and other sustainable energy devices, widespread use of "Living Machines" (a form of wastewater treatment that mimics wetland self-cleaning and restoration functions), and organic food production combined with the utilization of new energy sources. Relying on wind turbines, solar water heating systems, and waste recycling programs, Findhorn Ecovillage's carbon footprint is only half the UK national average. Yet, the residents' happiness index far exceeds societal norms.[ ]
The life care system is integral to human socialization, influencing individuals' socialization through social interactions, cultural transmission, and social support. Within this system, individuals learn how to interact with society, adapt to social norms and cultural values, and develop social skills and identity. In ecological care, discussing therapeutic activities fostering a higher level of social connection and service finds a successful example in the Vegetarian Ark's organic farm.The organic farm constitutes the second major component of the Veggie Ark Future Space, spanning over 500 acres of land and cultivating speciality crops like organic Valencia oranges, coffee, moringa, wild Yunnan olives, bananas, and passion fruit using "natural farming methods. With annual fruit orchard revenues in the millions, representing only 10% of the total revenue, the Vegetarian Ark, primarily operating as an inn, leverages the organic farm and estate within its agricultural system. It complements this with a vegetarian restaurant, farm activities, food e-commerce, custom travel services, and cultural dissemination, ultimately creating a unique green life ecosystem that offers substantial returns on capital.(Figure 4)

Figure 4. The organic farm in Veggie Ark Future Space (Photo offered by Veggie Ark)

Furthermore, the farm encourages its user community to cultivate organic food themselves. Each year, the farm regularly sends customers non-genetically modified seed varieties. It provides cultivation guidance, effectively institutionalizing the unique healing mechanism of the space as a seed to be sown worldwide through people's actions, genuinely transforming the lifestyles of the masses. the Veggie Ark's organic farm serves as a significant practical space where human-nature interaction translates into life care, and it has found a win-win approach in ecological conservation and economic development.
Within ecological care, the green agricultural industry becomes a benchmark for the iterative transformation of traditional production industries. Similarly, small-scale residential environments in urban areas can foster physical, mental, and spiritual care and healing through participatory practices in green agricultural industries. Examples include shared farmsteads, community gardens, and vertical garden plots on balconies. Moreover, derivative industries such as urban home organic farming courses, agricultural-sharing markets, cultivation study programs, and enthusiast clubs can develop, thereby igniting the vitality of traditional industries shifting towards the ecology care industry.

III. Social Care and Intergenerational Care

Since the late 20th century, the number and proportion of elderly populations have continued to rise. According

to data from the National Bureau of Statistics, as of the end of 2022, China had 280 million people aged 60 and above, accounting for 19.8% of the total population. Moreover, people aged 65 and above reached 210 million, constituting 14.9% of the population. According to estimates from the National Health Commission, by around 2035, the population of those aged 60 and above is expected to exceed 400 million, comprising over 30% of the total population, signifying a profound shift towards a heavily aged society in China.(Figure 5)

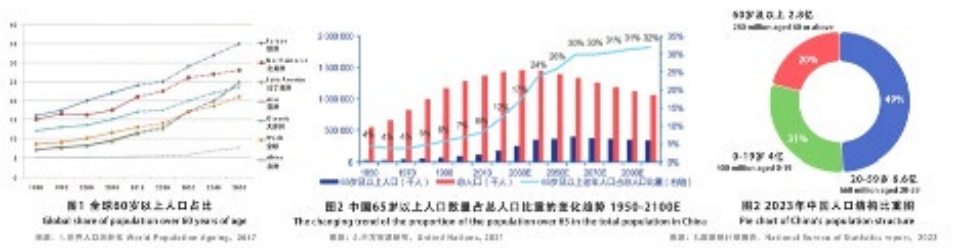

Figure 5. World and Chinese population ageing (Chart from the Internet and the author)

Social care, as a component of life care, draws from the social support theory. It refers to maintaining one's identity and acquiring emotional, service, and informational support through the network of relationships constructed among individuals in society. In an ageing society, the attention given to older people diminishes with increasing age and generational levels. Therefore, assigning new social functions to older people can enhance social care for this ageing demographic more effectively.

Located in Hangzhou, the Green Town Chunjing Taoranli project has iterated the traditional model of elderly care clusters with a system that combines "city-based care for the elderly, intergenerational communities, and medical and elderly care integration." Kindergarten children become the youngest caregivers in the community as they enter the elderly care centre. In contrast, active elderly individuals enter the kindergarten to become shared caregivers, assisting working parents in caring for their children. Additionally, the community offers loft-style housing units for independent living, encouraging elderly individuals to rent the upper floors to young college students promoting a sense of social responsibility for mutual assistance between generations.

Whether CCRCs (Continuing Care Retirement Communities) or CCKCs (Continuing Care Intergenerational Communities), these two cutting-edge care models focus on empowering vulnerable groups to be self-reliant and proactive. The Taoranli community provides an urban gardening platform that differs from typical community flowerbeds or green spaces. They offer "elevated vegetable gardens" that don't require bending over, catering to the preferences of elderly urban dwellers. Furthermore, the sales process uses a "referral system," addressing the social needs of the elderly and striving to create a highly collaborative care community. Sustainable social care in resilient cities helps residents achieve autonomy and self-sufficiency rather than merely meeting their needs through service-based industries.(Figure 6)

Figure 6. various community life in Tauranli (Photo offered by Taoranli and the author)

Highly autonomous communities are essential units in the cities of the future. In the town of Fenhorn, regardless of age or identity, every resident is obligated to participate in the maintenance and operation of the community. The continuous transformation of the fruits of their labour creates a virtuous cycle of social care. The high level of autonomy is closely related to the comprehensive literacy of the residents. Traditional communities should utilize the internet to break down information and platform barriers, reducing the lag in the impact of new technology industries on living spaces. Initiatives should start from the needs of people, actively establishing a linkage between "industry, community, and individual." Physical architectural spaces can only fulfil functional requirements; participatory design is what breathes life into living spaces. Today's urban public management is moving towards a more people-centric direction, with management teams of living spaces shifting their focus from individual services to community building. They help more residents in need find their role and value, experiencing love, understanding love, and creating love while being self-reliant.(Figure 7)

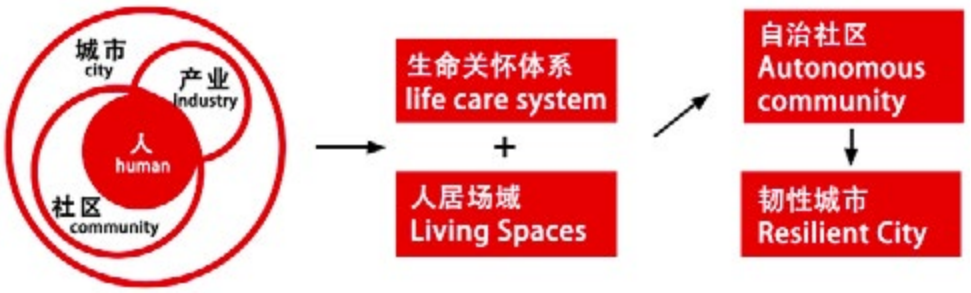

Figure 7. How to build autonomous communities and resilient cities (Chart made by the author)

IV. Conclusion:

The future development of resilient cities is no longer confined solely to the traditional renovation and improvement of physical architectural spaces. Instead, it increasingly focuses on constructing a more human-centric social ecosystem. At the core of this social ecosystem lies intelligent management based on artificial intelligence algorithms and the cross-domain integration of diverse industries. The aim is to enhance the quality of life for urban residents and meet their ever-evolving needs.

As an author, I am currently working to facilitate self-care among urban residents through forest therapy and expressive therapy. In the future, my efforts will be dedicated to researching the co-creation of an art therapy system and urban development. Public health issues will continue to deepen in significance alongside the evolution of societal consciousness. An awareness of social design centred around love and healing will lead us towards a brighter future.

References

Shen, S. (2022). Art and Therapy in Action: Participatory Practice and urban regeneration. Shanghai Culture (12),20-25.

Rachel Kaplan, Stephen Kaplan - The Experience of Nature_ A Psychological Perspective-Cambridge University Press (1989)

Copeland Claire,MacKerron Gordon & Foxon Timothy J..(2023).Futures for Findhorn: Exploring challenges for achieving net zero in an ecological intentional community. Futures. doi:10.1016/J.FUTURES.2023.103155.

Guo Rongli & Wang Haoyan.(2023).A Study of Community-based Elderly Care Services for Older People from a Social Support Perspective. Academic Journal of Humanities & Social Sciences(11). doi:10.25236/

AJHSS.2023.061104.

Empowering Sustainable Fashion Consumption: NurtureDenim Campaign for Generation Z Consumers Combines Digital Technology and Trend-Centric Element

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Abstract

Every second, large quantities of textiles are being disposed of in landfills or incinerated worldwide, necessitating changes within the fashion industry and the development of innovative business models. This study aims to examine the significance of consumer behavior patterns and consumption concepts in driving the implementation of sustainable fashion. Focusing on denim as the subject of investigation, a foresight plan called the "NurtureDenim Campaign" is proposed from a consumer-centric standpoint. This campaign seeks to engage young consumers and cultivate their positive perception of sustainable consumption patterns through the establishment of an online platform comprising the Low-carbon Selling Area, Remake Recycling Area, Interact Zone, and Cattle Farm. Furthermore, this paper employs a questionnaire-based empirical analysis, which demonstrates that the program effectively encourages Generation Z consumers to adopt sustainable fashion consumption behaviors. By bridging the gap between current "sustainable fashion" business models that primarily emphasize manufacturing while neglecting the consumer aspect, this study aims to provide valuable insights for both sustainable fashion practice and research.

Author keywords

Sustainable fashion; sustainable business models; circular fashion; upcycling design.

Introduction

5 million tonnes of clothing discarded each year in the European Union(EU), however, 1% of material in clothing is recycled into new clothing(EU, 2022). EU consumption of textiles has, on average, the fourth highest impact on the environment and climate change, after food, housing and mobility. It is also the third highest area of consumption for water and land use, and fifth highest for the use of primary raw materials and greenhouse gas emissions(EU,2022).The global fashion industry, driven by the 'fast fashion' business model has contributed to an increased volume of products with shorter life cycles(Stella Claxton & Anthony Kent,2020).However, when the next fashion trend comes along, these garments face the fate of landfill or incineration.

The Ellen MacArthur Foundation released its first report, Towards a Circular Economy: The Economic and Business Case for Accelerating Transformation, in 2012. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, re-manufacture, recycling, and composting(Ellen MacArthur, 2020). Since the concept of circular economy was introduced, circular economy models with different focuses have been proposed. It is clear that in the face of rapid climate change and

environmental issues, the fashion industry is in dire need of more contemporary, low-carbon, consumer-accepted foresight plans. And this study focuses on the creative business model of sustainable fashion with denim as the main focus.

Why denim ?

inception in 1853, denim has always served as a non-verbal medium to explain various concepts and lifestyles in different contexts. Initially, denim was used as a workwear for miners and cowboys because of its durability and longevity; then it spread to the subculture of Western clothing as a symbol of freedom and rebellion; and later on, it became popular as a fashion item for all ages, classes and social identities due to the iconography of glamorous denim-clad movie and TV heroes and artists(C. Regan, 2015) . Nowadays, can denim play its role as a symbol of sustainable fashion?

Anyone who has seen the documentary The Cost of Denim(Der Preis der Blue-Jeans, 2012) will associate denim with unfair social labor and water pollution. Analyzed objectively, denim possesses characteristics such as wear-resistance and low maintenance, making it a material that can be worn for extended periods. Additionally, denim records the wearer's daily habits through its naturally formed "creases," "fading marks," and "holes," allowing denim garments to act as a means of self-expression. Furthermore, denim provides a solid foundation for innovative remake designs, including patchwork, tie-dye, and graffiti. From an industrial perspective, denim stands out as a single category with a vast audience, high production volume, and simple fiber composition, making it a powerful focal point for driving sustainable development in the textile and garment industry.

The initiative known as The Jeans Redesign(The Jeans Redesign Insights report, 2021-2023), introduced by the Ellen MacArthur Foundation, aims to establish a paradigm of circular economy jeans. This endeavor entails specific requisites such as enhanced utilization, remanufacturing capacity, and the incorporation of safe, recycled, or renewable materials. Correspondingly, MUD jeans, a Danish denim enterprise, has formulated a comprehensive ten-step course of action harmonized with the principles of circular economy(De Nardo & Enrica,2021). These encompass strategies pertaining to toxic-free production, transparent procedures, seasonless designs, and others. Both The Jeans Redesign and MUD jeans exemplify a shared emphasis on augmenting the manufacturing and product design processes to optimize denim recyclability and minimize carbon footprints. While it is also crucial to recognize that effectuating sustainable consumption necessitates a fundamental shift in consumer behavior and attitudes. However, challenges persist within the purview of The Jeans Redesign and MUD jeans initiatives, chiefly owing to limited consumer engagement and cognitive capacities.

Raw denim enthusiasts constitute the initial cohort of individuals who willingly engage in prolonged wear of denim garments for at least three to five years, despite the absence of a sustainability-driven motive. Among denim enthusiasts, there is a kind of belief that raw denim has to be "tortured" to get perfect fades(Rahmandani, F. & Sari, R. P. , 2020). Through the fade "break in" process, raw denim users create the best fades they can think of as a form of struggle and their personal unique story with raw denim. Inspired by the above case, NurtureDenim Campaign represents a groundbreaking business model that leverages the century-old heritage of denim apparel culture, whose primary objective is to utilize digital technologies and incorporate trends, entertainment, and personalization concepts to attract a larger cohort of Generation Z consumers into the community of long-term denim wearers.

NurtureDenim Campaign

NurtureDenim Campaign is implemented through a WeChat mini-program (A WeChat mini program is a lightweight application that can be accessed and used within the WeChat app itself), with the aim of promoting low-carbon fashion and targeting Generation Z consumers. To prioritize platform functionalities, the campaign incorporates the Kano model to classify consumer demands and assign priority levels. Based on the results obtained from applying the Kano model, the NurtureDenim Campaign consists of four sections: Low-Carbon Selling Area, Remake Recycling Area, Interact Zone, and Cattle Farm.

Low-Carbon Selling Area

Low-Carbon Selling Area is a platform that sells low-carbon denim clothing, addressing the challenge of limited availability on other e-commerce platforms. It connects sustainable manufacturers with consumers seeking eco-friendly products, ensuring reliability through certifications, sustainable labeling, and transparent production. Notably, all products have electronic labels for traceability.

Remake Recycling Area

Remake Cycling Area operates within the Customer to Manufacturing (C2M) model, whereby remake customization involves designing and manufacturing based on the user's original garment and delivering it back to the user(Fig 1). As such, remake customization does not necessitate measuring and pattern making processes, but instead focuses on creating new designs using the existing garment.

Figure 1. NurtureDenim campaign cycle flow.

Previous research has identified several reasons why consumers discontinue the use of denim clothing, including 24.63% citing damage or stains affecting normal wear, 50.32% finding the clothing pattern loose or ill-fitting, and 25.05% expressing dislike for outdated styles. Addressing these concerns is assumed to significantly prolong the usage cycle of denim clothing. Past experiences with denim remake, whether undertaken by consumers themselves or through offline stores, have often been accompanied by inconveniences such as unsatisfactory results, complex procedures, long distances, and the need for repeated communication. In response to these pain points, Remake Cycling Area has developed a modular customization system to streamline the consumer remake process(Fig 2). Following the remake, 68.15% of consumers reported decreased urgency to purchase new clothing since their existing garments were being reused. Moreover, wearing remake clothing elicited positive perceptions among consumers regarding the prolonged use of denim clothing, including unique clothing personality, cost-effectiveness, enjoyment derived from the behavior, and the ability to share experiences with friends(Fig 3). These findings suggest that incorporating elements such as personalized customization, enjoyment, and trendiness can effectively enhance the appeal to Generation Z consumers.

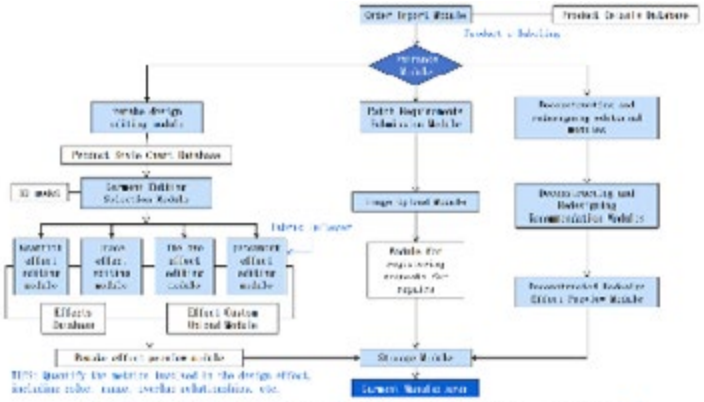


Figure 2. Remake customization system workflow framework diagram.

Interact Zone

Interact Zone serves as a platform for consumers to engage in mutual communication and interaction. Under the NurtureDenim Campaign, individuals employ denim apparel as a medium to narrate their personal preferences

and share interesting anecdotes related to wearing denim garments. Moreover, the Interact Zone actively promotes low-carbon lifestyles and introduces sustainable manufacturing processes, thereby instilling sustainable awareness among consumers and alleviating concerns regarding the reliability of the products.

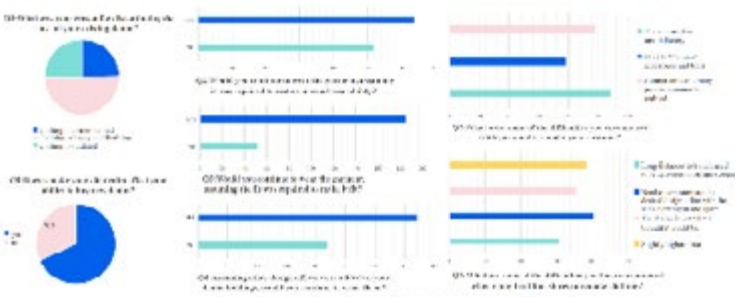
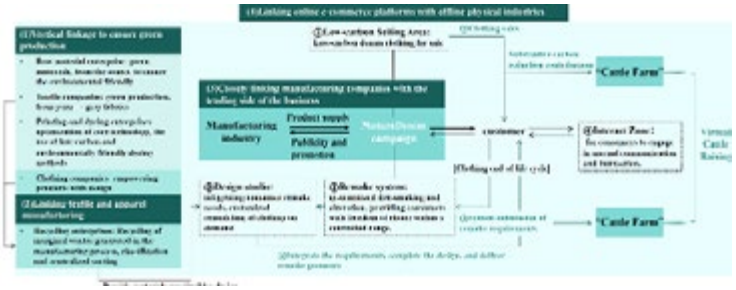


Figure 3. Questionnaire survey results

Cattle Farm

Cattle Farm metaphorically represents the prolonged use of denim garments, mirroring the practice of rearing cattle. The Cattle Farm quantifies the substantial carbon reduction contributions made by users in the NurtureDenim Campaign, including the purchase of low-carbon denim clothing and the recycling of old denim clothing, into feed for the growth of calves. As a result, users can receive positive feedback through the gamified experience of raising calves. Simultaneously, by enabling users to perceptibly apprehend the implications of their own carbon footprints, this experience prompts introspection and critical examination regarding their personal lifestyles.



According to Eunsuk Hur (2019), the implementation of sustainable consumption faces challenges at three levels: individual, social, and cultural. The NurtureDenim campaign addresses these challenges by offering remake design services that cater to the hedonistic desires of individual consumers, providing an Interact Zone for communication and interaction to foster a sense of belonging within social circles and alleviate peer pressure on the social level, and initiating a low-carbon fashion trend among Generation Z consumers, associating long-term denim wear with trendiness to resist the allure of fashion marketing strategies on the cultural level.

Conclusion

This paper has elucidated the NurtureDenim sustainable fashion project in the context of denim apparel. Through the integration of digital intelligence, this project effectively fosters a semantic shift in contemporary denim culture, catering to the demands of young consumers and attracting a wider audience to engage with and explore these innovative initiatives. Moreover, with its implementation strategy emphasizing a seamless transition and practicality, NurtureDenim serves as a valuable conduit between the prevailing era of "fast fashion" and the impending transition towards a more ecologically conscious paradigm of "eco-friendly fashion".

NurtureDenim Campaign has established an internal test version platform and successfully collected over 1500 questionnaires. Drawing from the consumer perspective, this study conducts empirical research to confirm that interventions such as personalization, product electronic labeling, and gamification can effectively enhance Generation Z consumers' attention and stimulate their engagement in sustainable fashion consumption practices. The findings of this study provide valuable insights for the development of sustainable fashion strategies and low-carbon marketing initiatives.

References

Stella Claxton, & Anthony Kent. (2020). The management of sustainable fashion design strategies: An analysis of the designer's role. Journal of Cleaner Production, 268, 122112.

C. Regan. (2015). Role of denim and jeans in the fashion industry. In Woodhead Publishing Series in Textiles, Denim, Woodhead Publishing. Pages 191-217.

Rahmandani, F., & Sari, R. P. (2020). Raw Denim as a Means of Communication: Self Expression and Identity. Asian Journal of Media and Communication, 4(2).

De Nardo, Enrica. (A.A. 2021/2022) Circular business models in the denim industry: the case of MUD Jeans. Roman: Luiss Guido Carli, Organizational design.

Eunsuk Hur & Tom Cassidy. (2019). Perceptions and attitudes towards sustainable fashion design: challenges and opportunities for implementing sustainability in fashion. International Journal of Fashion Design, Technology and Education, 12:2, 208-217, DOI: 10.1080/17543266.2019.1572789

R. Aus, H. Moora, M. Vihma, R. Unt, M. Kiisa, S. Kapur. (2021). Designing for circular fashion: integrating upcycling into conventional garment manufacturing processes. Fashion Textiles, 8.

Ellen MacArthur Foundation. (2021a). CIRCULAR BUSINESS MODELS -Redefining growth for a thriving fashion industry.

Ellen MacArthur Foundation. (2021b). THE JEANS REDESIGN -Insights from the first two years.

European Commission. (2022). EU Strategy for Sustainable and Circular Textiles. https://ec. europa. eu/eurostat.

Engaging with the Other: Participatory Curatorial Models, Weaving Perception, Action, and Relation to Confront Digital Biopolitics through Embodiment Performativity

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Abstract

This study responds to the survival challenges posed to all life in the era of artificial intelligence technological transformations. Examining the impacts of Intelligent Artificials and Artificial Intelligence, we explore the construction of a symbiotic model based on the "NARRATIVES OF LOVE ——TOWARDS HEALING, TRANSFORMATION AND TRANSCENDENCE," delving into the opposing facets of love – loneliness and fear. Drawing from profound experiences in the life situations of East Asian women and the existential patterns entailed by becoming hostages to the AI era, the research confronts the intensifying individual competition driven by a new wave of technological revolution, potentially leading all life to the plight of being forsaken.

The study questions whether design and curation, utilizing AI technology and participatory curation models, can interconnect evasive and isolated individuals. The aim is to counteract digital biopolitics, touching the Other and conspiring for coexistence, rather than employing technology to oppress and expel collective life. The emergence of technology prompts a reevaluation of the essential differences between humans and machines, urging a shift towards an embodied perspective to reconstruct the Turing test for humans. To Confront Digital Biopolitics through embodiment performativity, the study seeks to construct a participatory curatorial model spanning from perception and action to connection.

Author keywords

Participatory curatorial models; Digital biopolitics; Perception; Action; Relation.

Introduction

This study aims to address a range of challenges faced by the contemporary curatorial field, including issues of exhibition inactivity, diminished real-world responses, collective public absence, audience homogenization, and a lack of dialogue with society. These challenges are largely influenced by the atomization of social experiences, leading to feelings of loneliness and fear, culminating in societal fragmentation. The primary theoretical foundation draws from the philosophical aesthetics debate on participatory art highlighted by the American scholar Claire Bishop. This study aligns with the "antagonism" pathway in the Social Turn (Bishop, 2006) of participatory and socially engaged art, supported by the "aesthetics of dissensus" proposed by the French philosopher Jacques Rancière. In the context of biopolitics, all life gradually finds itself in the precarious existence outlined by Judith Butler based on Agamben's notion of "Bare life."

Facing the new wave of automation technology, particularly artificial intelligence, propelling humanity into an intensified individual competition within a marathon-like process of modernization, all life faces the prospect of

becoming forsaken. This entails collective unemployment, societal exclusion, and a soft expulsion into invisibility, even to the extent of societal death, as a consequence of dehumanization techniques employed by mainstream society. Beyond becoming forsaken and excluded from mainstream discourse and socio-economic structures, individuals are left with self-exploitation and emotional exploitation, prompting exploration into alternative possibilities. The study questions whether design and curation, utilizing artificial intelligence and participatory curation models, can interconnect evasive and isolated individuals, counteracting the societal differentiation under the lens of digital-biopolitical perspectives. This inquiry seeks to engage with the Other and collaborate for coexistence, challenging the narrative of technology-driven oppression and expulsion of collective life.

Key Contributions:

- The study shifts from the conventional emphasis on knowledge and information production in curatorial models to a progressive perspective encompassing perception, action, and connection.
- In the field of relational aesthetics, the study utilizes an embodied perspective to confront digital identity politics, thoroughly analyzing the power dynamics, identities, and political movements within social groups.
- The study contributes to the exploration of ways in which perception, action, and connection can counteract social loneliness and group fragmentation, constructing a participatory curatorial model based on embodied cognition to address identity and life politics.
- The research offers a supplementary response to the emphasis on knowledge production and value judgments in academic curatorial models, promoting innovation and transformation in curatorial practices to meet contemporary societal needs.

The "Participatory Curatorial Model" targets the masses potentially trapped in the survival predicament of forsaken existence, subjected to the biopolitical control of life and reduced to behavioral patterns within the data matrix landscape. The essence of the "Participatory Curatorial Model" lies in participation and connection. It serves as a sensory mobilization organizational model, addressing the core appeal of inner connection and extending outward as a motivation for societal cohesion.

The design of the "Participatory Curatorial Model" is rooted in generative curatorial models, utilizing general artificial intelligence applications such as AIGC. It is based on the performativity of embodiment, encompassing a participatory curatorial model transitioning from perception and action to connection.

Through "Participatory Curation," the author attempts to design participation patterns from levels of "perception-conscious subject" to "action-negotiation and resistance-conscious subject" and further to "connection-generating new subject." These participatory levels progress and mutually reinforce the individual socialization process, encouraging individuals to transition from perceiving and understanding emotionally and sensorially to taking action and forming connections. In a world still marked by isolation, division, fracture, and alienation, it is the awareness of the vulnerable and fragile nature of bare life and human flesh that compels us to assume ethical responsibilities toward others. Seeing the face of the Other, engaging with the Other, and seeking yet-to-be-healed boundaries.

The specific methodological model includes, in addition to conventional multisensory and multimodal integrated participation, various aspects such as atmospheric design in the field, generating events to construct situations, sensory substitution based on the principles of brain plasticity, and expanding the realm of perception through biotechnology to coexist with the natural biological system. The study also explores how to create societal ripples from re-enacting scenes to eliciting social dynamics.

The author is dedicated to researching participatory curatorial models constituted by perceptual interaction,

action patterns, and connection modes. The aim is to reconstruct the meeting status, dialogue relationships, and collective memories when audiences encounter creative and curatorial practices in various social metaphorical contexts.

Engaging with the Other: A Practical Study of Participatory Curatorial Models in the Context of Biopolitics, Illustrated by the Virtual Exhibition "Sanctuary"

In the preceding sections, we introduced a multi-tiered participatory curatorial model designed to address challenges posed by social atomization and power dynamics and identity politics among groups. Now, we apply this model to an actual curatorial practice case study - the virtual exhibition titled "Sanctuary." Through this case study, we illustrate how to construct a participatory curatorial model, combating digital-biopolitics through embodied performativity, progressing from perception to action and connection.

Figure 1. Wang, Y., 'Sanctuary' Virtual Exhibition Concept, May 2023. Image generated by AIGC.

The final project for the virtual exhibition "Sanctuary" presents visualizations of the anticipated exhibition effects. The exhibition is divided into zones - "Ruin," "Matrix," and "Respite." Various media such as crowds, lighting, imagery, interactive installations, immersive landscapes, and behavioral patterns and performance modes, interventions, and events are utilized to create scenarios. The curatorial theme revolves around tears as the smallest unit of shelter self-constructed by the human body. Tears, being a universal language and connection method, are explored as a behavior of seeing the faces of others in empathy. Tears weave through our lives - from crying at birth to pivotal moments, joyous weddings, and mournful funerals. The curation traces these clues, from atmospheric design to generating events that construct scenarios.

Figure 2. Wang, Y., 'Sanctuary' Virtual Exhibition Concept, May 2023. Image generated by AIGC.

The "Sanctuary" exhibition attempts to construct a shelter through the ritual of "tearing." Crying and shedding tears are presented as a collective ritual for individuals to return to calmness, bridging interpersonal relationships

Figure3. Wang, Y., 'Sanctuary' Virtual Exhibition Concept, May 2023. Image generated by AIGC.

Figure 4. Wang, Y., 'Sanctuary' Virtual Exhibition Concept, May 2023. Image generated by AIGC.

Figure 5. Wang, Y., 'Sanctuary' Virtual Exhibition Concept, May 2023. Image generated by AIGC.

through tears, advocating from self-care to collective care, and ultimately to mutual dependence. Tears signify vulnerability and form an essential component in establishing connections among humans. Through multi-layered and deeply logical participatory embodied practices generated by embodied performativity, the study aims to acquire the intrinsic connections and interdependence in the survival state within the social context.

Figure 6. Wang, Y., 'Sanctuary' Virtual Exhibition Concept, May 2023. Image generated by AIGC.

In this work, performers, who are everyday essential workers such as delivery personnel, security guards, and janitors, take center stage. These workers, like the air we breathe, become nearly invisible laborers when donning their work uniforms. In daily life, we tend to filter out their faces, obscured by the societal roles represented by their uniforms - a form of segregation and expulsion, a form of societal loss of language. Following Levinas's logic, faces enable discourse and possibility. When we ignore their faces, we may be denying their social survival space. The study invites these workers, concealed by uniforms, to leave their familiar living spaces, enter public institutions such as museums and art galleries, spaces rich in tools reinforcing hierarchy, and encounter the conventional audience represented by the middle class. The endeavor aims to reclaim public institutions like museums and art galleries, which construct cultural identities and consolidate societal consensus, for all living individuals. It not only physically places the socially unseen Other in institutional spaces but also elevates their value on par with exhibits.

In the "Sanctuary" exhibition, the challenge is to make their faces visible, their voices heard, transitioning from a state of social silence to vocal expression and resonating with others. Performers, after removing their work uniforms and donning their regular attire, blend into the crowd. Both performers and participants remain unaware of each other's identities, connected by strings tied around their necks. Every individual has an equal right to vocalize through the strings' vibrations, creating a resonating echo when one speaks. Simultaneously, when an individual walks, moves, or crouches, it causes tension in the strings, creating discomfort, breathing impediments, and tearing sensations for other individuals. Collective action and collaboration require responsibility for the actions of others, a metaphor for our interdependent lifestyle.

Distinct from relational aesthetics, which tends to lean towards a post-colonial perspective, often centered around Euro-American institutional centrism, participatory curation, through embodied performativity, can be seen as an intervention against digital-biopolitics. It not only encourages independent thought and action among the audience but also endeavors to create temporary action communities, jointly exploring ways of coexistence. This can be viewed as a critique of the mass state, as it seeks audience autonomy and collective action, rather than passively accepting influences from elites or mobs. This model helps balance power relations among different groups in society, promoting the diversity and equilibrium of social order. In the face of challenges such as social division, political polarization, and information overload, participatory curatorial models using embodied performativity explore the metaphorical relationships between art, design, society, and politics. By embedding the masses in the framework of biopolitics and identity politics through participatory curation models, it awakens the sensory and bodily involvement of the audience, prompting them to transition from passivity to active participation, from individual actions to collective engagement.

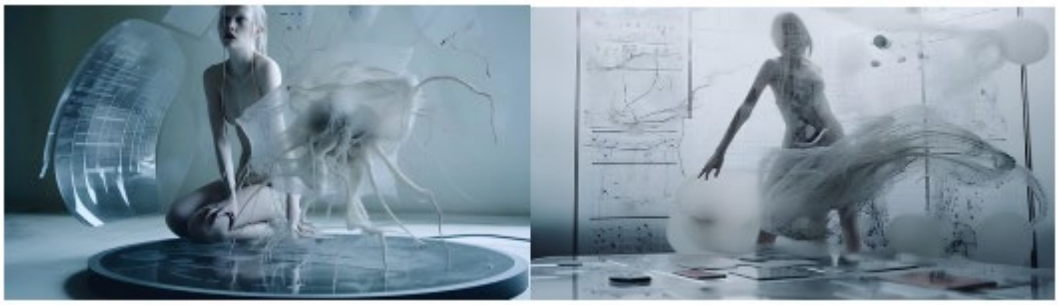

Figure 7. Wang, Y., 'Sanctuary' Virtual Exhibition Concept, May 2023. Image generated by AIGC.

In the face of prevalent biases towards crying, tears have departed from everyday contexts and the implicit signals of empathy. They are obscured by gender biases, stereotypes, and structural deviations. Simultaneously, this departure aligns with the numbing survival state within the landscape of society, becoming a residual numb existence. Perhaps in the not-so-distant future, we might entirely lose the instinct to produce emotional tears, the instinct of empathy, and the courage to establish trust and connections with others.

Within the framework of the "Sanctuary" exhibition, the author envisions a future where crying and shedding tears become a scarce resource. To pursue the instinct of tears and the emotions and human nature it encapsulates, the narrative introduces a concept of cyborg enthusiasts and techno-determinists who believe in genetically modifying the body. This group gathers scientists, engineers, synthetic biologists, and other experts in the field of life sciences. They clone and genetically edit women who still possess the ability to shed emotional tears and keep them as precious research specimens in the Tears History Museum.

Through the collection of their tears, the scientists analyze the chemical composition and quality of emotional tears, continuously synthesizing biological genes for bio-iterations. These tears are then mass-produced for the market, where consumers hope to regain the ability to cry and metaphorically reconnect with their humanity. The synthetic tears produced carry the collective vulnerability of techno-determinists and the desire for technological advancements. The cloned female bodies, treated as farms, parallel the societal position of the weak, represented by women, in a capitalistic society that values strength. It echoes the plight of delivery workers trapped in algorithmic systems, using their physical bodies to fill the gaps in those systems.

The project intervenes from a perspective of technological ethics, aiming to rethink how we perceive the Other and establish connections with the surrounding world. The use of a technological ethics lens prompts reflection on the societal positioning of cloned individuals and the ethical implications of exploiting their tears as a commodity. This narrative challenges the boundaries of ethical considerations in a future where technological advancements may redefine the very essence of human experience.

Conclusion

In summary, the integration of digital-biopolitics, relational aesthetics, bare life, and participatory curatorial models provides a new perspective for understanding social relationships and political dynamics. Through the revival of sensory mobilization, bodily participation, and collective memory, the model guides the audience from individual actions to collective engagement, building shared experiences, eradicating group differentiation, and dispelling the loneliness and fear dispersed among the masses. The core concept of this model is the "interpretation of love," filling the void in social connections through perception, action, and connection - "Towards Healing, Transformation, and Transcendence."

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References

Bishop, C. (2012). Artificial Hells: Participatory Art and the Politics of Spectatorship. Verso.

Bourriaud, N. (2002). Relational Aesthetics (S. Pleasance & F. Woods, Trans.). Les Presses du Reel.

Bourriaud, N. (2009). Altermodern. Tate Publishing.

Kester, G. H. (2011). The One and The Many: Contemporary Collaborative Art in a Global Context. Duke University Press.

Ihde, D. (1990). Technology and Life World: From Garden to Earth. Indiana University Press.

McDonough, T. (2004). The Meaning of Decay in Art. In Guy Debord and the Situationist International: Texts and Documents (pp. [page numbers]). The MIT Press.

Merleau-Ponty, M. (2002). Phenomenology of Perception (Jiang Zhihui, Trans.). Beijing: The Commercial Press.

Butler, J., He, L., & Zhao, Y. (2013). Vulnerable Lives: The Power of Mourning and Violence (He Lei, Trans.). Zhengzhou: Henan University Press.

Butler, J. (2016). Frames of War (He Lei, Trans.). Zhengzhou: Henan University Press.

Bishop, C. (2006). The social turn: collaboration and its discontents. ArtForum, 178-183, 181, 183.

Bishop, C. (2004). Antagonism and Relational Aesthetics. October, 110, 51-79, 67, 73.

Downey, A. (2007). Towards a Politics of (Relational) Aesthetics. Third Text, 21(3), 267-275.

Francis, M. A. (2014). The Dark Side of Art's Social Turn: Towards a Discourse on the Impact of Art's Use of Social Forms Upon the Social. Journal for Cultural Research, 18(1), 25-43.

Schubert, L., & Gray, M. (2015). The Death of Emancipatory Social Work as Art and Birth of Socially Engaged Art Practice. British Journal of Social Work, March 26, 1349-1356.

Research on the application of ceramic figures formed by clay tablets in ceramic art

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Abstract

Clay tablet molding is a kind of molding technique widely used in contemporary ceramic art. It combines many kinds of expression forms of eastern and western ceramic art creation. The clay figurine is an art form of creating figure sculpture with clay figurine technique, in which the clay figurine is utilized and brought into play by the clay character and Clay language, at the same time, it shows the aesthetic value in accordance with the Chinese traditional culture, and its artistic effect is unique in many ceramic art forms, and has received a lot of attention and love. The creation technique of clay tablets and the meaning expressed in the works are similar to those of Chinese freehand brushwork, it emphasizes the aesthetic characteristics of drawing form by God, forming images with each other, coloring according to the category, using the Law from the nature, and pursuing the meaning beyond the image, the aim of this paper is to discuss the applied value of clay figure in ceramic art from my own feeling in the process of creation. Law from the nature

Key words: clay tablet molding; figure; ceramic art

Author keywords

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Background

Ceramic art creation, as a creative form of artistic expression, requires the creator not only to have a more acute and profound feeling of ceramic art, but also to have a more novel and unique artistic concept, and more creative forms. The formation of ceramic art works has many different forms of expression, and the open comprehensive thinking is also an important factor to achieve an excellent work. As one of the molding methods of ceramics, clay sheet molding has different application scenes and performance characteristics in different periods. With the development of Chinese traditional ceramic art, the use of clay is becoming more and more skillful. The clay tablet molding technique developed from serving the practical application of the original pottery to mastering the clay tablet skillfully, and formed the red-tape decoration style in the later stage. At present, with the influence of modern art concept, artists begin to return to the characteristics of the material itself, through the traditional ceramic molding method of clay molding to explore, giving clay art a new look, the unique aesthetic language has been discovered. The clay tablet molding also transforms from a simple ceramic molding technique into a

modern ceramic art creation method.

The clay chip molding technique

ceramic is a man-made object with a long history, it has been accompanied by the progress of human civilization. The techniques and means of ceramic forming are very clear and systematic in the different stages of ceramic history.There are various methods of ceramic molding, there are: wheel method (Fig. 1) , Coil method (Fig.2) , Clay tablet method (Fig. 3) , kneading method (Fig.4) , mold molding method (Fig.5) , 3D printing molding (Fig.6) and so on. Different ceramic molding techniques have different applicable scenes, serving the production of different ceramic works.

Fig.1 Wheel method

Fig.2 Coil method

Fig.3 Clay tablet method

Fig.4 kneading method

Fig.5 mold molding method

Fig.6 3D printing molding

As one of the important ceramic molding techniques, sliver molding method can be traced back to the Neolithic age. The clay tablet molding method originated from the actual needs of the ancestors. From the unearthed artifacts, most of them are living pottery. Although the extant archaeological documents and evidence can not restore the original pottery scenes at that time, and there are differences on the original appearance of the prehistoric pottery scenes, however, the unearthed pottery pieces still give us a reference on the origin time of clay tablets molding technology. In addition to its use on earthenware, the clay can also be seen in large sculptures such as the armour of the terracotta warriors (Figure 7) . In the song and Yuan dynasties, the application of clay tablet forming technology in ceramic sculpture became mature, and some works appeared, such as sitting statue of Kuanyin (Figure 8) , statue of Kuanyin, etc. . It can be seen that in the development of ceramic technology, the clay forming techniques developed from simple collage and bending on utensils to skillfully using, imitating and gradually forming a cumbersome decorative style in the later stage, after the low-level to high-level, rough to fine transformation process.

Fig. 7 terracotta warriors

Fig.8 Sitting statue of Goddess of mercy

Figure Clay tablet molding technique in ceramic art form

In the clay sheet molding technique, the clay sheet curl molding method is relatively more flexible and free, and also easy to combine with other molding techniques. In the space sense and modern sense of ceramic art works, clay sheet curl has its unique language charm. The clay sheet curl molding has a relatively independent artistic expression in the clay sheet molding. The manufacturing technology of clay sheet curl molding is different from other ceramic molding methods. The roll-up of the slime needs to start from the kneading and processing of the whole slime, first of all, in the process of mixing and processing the slime, according to the degree of softness and hardness of the slime itself, carry on a moderate processing to the dry humidity of the mud material. Secondly, in the process of slime forming, there are certain requirements for the softness and viscosity of the slime, which need to reach certain standards in the treatment of the slime. Then, in the process of clay sheet curl molding, it is necessary to use cutting, curl, paste and other performance techniques to shape the body for decorative

treatment. Especially in the production of relatively complex characters, the first need for the creator to figure structure, perspective of the three-dimensional space have a certain understanding, but also need to figure facial expression effect decoration, even with the help of make-up clay or glaze to be auxiliary treatment, in order to highlight the physical characteristics of the work as well as its own material advantages, make the work more vivid and natural.

Clay figure creation show

The"Soul" of ceramic works comes from the heart of the ceramic artist. The language of clay is rich and colorful, and every potter can experience the nature of clay in different ways. The ceramic art works made by the method of clay sheet molding, although there is no other material sculpture works have strict modeling, but its feeling is very flexible, smooth and vivid. A good set of ceramic works, not only to give the public in the visual can trigger emotional resonance, but also to make it with the current culture to maintain resonance, this is my original intention to do ceramic.

Conclusion

To sum up, the creation phenomenon of ceramic figure sculpture by clay piece shows two kinds of aesthetic interest: freehand expression and concrete expression. Freehand expression tends to play clay abstract and flexible modeling ability, release the personality of clay and retain the natural texture of clay, the image space of"Likeness and unlikeness" and the ideological spirit of"The unity of heaven and man" are pursued in the creation, while the concrete expression tends to realize the balance between technique and clay, and has a strong purpose in the use of clay tablets for modeling, it presents a more rational and professional beauty of realistic meaning, and has the artistic effect of both spirit and form. But generally speaking, no matter which kind of expression form, the image style and artistic language of the ceramic figure sculpture formed by clay show the unique Chinese traditional aesthetics, such categories as"Tao", "Miao", "Image", "Qi Yun" can be found in many works, reflecting the unique views of domestic artists on clay art, and different from the aesthetic system of Western art, modern ceramic art concept and the combination of local traditional culture is an excellent model.

References

Lulu Li. The "Living Fossil" of Clay Sheet Building Pottery Technology - Investigation of Li Ethnic Pottery Craft, [J], Chinese HistoryMuseum Journal, 1993, Issue 01, 102-107

Wenjie Li. Pottery Craft of Chengbei Creek Culture, [J], Journal of the Chinese History Museum, 1993, Issue 01, 97-101+141

Sheng Huang. Freehand brushwork in Modern Ceramic Art Creation, [J], Literature and Art Research, 2008, Issue 09, 147-148

Bingqin He; Zhengzhen Kong. "Pinched without hindrance - A Brief Discussion on Modern Ceramic Art Modeling," Journal of Nanjing Academy of Arts(Art and Design Edition), 2009, Issue 03, 164-166

Jun Lu; Chen Ligang. The Practical Significance of Mud Sheet Forming, [J], Jingdezhen Ceramics, 2010, Issue 03,120-121

Qin Li. Research on the Forming Characteristics of Ceramic Clay Sheets, [J], Journal of Hubei Academy of Fine Arts, 2010, Issue 01,97-100

Qin Li. Reflections on the Aesthetic Orientation of Ceramic Sculptures Formed from Clay Sheets - "The Wonder lies between Similarity and Non Similarity", [J],Journal of Hubei Academy of Fine Arts, 2009, Issue 04, 102-105

Qi Jing ; Guojuan Dong.Research on the Artistic Characteristics of the Clay Sheet Forming Method for Purple Sand Figure Sculpture, [J], Beijing Printing School Journal of the Chinese Academy of Sciences, 2021, Issue 10, 58-60

Unveiling New Horizons in Chinese Environmental (Art) Design Education through Design Thinking Transition: A Case Study on the "Design Your Campus" Workshop

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Abstract

From the 1950s through the 21st century, the design field has seen pivotal shifts encapsulated in five distinct trends, transitioning towards strategy, intangible values, and interdisciplinary collaboration, with a profound emphasis on "Design Thinking (DT) " (Lou, 2017) . This research, drawing upon the frameworks of Corss (2023) and Johansson - Sköldberg (2013), systematically categorizes design thinking into three distinct paradigms. Addressing Chinese Environmental (Art) Design Education (CEADE), the research highlights the outdated primacy of interior decoration, underscoring the need for reform towards a more holistic, forward-thinking approach emphasizing interdisciplinary cooperation and societal responsibility. Using the "Design Your Campus (DYC)" workshop at the Beijing Institute of Fashion Technology as a case study, the research illustrates the transformative potential of collaborative learning in molding "design-driven innovators." Echoing the inclusive principles of Mah ā y ā na Buddhism (大 乘 佛 法), the research advocates for an expansive application of design thinking, envisioning it as a pivotal tool to address complex societal challenges, championing a renewed, comprehensive perspective in design thinking, enriched by the spiritual universality intrinsic to Mahāyāna Buddhism's doctrines.

Author keywords

Design thinking; Chinese environment (art) design education; Spatial design education; Design-driven innovator; Mahāyāna Buddhism

Introduction

Over the decades, the design paradigm has transitioned from "style creation" to "design-driven innovation", experiencing five significant trends that reposition design as a driver of innovation (Lou, 2017; Kimbell, 2011; Buchanan, 1992). In China, the Environmental (Art) Design discipline, originally rooted in interior decoration, has expanded its purview to include a holistic understanding of indoor and outdoor spaces, integrating urban planning, architectural, landscape, and furniture design (Zheng, 2019; Yu, 2020; Song, 2020). Yet, with evolving societal demands, there is a growing emphasis on interdisciplinary skills, collaborative innovation, and social responsibility in design, rather than mere aesthetics (Piotrowski, 2013). Addressing these "wicked problems" necessitates a transformation in design education, particularly within the CEADE curriculum (Rittel & Webber, 1973).

Central to this evolution is DT, essential for shaping "design-driven innovators". This paper examines design

thinking in environmental art design education, informed by a multidisciplinary workshop at the Beijing Institute of Fashion Technology. This exploration, enriched by an analogy with the spread of Buddhism, evaluates the potential roles and trajectories of future design-driven innovators, reflecting the shifting dynamics in design practice and academia (Cross, 2023).

Literature Review

Design Thinking

Originating in the West, DT has significantly evolved over four decades, marking its footprint in design, management, and business innovation (Brenner et al., 2016; Mootee, 2013). While Tim Brown of IDEO (2018) encapsulated DT as a human-centric bridge between technology and business, the concept has been critiqued for lacking precision (Xin, 2022). The evolution of design thinking, from the 1960s' "design methods movement" to today's term "design thinking", is seen not as a linear replacement of concepts, but an amalgamation process, characterized by 3 key transformations (figure 2).

Figure 1. Timeline of design thinking evolution

1. The first transformation (1960-1980) focused on "design as a scientific discipline," with scholars applying scientific paradigms to the design process in an attempt to develop design into a discipline grounded in scientific principles. This period is often considered the beginning of design thinking research (Johansson, et al, 2013).

2. The second transformation (1980-1990) centered on a shift in "design cognition (Kimbell, 2011)." The scientific paradigm-driven research was criticized, as theoretical results failed to gain recognition and application in practice, creating a gap between research and practice. Nigel Cross (2006) and others, based on previous research, compared designers and scientists in terms of cognition, thinking, and action, proposing the concept of "designerly ways of knowing" and its underlying theory. During this time, "design thinking" was first used as an academic term in architecture and urban planning, while Donald Schon introduced "reflective practice" as a critique of the "technical rationality" represented by Herbert Simon.

3. The third transformation (2000-present) emphasizes the "integration of design thinking with other disciplines (Schallmo, et al, 2018)." Design-driven consultancies like IDEO and Frog have emerged as industry leaders, and the rise of service design as a new design field has led to the development of novel tools and processes for co-creation and participatory design. This shift towards collaborative design and multidisciplinary teams focuses on open and internalized creative processes and ways of thinking, making them more transparent and accessible to all.

With insights from Cross (2023) and Johansson (2013), DT is charted from discipline-focused DT1 to an interdisciplinary DT3 (table 1). This research addresses DT's ongoing transformation and underscores its journey towards a cross- disciplinary essence pivotal for 21st-century challenges.

The academic realm recognizes DT as a robust tool beyond mere aesthetics, incorporating it as a unique cognitive approach in education (Dell'Era et al., 2020). Global educational initiatives, exemplified by partnerships like the Global Innovation Design project, harness DT, amalgamating creativity, business, and engineering. These initiatives emphasize holistic, interdisciplinary learning, preparing designers for intricate real-world scenarios (Lou & Ma, 2015). Contemporary studies stress the need for a paradigm shift in design education, advocating for adaptability and social responsibility in response to evolving global challenges (Meyer & Norman, 2020; Friedman,

Table 1. 3 visions of DT.

Name	Note	Description
DT1	Also called Designerly thinking (Johansson–Sköldberg et al., 2013), original version of Design Thinking	This version of DT focuses on the academic development of a professional designer's practice, encompassing their practical skills, competence, and the theoretical reflections surrounding the interpretation and characterization of their non–verbal abilities. Designerly thinking bridges the gap between theory and practice from a design perspective, rooted in the academic field of design (Johansson–Sköldberg et al., 2013).
DT2	Simplified version of 'designerly thinking ' (Johansson–Sköldberg et al., 2013) grand version of Design Thinking	In this interpretation, the term "design thinking 2" is used specifically when design practice and competence are applied beyond the traditional design context, including areas such as art and architecture, to collaborate with individuals without a scholarly background in design, particularly in management. DT can be seen as a simplified version of "designerly thinking" or a way to describe a designer's methods integrated into an academic or practical management discourse (Johansson–Sköldberg et al., 2013).
DT3	based on design thinking1 (Nigel Cross, 2023)	This new version could extend DT out of the making paradigm of professional design practice, towards a competency, a way of thinking and working that embodies a broader form of strategic, adaptive, co–operative intelligence for engaging with wicked problems (Nigel Cross, 2023).

2019).

However, Design thinking's role in spatial design education is a relatively untapped field with scarce literature and research. In his 2018 doctoral research, Pham Tu Ngoc argued that conventional models fail to capture the intricate interior design process, leading him to establish a design thinking-based educational methodology recognized for its human-centric, cross-disciplinary, problem-solving, and exploratory traits. In 2019, Annalinda De Rosa identified fresh challenges in spatial design due to global shifts, promoting a "space + service" cross-disciplinary strategy. This strategy affirms Muratovski's 2016 claim that modern design extends beyond physical entities to designing systems, strategies, and experiences. Moreover, in recent years, Tongji University's DESIS group has fused spatial design with social

innovation theories by Ezio Manzini (2015), implementing several community micro- renewal projects in Shanghai, including "NICE 2035" and "Open Your Space". They've also contributed to the creation of several FabLabs in the Tongji neighborhood, collaborating with institutions like the MIT MEDIA LAB, Aalto LAB from Finland, and Aston Martin LAB.

Chinese Environmental (Art) Design Education

Over its seven-decade trajectory, the CEADE has evolved significantly, delineating a shift from a focus on art pieces and murals (1956-1978) to embracing broader infrastructure designs and current space-based social innovations, with a profound influence from China's socio-political landscape (Zhang, 2019; Zhen, 2019; Song, 2020). Officially termed "environmental design" by China's Ministry of Education in 2011, it fosters the integrated study of diverse environments aiming to optimize human habitats, despite the ongoing discourse balancing "art" and "design" in its descriptor (The 6th Discipline Evaluation Group of the Academic Degrees Committee of the State Council, 2013; Cai, 1999). The field, mirroring global spatial design trends, urges graduates to pursue careers in spatial and interior design, and architecture (Zhang, 1986; Song, 2020). Nevertheless, it confronts dilemmas like the lack of a distinct paradigm, ambiguous focus, and a fragmented academic landscape, accentuated by historical and cultural differences within the Chinese context (Winch, 1958; Kuhn, 1962; Yu, 2020; Lou, 2019; Song, Yu & Li, 2019; Che, 2022; Cai, 1999). Building on this historical backdrop, the author (2023) revisits the term "Environmental (Art) Design" offering a deeper understanding rooted in the unique linguistic nuances and traditional Taiji philosophy prevalent in the Chinese cultural context. The new model (figure 1) conceptualizes design not as isolated elements but as a harmoniously intertwined and continuously evolving entity, emulating the principles of Yin and Yang, which denote the material and immaterial elements, respectively. It showcases an alignment with Buchanan's four-order design model formulated in 2001, which categorizes design into symbols, physical objects, activities, and systems, promoting a vision of symbiosis and transformation that can potentially guide the future trajectories of the CEADE in a way that honors its foundational philosophies while innovating for the contemporary era.

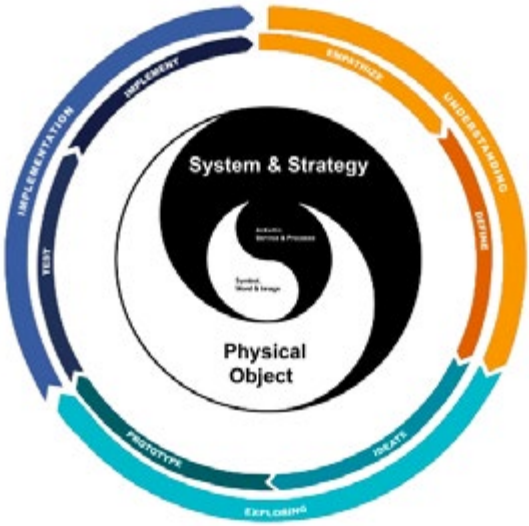

Figure 1: New concept and process model of CEAD

"Design Your Campus" Workshop

During the four-day "DYC" workshop, three interdisciplinary groups aimed to improve campus environment and lifestyle through new environmental design concepts, emphasizing user needs and sustainable solutions. Focusing on Group B's initiative (figure 2), they devised a multifaceted approach to the stray cat issue on campus, intertwining online and offline resources to foster a symbiotic human-animal environment. The project proposed an integrated strategy featuring smart shelters and safety systems, highlighting a deep understanding of the " physical + non- physical" design object, rooted in community engagement and stakeholder needs.

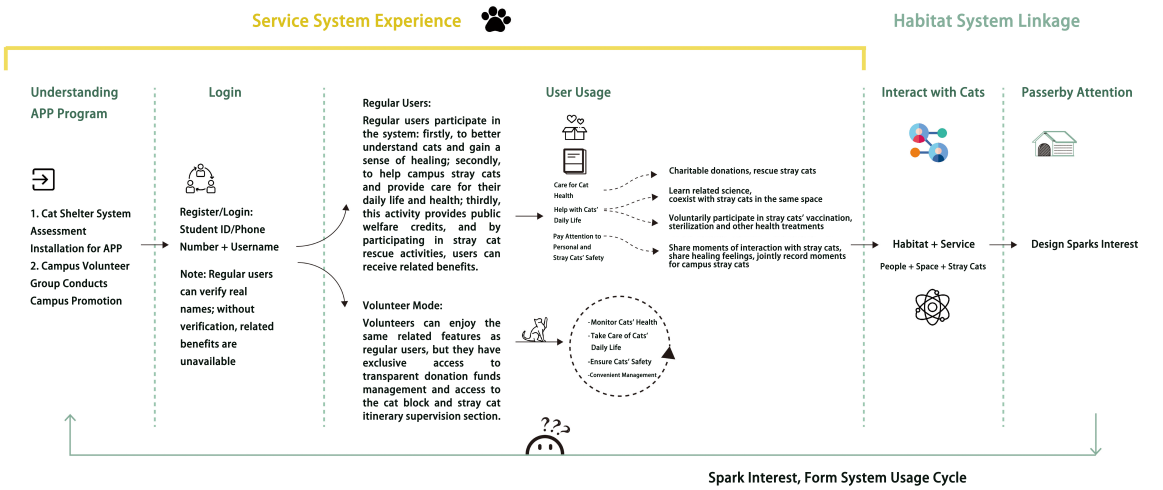

Figure 2: Stray cat campus service system + habitat system design (completed by Group B)

Table 2. Workshop details.

Target	The workshop leveraged the familiar campus environment as an exploratory ground, aiming to identify and address complex issues embedded in the daily academic lifestyle. This endeavor not only represents a pilot reform in environmental design education but also heralds an innovative educational strategy that shifts away from the traditional "outcome-oriented" teaching methodology to emphasize systemic "DT".
Group B. Stray Cats Habitat and Service System Design	Stray cats represent a complex systemic issue. While many people appreciate their cuteness and vitality, the severe conditions they live in are often overlooked. Despite the joy they bring, stray cats can pose significant safety and hygiene risks. The group's campus research connected stray cats to healing and raised concerns about their living conditions and their impact on the environment. Addressing health, survival, safety, and management issues of the cats, they created a sustainable online-offline integrated habitat + service system. Collaborating with campus cat enthusiasts, they established an interactive system for transparent philanthropy, sharing, and virtual cat adoption coupled with physical habitats, aiming to supervise and aid the stray cats adequately.

During the final stage of the workshop, the author designed a questionnaire distributed to over 10 experts for project evaluation based on seven competencies (professional knowledge, creativity, interdisciplinarity, management and leadership, adaptability, collaborative innovation, and social responsibility). The results were visually represented using a radar chart with "spiderweb lines" extending from the center, representing different competence levels (figure 3).

For Group B's campus stray cat project, the scores were as follows: professional knowledge (3), creativity (5), interdisciplinarity (5), management and leadership (3), adaptability (3), collaborative innovation (4), and social responsibility (5). A deep analysis of these scores highlighted the project's strengths in creativity, interdisciplinarity, and social responsibility, achieving the highest score of 5 in each. The project also performed well in collaborative innovation with a score of 4. However, there was room for improvement in professional knowledge, management and leadership, and adaptability, each scoring 3. To enhance the overall project quality, it was suggested that group B augments their expertise in the respective fields, improve project management strategies, and boost adaptability and flexibility. Despite the areas for improvement, the project established a strong foundation with potential for reaching higher standards through continued effort.

Figure 3: Group B's 7-competency assessment radar chart

Discussion and Conclusion

In the evolving landscape of DT transformation, this research engages with Friedman's 11 designated design challenges to underline the imperative of endowing contemporary designers with seven pivotal competencies. The investigation utilizes an empirical case study strategy to authenticate the approaches proposed in the nascent paradigm of CEADE, extracted from prior academic explorations. The innovation heralded by the nascent CEADE framework in the Chinese context can be summarized as follows:

1.It centralizes a design-centric methodology, cultivating an interdisciplinary, systematic, and fresh perspective that ventures beyond the established paradigms of architecture and art-driven philosophies, thereby filling a conspicuous void in the discipline's central tenets.

2. While traditionally seen as a pronounced vulnerability, the expansive and somewhat ambiguous borders of CEADE can be harnessed as an asset, allowing for a greater level of openness and converting known weaknesses into potential strengths through the embracing of its inherent fluidity and uncertainty.

3. Despite the persisting deliberations regarding the segregation of design as an independent discipline and the complications accentuated by the superficial diffusion of DT2, the nascent CEADE posits itself firmly within the spatial design sphere. This commitment not only validates its disciplinary locus but facilitates synergistic and collaborative advancements with allied academic realms.

4. Moreover, the study facilitates an enriched understanding of the divergent discourse around design thinking — a debate still vibrant in scholarly circles. The discussion leverages the insights of Cross (2023) and Johansson(2013), adopting three different lenses to DT, each finding a parallel in the dichotomous interpretations of ancient Indian Buddhist philosophies. The narrative further intertwines with the metaphoric reference to the Chinese epic "Journey to the West(西游记)", contemplating the transformational journey of DT, akin to the Buddhist doctrinal shift from Theravada (小乘佛法) to Mahayana (大乘佛法).

Projecting forward, it is anticipated that DT3 will act as a linchpin for fostering a wider and more efficacious platform for interdisciplinary collaborations, mirroring the inclusive vision of Mahayana Buddhism. This anticipatory vision hinges on the potential of DT3 to arm designers with a comprehensive lens, thereby enhancing their capacity to address expansive and intricate societal dilemmas, echoing the universal essence encapsulated in this philosophical doctrine.

References

Allwood, J.M., Cullen J.M., Carruth M.A., Cooper D.R., McBrien M., Milford R.L., Moynihan M., Patel A.C.H. (2014) Sustainable Materials with Both Eyes Open. UIT Cambridge, England

Attia, M. & Edge, J. (2017) Be(com)ing a reflexive researcher: a developmental approach to research methodology, Open Review of Educational Research, 4:1,33-45, DOI: 10.1080/23265507.2017.1300068

Brown, T. (2008). Design thinking. Harvard business review, 86(6), 84.

Brown, T.(2018). Design thinking defined. Retrieved April 1, 2023, from https://designthinking.ideo.com.

Buchanan, R. (1992). Wicked problems in design thinking. Design issues, 8(2), 5-21.

Buchanan, R. (2001). Design research and the new learning. Design issues, 17(4), 3- 23.

Brenner, W., Uebernickel, F., & Abrell, T. (2016). Design thinking as mindset, process, and toolbox: Experiences from research and teaching at the University of St. Gallen. Design thinking for innovation: Research and practice, 3-21.

Calabretta, G., Gemser, G., & Karpen, I. (2016). Strategic Design: 8 Essential Practices Every Strategic Designer Must Master. Laurence King Publishing.

Council, B. D. (2005). The Design Process: The 'double diamond'design process model. http://www. designcouncil. org. uk/about-design/how-designers- work/the-design-process/. Acesso em, 11(12), 2013.

Cross, N. (2006). Designerly ways of knowing. Springer London.

Cross, N. (2023). Design thinking: Understanding how designers think and work. Bloomsbury Publishing.

Dam, R., & Siang, T. (2019). 5 Stages in the design thinking process. https://www.interaction-design.org/literature/article/5-stages-in-the-design- thinking-

De Rosa, A. (2019). S+S. Dialogues on the relationship between spatial design and service design. Disclosing the fundamentals for a transdisciplinary approach (Doctoral dissertation). Politecnico di Milano, Milano.

Dell'Era, C., Magistretti, S., Cautela, C., Verganti, R., & Zurlo, F. (2020). Four kinds of design thinking: From ideating to making, engaging, and criticizing. Creativity and Innovation Management, 29(2), 324-344.

Johansson‐Sköldberg, U., Woodilla, J., & Çetinkaya, M. (2013). Design thinking: past, present and possible futures. Creativity and innovation management, 22(2), 121- 146.

Keinonen, T., & Koskinen, I. (2007). Research Driven Design Education. IASDR07 Proceedings. The Hong Kong Polytechnic University Press.

Kimbell, L. (2011). Rethinking design thinking: Part I. Design and culture, 3(3), 285- 306.

Krippendorff, K. (2005). The semantic turn: A new foundation for design. crc Press.

Lou, Y. (2010). 创新之道 : 创意、创新和城市 . [On Innovation: Creativity,Innovation and City]. Architecture of Times, (6), 16-19. (in Chinese).

Lou, Y. (2017). 设计的疆域拓展与范式转型 . [The Expanding Scope and Paradigm Shift of Design]. Architecture of Times, (1), 11-15. (in Chinese).

Lou, Y. (2019). The idea of environmental design revisited. Design Issues, 35(1), 23- 35.

Lou, Y., & Ma, J. (2015). A 3D "T-shaped" design education framework. Arts, research, innovation and society, 123-136.
Lou, Y., Leuba, P., & Zhu, X. (2008). 环 境 设 计 . [Environmental Design]. Higher Education Press. (in Chinese).
Manzini, E. (2015). Design, when everybody designs: An introduction to design for social innovation. MIT press.
Mootee, I. (2013). Design thinking for strategic innovation: What they can't teach you at business or design school. John Wiley & Sons.
Montgomery, D. (2013). Helping teachers develop through classroom observation. Routledge.
Newson, A, Suggett, E., & Sudjic, D. (2017), Designer maker user, London: Phiadon
Norris, J (2016) A-Z of craft: A is for artisan, Crafts, September/October 2016, p.45
Pham, T. N. (2018). Design Thinking as a Driver of Vietnamese Interior Design Education (Doctoral dissertation). Politecnico di Milano.
Piotrowski, CM. (2013). Professional practice for interior designers. John Wiley & Sons.
Ratto, M. (2011). Critical making: Conceptual and material studies in technology and Social Life. The Information Society, 27(4), 252–260. https://doi.org/10.1080/01972243.2011.583819
Rowland, J. (1993). Designing and reporting your research. Research in education and the social sciences: Telling it as it is, 19-28.

Schön, D. A. (1983). The reflective practitioner: How professionals think in action. Basic books.
Simon, H. A. (1996). The sciences of the artificial. MIT press.
Stempfle, J., & Badke-Schaub, P. (2002). Thinking in design teams - an analysis of team communication. Design studies, 23(5), 473-496.
Tovey, M., & Porter, S. (2003). Styling and design: Intuition and analysis in industrial design. Design studies, 24(6), 657-677.
Trott, P. (2017). Innovation management and new product development. Pearson UK.
Ulrich, K. T., & Eppinger, S. D. (2016). Product design and development. Mcgraw-hill education.
Urquiola, P. (2018). Patricia Urquiola: Time to make a book. Rizzoli International Publications.
Von Stamm, B. (2008). Managing innovation, design and creativity. John Wiley & Sons.
Wang, X., Guo, X., & Wu, C. (2014). 工艺美学创新与装置艺术探究 . [Craft Aesthetics Innovation and Installation Art Exploration]. Art Research, (10), 98-101. (in Chinese).

Cumulus Beijing CAFA 2023

Day 3

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CAFA

Design Flow

设计流

Transdisciplinary Innovation Design Education: A Case Study from the Central Academy of Fine Arts

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Abstract

The "Transdisciplinary Innovation Design" course is a core teaching practice in the Innovation Design major at the School of Design, Central Academy of Fine Arts. As a fluid design approach that integrates disciplines, this course combines innovative medthods, case studies and project practice in the undergraduate design innovation teaching process. It effectively delineates the relationship between design-driven innovation and business, technology and humanities, cultivating students' innovative thinking and transdisciplinary collaboration skills. The course guides students to work in teams, delving into the value, goals, processes, methods, tools, and significance of design, while also deepening their understanding of design tools and patterns in public and commercial organizations.

This paper analyzes the teaching methods and student work cases of the "Transrdisciplinary Innovation Design" course offered by the author in the School of Design at the Central Academy of Fine Arts over the past five years, reflecting on the concept of the "Design Flow" of the Cumulus Beijing Conference.

Keywords

Innovation design education, Design driven innovation, Transdisciplinary collaboration

Background

The development of the industrial revolution has driven the specialization of industries. Over the past hundred years, education has been nurturing talents in response to the demands of corresponding industries. Disciplines such as graphic design, fashion design, product design, and automotive design emerged in response to relevant industries. However, as the times have changed, the challenges we face today have become increasingly complex, often defying solutions from a singular knowledge perspective. Therefore, in addition to the need for "experts," there is a need to cultivate "transdisciplinary innovator" who can bridge different fields. By combining methods from design, humanities, science, and business, and developing keen analytical and problem-solving abilities for complex issues, this has become focal point of exploration at the Innovation Design major, School of Design, China Central Academy of Fine Arts. In alignment with the national "Innovation-Driven Development" strategy, this course has embarked on the method to meld technological, market-driven, and design-driven innovations. This course aims to construct a teaching methodology for transdisciplinary innovation design rooted in Chinese characteristics. Its goal is to cultivate innovative talents with a global perspective, trans-disciplinary design capabilities, intercultural understanding, critical thinking, and societal insight.

In the subsequent sections, the author will systematically introduce the methods employed in the development of this course and analyze the works of young designers who have emerged from it.

Introduction

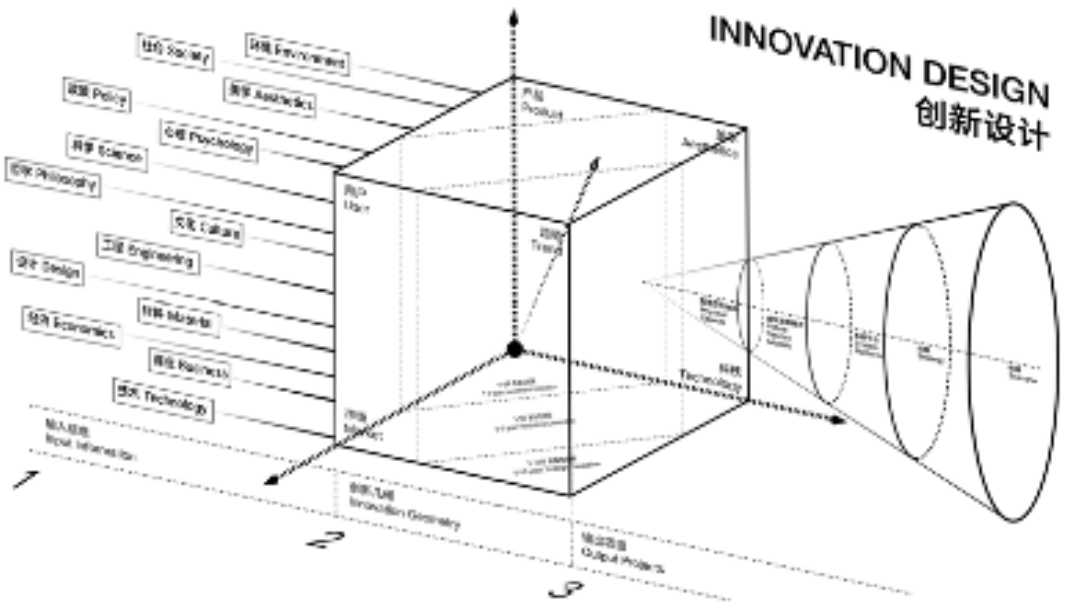

Figure 1. Innovation Design structure, Shuxin Cheng

When people talk about innovation, they often focus on technology-driven or market-driven innovation. The methodology of innovation spans across fields from economics, management, natural sciences, humanities and social sciences to art. When we confront an ever-changing world, the question becomes: how can we approach complex cross-disciplinary problems from a design perspective, creating forward-looking solutions or seizing potential innovation opportunities? Innovation Design major does not initially constrain the form of potential solutions. Instead, it emphasizes the training of research methods, innovation tools, and thinking patterns.

The Innovation Design comprises three components: Innovative Methods, Design Engineering, and Trend Design. By analyzing and understanding aspects such as society, culture, economy, environment, and technology and integrating interdisciplinary innovative methods and concepts, it seeks to nurture innovative talents with an international outlook, interdisciplinary design capabilities, cross-cultural understanding, critical thinking, and social insights. The Innovation Design major divides the timeline of "innovation" into three stages: "Progressive Innovation Design" for the first three years, "Revolutionary Experimental Innovation" for the next three to five years, and discussions on "Strategic Scenario Design" beyond five years.

Course Framework

Figure 2. "Transdisciplinary Innovation Design" course exhibition poster, 2021

"Transdisciplinary Innovation Design" course is structured within the Innovative Methods section of the Innovation Design major. This course serves as a foundation, incorporating the author's "Innovation Geometry" model, providing students with a platform to showcase their proficiency in knowledge application and technological utilization. It encompasses the mastery of pivotal design elements, including lifestyle exploration, background research, trend analysis, and the ability to succinctly summarize project processes and outcomes. Additionally, it emphasizes the development of advanced skills in project management, communication, and presentation. As a result of this comprehensive educational approach, students are equipped to effectively amalgamate technological trends, design principles, and business considerations within their design projects. Through transdisciplinary practical projects, they cultivate competence in rapid prototyping, design simulation, and the visualization of innovative design concepts. Importantly, they learn to translate theoretical knowledge into practical applications.

The course predominantly centers on group-based projects and employs experiential and interactive teaching methodologies. It encourages students to extend their learning beyond the confines of the classroom, facilitating engagement in society through field research.

"Transdisciplinary Innovation Design" course is conducted within an 8-week timeframe, offering three sessions per week. This course incorporates various facets such as laboratory technology, anthropological methods, interactive experience design, business model development, and artistic narrative expression. These components form a transdisciplinary knowledge radius, broadening students' horizons. Throughout the course, students are guided through the following sequential steps: questioning, researching, inspiring, designing, developing, testing, reflecting, and storytelling.

Furthermore, it fosters in-depth design exploration targeted at potential user demographics. This approach is

characterized by its exploration of progressive innovation solutions and the pursuit of revolutionary experimental innovations.

Transdisciplinary Attributes

The transdisciplinary nature of this course is evident in the ability to encompass multiple academic fields and integrate knowledge and methods from different domains to address complex problems and drive innovation.

Curriculum Design: This course amalgamates knowledge from various academic fields, such as art, science, engineering, social sciences, and more, to tackle complexity and diversity.

Research Themes: The research themes in this course span across multiple domains, such as boundaryless perception, innovations in the realm of holistic health, mixed-reality living, and more. It encourages students to contemplate the multifaceted aspects of problems and nurture comprehensive problem-solving skills.

Working Methods: By forming diverse teams, students with different professional backgrounds and interests collaborate to solve problems. The intersection of expertise from various fields provides a broader thinking framework, facilitating the generation of creative solutions. Students employ various methods, including experimentation, design, data analysis, among others, to address intricate issues.

Figure 3. "Transdisciplinary Innovation Design" course exhibition, Exhibition Hall, School of Design, CAFA, 2021

Exhibition and Discussion of Achievements: The course presents student team's milestone achievements through exhibitions and seminars, inviting experts from various fields to partake in discussions. This fosters feedback from diverse domains and promotes cross-disciplinary collaboration and learning.

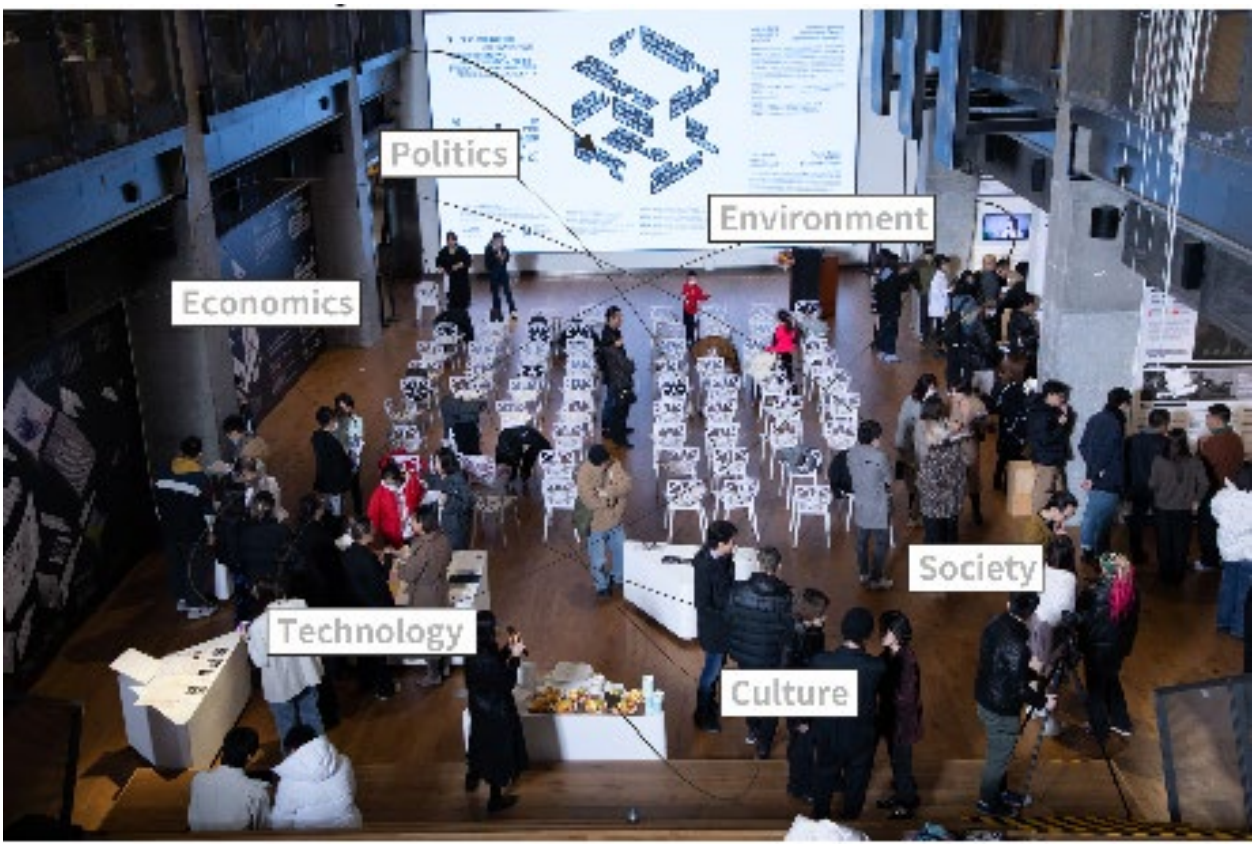

Figure 4. "Transdisciplinary Innovation Design" course exhibition mingle, Exhibition Hall, School of Design, CAFA, 2021

Diverse Participants: Exhibitions and seminars invite experts, scholars, and practitioners from various fields, such as the economy, media, legal services, technology, entertainment, fashion, music, politics, and more. They offer perspectives and insights stemming from different disciplinary backgrounds.

Conclusion

The "Transdisciplinary Innovation Design" course underscores the importance of transcending traditional disciplinary boundaries. It encourages students to think and act at the intersection of multiple fields of knowledge. The key features of this pedagogical approach include:

Integration of Multidisciplinary Knowledge: This course integrates knowledge and methodologies from diverse academic disciplines, enabling students to comprehend and address complex issues from multiple perspectives.

Fostering Innovation and Creativity: This approach encourages students to challenge conventional thinking, fostering innovation and creativity, and preparing them to become future problem solvers and innovators.

Cultivating Teamwork and Communication Skills: This course requires students to collaborate in diverse teams, enhancing their abilities in teamwork and cross-disciplinary communication. Problem-Driven Learning: Students learn through the process of addressing real-world problems, facilitating the application of theoretical knowledge to practical contexts.

Exhibitions and Discussions: Students are provided with opportunities to showcase their achievements and engage with audiences from various domains, facilitating cross-disciplinary exchange and feedback in real-world

contexts.

Social and Cultural Insights: This approach encourages students to venture beyond the confines of the campus, promoting an understanding of real societal and cultural factors. This enables a better grasp of user needs and backgrounds, leading to more targeted solutions.

Most importantly, this course offers students a comprehensive learning experience, cultivating their holistic thinking abilities and enabling them to effectively tackle intricate real-world challenges. This educational approach, driven by design, plays a vital role in nurturing individuals with trans-disciplinary knowledge and innovative thinking, poised to be catalysts for change.

References

Glanville, R. (1999). Re-searching Design and Designing Research. Design Issues. 15. 10.2307/1511844.

Shuxin, C. (2021) Innovation Geometry Model as a Way to Explore Future Innovative Opportunities. P.-L. P. Rau (Ed.): HCII 2021, LNCS 12772, pp. 318–329, 2021. https://doi.org/10.1007/978-3-030-77077-8_25

The Two Main Forms of Design Flow

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Abstract

In the encompassing material world, everything can take the form of "flow" – be it the flow of people, goods, behavior, emotions, data, and more. Therefore, when discussing this at a conceptual level, the essence of design closely linked to materiality is "flow" – the manifestation of a fluid form of overall consciousness. In the realm of design theory, design flow does not refer to the traditional process of design, from needs analysis, research, detailed design to product launch and sales. Instead, it denotes the study and expression of design values and orientations. It serves as both a design methodology and a crucial task in constructing the underlying values of designers.

The understanding of design flow can easily be seen as a reexamination of the design process. The traditional concept of "flow" is considered a "process," emphasizing a linear thought process and a step-by-step implementation, leading to a "mechanical rationality" outcome. Essentially, we have been persisting in the rationalistic framework since the Enlightenment era, especially prevalent in the field of design. However, the powerful inertia of this thinking, evident today, cannot be simply encompassed or obscured by the simplicity of postmodernist design. More unnoticed drawbacks have made creators prone to fatigue and lethargy in their work.

The synergy between industrial machine civilization and artificial intelligence, as well as information technology, is undoubtedly apparent today and in the foreseeable future. Emerging artificial intelligence and big data models are flattening modernist design, causing certain specialized design sectors to rapidly shift towards artificial intelligence. Through AI and big data, the will of individuals can be effortlessly manifested, allowing everyone to become a "designer." Is this not the democratization of design pursued by the masters of the modernist movement over a century ago? Interestingly, the first and second industrial revolutions were also separated by approximately a hundred years! The advent of new technologies has abruptly placed the century-long operation of modernist design into an entirely new industry context. Traditional design knowledge systems urgently need fresh interpretations and applications to break through mental barriers and foster reflection.

In the creative process of design, design flow can manifest in various forms, deeply influencing, and even determining, the level and boundaries of our creations. It primarily consists of two creative "flow consciousness" components: explicit line flow and implicit line flow, as well as the contradiction flow. These two components have a hierarchical relationship with progression.

I. Design Flow Composed of Explicit and Implicit Lines

German philosopher Arthur Schopenhauer (1788–1860) posited that "the world is my representation." Here, the "I" is not a subject but an entity—will. Similarly, this "representation" is the phenomenon—the world is the representation of will. Schopenhauer discovered that if one starts the journey toward objective knowledge from the phenomenon, one can never surpass it, remaining confined within appearances. If artistic or design creation is based on phenomenal logic, the conclusion will perpetually be a subjectification of phenomenal logic. We would still be outside things, unable to fathom their inherent nature. Schopenhauer believed that human

cognition (including artistic creation) is not only about recognizing the subject but also about the self being among the entities it needs to comprehend. The self is the thing itself, (the "noumena" in Kant's term). Liu Xie, a literary theorist from the Southern Dynasties of China, in his work "Wenxin Diaolong · Yinxiu," approached this from a philosophical perspective, suggesting that "yin" and "xiu" represent a contradictory unity. Liu Xie stated, "Literature knows excellence and concealment. Concealment refers to the profound essence outside the text; excellence is the unique and outstanding within the composition." Concealment implies expressing meanings beyond words, with layered connotations and multiple meanings, while "excellence" is the opposite, requiring a conspicuous and prominent presence.

In design, the creative will and representation can be understood in design epistemology as the implicit and explicit lines of design. They form a "flow" of will, summarized as follows:

1. In the actual process of creative thinking, any will and representation cannot be distinctly separate or independent. Explicit and implicit lines often intertwine, winding upward, continually oscillating (verification or argumentation), integrating into a "whole." This forms a sense of space and time in design, an inherent perception in our subconscious. This "whole" is the framework of thought, a dynamic fluid process, and can also be considered the presentation of the material "whole." Explicit and implicit lines, unlike the relationship between the concrete and the abstract, differ in that they are a dynamic cognitive process, a "flow." It is akin to the constant self-balancing process of flowing water towards the sea, leaning towards the category of design methodology. In contrast, the concrete and the abstract belong to the philosophical category of dialectical unity. They represent two different ways of understanding reality and thought, without emphasizing methods and processes, expressing a philosophical speculative relationship.

2. The Primacy and Subordination of Explicit and Implicit Lines:

In the realm of art creation, there is no absolute balance or uniformity in all things. In artistic creation, we may emphasize implicit lines as primary and explicit lines as "phenomena" or auxiliary, or vice versa, emphasizing explicit lines and neglecting implicit lines. Considering the essence of the first point, we understand that there is no fixed hierarchy or distinction in strength between explicit and implicit lines. This hierarchy is not constant, requiring creators to skillfully manage the proportion between the two or consciously adjust their ratio, being capable of doing so at any moment.

3. Explicit and Implicit Lines Ensure Design Differentiation:

Explicit lines, being relatively stable, have fluctuations but are generally steady. In contrast to explicit lines, understanding and expressing implicit factors in implicit lines are the fundamental guarantee of the differentiation of works. Through clever design, implicit lines can, in specific situations, transform into the so-called explicit lines. However, this transformation needs to be planned at the beginning of the design with suitable design concepts. For instance, this could involve forms with strong suggestive but functional aesthetics. These aspects ensure the differentiation and individualization of design. One of the greatest novelists of 20th-century France, Marcel Proust (1871-1922), believed that writers have two selves: the inner self (implicit lines) existing in artistic life and the outer self (explicit lines) in real social life. In artistic creation, it's not the external self but the internal self that is at work. According to Proust, these selves "rise powerfully and completely to the surface through non-subjective memory." This understanding aligns with the concepts of concealment and excellence, explicit and implicit.

II. Contradictory Flow in Creation:

In dialectical materialism, contradiction originates from Hegelianism and generally refers to an inherent opposition within a domain, a unified force, or an object. These contradictory elements must exist in objective reality. They do not mutually offset or devour each other but rather practically define and ruthlessly reveal each

other's existence. This aligns well with the fundamental viewpoint of existentialist philosophy.

Design fundamentally possesses strong applicability and utility, a key distinction widely acknowledged between art and design. Simultaneously, design carries a pronounced need for autonomous aesthetics. This innate contradiction, viewed by Edward Bullough (1880-1934), involves a relationship between utility (practicality) and distance (beyond practicality) termed "the inherent contradiction of distance." If the creator is too distant from the object, it leans towards idealism; conversely, leaning towards natural realism occurs if the distance is too close. Setting the distance too subjectively is idealism, and setting it too objectively is realism. The management of this distance is precisely the temporal and spatial distance between things and the subject.

1. Contradictory Flow in Opposition and Unity:

Ancient Greek philosopher, mathematician, and father of mathematics Pythagoras believed that mathematics is the foundation of everything. Without mathematics, understanding the physical world is impossible. He asserted that the physical world depends on the interaction forces between opposites, such as up/down, sunny/rainy, etc. According to the Pythagorean view, "existence" implies opposites, containing or depending on opposites.

Opposition and unity exist in reality, determining our creations. Complete balance between them implies stagnation and imbalance in creation (unless deliberately intended). In the creative process, either opposition or unity eventually takes the lead; it just needs time to manifest. Unity is the basic principle that allows any specific opposite to exist as a force against any other opposite, e.g., "closed" can only exist if there is "open," and "round" cannot exist without "square." They are opposing yet mutually affirming, with one's existence being necessary because the opposite requires it.

Knowing these philosophical principles of creation, we can intentionally exaggerate the opposition in a work, "deliberately disrupt" the unity, or let the imbalance between the two become even more imbalanced, forming a powerful contradictory flow in the creation. This creative philosophy can interpret the majority of artistic or design works. As Parmenides of Elea from the ancient Greek "Eleatic" school said: "Harmony always arises from opposition!"

2. The Dramatic Propelling Force of Contradictory Flow on Artworks:

French literary giant Voltaire believed that every scene in drama must depict a struggle. French drama theorist Brunetière (1849-1906) in his work "The Laws of Drama" also clearly identifies conflict as the essential characteristic of dramatic art. In design, conflict, akin to symbiotic contradictions, is equivalent to the conflicts inherent in drama. Essentially, both serve as the origin of creation! From a certain perspective, dramatic works are replete with conflict. Conflict arises from various artificially set contradictory flows. It can be said that a drama without conflict is not a good work. In various types of works, the plot depends on the setup of conflicts and is subject to the level of conflict design. Design, much like drama, has designers as the directors of their own works. They need to establish the conflicting parties of "spear" and "shield" at the beginning of the work – without a "spear," there is no "shield," and if there is a "shield," a "spear" is needed. There are mainly two types of contradictory flows:

1）Contradictory Expressions in Artworks Caused by Stream of Consciousness Conflict: This involves the portrayal of conflicts arising from differences in cognition and consciousness within the work. It includes internal contradictions within the work itself (the inner world of the dramatic protagonist), contradictions between the work and the surrounding environment, and contradictions between the work and the non-contact environment, such as in the dramatic works "Thunderstorm" and "Teahouse."

2）Contradictory Expressions in Artworks Caused by Social Contradictions: This includes contradictions between an individual's consciousness and the consciousness of others, as well as the relationship and

expressions of contradictions between them and their social attributes. It also involves contradictions between individuals and the social environment, forming a comprehensive contradictory flow. In dramatic works, this is often achieved by "humanizing," "objectifying," or "concretizing" the social environment, the irreconcilable contradictions gradually emerging between them and the protagonist, thus driving the dramatic development of the story. Unlike dramatic works, design works usually appear in a fixed form, requiring the condensation of the contradictory flow into a specific contradictory entity, focusing on key aspects.

In summary, in artistic creation, the juxtaposition and symbiosis of explicit and implicit lines, spear, and shield are crucial means and indicators for giving depth to an artwork. These elements are not isolated within the ideological consciousness of creation but are always and must be pre-existentially present in our creative consciousness in the form of a "flow." This "flow" gradually becomes the subconscious of our design, flowing into the minutiae of the creator's innermost thoughts, providing the audience with a more diverse and multi-perspective artistic enjoyment and experience. This is called the "design flow"!

In design, it is essential to be adept at layout and skillfully establish contradictions, light, and shadow as a three-dimensional dynamic framework and process. It becomes a dynamic adjustment process of artistic thinking and design methods. This is a state in which the things we create and objective things (naturalism) exist, or a fluid state of the coexistence and symbiosis of multiple things.

Trying to Crack the Secret of China's Shared Economy

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Abstract

After experiencing a period of rapid development in China, the shared economy has now entered a period of decline. In order to uncover a series of questions surrounding the shared economy, such as "why do so many sharing economy platforms fail", "Why is there a division between the shared economy and the sharing economy" and "Is the traditional sharing of resources a shared economy?". The authors tried to describe three kinds of shared economy models through two sets of words: "owning and using" and "exclusive, shared and sharing". The authors tried to draw the following conclusions through the concrete analysis of the two kinds of lifestyles: The first kind of traditional shared resources mode is the ancient shared economy; The second type of sharing of personal idle goods is the dynamic shared economy. The third type of conversion of individual ownership into platform ownership is a failed attempt at a shared economy, the core problem of which is excessive reliance on capital. This study is the basis of the authors' series of studies on the shared economy, trying to find out the problems first and then explore new pathways and new methods on this basis.

Author keywords

"Own and use"; "exclusive; sharing and shared"; sharing economy; shared economy

Introduction

The concept of the shared economy was first described in a paper <Community Structure and Collaborative Consumption: A Routine Activity Approach gt> by Marcus Felson and Joe L, Spoeth in 1978. That model didn't attract much attention until Brian Chesky and Joe Gebbia founded Airbnb in 2008. And in 2010, Rachel Botsman and Roo Rogers gave a more detailed description of the sharing economy model in their <What's Mine is yours>, which promoted the global spread and development of the sharing economy (Ni,2015). Influenced by this, China has also experienced a period of rapid development. In 2017, the transaction volume of China's shared economy reached 490.25 billion yuan (RMB), the financing scale reached 216 billion yuan (RMB), the number of platform employees was 7.16 million, the number of service providers was 70 million, and the number of users was 700 million (Zhang et al.,2019). At the same time, monographs on the theory and practice of shared economy and shared economy emerge in an endless stream: Economic theory (Jiang,2017); Business Theory (Alvin et al.,2015; Don,2014). Field experience: (Robin 2015; Ma et al., 2016); Summary of experience: (Cao,2015; Guo,2016; Zhang,2016; Craig,2016). But at the present time, fewer and fewer people pay attention to the shared economy, and only few shared economy platforms barely survive. Why do so many shared economy platforms fail? (Zhang et al.,2019). Why is there a division between the shared economy and shared economy? Is

traditional resource sharing a shared economy?

Methodology

In order to study the related issues surrounding the shared economy, the authors first tried to simplify the economic model with two sets of easy to understand words. The two groups of words are "to own and to use"; "exclusive, shared and sharing". Group 1 "to own" means to possess, have, get, or keep something; To use means to put people, money, etc. to work for an end. The former focuses on the holding state; The latter focuses on getting results. Related terms include "ownership" and "right to use" (Ma et al., 2016; Ling, 2017). Another group of "exclusives" are individuals who own and use them alone; "Sharing" is personal ownership, allowing others to use; "Shared" is shared ownership, shared use. The authors tried to use these two sets of words to crack the complex economic model, so that the problem becomes clear.

Business models in the real world are very rich and not static (Mitani, 2015). In order to summarize the typical economic model for analysis, the authors condensed the social development system into four stages: First, the pre-civilized society was located as the first stage, where the ancestors were full of reverence for nature, they defended and owned a living area in order to obtain the right to use, for which the people must unite and share resources. For the sake of simplifying the work, the authors have positioned the entire agrarian and nomadic civilization of the past as the second stage, because during this relatively long period, human beings actually lived in a barbaric and predatory society in order to own and control resources. (Stanley et al.,2014; Raul et al.,2023); In this stage, the upper class monopolized resources and maintained the survival of the lower class by sharing the right to use them. The third stage is from the Industrial revolution in Britain to the present, the society is relatively civilized and individuals are encouraged to obtain the ability to own resources through competition. At the same time, they share the fruits exclusively and maintain the government's ability to return the shared social public resources to the society through taxation (Rachel et al. 2015). The fourth stage focuses on exploring the current new economic model, which mainly benefits from a series of scientific and technological advances such as the Internet, big data and intelligence, which greatly promote social exchanges and make information more smooth and convenient. This creates conditions for individuals to share what they have with others. As the audience can completely "use rather than own" (Jiang, 2017). For example, shared living Airbnb, shared travel Uber and so on.

It is significant to note that not all sharing of personal items is successful, that even the best economic and social systems can be "gamed" (W, 2023). The real world can be described as a near-death experience. For the sake of facilitating the study of the shared economy, the authors finally summarized three types of typical economic models related to sharing: 1, traditional sharing resources model; 2, Sharing personal idle goods model; And 3, transforming personal ownership into platform ownership model. In the following, the author will analyze the two types of lifestyles in daily life, short-term rental living and short-distance travel, and concretely show how the two groups of words show the differences between the three typical sharing economy models, so as to find out the deep reasons for the decline of the sharing economy.

Discussion

Firstly, we use two sets of words to generate interpretable descriptions of short-term rental with reference to the three classical economic models. The first type of traditional shared resources model is to rent in hotels and restaurants. This type of rent-for-rent lifestyle has existed since ancient times, requiring the owner to invest upfront to create a dedicated space for public use. This kind of traditional economic model with shared value has the advantage of scale, but the disadvantage is that the investment has a certain risk. The second type

of sharing of personal idle items is to share the living space owned by individuals with others for the purpose of generating income or expanding communication. The advantages of this new way of sharing economy are convenience and human touch and the downside is the privacy of renters and the sense of constraint that renters feel, such as Airbnb's early development model (Tom, 2017) . The third type of conversion of personal ownership into the platform ownership model is to transform the idle space owned by individuals into a relatively independent service space for the purpose of generating revenue. The advantage of this new model is that the assets are revitalized, and the operators are divided into two kinds: one is the actual owner of the space while they could often gradually generate income with a good attitude after investing appropriate space transformation funds. The other is "the second landlord", which chooses the area suitable for operation to rent and transform the living conditions to achieve commercial purposes, but this is a test of comprehensive ability. The disadvantage is that the benefits are not controllable. After all, "the second landlord" invests a certain amount of capital, at least a few called homestays, more than a few floors or a hotel, such as Home Inn Hotel Group, 7 Days Inn, etc., which has basically the nature of a hotel but the space is rented rather than owned. Airbnb now has a large number of such listings. From the above three types of short-term rental methods, the first and third types belong to the shared economy due to the direct owners of the space or the indirect "the second landlord" with the sole purpose of providing rental space. The second category belongs to the sharing economy while the space is the owners ' priority to their own living with due consideration for the tenant experience. The second group is now the beneficiary of changing times and it's exactly the reason for Airbnb's success. The first group belongs to the victims of partition, while the third category is asset-light but its effectiveness depends on operational capacity. With the development of the operation, the third group has a tendency to over-rely on capital and gradually become "primitive, naked capitalism". (Steven, 2017)

Now let's take another kind of short trip and use the three classical economic models to generate two sets of words that can be interpreted. The first type of traditional shared resources model is the public transportation system that replaces walking for traditional short trips. In this model, the government or commercial platform invests in and owns the infrastructure, and the public uses it for free or for a fee. The advantage is convenient support due to the shortage in the rush hour queue but which cannot always meet the demands of the single. The second type of sharing of personal idle items is that with the impact of the shared economy and the help of information technology, private cars owned by individuals can be shared with the public through the sharing platform. Like Zipcar, Uber and DiDi. (Robin, 2015). The advantage of this model is that it solves the limitations of taxis in the past and revitalizes social resources. The actual operating platform does not own the car, and the owner chooses whether to provide the service for passengers according to his own situation. This model has been a disaster for taxi companies but a boon for consumers. Because of its obvious advantages, it has been sought after by capital once it was published. The search for market share has become the platform's focus, in the words of Steven Hill, author of RAW DEAL, "to use its greedy claws to wipe out all competitors and take the top spot in the sharing industry." (Steven, 2017). The third type of personal ownership into a platform ownership model is to solve the one-kilometer shared travel "shared bike". The difference between this model and sharing a personally owned car or home is that the platform must own the resources and users only need to pay a deposit to use them. In the early stage of its development, there are two types of products, Ofo and Mobike, of which Ofo is a traditional bicycle with intelligent lock while Mobike has reinvented parts like tires for sharing. The former is more like sharing private bicycles with others. If it is OK on campus once it enters the broad society, the latter maintenance cost will be amazing. It is precisely because of the differences in the team's cognition of the shared economy that the fate of Ofo is more bumpy than that of Mobike. In fact, Mobike and the United States Group that acquired it in the later period are not winners. According to a ZAKER News article

entitled "Shared bicycle price is criticized, it is better to buy a bicycle," revealed: from 23:00 on August 10, 2022, the 90-day free discount price of Meituan Bicycle riding card will be adjusted from 60 yuan to 90 yuan (RMB)..... The three shared bike head platforms are still in a bleeding development. Hellobike suffered a total loss of 4.841 billion yuan (RMB) in the three years from 2018 to 2020, Mobike under Meituan also lost nearly 5 billion yuan (RMB) in the three years, and Qingke under DiDi suffered a loss of up to 30 billion yuan (RMB) in 2021. Why is the same sharing economy model to solve the travel problem? Is DiDi's cars much better than Meituan's bicycles?
The authors further refined and sorted out the differences between the three models: the first type of traditional shared resources model can be implemented by relying on the considerable strength of the operator. That is to say, it can save enough money by itself or borrow and own assets. Although this type of model is a heavy asset with certain risks, it will gradually recover costs and create profits as long as it is well operated. The second type of sharing of personal idle goods promotes the creation of new value for personal idle goods. The platform doesn't own the assets, it just charges fees in between. For the time being, although the development of such enterprises has many problems and needs to be improved, the overall situation is still developing steadily. The third type of personal ownership into the platform ownership model is more prominent. The new sharing economy needs to rely on the platform operation so that it first needs to inject funds in order to have the ability to serve users, which used to be personal accumulation and how much ability to do bigger things. Now through the input of venture capital it can quickly have the ability to capture more users, but the cost is to enter the cycle of being kidnapped by capital. At present, due to the gradual decline of the sharing economy, the research enthusiasm has declined significantly so that few research monographs have come out to reflect on the problem. However, we can still obtain a large number of critical and reflective essays through the Internet platform. After collecting and analyzing a number of viewpoints, the authors selected an article entitled "We have studied hundreds of sharing projects and summarized the five reasons for failure" to share with you.
The authors summarized the problems as follows: 1, Most of them are entrepreneurial projects, which rely heavily on capital and lack absolute right to speak; 2, Lack of innovation and differentiation; 3, False demand cannot withstand the market's test; 4, The development is striding too fast and too fierce, resulting in excess supply, waste of resources, contrary to the original intention of sharing; 5, There are also some projects that are completely designed to attract attention, hype, and hot-points, and they have no intention of success from the beginning. The authors believe that there are indeed many problems in various transformation modes. But in terms of various internal and external factors, the authors believe that the core problem is: All the third type of sharing economy that transforms personal ownership into a platform ownership model, whether it is expensive to jewelry, clothing, bicycles or strollers, or cheap folding stools, basketball, umbrella or power bank. Because the platform wants to quickly seize the market with capital for owning resources, so at present none of them is satisfactory to investors. Because capital is for the purpose of profit, reflects the capital's "selfish" world view, "insatiable" values. Venture capital is a double-edged sword, do not rely on it, and cannot quickly occupy the market, but once kidnapped, it is a short-sighted tool to make money. Often in the name of the public, startups are actually more concerned about beautiful data. All to-go-public as the ultimate goal, once successful, either lose morale, or become a track for a larger capital game. For the moment, the commercial scale of the third type of sharing economy model is simply not in the eye of capitalists, so the current downturn in the sharing economy is more normal. If you want to comprehend the sharing economy now, it is difficult to find such books in physical bookstores. And if you buy new books online, many of them are discounted by two percent.

Conclusion

1. Through the two sets of words "own and use" and "exclusive, shared and sharing", the complex economic model is simply described into three models related to the sharing economy: the first type of traditional

shared resources model; The second type of sharing personal idle goods mode; The third category transforms individual ownership into platform ownership.

2. The first type of traditional shared resources model also belongs to the category of shared economy, and has existed in ancient times. Although it needs to allocate heavy assets and will be affected by the new economic model, it can be predicted that it will still have vitality in the future for a long time.

3. The second type of sharing personal idle goods model is a new kind of economic model generated by the age of information and the Internet, but it can only be called "shared". With the intensification of competition, its greedy nature will be revealed. Whether it can control the monster is unknown, but it is certain that this model is not the shared economy.

4. The third category, transforming individual ownership into platform ownership, is a valuable experiment in the shared economy, but it has failed. The root of the problem is to try to build a platform for sharing economy under the logic of shared economy. Because it does not have the strength of the traditional shared resource model, the operation model of quick success has prematurely destroyed the lives of countless startup companies.

5. With the development of society, people have realized that the traditional way of life and economic model can no longer make the society develop in a more sustainable direction. Human beings need to explore new ways of life and economic models. It is not that everyone must own first in order to use, but a new sharing economy model with common ownership and shared use can be explored. Given space constraints, who, at what stage in life, should try to use only rather than own? What types of things will they use? What is a new sharing economy model that can fulfill the above needs? We will gradually share our thinking and practice with you in the future.

References

Alvin E Roth(2015). Sharing economy-market design and its application (Fu Shuaixiong, Trans). Machinery Industry Press.

Cao Lei, Chai Yanfei, Shen Yunyun, Cao Dingzhe (2015). Uber-opening the era of "sharing economy". Machinery Industry Press.

Chen Fengdi, Liao Pingping. (2022). Characteristics, problems and countermeasures of the development of the sharing economy - based on the perspective of changes in production relations. Asia-Pacific Economy (04), 125-133. doi:10.16407/j.cnki.1000-6052.2022.04.007.

Craig Lambert(2016). Free - How is work redefined in the era of the sharing economy? (Meng Bo, Li Lin, Trans). Guangdong People's Publishing House.

Curtis, S. K. (2021). Business model patterns in the sharing economy. Sustainable Production and Consumption, 27, 1650-1671.https://doi.org/10.1016/j.spc.2021.04.009

Don Peppers, Martha Rogers (2014). Sharing economy-how to achieve a win-win situation for employees and customers in the Internet era (Qian Feng, Trans). Zhejiang University Press.

Dong Xiaosong, Huo Yifan, Zhao Xing. (2023). Sharing economy sustainability evaluation: social perception and objective performance. Scientific Research Management (01), 79-88. doi:10.19571/j.cnki.1000-2995.2023.01.009.

Guo Zede (2016). Sharing economy-origin + motivation + future. Beijing United Publishing Company.

Jiang Qiping (2017). Sharing economy-political economics of monopolistic competition. Tsinghua University Press.

Koji Mitani (2015). The complete history of business models (Ma Yunlei, Du Junlin, Trans). Jiangsu Phoenix

Culture Publishing House.
Ling Fafa (2017). Sharing economy-redefining the future. Chongqing Publishing House.
Ma Huateng et al. (2016). Sharing economy-new economic plan for supply-side reform. CITIC Publishing Group.
Ni Yunhua, Yu Zhongyi (2015). The general trend of sharing economy. Machinery Industry Press.
Rachel Botsman, Roo Rogers (2015). Sharing economy era-collaborative consumption business model under Internet thinking (Tang Chaowen, Trans). Shanghai Jiao Tong University Press.
Raul Heyne, Peter Boettke, David Prychitko (2023). The way of thinking in economics (Lu Xuexu, Trans). Zhejiang Literature and Art Publishing House.
Robin Chase(2015). Sharing economy-reconstructing new business models for the future (Wang Rui, Trans). Zhejiang People's Publishing House.
Stanley L, Brue Randy R, Grant (2014). History of Economic Thought (Di Xiaoyan, Trans). Peking University Press.
Steven Hill(2017). Economic Singularity-Sharing Economy, Creative Destruction and Future Society (Su Jingchun, Trans). CITIC Publishing Group.
Tom Slee(2017). What the sharing economy doesn't tell you (Tu Qi, Trans). Jiangxi People's Publishing House.
W, Brian Arthur(2023). Complex Economics (Jia Yongmin, Trans). Zhejiang Science and Technology Press.
Zhang Xianhua (2016). Comprehensive report on corporate information disclosure in the era of sharing economy. Economic Science Press.
Zhang Xinhong, Yu Fengxia, et al. (2019). 100 Questions about the Sharing Economy. Party School of the Central Committee of the Communist Party of China Press.
Öberg, C. (2023). Towards a typology of sharing economy business model transformation. Technovation, 123, 102722. https://doi.org/10.1016/j.technovation.2023.102722

Shanshui Architecture: An Evolution of Tradition?

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Abstract

Since the beginning of the 21st century, a large number of Chinese architects have started to engage in architectural creation and discourse construction centered around the theme of traditional Chinese 'shanshui' culture. This raises three related questions: first, can 'shanshui architecture' be used to summarize the phenomena that have already occurred as a 'trend'? Second, how did 'shanshui culture' become the intrinsic gene of 'shanshui architecture'? Third, what is the significance of 'shanshui architecture' for the future construction of China's discourse system? This article examines the overall historical evolution from 'shanshui culture' to 'shanshui city' to 'shanshui architecture' from the perspectives of shanshui concepts, shanshui images, and shanshui gardens. The research finds that the contemporary Chinese 'shanshui architecture' trend has preliminary theoretical conditions and has accumulated the potential to trigger a movement of Chinese shanshui architecture, thereby contributing to the construction of a contemporary Chinese architectural discourse system with genuine Chinese cultural genes.

Author keywords

Shanshui Architecture; Shanshui Culture; Shanshui City; Shanshui Garden; Architectural Trend.

Introduction : "Shanshui" has become a key term in contemporary Chinese architecture.

Since the beginning of the 21st century, a large number of contemporary Chinese architects have begun to explore and practice contemporary Chinese architecture with the relationship between architecture and nature as a clue, one of the keywords being "shanshui". Architectural creations themed around "shanshui" are presenting an increasingly recognizable appearance. Represented by a group of important contemporary architects and scholars such as Wang Shu, Zhang Yonghe, Liu Jiakun, Ma Yansong, Zhu Pei, Amateur Architecture Studio, Li Xinggang, Dong Yugan, etc., although their individual cases vary in function, type, form, and style, and have not yet been clearly summarized as a school or trend, the citation and transformation of traditional shanshui thought resources have become a cultural attitude and underlying logic that they commonly pursue. At the same time, a new generation of architectural historians and theorists, such as Feng Shida, Li Xiangning, Lu Andong, Jin Qiuye, Wang Xin, and architects who are also engaged in theoretical writing, such as Wang Shu, Zhang Yonghe, Dong Yugan, Ge Ming, Gu Kai, etc., have all conducted necessary in-depth thinking on certain specific themes and topics of "shanshui" architecture.

In response to the current changes, can we use "shanshui architecture" to summarize them as a "trend" or "theoretical summary"? If so, how can we trace back from a historical dimension how the "shanshui tradition" became the cultural gene and academic path of the "shanshui architecture" trend? How to judge the national

significance of "shanshui architecture" for the future construction of China's discourse system? If not, under what conditions can "shanshui architecture" be called a trend or theory? What do we already have, and what do we still need to build? This article will make broad-brush considerations on these issues through historical sorting: first, it examines the three levels of traditional Chinese shanshui culture: shanshui concept, shanshui image, and shanshui garden; then it examines the three dimensions of modern Chinese shanshui city: modernization dimension, human settlement dimension, and architectural dimension; finally, it examines the internal contradictions and tensions of contemporary shanshui architectural theory discourse, as well as judgments on the revelations for the future.

1. The Three Levels and Evolution of Shanshui Culture

1.1 The Rise and Evolution of Shanshui Concept

The "Shanshui Concept" in China can be traced back to the ancient worship of mountain and water deities. Natural landscapes were important objects of worship before the Qin Dynasty, and the worship of these landscapes also gave rise to the concept of the relationship between humans and nature. For example, Laozi's philosophical view of "Man follows the earth, the earth follows the heaven, the heaven follows the Dao, and the Dao follows nature" suggests that nature here is not only the natural world that is not human, but also carries the meaning of being free and natural. Confucius' saying "The wise find pleasure in water; the virtuous find pleasure in mountains" became an important concept influencing the aesthetics of nature in later generations, embodying the ancient Chinese philosophical view of "unity of man and nature" and summarizing the main spirit of ancient Chinese aesthetic culture. There is also Zhuangzi's aesthetic way of "body and object transformation". During the Wei Jin, the literati of the gentry class often traveled to mountains and rivers, chanting poems, practicing Zen, and discussing metaphysical principles, giving birth to landscape poetry and landscape painting. In this period, the relationship between humans and nature evolved from religious worship to philosophical contemplation and then to cultural aesthetics, and natural landscapes began to become independent aesthetic objects. Poets like Tao Yuanming and Xie Lingyun have already used landscapes as objects of cultural aesthetics and ideal sustenance, and people began to infuse personal ideals into the Dao of landscapes and nature, seeking a space for spiritual habitation.(Ninggao, 1991) This shift in aesthetic approach has opened up new dimensions for the development of shanshui imagery and shanshui gardens.

1.2 The Rise and Evolution of Shanshui Imagery

The "Shanshui Imagery" can be traced back to the ancient maps depicting geographical landscapes and cityscapes, from the early "man is greater than the mountain" to the Southern Dynasty Zong Bing's landscape painting theory "Painting Shanshui Preface" proposing "to charm the Dao with form", "reclining travel", and "unleashing the spirit" as markers, giving shanshui painting an independent aesthetic character. During the Sui and Tang Dynasties, shanshui painting matured, and blue-green shanshui and ink shanshui pushed shanshui painting to new heights. During the Northern Song Dynasty, Guo Xi's " The Lofty Message of Forests and Streams" proposed the "three distances method" of "high distance, deep distance, and level distance", pioneering the observation of landscapes and scattered point perspective. Through multiple viewing methods such as looking up, looking straight, and looking down, he defined the spatial composition and formal principles of landscape painting. The shanshui painting not only needs to be walkable and viewable in form, but also needs to have a sense of space, so that literati and scholars can live in it and travel leisurely, in order to entrust the realm of seclusion in the mountains and wilds. By the Ming Dynasty, literati paintings of ink shanshui emphasized "painting with poetry, painting with books, and painting with Zen", pursuing pleasure rather than resemblance. The brush and ink of landscapes are separated from "object meaning" and seek "heart

meaning", becoming the expression of the painter's spirit.(Cahill, 2009) Gu Kai of Southeast University School of Architecture believes that Dong Qichang's shanshui painting can be regarded as the recognition of "gardening and painting interconnected" and "painting is gardening" in the literati concept. (Kai, 2010) Shanshui painting, as a thought experiment for gardening activities, will continue to stimulate the practice of shanshui gardens and foreshadows the intertwined relationship between shanshui culture and architectural practice in the 21st century.

1.3 The Rise and Evolution of Shanshui Gardens

The development of "Shanshui Gardens" can be traced back to a thousand years ago, the "Book of Poetry" has descriptions of the Lingtai and Lingzhao at the end of the Shang Dynasty. From the Qi Garden built during the Western Zhou Dynasty, to the gardens of the lords during the Spring and Autumn Period, to the gardens of the Qin and Han Dynasties, all have "mountains, stones, trees, and ponds, terraces and pavilions", and have the basic form of a shanshui garden. During the Liu Song period, with the emergence of shanshui poetry and painting, the literati also pursued natural shanshui gardens, with the reproduction of natural landscapes as the aesthetic pursuit, "as if natural". By the Tang Dynasty, the aesthetic of landscape culture had become the lifestyle of the literati. Wang Wei built the Wangchuan Villa shanshui garden, wrote the "Wangchuan Villa" shanshui poem, and painted the "Wangchuan shanshui painting". From Wang Wei, we can see the mutual penetration and combination of the literati's poetry, painting, and garden building under the influence of shanshui thought. During the Song and Yuan Dynasties, from Su Shi's management of the "West Lake" and repair of the "Su Causeway", to Chao Wujiu's "Returning Garden", literati and painters built gardens, "reaching the peak". By the Ming and Qing Dynasties, shanshui gardening had transformed into being mainly presided over by professional garden builders, such as the earliest recorded professional garden builders Lu Die Shan, Ji Cheng, Zhang Nan Yuan, and others. Although literati painters still participated in garden building, they gradually transformed into depicting and expressing gardens, such as Wen Zhengming's "Humble Administrator's Garden Painting Song", Shen Zhou's "Dongzhuang Painting", etc., and the shanshui garden itself became the aesthetic object of literati painters. After the death of Ge Yuliang, the garden builder of the greatest stacked mountain in the shanshui garden, the Opium War broke out, marking the end of ancient Chinese history, and the art of shanshui gardening also declined and was interrupted. (Xun, 2019)The subsequent revival of shanshui gardens will intervene in the contemporary architectural system in multiple dimensions such as cities, habitats, and architecture.

2. The Rise and Development of Shanshui Cities: Discontinuity and Continuity

The frequent wars in the early 20th century and the construction of the national state during the Republic of China period led to a structural decline in traditional shanshui culture, but its ideological genes still exist. Liang Sicheng represents the discontinuous continuity of the official system, while Tong Jun and Liu Dunzhen's garden research in the 1930s represents the discontinuous continuity of the literati system. In the late 20th century, shanshui culture achieved new developments in the dimension of shanshui cities, manifested as three distinct and continuous paths represented by Qian Xuesen, Wu Liangyong, and Ma Yansong.

2.1 Qian Xuesen's Shanshui City: Urbanization of Shanshui

In the 1950s, Qian Xuesen started with garden studies, and by the 1990s, he proposed the concept of shanshui city, linking the future urban development model with the concept of shanshui gardens. (Mengchao, 2000) In his letter to Wu Liangyong on July 31 of that year, Qian Xuesen mentioned, "I have been thinking about a question in recent years: Can we integrate Chinese shanshui poetry, Chinese classical garden architecture, and Chinese shanshui painting to create the concept of 'shanshui city'? In this way, people can leave nature and

return to nature." (Shixing, 2000)Qian Xuesen proposed that China's urban construction should turn the city into a super-large garden, a man-made shanshui, that is, a "shanshui city", which promoted the "Shanshui City Discussion Meeting", prompted Chinese architecture to reflect on various problems of modern architecture and urban development models, and continued the ideological resources of China's traditional shanshui culture for thousands of years, becoming a beneficial exploration in response to the theme of the times. The proposal of Qian Xuesen's shanshui city concept also provides a theoretical reference for the future practice of architects such as Wu Liangyong and Ma Yansong.

2.2 Wu Liangyong's Shanshui City: Humanization of Shanshui

Wu Liangyong believes that shanshui city and human settlement environment research have a common pursuit, discussing not only aesthetics, but also a series of issues such as ecology, cultural context, and urban development.(Liangyong, 2003) In addition to the above understanding of "shanshui", there is also the "Art of Shanshui", which is a comprehensive feng shui theory that combines geography, meteorology, landscape studies, ecology, urban architecture and other aspects, emphasizing the philosophical view of "unity of man and nature", studying the natural shanshui orientation, defining the geography of rivers and mountains, urban site layout, village and town residential planning, which is a knowledge that combines philosophy and aesthetics. Large-scale cities or architectural groups in ancient China were all completed under the guidance of this "Art of Shanshui" feng shui theory. Wu Liangyong's research on the living environment is comprehensive, and shanshui culture is incorporated into the research system of contemporary architecture.

2.3 Ma Yansong's Shanshui City: Architecturalization of Shanshui

From Qian Xuesen's shanshui city, to Wu Liangyong's human settlement studies, to Ma Yansong's architectural manifesto "Shanshui City" published in 2014. The transformation from the discontinuity of architectural studies to the practice of contemporary architectural studies has been completed. Ma Yansong further thought and explored the concept of shanshui city along Qian Xuesen's line of thought. He believes that the idea of shanshui city is a call for natural life, which comes from a spiritual guidance. He believes that classical cities are about gods, modern cities are about capital and rights, and future cities should be about people and nature. This is the concept of "shanshui city" proposed by Ma Yansong.(Yansong, 2014) Ma Yansong's shanshui city directly points to contemporary practice, opening up new practical dimensions for the intertwining of shanshui culture and contemporary architecture.

3. Shanshui Architecture's Diverse Practices and Internal Tensions

3.1 Diverse Practices of "Shanshui Architecture": Analysis of Four Paths

If the development of shanshui culture since the Qin and Han dynasties has a vague correlation with the medium or carrier, the earliest appearance is the non-material shanshui of thought, such as the philosophical views of Confucius and Laozi, followed by shanshui poetry and shanshui painting in the form of painting, and then the material shanshui garden. Qian Xuesen's concept of shanshui city further magnifies the material scale of shanshui to a larger artificial environment, and shanshui architecture as a medium-scale material shanshui being discussed and defined is an inevitable result, making shanshui city, shanshui garden, shanshui image, and shanshui concept all converge into the contemporary "shanshui architecture" trend within the architectural profession.

Dong Yugan: The Path Mainly Based on Shanshui Gardens

Shanshui gardens have the most direct impact on contemporary architects, such as Dong Yugan's "Modernity of Gardens", all draw inspiration directly from shanshui gardens. Dong Yugan believes that Western architectural studies are centered on the architectural entity, while in China's shanshui gardens, the relationship between

architecture, nature, and people becomes the focus, so it can break away from the integrity of architecture, architectural proportions and other issues, and reopen the imagination of space. (Yugan, 2006)Dong Yugan's Qingshui Clubhouse, Red Brick Art Museum and other practical works draw inspiration from shanshui culture, focusing on the shanshui experience of people in them, but it is difficult to directly judge the relationship between its architecture and shanshui from the appearance. In the research field, Ge Ming takes "garden as a method", uses the tree-stone structure of the garden as a way to study space, and summarizes the "Six Rules of Gardens".(Ming, 2015) Tong Ming believes that we need to "look back at the garden", because the significance of shanshui culture to contemporary architecture is not only to create a realm, but also to rethink the cognition of the living environment. Shanshui gardens, as a method, also influence the practice and research of contemporary architecture, and the same is true for shanshui imagery.

Wang Shu: The Path Mainly Based on Shanshui Imagery

In 2012, Wang Shu published "We are in Need of Reentering a Natural Philosophy", proposing to "rebuild a contemporary Chinese local architectural studies", advocating the human geography of the natural way and "mountain" "water" as the poetic background, (Shu, 2012)his representative work Ningbo Museum's "Big Mountain Method", China Academy of Art Xiangshan Campus "architecture occupies half, nature occupies the other half" layout, all reflect that Wang Shu's thinking about shanshui culture has deeply penetrated into his practice. Wang Shu's "Return to the Way of Nature" was inspired by shanshui gardens, and was also greatly influenced by shanshui paintings. In addition to Wang Shu, shanshui imagery also influenced a large number of architects' works including Da She's "Sensitive Urbanity", Li Xinggang's "Scenery and Geometry", and Wang Xin's "An Architecture Towards Shanshui" teaching research. Wang Xin's " Arcadia" teaching is a shanshui thought experiment. Traditional shanshui paintings have always stimulated garden practice, and in contemporary times, Wang Xin uses the method of "paper garden" to try to keep shanshui culture always parallel and complementary to architectural practice. (Xin, 2016)Shanshui imagery and shanshui gardens "communicate with each other in gardens and paintings", jointly promoting the experimental and experiential nature of contemporary architecture, while the impact of shanshui concepts on contemporary architecture is different.

Zhu Pei: The Path Mainly Based on Shanshui Concept

Shanshui concept has influenced many architects, represented by Zhu Pei's "Natural Architecture", who pay more attention to the environment and the rules and attitudes behind construction. The architecture influenced by shanshui culture shows a diverse focus on ecology, form, space, environment, and construction logic. Different from the pursuit of shanshui experience or shanshui form, Zhu Pei's "Natural Architecture" pursues an architectural attitude influenced by climate, natural environment, and traditional factors. It is difficult to experience a direct relationship with Chinese shanshui from its architectural space, and it does not focus on the shaping of shanshui form. Xin Saibo believes that Zhu Pei's "Natural Architecture", in addition to the dimension of natural ecology, points more to the Taoist "natural" shanshui construction philosophy. (Saibo, 2021)If shanshui gardens and shanshui imagery pay more attention to the spatial experience of architecture, and the architecture influenced by shanshui concepts pays more attention to the construction logic and attitude of architecture, then the architecture of Ma Yansong under the influence of shanshui city pays more attention to the shanshui form of architecture. The analysis of shanshui experience, shanshui form, and shanshui construction only focuses on some aspects of the architect's works, and the practice works in reality involve more complex and diverse dimensions of shanshui culture.

Ma Yansong: The Path Mainly Based on Shanshui City

Different from the experiential shanshui architecture, Ma Yansong's architecture obviously has more shanshui

form. He believes that the architecture of shanshui form is an organism that generates emotional connections between nature and people, and is a call to nature and life. Gu Mengchao believes that Ma Yansong's formulation accurately grasps the tradition of Chinese shanshui architecture, and shanshui is man-made second nature. However, when Zhang Yonghe once evaluated Ma Yansong's shanshui-shaped architecture, he believed that its form was superficial. Li Xiangning believes that Ma Yansong's large-scale, high-density man-made shanshui city is a rebellion, resisting the rapid urbanization status quo with the pursuit of shanshui nature, (Xiangning, 2014) while Wang Mingxian believes that Ma Yansong's shanshui city concept is a imaginative prophecy for the future city. (Mingxian, 2014) The four contemporary architectural practice paths of shanshui culture, including Ma Yansong's shanshui city, have created a new situation for Chinese architectural studies that is completely different from the 20th century Chinese architectural studies.

3.2 The internal tension of "Shanshui Architecture": Wang Mingxian's question

Wang Mingxian's question: Ancient and modern, East and West.

In 2014, Wang Mingxian pointed out in the article "a Conversation with the Nature: Righteousness ought to be included in discussion of future urban culture" that since the first modern architectural work "Building Construction" was published in China in 1910, China's modern architecture has a history of more than 100 years. However, in the 20th century, Chinese architectural studies did not propose architectural thoughts with global influence, and the Chinese architectural community did not appear similar to Japan's "Metabolism" movement that had a significant impact on world architectural studies in the 1960s. (Mingxian, 2014) In response to the critical question raised by Wang Mingxian from the macro perspective of Eastern and Western cultures on Chinese architectural studies, we should start from the current situation of architectural practice and research of contemporary shanshui culture and try to make a preliminary response. Although Chinese architectural studies did not appear to have a significant impact on the architectural movement in the 20th century, since the 21st century, a large number of contemporary Chinese architects and scholars have shown a common cultural consciousness and the underlying logic of creation, and have already had a considerable range of influence and intellectual depth. So how should we define the practice and creation of such a group of architects and scholars? The author is willing to summarize it as a "shanshui architecture" trend.

Shanshui Architecture has risen as a Recognizable Trend

The exploration of "Shanshui Architecture" began to emerge in the 1990s, and in the past decade of many architectural theories and creative practices, it has gradually developed into a focused research topic. Shanshui architecture has risen as a recognizable trend in future Chinese architectural studies and has accumulated the energy that may give birth to the Chinese shanshui architectural movement. Shanshui architecture not only has a wide cultural impact due to its large number of creations on the theme of shanshui, making it comparable to the architectural trends of other countries in the world; also because shanshui culture has a profound accumulation spanning thousands of years in China, and it has had an extremely wide-ranging impact in the fields of Chinese thought, culture, art, and construction., contemporary shanshui architecture as a continuation of the development of shanshui culture for thousands of years, so its internal cultural driving force is inexhaustible, Chinese shanshui architectural trend will have a more lasting cultural vitality.

Conclusion: From shanshui culture, to shanshui city, to shanshui architecture

The trend of shanshui architecture has gone through the evolution from shanshui culture to shanshui city and then to shanshui architecture. If the creations of a large number of contemporary architects and scholars about "shanshui" are interpreted as a design flow, there is no doubt that its source comes from the shanshui culture that has been around for thousands of years. The intellectual resources and cultural drive of contemporary

"shanshui" architectural creation all come from this. The rise and development of shanshui architecture will trigger a transformation in Chinese architectural studies, refining the standards and special creative principles of Chinese architectural language, and will transform the academic and disciplinary system mainly inherited from Western architectural studies into a truly constructed contemporary Chinese architectural discourse system with Chinese cultural genes and measured by Chinese culture. Once such a system is established, it will provide important support for shaping and disseminating China's unique cultural discourse from the perspective of architectural studies, and provide China's thoughts and insights for the world in the intertwined global changes.

References

Cahill, J. (2009). The Distant Mountains: Chinese Painting of the Late Ming Dynasty (1570-1644). Joint Publishing.

Kai, G. (2010). Establishment of picturesque principle for gardens and transition of garden-making in the late Ming. Architectural Journal(S1), 127-129.

Liangyong, W. (2003). Humanistic Reflection on Environment Science of Residence of Human being. URBAN DEVELOPMENT STUDIES(05), 4-7.

Mengchao, G. (2000). On Qian Xuesen and City with Hills and Watersas well as Architecture Science. Architectural Journal(07), 12-13+74.

Ming, G. (2015). Notes on the Wei Yuan Garden. Architectural Journal, 12, 35-37.

Mingxian, W. (2014). A conversation with the nature: Righteousness ought to be included in discussion of future urban culture. In Shanshui City (pp. 196-199). Guangxi Normal University Press.

Ninggao, X. (1991). The Origins and Profoundness of Chinese Shanshui Culture. Chinese Landscape Architecture(04), 15-19.

Saibo, X. (2021). A Spontaneous Construction Analysis of the Architectural Design of the Jingdezhen Imperial Kiln Museum. Time Architecture(01), 88-99. https://doi.org/10.13717/j.cnki.ta.2021.01.016

Shixing, B. (2000). Qian Xuesen and Shan-shui City. URBAN DEVELOPMENT STUDIES(06), 15-20+80.

Shu, W. (2012). We are in need of reentering a natural philosophy. World Architecture(05), 20-21. https://doi.org/10.16414/j.wa.2012.05.004

Xiangning, L. (2014). Nonlinear Utopia: Ma Yansong's Architecture Practices. In Shanshui City (pp. 192-194). Guangxi Normal University Press.

Xin, W. (2016). Architecture require picturesque "Guanfa". Archicreation(04), 170-185.

Xun, C. (2019). Chinese Gardening Art. Beijing Publishing Group.

Yansong, M. (2014). Shanshui City. Guangxi Normal University Press.

Yugan, D. (2006). Diluted Chinese Stle. Time Architecture(03), 28-35.

Research on China's Industrial Design Trends in the Context of "China-Chic"

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Abstract

Currently, China finds itself in the midst of a significant transformation, transitioning from a state of mid-industrialization to a post-industrialized landscape. This shift has made increased investment in industrial design an imperative necessity. A noteworthy concept, known as "China-Chic," has emerged, denoting Chinese products that bear distinct Chinese characteristics. These products are aligned with contemporary aesthetics and technological trends, showcasing China's self-expression on an international stage.

This paper undertakes a comparative examination of the evolutionary trajectories of industrial design styles imbued with national identity in various countries. The study concludes that the essence of industrial design with Chinese attributes should stem from the fusion of traditional culture and modernity. To uncover this nexus, the paper employs co-occurrence analysis, offering insights that can contribute to the development of Chinese industrial design styles endowed with national uniqueness within the overarching framework of "China-Chic."

Introduction

In the present era, generating and implementing innovative ideas is of paramount importance. China has emerged as the world's largest industrialized nation. In the seven decades since the founding of the People's Republic of China, it has established the most comprehensive industrial system globally. The production of major goods ranks among the world's highest, fostering increased international competitiveness and securing its position as the world's leading exporter for many years. Often referred to as the "world's factory," China has exported a substantial volume of manufactured goods, significantly elevating living standards worldwide, including within China itself. However, over the past few decades, due to the relatively modest starting point of Chinese industrial design, China has often exported inexpensive industrial products that closely mimic foreign counterparts. This has led to a perception that "Made in China" is synonymous with low-cost, imitative products.

In the current era marked by rapidly shifting international dynamics, China's consistent economic growth across the entire industrial spectrum, coupled with remarkable technological advancements, has led to an enhanced sense of well-being, personal fulfillment, and national identity, particularly among the younger generation. Within the realm of culture, there is a growing demand for works that propagate Chinese values and products that embody Chinese aesthetics. Concurrently, the advent of technologies like big data, artificial intelligence, and drones promises revolutionary changes in China's industrial design landscape. In response, the concept of the "China-Chic" has emerged. Initially, before 2018, the term " China-Chic " narrowly referred to niche brands crafted by local trend designer. However, post-2018, the concept expanded to encompass Chinese products

characterized by Chinese attributes, adhering to contemporary aesthetics and technological trends, while projecting a self-assured international perspective (Institute for Culture Creativity, Tsinghua University, 2019). In this new historical phase, "China-Chic" design is expected to exhibit high aesthetic and cultural qualities, serving as a national emblem reflecting Chinese characteristics as Chinese industrial products make a global impact.

Industrial Design through a Cultural Perspective

The anthropologist Malinowski described culture with a vast apparatus of material, human, and spiritual layers (1944). He asserted that material culture is the most immediately observable aspect of culture, shaping a culture's level of development and work efficiency. However, he also posited that material possessions alone, devoid of the spiritual component, are devoid of life and utility. The utilization of artifacts entails the acknowledgment of values, representing the spiritual dimension. Artifact consumption necessitates collective cooperation, subsequently influencing the organizational facet of culture. F. Graebner, a German scholar affiliated with the transmissionist school of cultural anthropology, proposed an intriguing concept known as the "cultural wave" (Lin, 1991). The enigmatic "cultural wave" can be viewed as a phenomenon wherein geographically distant cultures come into contact with each other due to human needs for material goods and affluence. With each exchange of goods, the costs may decrease and potential profits rise, yet this interaction simultaneously raises awareness of the existence of other cultures.

Industrial products, as products of industrial civilization, often serve as conduits for cultural dissemination due to their worldwide circulation and significant impact on lifestyles. During China's semi-colonial and semi-feudal era in 19th century early 20th century, industrial products like textiles, thermos flasks, matches, bicycles, and then automobiles, trains, and ships entered the country one after another. These products constituted early means through which the Chinese populace gained exposure to the world beyond its borders. Post-World War II, the United States utilized industrial products as vehicles for exporting American values and lifestyles globally, including Europe. "Fridge , washing machine , television set and automobile , each were symbols of yet another step having been taken towards the middle class (Tumminello,2011)". America's industrial design, exemplified by streamlined design, broadcast its leadership in industry to the world. In these cross-cultural interactions, people often initially embrace the material achievements of industrial civilization. They subsequently adopt the lifestyle shifts it engenders and eventually internalize the aesthetics and values it represents. Over the last century, the widespread dissemination of culture has been substantially driven by the spread of modernization, closely accompanied by the proliferation of modern transportation and industrial products. Thus, industrial design constitutes an exceptionally potent vehicle for cultural diffusion.

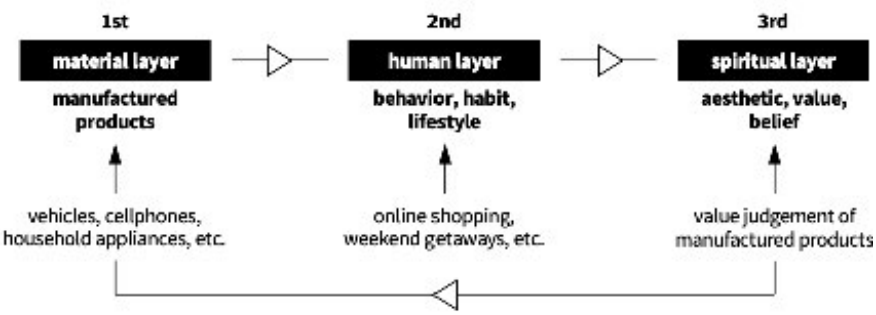

Figure 1. Process of culture dissemination through industrial design.

Following the introduction of the "Belt and Road" policy, Chinese high-tech products like high-speed rail, new energy vehicles, cell phones, and smart homes have expanded globally, serving as symbols of "Chinese modernization" and potent mediums for conveying China's narrative and voice. These products are transforming the perception of Chinese-made goods, moving away from the stereotype of being cheap and of low quality. Consequently, industrial design, within the context of the "China Chic, " is expected to be visionary and pioneering while simultaneously remaining recognizable and accessible, encapsulating the Chinese aesthetics and values.

A notable phenomenon in cultural communication is the prevalence of ethnocentrism, where each culture tends to employ its own cultural values as a lens to observe and judge others, often seeking dominance over other cultures. However, when industrial design is utilized as a platform for cultural dissemination, due to the varied perspectives of businesses on consumers, it becomes more accessible to foster what we may call "reciprocal understanding." This form of understanding is rooted in dialogue and cooperation, enabling us to transcend cultural biases and the inclination to view other cultures merely as sources of knowledge, comprehension, and interest fulfillment.

Background to the Emergence of Chinese-style Industrial Design

Huang Qunhui, in his article "China's Industrialization Process: Stages, Characteristics, and Prospects," contends that China's industrialization is currently transitioning towards service-oriented manufacturing (2013). This transition necessitates increased involvement of service elements such as industrial design, accounting, law, finance, in the product manufacturing process. Furthermore, Huang Qunhui postulates several characteristics of China's industrialization process: 1.China's industrialization occurs within the context of a vast population, exceeding the combined populations of all industrialized countries and regions; 2.China's industrialization is characterized by sustained rapid growth, a feat few countries worldwide have maintained over an extended period; 3.China's industrialization predominantly follows a low-cost, export-oriented model, with affordable Chinese products permeating nearly every corner of the globe.

The aforementioned characteristics of China's industrialization create exceptionally unique circumstances for the advancement of Chinese industrial design. Within China, designers confront an expansive market of unprecedented scale, unparalleled in many respects. Industrial products are being both manufactured and consumed in staggering quantities. Moreover, in the context of rapid industrialization, efficiency has emerged as the linchpin for enterprise survival. The design process itself now unfolds at a significantly accelerated pace, often completing in merely half or even one-third of the time compared to foreign counterparts operating within the same industry. Furthermore, Chinese designers contend with an exceptionally diverse and intricate consumer landscape. The demands of consumers vary not only across different countries but also within distinct regions of the same nation. These unique features provide distinctive opportunities and challenges for the evolution of industrial design in China.

Analysis of Nation-Specific Industrial Design Styles

Over the course of more than a century of industrial design evolution, numerous countries have cultivated distinct industrial design styles, each uniquely tied to its historical and socio-economic context. Examining the genesis of these styles, it becomes evident that industrial design is intricately interwoven with technological advancements, economic progress, societal dynamics, and prevailing lifestyles. One can argue that these styles themselves are the outcomes of the confluence and fusion of these multifaceted factors.

The German industrial design style, for instance, began taking shape during the 1910s through the "Working

Alliance." It matured during the 1930s, notably in the era of "Bauhaus" design. Subsequently, it was perpetuated by industrial design luminaries such as Dieter Rams after World War II. This evolution of style became inextricably linked to the emergence of modern industrial production paradigms. Figures like Gropius, a pioneering force in modern design in Germany, championed a design ethos that prioritized service to society as a whole rather than serving a privileged few. Concurrently, the adoption of standardization and mass production techniques significantly reduced costs, allowing the broader public to partake in the fruits of the industrial revolution. Hence, the German industrial design style distinctly adheres to a "de-decorative" tradition, consistently emphasizing principles such as "less is more" and "form follows function." Dieter Rams' "Ten Principles of Good Design" in the 1970s aptly encapsulates this tradition. Given its compatibility with modern production methods, this design philosophy transcended national boundaries, gradually coalescing into an "international design style."

In stark contrast, the American industrial design style was profoundly influenced by consumerism. Figures like Raymond Loewy famously asserted that " he most beautiful curve is a rising sales graph." Designers during this formative era believed in the maxim "form follows market" as opposed to "form follows function." Consequently, American design during this period often exhibited a penchant for ostentation. For example, the "streamlined style" became emblematic of American industrial design, thanks to its superb aerodynamic attributes. Originally applied to vehicles like cars, airships, and trains due to their aerodynamic benefits, streamlining gradually found its way into products with no aerodynamic requirement, such as lamps, telephones, and irons. Here, the emphasis shifted from practicality to formality, highlighting the products' aesthetic allure. Post-World War II, a plethora of American industrial products were exported globally. Consumers often acquired these products not solely for their functionality and cost-effectiveness but also because they epitomized the American way of life through their distinctive forms. The 1960s marked a period of reevaluation of consumerism-based styling, though market-oriented industrial design processes and standards continued to exert a profound influence worldwide.

The Japanese industrial design style crystallized after World War II, flourishing during Japan's rapid industrialization. To adapt to Japan's high population density, intense urbanization, and fast-paced urban life, Japanese industrial products embraced simplicity, compactness, portability, and multifunctionality. Additionally, Japanese industrial design strongly reflects traditional aesthetics. Influenced by Shintoism's reverence for nature, Buddhism's embrace of emptiness, and Taoism's notion of nothingness, Japan fostered a "wabi-sabi" aesthetic (Wang, 2015). This ethos champions simplicity, serenity, naturalness, and unadulterated beauty—coinciding seamlessly with the modern design principles of simplicity, de-decorativeness, and "less is more." Concurrently, the clamor of urbanized life amplified the demand for natural elements and materials in everyday life. The fusion of these elements birthed the distinctive aesthetic essence of Japanese industrial design.

From these case analyses, it becomes evident that the development of nation-specific industrial design styles stems not exclusively from the nation's traditional culture and unique aesthetics but results from their intricate entanglement with modernity. During the trajectory of industrial design's evolution, elements of national culture and traditional aesthetics collide and amalgamate with modern influences, such as mass production, consumerism, and urban living. Elements compatible with modernization are assimilated and magnified, finding their way into industrial product design and daily life. In contrast, elements incompatible with modernization become part of a nation's cultural heritage, often preserved in documentaries and museums. The establishment of a nation's distinct industrial design style typically necessitates a comprehensive modernization process.

Exploring the Intersection of Traditional Chinese Culture and Trends in Chinese Industrial Design through "Co-

word Analysis"ountries that have

Co-word analysis, or keyword co-occurrence analysis, is a method employed to uncover the intricate semantic connections between keywords within a particular domain of knowledge. This approach hinges on evaluating the frequency and centrality of keywords within the existing literature. Consequently, it aids in identifying overarching research themes and discerning areas of consensus or divergence within a given subject or field. Based on a scientometric analysis conducted using CiteSpace, we present the top 10 high-frequency co-occurring keywords within the realm of "traditional culture" and "industrial design" in Chinese academia between 2000 and 2023. These keywords are organized by five-year intervals as follows:

Table 1. Co-occurring keywords within the realm of "traditional culture" and "industrial design" in Chinese academia between 2000 and 2023

Year	Top 10 high-frequency co-words
2001-2005	Design Management, Design Culture, Expression, Nature, Social Environment, Ideal Personality, National Characteristics, Localization Effective Management
2006-2010	Design Education, Innovative Design, Design Philosophy, Diversification, Development Strategy, Cell Phone Design, Industrialization, Harmony, Chinese Elements, Semiotics
2021-2015	Innovation, Modern Design, Chinese Elements, Symbolism, Westernized Chinese Style, Chinese Dream, Internet, Product Styling, Human-Machine System, People-Orientation, Corporate Innovation
2016-2020	Intelligence, Curriculum Ideology, Innovation and Application, Chinese Elements, Design Education, Green Design, Local Culture, Social Development, Economic Development, Business Rights, Practical Ability
2021-2023	Curriculum Ideology, Cultural and Creative Products, Evaluation Methods, Development Strategies, Aesthetic Thinking, Cultural Innovation, Creative Thought, Labor Alienation, Discipline Construction, Design Strategies

This analysis underscores that Chinese academic interest in exploring the interplay between traditional culture and industrial design has evolved significantly over the examined time periods. Giles' Speech Accommodation Theory (1987) offers valuable insights into the linguistic dynamics of communication. It posits two forms of speech accommodation: "convergence," wherein the speaker adapts their speech to align with their interlocutor, and "divergence," where the speaker deliberately departs from their interlocutor's language in certain situations. Historically, industrial design in China primarily focused on showcasing the nation's distinctiveness, locality, and the natural environment. The emphasis was on highlighting the "uniqueness" of Chinese culture on the global stage to foster cultural self-awareness and gain international recognition. However, as China's industrialization transitioned from its early to middle stages, industrial design assumed a more pivotal role in serving the manufacturing sector and the digital realm, facilitating rapid progress by contributing to the national economy. In the present context, as China approaches the later stages of industrialization, Chinese design has matured in its values and aesthetic outlook. The emphasis now lies in pursuing "universal values" that resonate with humanity at large rather than fixating solely on the "individualistic" aspects of Chinese culture. The pursuit of these "universal values" is achieved through a shared

expression of commonality. It can be posited that over the past two decades, Chinese industrial design has traversed a transformative journey from a "convergence phenomenon" to an "assimilation phenomenon."

Manifestation of Chinese Values and Aesthetics in Industrial Design

While China's industrial design has yet to establish a distinct national and cultural style, numerous manufacturing enterprises have achieved global commercial success. Examining these companies' design styles from the perspective of Chinese culture can provide valuable insights for the development of a unique Chinese industrial design style.

Xiaomi Ecosystem - The Art of Humility and Balance:

In recent years, Xiaomi's ecosystem has emerged as a prominent player in the smart hardware industry, with over 50% of its revenue coming from the global market in 2022. This success is attributed to Xiaomi's robust business strategy, which capitalizes on China's expansive market. The Xiaomi ecological chain's products often outperform competitors in quantities due to their strong brand reputation, granting Xiaomi substantial bargaining power with suppliers. The products' high cost-effectiveness, in turn, fuels increased sales. Guided by this business model, Xiaomi's industrial design ethos aims to cater to the majority of users.

Li Ningning, the design director, articulated their philosophy, stating, "Our design mentality is to remain humble. While flashy designs may garner attention, saturating every product with extravagance can make a living space uncomfortable. Our goal is for Xiaomi's products to seamlessly integrate into any home environment, encouraging users to embrace Xiaomi's product line without the need for ostentatious designs." Xiaomi's design style aligns with a Chinese philosophy of humility and balance, emphasizing impartiality, eclecticism, and harmony, thereby achieving a harmonious product-environment and product-system relationship. In essence, this embodies a Chinese interpretation of "honest design."

SHEIN - Using no way as way

SHEIN has risen to prominence as a leading brand in the global fast-moving consumer goods sector. In 2021, it became the top iOS shopping app in 54 countries and regions. SHEIN's success is rooted in its well-established supply chain system in the Pearl River Delta region. Thanks to seamless integration across the supply chain, SHEIN's suppliers possess remarkable rapid-response capabilities, delivering goods within 7-10 days and accommodating small-scale orders ranging from 100 to 500 pieces.

Differing from traditional fashion brands, SHEIN lacks a signature design style. Instead, it relies on an 800-strong design team that harnesses big data to track real-time information on colors, fabrics, and styles. This data guides designers in their creative processes. Moreover, SHEIN has launched the SHEIN X designer incubation program, attracting thousands of designers worldwide and introducing tens of thousands of original products. By leveraging digital design tools and collaborative design, SHEIN manages to "use no way as way, have no limitation as limitation. " This streamlined approach significantly reduces design process time within the fashion industry, which demands rapid product updates, thereby ensuring the enterprise's core competitiveness.

Conclusion

In the contemporary landscape, China's industrial design finds itself at a pivotal juncture. Against the backdrop of an impending wave of "China-Chic," the examination of China's industrial design trends takes on profound significance. Co-word analysis, serving as a tool of library and information science, offers a broader perspective for reconsidering the aesthetics and value judgments inherent in design. This perspective extends beyond the confines of specific cases, enabling a more comprehensive understanding of the evolving "language" of Chinese industrial design. This undertaking not only contributes novel insights to the field but also introduces a fresh

research methodology, promising to enhance both the development of design practices and the efficacy of design education.

References

Institute for Culture Creativity, Tsinghua University. (2019). "China-Chic" Research Report. Beijing.
Malinowski, B. (1944). A Scientific Theory of Culture. N.C.: The University of North Carolina Press.
Lin, H. (1991). Cultural Anthropology. Beijing: The Commercial Press.
Tumminello, P. (2011). Car Design Europe: Myths, Brands, People. Krefeld, NRW: teNeues.
Wang, S. (2015). History of Modern World Design (2nd edition). Beijing: China Youth Press.
Giles, H., Mulac, A., Bradac, J. J., & Johnson, P. (1987). Speech Accommodation Theory: The First Decade and Beyond. In M. McLaughlin (Ed.), Communication Yearbook (Vol. 10, pp. 13-48).
Li, N. (2020). Interview with Li Ningning, Industrial Design Director of Xiaomi Eco-chain: Doing Minimalist Design with a Humble Heart. Package & Design, 4-27.

Form-Finding in Turbulent Fluidic Environments Through Self-Assembly

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Abstract

This research aims to explore the potential of self-assembling systems as an autonomous design methodology for creating stable shapes in turbulent fluidic environments. By studying the interaction between these systems and fluids, we can better understand how stable shapes emerge in stochastic conditions. The development of physical form-finding autonomous systems based on self-assembling programmable modules has the potential to create structures that are better adapted to their surroundings, resulting in increased efficiency and functionality. This research seeks to investigate the role of self-assembling systems in the emergence of stable shapes in turbulent fluidic environments.

This paper contributes significantly to the theme of "Design Flow." It explores the use of self- assembling systems as an autonomous design method for creating stable shapes in turbulent fluidic environments. By studying the interaction between these systems and fluids, it investigates how stable shapes emerge in dynamic conditions. This research focuses on developing physical form-finding autonomous systems with self-assembling programmable modules, representing an evolving and adaptive approach to design. It emphasizes creating structures that better adapt to their surroundings, enhancing efficiency and functionality. Thus, the paper demonstrates how design, in a constant state of evolution, can reshape architectural and fluidic environments, aligning with the concept of "flow" in design processes.

Author keywords

Self-assembly; form-finding systems; fractal growth; emergence; programmable matter; physical computing.

Introduction

The field of architecture is changing, especially in form-finding systems (Ekblaw & Paradiso, 2018). This shift is redefining architectural approaches, introducing the idea of autonomous form- finding systems. This transition emphasizes autonomous creation and design, departing from heavy external control. This project demonstrates the feasibility of these form-finding autonomous systems based on fractal geometries and self-assembly, using programmable modules to create architectures that can adapt to different conditions. Adding magnet-equipped programmable modules revitalizes the tangible computing system. This innovation employs two programming methods: deterministic and non-deterministic self-assembly (Tibbits, 2016). Deterministic follows a preset path, while non-deterministic impresses with its adaptability in experiments. This exploration blends technology and nature, revealing the innate ability of autonomous systems in chaotic fluidic settings. It hints at a future where architectural structures harmonize with self-assembly in fluidic landscapes.

Modules

The initial module design used hexagonal tessellation to encourage emergent behavior via local interactions. These interactions result in incremental growth patterns. We focused on the
symmetrical snowflake formation among the numerous possible arrangements achievable with six identical modules.

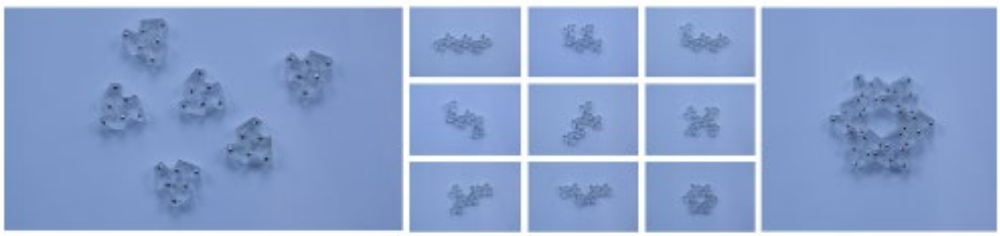

Figure 1. Modules, patterns, and the snowflake pattern.

Deterministic Self-assembly

The initial study explored deterministic self-assembly using tangible models. We designed a snowflake-like structure using six modular units, each with ring-configured internal magnets (as shown in figures 2 and 4). External forces or agitation disassembled and reconfigured the system, proving its ability to rebuild into a predefined structure.

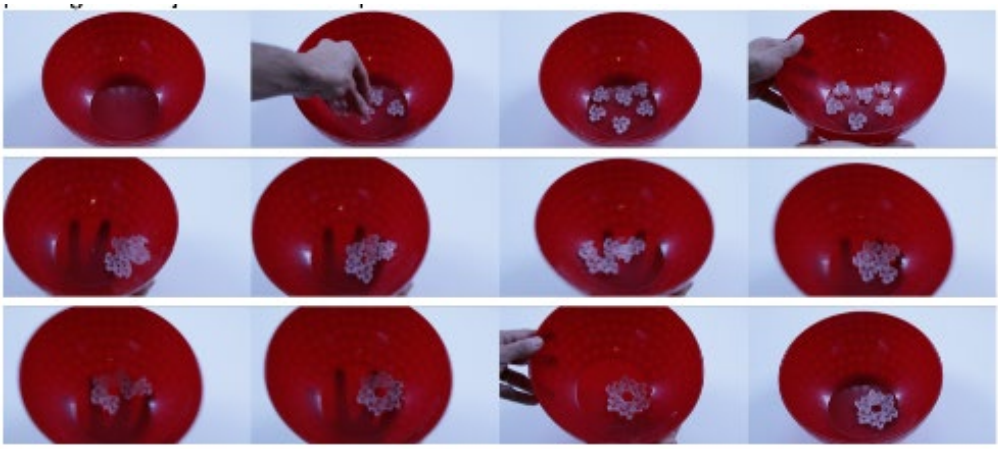

Figure 2. Deterministic Self-assembly.

Evolution of the Module

Following initial module testing, iterative design enhancements were made to improve overall system connectivity. We evaluated and systematically adjusted configurations to ensure compatibility and assembly with other components. Through experimentation and refinement, we optimized the module's geometry for maximum connectivity, verified through objective measurements and evaluations.

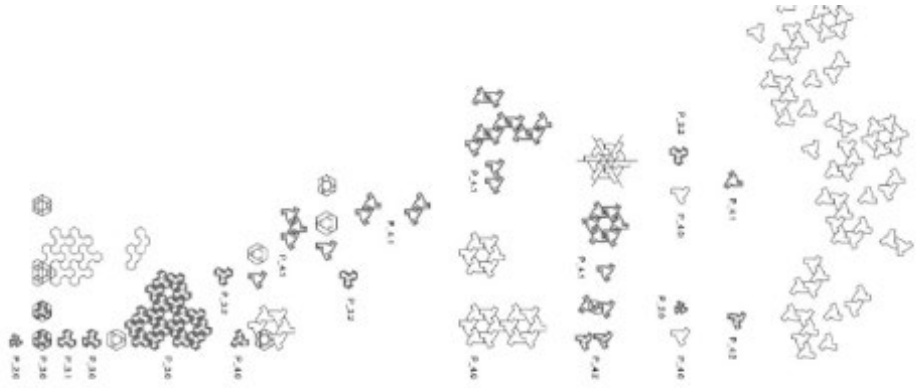

Figure 3. Evolution of the Module.

The design process resulted in two different modules that were developed for the experiments. The basic module, which is the smallest component of the system and the snowflake module, which is based on the assemblage of six basic modules into the snowflake pattern. While the basic module has six slots, the snowflake has twelve slots that can be programmed with different magnets configurations and represents a second order of magnitude for the system.

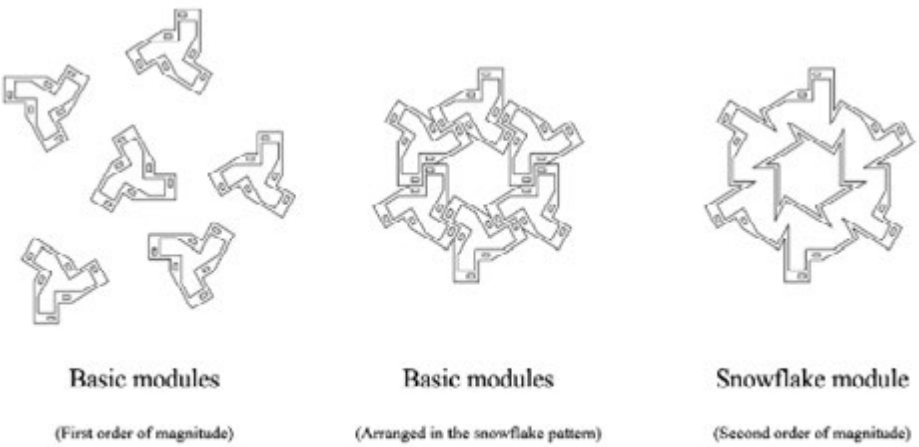

Figure 4. Modules.

Programming

Magnets enable slot programming with three options: North, South, or Neutral (empty) achieved by slot magnetic orientation adjustment, as shown in figures 5 and 8. This customization manipulates connectivity levels during module interaction, allowing precise control, from high to low connectivity, impacting the system's behavior and resultant structures significantly. This approach offers potential for complex structures, with precise control via programmed magnetic interactions. It extends applications to fields like robotics and materials science, introducing a new dimension of control to self-assembly systems, broadening technological possibilities.

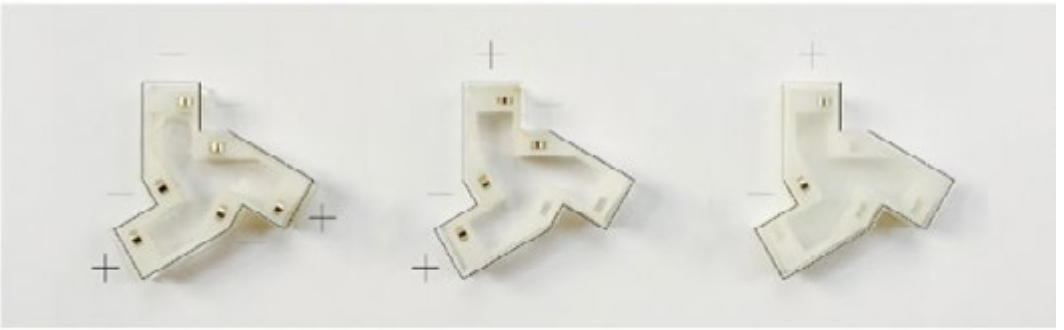

Figure 5. Basic Modules Programming.

At the upper-left corner of Figure 6, the data illustrates that two universal connectors have the capability to establish nine distinct strong bonds (sb). Conversely, at the opposite corner, it is evident that two ring connectors are limited to forming merely two weak bonds (wb). Employing magnets offers a mechanism to conveniently regulate the system's fragility and connectivity.

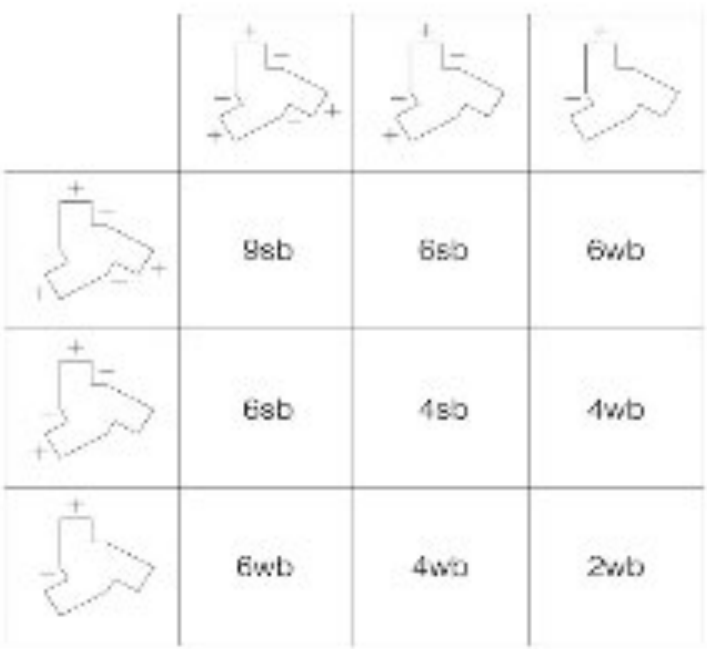

Figure 6. Matrix of possible bonds between modules.

Non-deterministic Self-assembly I

We used a 20-gallon fish tank for experiments. We observed the system's growth, self-regulation, bond formation, dissolution, and new organization patterns. We aimed to understand its tendency toward equilibrium in its environment, studying stability and vulnerability patterns.

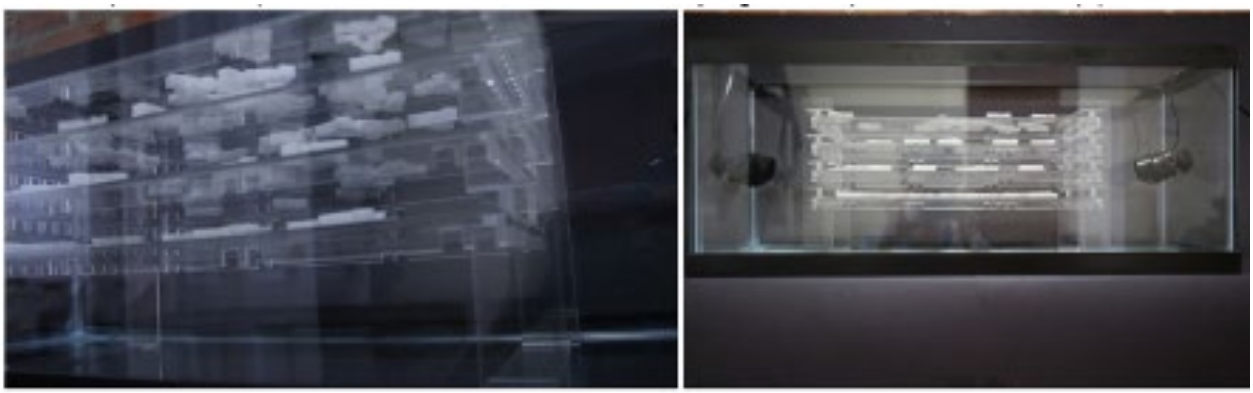

Figure 6. Experimental habitat before being filled with water.

We used a structure to trap air layers and employed two hydro-jets for turbulence. Figure 7 illustrates our modular self-assembly system adhering to physical dynamics, adapting to the environment, until achieving equilibrium.

Equilibrium signifies stability and the cessation of changes within a system, defining the ideal module

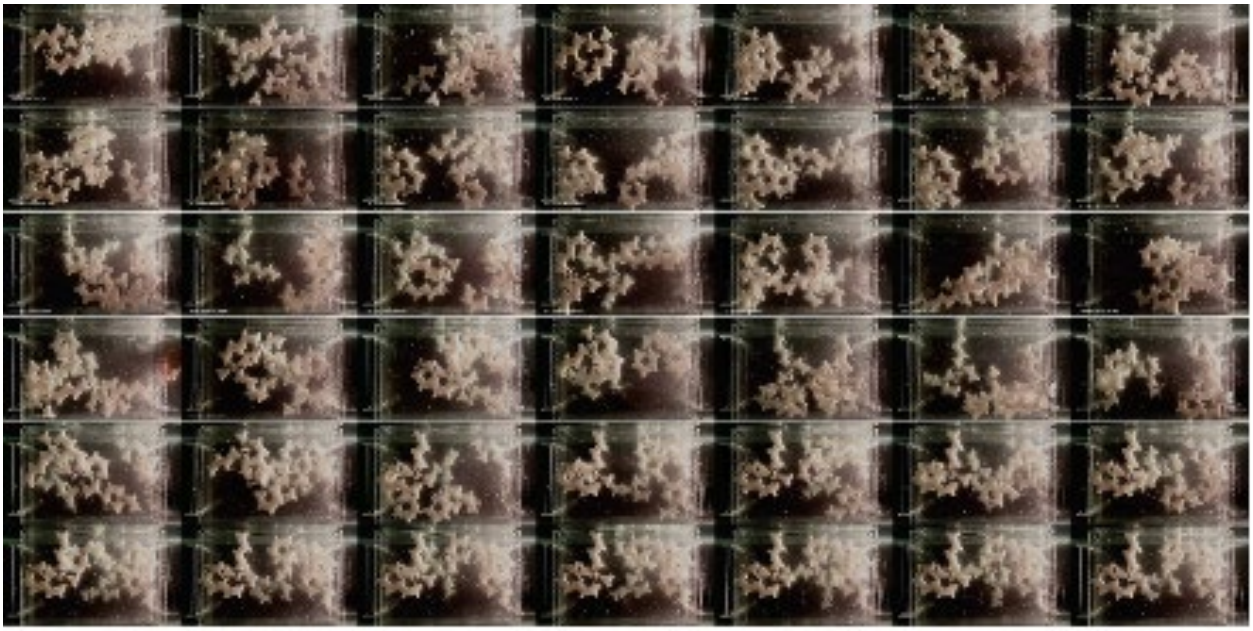

Figure 7. Non-deterministic self-assembly I.

configuration. After achieving equilibrium, we proceed with scanning to create a model of the adapted structure, optimizing it for specific environments. Systems like this one hold potential applications in architecture, civil engineering, industrial design, and robotics.

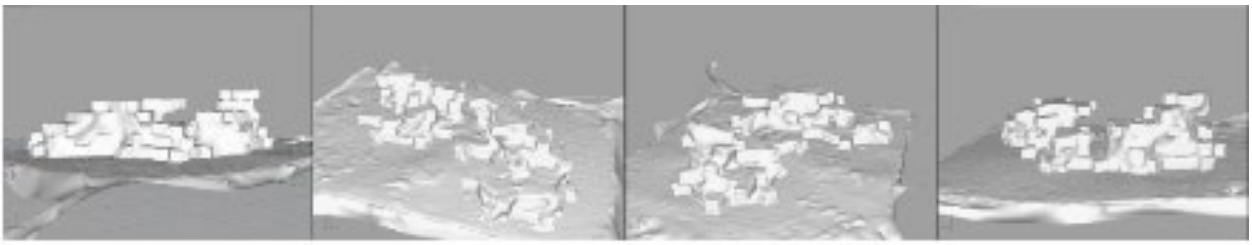

Figure 8. 3D model of the resulting configuration

Lastly, diverse experiments adjusted system connectivity and fragility to find optimal module configurations for cohesive structures.

Non-deterministic Self-assembly II

In the second experiment, non-deterministic self-assembly was tested outdoors in a lake using robust snowflake modules. Results aligned with expectations as the system moved towards stability, despite challenges in the vast lake environment. (Whitesides & Grzybowski, 2002)

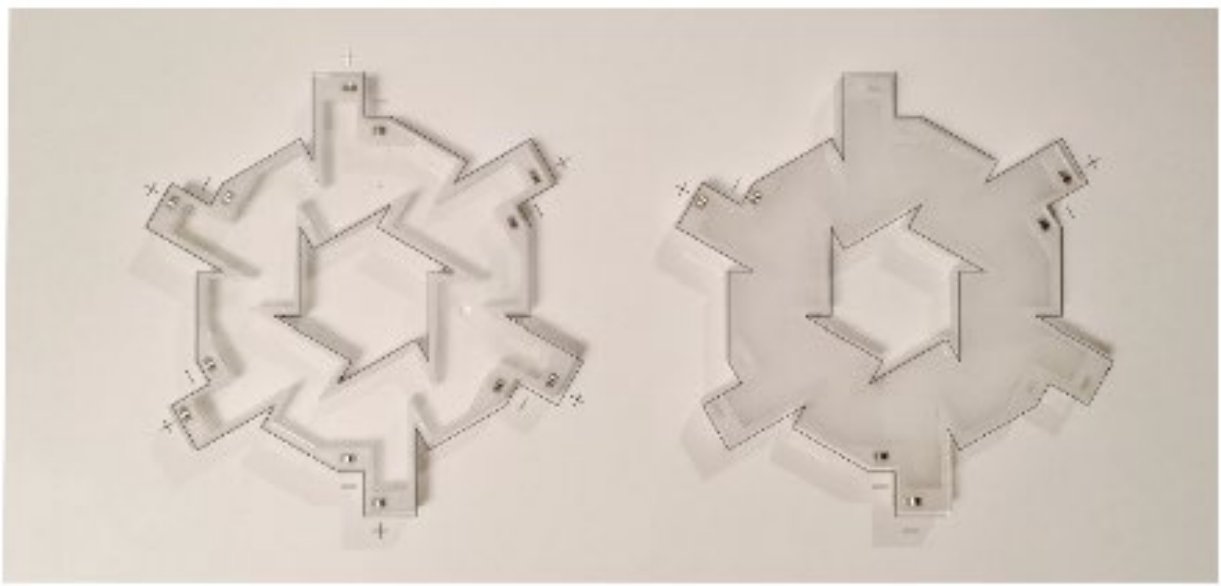

Figure 8. Snowflake modules programming

This experiment underscores the importance of accounting for the scale and complexity of the environment in self-assembly research. It also showcases the potential of self-assembly in natural settings, extending its applicability beyond controlled laboratory conditions.

Figure 8. Non-deterministic self-assembly II.

Self-assembly, the autonomous arrangement of components into structures, applies across materials science, nanotechnology, and robotics, but managing its complexity remains a challenge. Fractal self-assembly at the nanoscale has produced diverse structures, spurring interest in architectural robotics and challenging traditional self-assembly paradigms with its introduction of multiple scales. This novel framework aligns closely with organic growth patterns seen in plants and organisms, characterized by intricate fractal geometries. Looking ahead, the future of self-assembly, as explored in this research, holds promise and could be further propelled by emerging technologies, exemplified by Nisser et al.'s "Selective Self-Assembly Using Re-Programmable Magnetic Pixels" (Nisser et al., 2022), expanding the horizons of its applications.

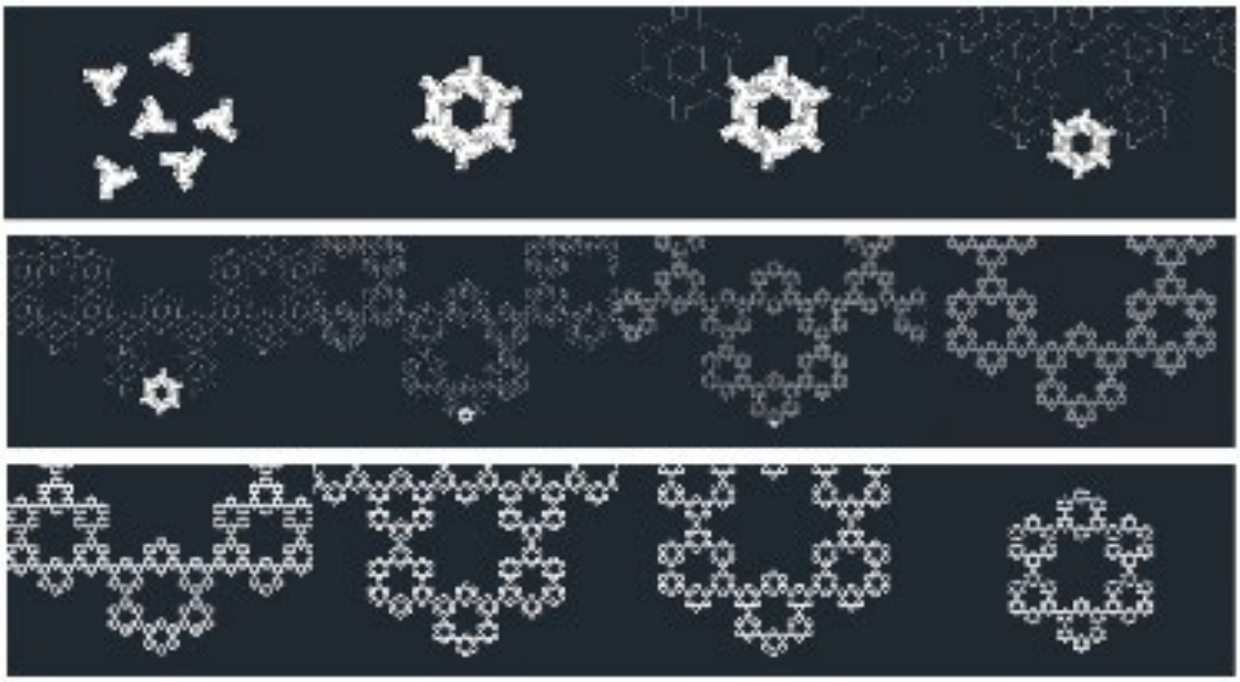

Figure 8. Non-deterministic self-assembly II.Conclusion

Conclusion

In the realm of form-finding in turbulent fluidic environments, self-assembly, including fractal growth, has illuminated a path to adaptive architectures. Meticulous study and experimentation unveiled the potential of self-assembling systems as versatile, autonomous design methodologies, capable of mimicking fractal growth patterns. The interplay between programmable modules and fluid dynamics revealed emergent behaviors, highlighting adaptable structures. This synergy of innovation and adaptation foresees architectural designs echoing the natural fluidic choreography of their surroundings. The findings emphasize understanding the equilibrium between complexity and stability and encourage considering fluidic environments' scale and intricacies. Across disciplines, the fusion of morphology, fluidic dynamics, and fractal growth presents captivating opportunities. Beyond architecture, insights could influence fields from industrial design to modular robotics, benefiting from self-assembly and fractal growth principles. In closing, the journey through turbulent fluidic environments via self-assembly has opened a gateway to innovative design paradigms, redefining architecture and beyond.

References

Ekblaw, A., & Paradiso, J. (2018). TESSERAE: Self-Assembling Shell Structures for Space Exploration. In Proceedings of IASS Annual Symposia, 2018:1–8. International Association for Shell and Spatial Structures (IASS).
Tibbits, S. (2016). Self-assembly lab: experiments in programming matter. Taylor & Francis.
Whitesides, G. M., & Grzybowski, B. (2002). Self-assembly at all scales. Science, 295(5564), 2418- 2421.
Nisser, M., Makaram, Y., Faruqi, F., Suzuki, R., & Mueller, S. (2022). Selective Self-Assembly Using Re-Programmable Magnetic Pixels. arXiv Preprint arXiv:2208.03799.

Should the design process be re-imagined? The interplay of human creativity and AI innovation

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Abstract

The paper explores the evolving relationship between human creativity and artificial intelligence (AI) innovation in the context of design processes. It addresses the increasing integration of technology into daily life and work processes, which has sparked concerns about the potential obsolescence of human capabilities. The emergence of AI-based software for text and image generation has raised questions about the value of human contribution even in the creative disciplines, which until recently seemed likely to be man's last stand of defense in the face of advancing machine capabilities. The paper discusses examples like ChatGPT and Midjourney's recent successes as instances of AI's creative potential. To investigate more deeply what role AIs play in the design process and what tasks are still the preserve of human designers, the paper presents a case study involving a workshop that explores the collaboration between designers and AI, using Italo Calvino's Invisible Cities as a theme. The study investigates the extent to which AI can replicate human creativity in translating mental images into designs. The design process involves using AI for text-to-image generation, employing Midjourney software, and adapting AI-generated text into prompts for image creation. The study emphasizes the creative input of human designers in guiding AI-generated content. In conclusion, the paper underscores the role of the designer as central in the design process, with AI tools serving as valuable aids for inspiration and concept generation. It highlights the complexity of generating specific graphic products through AI and emphasizes the need for skilled designers to harness AI's potential effectively.

Author keywords

Artificial Intelligence, Design Process, Technology, Prompt Designer

Introduction

In the contemporary world, the ever-increasing and sometimes invasive incidence of technology in daily life and in the many facets of work processes proves to be a relevant issue. This trend is by no means foreign to the design context, where technological innovation is often accompanied by a kind of dystopian preoccupation, a premonition of the possible future obsolescence of human abilities (Keynes, 1933). However, it is crucial to point out that history has amply demonstrated that every industrial, technological or digital revolution that has marked the course of humankind has been followed by a significant improvement in the general welfare of the population (Frey & Osborne, 2013).

Over the past century, for example, average weekly working hours have steadily declined, accompanied by better wages and generally more affluent lifestyles (Magnani, 2020). This evolving trend provides a solid basis

for predicting that the same process of improvement may be repeated in the future, regardless of the type of technology involved and the field in which it is embedded.

However, the emergence of innovative Artificial Intelligence (AI)-based software dedicated to text and image generation has triggered new thinking about the value of human contribution. Until recently, technology had been able to replace humans in mainly repetitive, strenuous or dangerous activities. Yet, it is only on rare occasions that signs of what we might call creative thinking on the part of an AI could be observed. Examples such as AlphaGo, the Google program that defeated the world champion in the Chinese game of Go (Chouard, 2016), or Eugene Goostman, the AI that apparently passed the Turing test (Warwick & Shah, 2016), are still limited in their areas of application.

Homo artificialis and Contemporary Humanity

The concept of "Homo artificialis" is often discussed in different contexts to explore the relationship between humanity and technology and to understand how the use of tools and artifacts influences our nature and evolution (Incoronato, 2016).

It's important to underline how the philosophy of design is, in fact, a sub-discipline of the philosophy of technology. (Fregonese, 2019)

Furthermore, another crucial point concerns the large amount of studies on the ethics of technique and technology. This raises the question of the relationship between responsibility, human agents and technologies, especially considering how independent or almost human the latter have become.

Contemporary Man is immersed in artificiality in every aspect of his existence, even on a biological level. While it is sometimes argued that technology dehumanizes and that social networks are depersonalizing, opposite reflections emerge: technology humanizes and constitutes the fulcrum of our humanity. The central point of discussion concerns how technologies influence the social sphere and our way of thinking.

Over the last thirty years, the sociology of technology has seen considerable development, driven in part by the criticism of so-called "technological determinism", a concept that suggests that the development of technology and its consequences are controlled by an internal logic, beyond human control. This perspective has been replaced by a more nuanced view of the relationship between technology and society. (Salento, et al., 2018)

Digital technology represents only the latest step in this evolution. Everything artificial is, by definition, unnatural, as Simon indicated in The Sciences of the Artificial (1969). Simon asks whether we can develop science or knowledge relating to non-natural phenomena. He provides an initial definition of "artifact" as a synthetic or artificial object, the development of which is at the center of evolutionary activity. Richard Dawkins, known for the popular book The Selfish Gene (1976), states that technological evolution advances at such a speed as to surpass human biology. However, it is essential to consider the gap between our biological and technological evolution, as this gap has generated fears, fragility and a sense of inadequacy which, in turn, has stimulated human creativity through art, spirituality, philosophy, music, mathematics and science are all drivers of technological evolution. From this perspective, technology makes us more human. Engineers, architects, designers and all those who work with technology must recognize their influence on the design of the new humanity. It is essential to discuss technology, design it and use it responsibly, since our deepest human essence lies within it. As a tool, artificial intelligence allows artists and designers to explore new aesthetic territories and generate results that push the frontiers of creativity further.

However, it is in the last period that much more significant progress has been made, which is shifting the balance between human capabilities and computational computing in the realm of creativity. The launch of ChatGPT in November 2022 is a striking example. This highly successful chatbot demonstrates the ability to

produce text ranging from themes to poems, even scientific papers (Hill-Yardin et al., 2023). In a similar vein, text-to-image AIs such as Midjourney, Dall-E, or Stable Diffusion are demonstrating that they can generate graphic works that are often indistinguishable from those created by professional painters or illustrators (Roose, 2022).

Intriguing is the evolution that is taking place in the field of design. Technology is no longer seen merely as a means of translating imagination into concrete designs through 3D modeling, rendering, and post-production software. Rather, there is the possibility that technology may take on a more active role, even going so far as to replace the designer in the creative phase (Epstein et al., 2020). This evolution raises fundamental questions about the future of the designer figure itself: will he or she be destined to be completely replaced by technology, as has happened in many other professions, or will he or she have to adapt and learn to master these new innovative tools (Dang et al., 2022)? Will the creativity inherent in human intelligence continue to play an irreplaceable role in devising and translating mental images into designs, or will technology and AI completely take over human work (Hertzmann, 2020)?

Knowing how to communicate with machines will increasingly become a strategic skill. Currently, the first training courses are emerging for the figure of the "prompt designer", which is the profession responsible for creating the commands with which we give instructions to machines. The clearer we are in articulating these instructions, the better the results we will be able to obtain from the software, especially given the ongoing revolution (Zamfirescu-Pereira, 2023). This skill combines elements of science and humanistic culture and is expected to become as important a design tool as design thinking or double diamond. In the near future, this new profession will establish itself, requiring less technical skills but greater ability to communicate effectively with machines. Most likely, we will learn to use Chat GPT as naturally as we use smartphones to take photographs today. This ability to combine text and images is typical of social media professionals, and if a similar profession has existed for years, there is no reason why another profession based on the same skill but focused on different results shouldn't develop. AI could become a common and accessible technology like many others already available, but this does not exclude the existence of highly specialized experts. The prompts will not be simple formulas, but will require a creative, non-mechanical approach. Machines will remain catalysts and will not replace human beings.

Case study

"Will we have a machine capable of replacing the poet and the writer, of conceiving and composing poems and novels? I am thinking of a machine that brings into action [...] all those elements that we are wont to regard as the most jealous attributes of psychological intimacy, of lived experience, of the unpredictability of mood swings, the shudders and heartbreaks and inner illuminations (Calvino, 1967)."

In the lecture Cybernetics and Ghosts held at various forums in 1967, Calvino imagines the figure of the literary autonomist: a machine capable of replacing the writer and thus making human beings obsolete even in their creative component. The writer himself points out how precisely the latter, in its various declinations, is the most jealous attribute of man, who would, in short, be willing to surrender his work to a machine if it is an exhausting, dangerous or tedious one, but who approaches with jealousy the advent of a machine capable of replacing human creative abilities (Antonello, 2005).

This very year (2023) marks the centenary of the birth of Italo Calvino, who was able to establish himself as one of the most influential Italian intellectuals of the second half of the 20th century. Among his most famous works are The Invisible Cities, published in 1972, a few years after the lecture mentioned earlier. The book consists of an anthology of short stories that, the writer imagines, are part of a dialogue between Marco Polo and the

Tatar emperor Kublai Khan, who questions the explorer about the cities of his immense empire. The result is a succession of detailed depictions of imaginary fabulous, fantastic cities with the most diverse characteristics.
In order to better investigate the mechanisms of collaboration between designers and artificial intelligences and what are the dynamics that bring the roles and skills of the two figures to collaborate in the design process, the paper presents the case study of a workshop carried out by the University of Genoa that had as its main theme Calvino's Invisible Cities.
The text, in fact, has among its peculiarities the ability to force the reader into a work of imagination to create a mental depiction of the described scenarios. For this reason, it is configured as an ideal theme to bring into play the capabilities of the latest text-to-image artificial intelligences and investigate how far they are able to replace humans in the transposition of such mental representations and, above all, what should be the role of the designer in managing these innovative tools to arrive at the desired result.
The workshop was conducted under the mentorship of the authors and was attended by 30 young designers in the manner that is described in the previous section.

Design Process

The workshop started from the identification of the invisible cities that would be implemented. From this early stage, the role of artificial intelligence was already central. In fact, since it was decided to make ten final products, only five of them would have Calvino's original text as their initial brief. The other five cities were to be derived from texts authored by ChatGPT. Five of the ten prepared working groups therefore proceeded by each requesting ChatGPT to produce the text of an invisible city, as if it were to be an extra chapter written in the style of Italo Calvino.
From this first phase, it already became apparent that text-to-text artificial intelligence on its own was not always capable of accomplishing satisfactory work. The goal was, in fact, to obtain five texts that could have been exchanged for Calvino's, i.e., tales of invisible cities in front of the reading of which an ordinary person would have had difficulty recognizing a different authorship from that of the original book.
On the contrary, it often happened that the text produced by ChatGPT had a language strongly discordant from Calvino's. For example, the AI sometimes resorted to non-literate language, sometimes even used bulleted lists, which seems to be one of the recurring traits of its usus scribendi (Thorp, 2023). At other times, more simply, the title it gave to the story, i.e., the name of the town, was not responsive to those proposed by Calvino, which are all classical women's names.
Once all the texts were obtained from which to start, the process aimed at making the related images was carried out. For this activity, it was decided to use Midjourney software (version 4) because of its good balance between ease of use and widely recognized ability to generate high-quality images (Roose, 2002; Ghosh & Fossas, 2022). In addition, there are several accounts in the literature of Modjourney's particular aptitude for making images related to architecture (Ploennigs & Berger, 2022; Radhakrishnan, 2023), a feature that makes it particularly adherent to the selected topic.
A focus on the operation of Midjourney becomes necessary at this point to make evident the human designer's input in the image development process.
AI text-to-image software makes use of machine learning, especially the GAN (General Adversarial Network) process. The latter is a learning method that allows neural networks to generate new data from the same data distribution used in the learning process (Goodfellow et al., 2014). This makes it possible to produce images from a huge amount of information with which the AI has been trained, but which is still unique and novel.
Access to Midjourney is provided by Discord, a third-party messaging service through which a request can be

provided to the AI via a text message using the /image command. From the request, the software generates four images, and the user can decide whether to work further on one of them by modifying the prompt or by having an upscaling performed and obtaining, in either case, four new variants. There are some tricks that can be used to have more control over the output, such as the -chaos command that defines how similar or different the four images produced are, or the -seed command that allows the generated images to be associated with one of the 4294967295 versions that the software could have come up with from the same prompt, so that the same aesthetic can eventually be recalled later using the same seed at a different prompt. Moreover, the command ::x [...] ::y allows users to define different weights to be attributed to different parts of the prompt. In this way, the software will focus more on certain elements specifically. Finally, in addition to the commands that Midjourney itself provides, there are certain keywords identified by users that can direct the software toward high-quality production, such as the words "extreme quality," "cinematic lights," "4K," and "HDR" inserted at the end of the prompt. Similarly, through keywords one can indicate the graphic style or other elements.

It was then necessary to adapt Calvino's (and ChatGPT's) texts by extracting from them the essential representational features to be translated into an effective prompt for Midjourney. For example, the city of Zezenia created by ChatGPT presented the following text:

Zezenia is a city located on an island rising in the middle of the sea. The city is divided into two parts: the underground city and the aerial city.

The underground city is an intricate labyrinth of tunnels and galleries that stretch for miles beneath the surface of the island. Here the inhabitants conceal themselves from the eyes of visitors, living in a secret world protected from the rest of the world.

The aerial city, on the other hand, is a city built on giant trees, made up of towers, bridges and platforms. Here the inhabitants live in the treetops and move about on suspended bridges, secured by ropes, that connect the various platforms.

The towers of the aerial city of Zezenia are all works of art, decorated with mosaics, carvings and sculptures created by the inhabitants themselves. Each tower has its own special beauty and the atmosphere there is unique.

The city of Zezenia is also famous for its special light, a magical light that seems to emanate from within the stones, flowers and trees of the city. This light gives the city a fairy-tale, dreamlike atmosphere that almost seems to be out of this world.

This text was translated into numerous prompts that aimed to obtain the desired images through a variety of approaches. Some of them are given below as examples:

imagine Overview of a city located on an island in the middle of the sea, that is built on giant trees, made up of towers, bridges, and platforms, the inhabitants of the city live among the treetops and move on suspended bridges, secured by ropes, that connect the various platforms , is also famous for its special light, a magical light that seems to emanate from within the stones, flowers, and trees of the city. This light gives the city a fairy-tale and dreamlike atmosphere that almost seems to belong to another world. That city has an underground and secret part, an intricate maze of galleries and tunnels that extend for kilometers beneath the surface of the island. Here, the inhabitants of that city hide from the eyes of visitors, living in a secret world protected from the rest of the world, extreme details, photorealistic, 4k, HDR --c 10 --s 50 --v 4

imagine High definition 3d model of an island where its possible to see the surface part, that is built on giant trees, made up of towers, bridges, and platforms ::2 and the submerged secret part that has a lot of intricate maze of galleries and tunnels :4 --c 50 --v4

front view of a floating rock which have the underground part that is full of house and tunnels while the other part is above trees filled with bridges and ropes and is located on the top of the rock, extreme details, fairy tail lights, ocean, rock --s 100 --v 4

It can be noted that the approaches are very diverse, and in Fig.1 one can see the wide variety of images that was generated. The images shown in the figure are, in the same way as the prompts mentioned above, just a few explanatory examples, but the process of finding the correct prompt and the subsequent image editing that followed included a total of more than 100 prompts and more than 400 images generated.
Once the final desired image was obtained, a responsive 3D model was created through the use of Rhinoceros modeling software, followed by 3D printing of an exhibition model of the respective city.

Result & Conclusions

The models of the ten realized cities were exhibited, alongside an explanatory poster of the source text and the design process carried out, at Genoa BeDesign Week 2023. The exhibition was quite successful, with more than 200 visitors enjoying observing the works created. The exhibition, titled "Calvino Thefted," also invited visitors to try to guess which of the cities were taken from Calvino's original text and which, on the contrary, were the result of AI's exclusive work. This interactive approach was met with great interest and it was possible to observe that, except for people who had a deep knowledge of the original text of The Invisible Cities, visitors in general were unable to guess the authorship of all the works.
Wanting to make a conclusive argument about the contribution of AIs in the design process, and of the role of the designer in their use, it is evident from the previous paragraph how Midjoruney (the same could be said for any other text-to-image AI as well as ChatGPT), by itself, is nothing more than a tool that, if used wisely, can lead to the required results. Such results are undoubtedly characterized by a very high level of accuracy and aesthetic appeal, to the point of generating a great deal of popularity in the media and often going viral. However, each time one of these images goes viral, as in the most famous case of the photos depicting Putin and Trump being arrested (Stanley-Becker & Nix, 2023 March 24), what does not emerge is how many attempts and steps of prompt modification were necessary to arrive at the desired result. The hidden truth is that, as was amply demonstrated in the paper, it can take hundreds of attempts, edits, and steps to get to the desired result, not to mention the post-production work that is often necessary. In addition, for the creation of a generalist image, such as "the Pope playing basketball" (this image has also gone viral in the past year), the task can be easier: if the AI can clearly identify the Pope's features and manage to generate a good quality image, it matters little whether this is set in a sports hall or a playground, whether the figure is isolated or surrounded by other players, etc. In contrast, the task becomes much more complex and articulated when what one wants to achieve meets a very detailed and precise description. It could be argued, therefore, that AI can be at present a very useful and fascinating tool for the creation of inspirational concepts, but that we have major limitations in the generation of specific graphic products. The role of the designer remains, therefore, central within the design process, and the new AI tools sit within it as tools that may be more or less effective depending on the field, but that like all tools need a trained figure who can best manage them to achieve the desired result.
Further future research will investigate these mechanisms in more detail and, in particular, how the designer can make use of these tools as a form of help in involving users in the design process, since it may be inexperienced users who need support in generating visual concepts that the experienced designer can then use to bring the project to fruition.

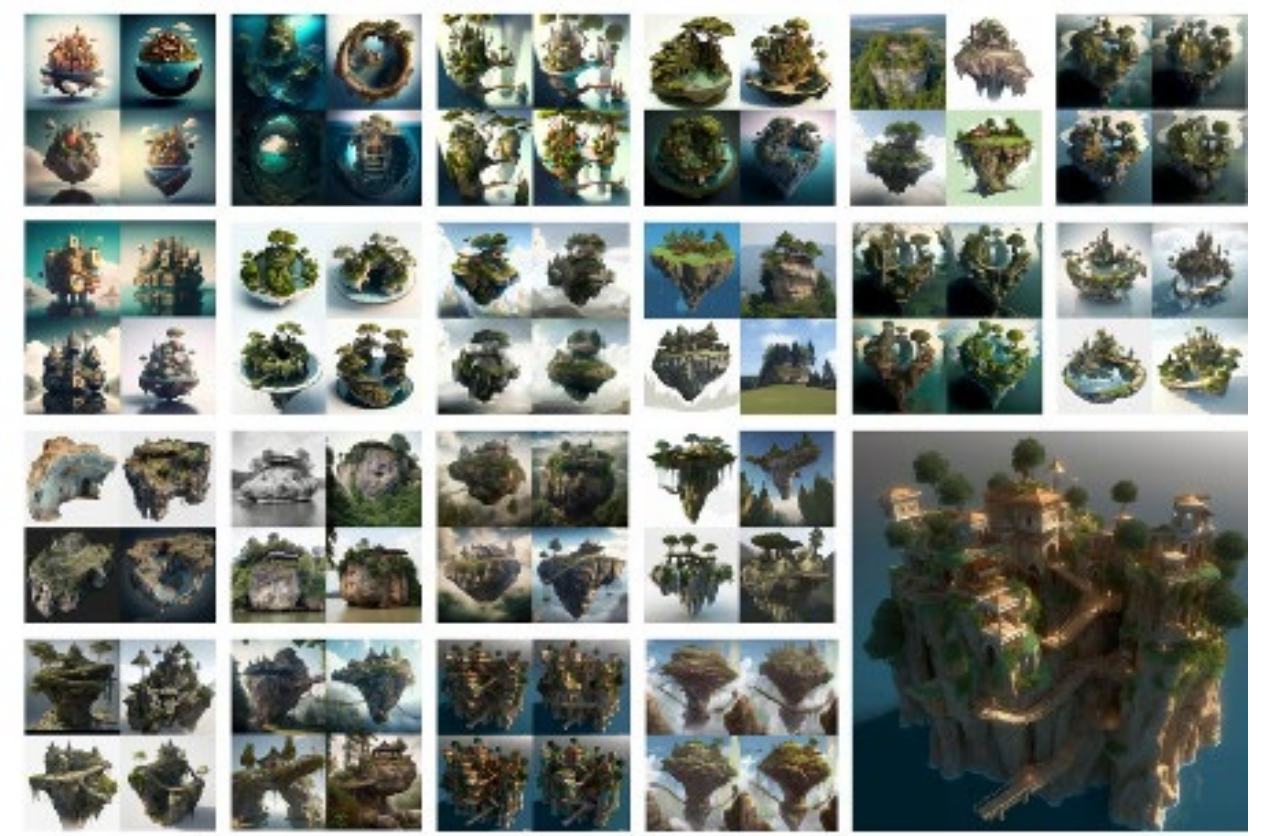

Figure 1. Some examples of the attempts that led to the final image (bottom right) of the city of Zezenia.

Figure 2. The final ten images of as many cities generated during the workshop

Figure 3. The exhibition of 3D models during LEAVE BLANK UNTIL FINAL ACCEPTANCE Design Week

Acknowledgments

Although the paper is the result of joint research work among the various authors, please consider the paragraphs "Introduction", "Case Study" and "Result&Conclusions" authored by Francesco Burlando, the paragraph "Homo Artificialis and Contemporary Umanity" authored by Xavier Ferrari Tumay and the paragraph "Design process" authored by Federica Maria Lorusso.

References

Antonello, P. (2005). Cibernetica e fantasmi. Italo Calvino fra mito e numero. Il ménage a quattro. Scienza, filosofia, tecnica nella letteratura italiana del Novecento, 169-230.

Calvino, I. (1967) Cibernetica e fantasmi - Appunti sulla narrativa come processo combinatorio, in Una pietra sopra, pp. 213 - 214, Einaudi Torino

Chouard, T. (2016). The Go Files: AI computer wins first match against master Go player. Nature.

Dang, H., Mecke, L., Lehmann, F., Goller, S., & Buschek, D. (2022). How to Prompt? Opportunities and Challenges of Zero-and Few-Shot Learning for Human-AI Interaction in Creative Applications of Generative Models. arXiv

preprint arXiv:2209.01390.
Dawkins, R. (1976). The selfish gene. Oxford university press.
Epstein, Z., Levine, S., Rand, D. G., & Rahwan, I. (2020). Who gets credit for ai-generated art?. Iscience, 23(9), 101515.
Fregonese, E. (2019). Filosofia e progetto. Breve storia di una vicenda attuale. Rivista di estetica, (71), 117-147.
Frey, C. B., & Osborne, M. (2013). The future of employment.
Ghosh, A., & Fossas, G. (2022). Can There be Art Without an Artist? (arXiv:2209.07667). arXiv. https://doi.org/10.48550/arXiv.2209.07667
Goodfellow, I. J., Pouget-Abadie, J., Mirza, M., Xu, B., Warde-Farley, D., Ozair, S., ... & Bengio, Y. (2014). Generative adversarial nets. proceedings of the 27th international conference on neural information processing systems-volume 2. NIPS'14.
Hertzmann, A. (2020). Visual indeterminacy in GAN art. In ACM SIGGRAPH 2020 Art Gallery (pp. 424-428).
Hill-Yardin, E. L., Hutchinson, M. R., Laycock, R., & Spencer, S. J. (2023). A Chat(GPT) about the future of scientific publishing. Brain, Behavior, and Immunity, 110, 152–154. https://doi.org/10.1016/j.bbi.2023.02.022
Incoronato, C. (2016). Homo artificialis: dall'umanesimo della purezza ai neoumanesimi dell'ibridazione. Homo artificialis, 1-212.
Keynes, J. M. (1933). National self-sufficiency. Studies: An Irish Quarterly Review, 177-193.
Magnani, M. (2020). Fatti non foste a viver come robot: Crescita, lavoro, sostenibilità: sopravvivere alla rivoluzione tecnologica (e alla pandemia). Utet.
Ploennigs, J., & Berger, M. (2022). AI Art in Architecture. arXiv preprint arXiv:2212.09399.
Radhakrishnan, A. M. (2023). IS MIDJOURNEY-AI A NEW ANTI-HERO OF ARCHITECTURAL IMAGERY AND CREATIVITY?. GSJ, 11(1)
Roose, K. (2022). An AI-generated picture won an art prize. Artists aren't happy. The New York Times, 2(September).
Salento, A., Masino, G., Maggi, B., Gasparre, A., & Rinaldini, M. (2018). Industria 4.0: Oltre il determinismo tecnologico. Alma Mater Studiorum - Università Di Bologna. https://doi.org/10.6092/UNIBO/AMSACTA/6041
Stanley-Becker, I., & Nix, N. (2023, March 24). Fake images of Trump arrest show 'giant step' for AI's disruptive power. Washington Post. https://www.washingtonpost.com/politics/2023/03/22/trump-arrest-deepfakes/ (retrieved on 18/09/2023)
Simon, H. A. (1996). The sciences of the artificial. MIT press.
Thorp, H. H. (2023). ChatGPT is fun, but not an author. Science, 379(6630), 313-313.
Warwick, K., & Shah, H. (2016). Can machines think? A report on Turing test experiments at the Royal Society. Journal of experimental & Theoretical artificial Intelligence, 28(6), 989-1007.
Zamfirescu-Pereira, J. D., Wong, R. Y., Hartmann, B., & Yang, Q. (2023, April). Why Johnny can't prompt: how non-AI experts try (and fail) to design LLM prompts. In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (pp. 1-21).

Gamification and Serious Games: Technological and Social Transformation through Video Game Interactions

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Abstract
The relevance of video game's industry both for its market scale, social impact and cultural role is testified by industry reports, scientific research works, strategic government fundings and policies supporting the use of video games as drivers for cultural and social innovation. However, it emerges the need for a more profound connection between game design research and practices, cultural critique, and reflective design research. Observing video games as an expression of the contemporary commodity form, this contribution aims to discuss designers' contribution in shaping the changing technocultural sphere enforcing the cybernetic idea of mutual influence between social and technological systems. This contribution is part of an ongoing research on how video games represent a space for designer's intervention and a tool for speculative enquiry in design-driven innovation processes.

Author keywords
Interaction Design; Gamification; Serious Games; Technological Determinism; Social Construction of Technology

Introduction

The relevance of video game's industry both for its market scale, social impact and cultural role is testified not only by industry reports, but also by the growing number of dedicated scientific research, strategic government fundings and national policies supporting the use of video games as drivers for cultural and social innovation. Reports published by national associations and research studies describe the economic impact and the diffusion of the industry around the globe describing a cartography dominated by established clusters in North America (Pilon & Tremblay, 2013), in the United Kingdom and Asia. Smaller regional clusters, or even sparse companies, are emerging even far from the main production hubs (Wolf, 2015) testifying the growth and the evolution of this productive sector. Institutions and national governments are both directly supporting the industry, for example with financial aids and tax breaks, and promoting the adoption of game-based practices to address issues outside of the entertainment sector (Ruffino, 2018a).
The "material turn" of game studies (Apperley & Jayemane, 2017) testifies the branching of the research on video games into a wider network of knowledge and disciplines with specific reference in the area of social sciences. In design literature, however, not much attention is dedicated to video games as a future space for designer's intervention in the changing production-consumption context triggered and shaped by digital technology innovations. It emerges the need for a more profound connection between game design research and practices, cultural critique, and reflective design research (Malazita & O'Donnell, 2023) to bridge the existing gap.

This contribution is part of an ongoing research on how video games have come to represent a space of intervention for designers and an instrument for speculative enquiry and anticipation in design-driven innovation processes. Video games represent a cultural form in which the characteristics of the transformative economy converge (Celaschi & Casoni, 2020; Pine II & Gilmore, 2013). Moreover, they represent the product of a complex industrial systems that merges physical and digital spaces. Here, two specific forms of game materialization - gamification and serious games - are discussed in relation to their role in the changing contemporary socio-economic context. The outcome serves as a preliminary framing for the development of the ongoing research.

Cybernetic interactions through Gamification and Serious Games

The increase of interest in the video game industry and its technologies must be contextualized within the economic scale of the video game market. It is estimated that in 2022 over 3 billion people play video games in a market which size is estimated to worth almost $200 billion (Newzoo, 2022). When considering gaming platforms, over half of the total revenues are estimated to be coming from mobile games. This market segmentation appears to be of particular interest since the mobile market, specifically that of games played on smartphones, has a significant shorter history compared to that of computer and console games. The development of the mobile game market, together with the evolution of new economic model of distribution and consumption had a significant boost in late 2007 with the launch of the iPhone and the opening of the App Store. Several studies have analyzed the evolution of business models in the video game industry (Lantano et al., 2022) and the evolving dynamics of virtual economies (Lehdonvirta & Castronova, 2014).

Observing such transformations in the video game industry from a design point of view allow to understand how the models and means of value production, consumption and exchange are transforming in contemporary technocultural society. The game market is a dynamic exchange field which materialize the experimental economy in which non-specialists are active actors of a "mainstream method for maximizing innovation" (Jagoda, 2020, p. 97) that has been made possible by technological transformation. Digital interfaces and networked digital systems have redefined the way users experience, navigate and interact with physical and digital spaces. In this context, video games open what has been defined as a "possibility space" (Squire, 2008) that enable the exploration of alternative ideas and behaviors. Game technologies, however, is often used to define experimental situation of which users are not always aware (Jagoda, 2020, p. 15). In the experimental economy, the production and consumption paradigms are no longer the ones that characterize the traditional industrial and post-industrial economy. In fact, in the experimental economy, commodities emerge from an iterative experimental process of production and re-production (Thomke, 2003; Thrift, 2008) rather than being a direct output of a linear process of problem solution. In designer's terms, the definition of the commodity form is a process of continuous innovation determined by socio-cultural, economic, environmental and technological variables (Celaschi, 2000, 2008). If the commodity form is an expression of the context, on the other way around, designer should consider how the commodity form can influence users' agency inside the experimental economy.

In the opening chapter of "Game Cultures. Computer Games as New Media" (Dovey & Kennedy, 2006), Jon Dovey and Hele W. Kennedy explore two opposite positions: the first one supports the idea that society shapes technological development (Williams, 1974/2003), the second one is that technology influence society (McLuhan, 1964/2015). As Dovey and Kennedy point out, new-media studies address this issue through the idea that the social and the technological systems, rather than being one dependent on the other, are actually intertwined through feedback loops like in cybernetic systems. The concept of a cybernetic loop of influences between

technology and society invites to reflect on the designers' contribution in the changing domain of human-computer interaction and at the same time, to analyze how designers' practice adapts and evolves under the influence of the technological environment.

In the next two sections, the perspective of technology determinism and social construction of technology (SCOT) will be explored through the analysis of gamification and serious games as game forms that materialize instances of the two positions through game mechanics and technologies. The intent is not to argue on a philosophical level the conceptual adherence of the two practices to one vision or the other. As it will be discussed, within gamification and serious games it's possible to draw examples that can be interpreted either as expression of technological determinism or as SCOT. At the same time, no general positive or negative connotation are associated to the two perspectives, although ethical implication will emerge as part of the discussion. The scope of this argument is to provide examples that highlight designers' contribution in shaping the changing interaction happening in human-computer-interaction (HCI) through video games enforcing the cybernetic idea of mutual influence between the social and technological sphere.

Gamification

The use of the term Gamification in the field of technology and human-machine interaction started spreading in 2008. One of the most referenced definition is that gamification is "the use of game design elements in non-game context" (Deterding et al., 2011). The game design elements are those used in most analogue and digital games and articulates along a growing scale of abstraction: from interfaces elements (badge and leaderboard) to game mechanics and dynamics. These components are applied in non-ludic context in order to achieve affective and motivational outcomes, behavioral outcomes, and (cognitive) learning outcomes (Krath et al., 2021). Specifically, as reported by Krath et al. (2021) studies on behavioral outcomes highlight the positive impact that gamification has when adopted for increasing engagement and improving performances. Gamification has become a popular term across many industries, and it has been proposed as a possible solution for solving even complex problems (McGonigal, 2011). However, criticisms have been made to gamification as it suggest a methodology that proposes easy to apply solution to complex issues (Bogost, 2014). Moreover, gamification has been criticized since its applications can leverage on human's cognitive and responsive mechanism not only to persuade and nudge towards positive or health attitudes, but also to exploit and influence users to corporation's profit or social control (Hon, 2022). It has been argued that, more than a design approach, gamification describes the form that contemporary economic and social technoculture is taking. Jagoda (2020) observes how Debord described spectacle as "a social relationship between people that is mediated by images" (Debord, 1967/2008) that broadcasted cultural and social expression of the late 1960s. Seemingly, gamification materializes contemporary economic and socio-cultural dynamics (Jagoda, 2020, p. 31). Compared to spectacle, gamification does so with the structural difference of game and network technologies. In this sense, Jagoda interprets gamification, not only as a design strategy, but as the manifestation of the contemporary economic, social and cultural environment that constitute a "formal and cultural counterpart to neoliberalism" (Jagoda, 2020, p. 63). By translating neoliberal values in mechanics of play, gamification emerges as a form of social determinism of technology, but, in the same time, it acts as mean of technological determinism of society, by leveraging on forms of nonconscious manipulation.

One of the most common applications of gamification is in sports and physical activity tracking. Not only specialized equipment for advanced sports practitioner, but also consumer gadget with tracking features saw a growing diffusion in the electronic market. The ease of use of tracking application facilitates the collection of personal data relatively to general or specific activity. Such practice is generally defined as "lifelogging" and consists in tracking information relevant for the user in a digital diary. Active and passive data collection

generate "lively data" which are big quantities of information describing a wide variety of aspects of human life (Lupton, 2016). With multiple sensors in our devices continuously tracking our physiological data, every aspect of our life can be measured and "as long as it ca be measured, it can be gamified and improved" (Hon, 2022, p.12). In the constant chase for personal improvement, of maximized performances, of the "best version of oneself", the quantification through personal analytics enables progress tracking, and gamification acts as a motivational nudge to keep pursuing goals. When motivation and commitment are not enough, a solution proposed by a product is generally available for purchase. In this sense, it could be argued that the quantified self is a product of technological determinism that uses gamification to encourage behavioral change. At the same time, users' data are collected and used to suggest custom products and services presented as something that can boost the charts and the leaderboards of personal analytics. Over time, gathered personal data accumulate and stratify. Users will eventually stop using tracking device - it has been estimated that abandonment rate for fitness tracker is 30% (Gartner, 2016). Gamification (or the lack of it) fails to transform the initial engagement with the technology in something different. The distance between the user and the technology does not change as the two parts do not influence each other (Ruffino, 2018b). One of the causes of tracking device abandonment is that they lack the capability to adapt to unforeseen changes and circumstances in users' lives (Clawson et al., 2015). The growing implementation of Artificial Intelligence technologies that are capable to predict, anticipate and adapt to users' needs and behaviors, could be considered a design strategy to activate a cybernetic connection between human and non-human agents. In context, the contribution of designers is to build meaningful interaction through user's data and to develop frameworks for technology adoption capable to adapt and interpret changes in users' lives and in the environment they live in. Together with self-tracking technologies improvement, the development of feedback loop across different physiological and psychological component is an area in which user experience design can significantly contribute (Chianella et al., 2021). The social dimension of data is a component on which gamification can leverage to build strong social relationships among users and between humans and machines.

Serious and Applied Games

Serious games are games designed with non-entertainment purposes. The original definition is attributed to Clark C. Abt (Abt, 1970) and has been widely adopted, reformulated and extended in literature (Laamarti et al., 2014; Michael & Chen, 2006; Susi et al., 2007). Related definition can be found in literature (games with a purpose, education games, game-based learning) that stress specific connotation and use context. Ian Bogost's definition of Persuasive games (2007) is built upon the representation system based on rules and interactions typical of video games for conveying a form of nonverbal persuasion that he calls "procedural rhetoric" (Bogost, 2007). Applied games is a term that has been proposed as a comprehensive definition for facilitating cross-disciplinary research and design innovation (Schmidt et al., 2015). In this contribution, the terms serious games and applied games will be used interchangeably since the discussion revolves around general approaches and it is geared to design applications.

Serious games have been developed for application in multiple areas with a particular focus on training and education. In the field of medical education and surgical training, for example, serious games are considered potentially valuable tools for their flexibility, operational cost and accessibility, even if more standardized assessment are generally required for full implementation (Graafland et al., 2012; Wang et al., 2016). With the development of game technology, a growing number of applications are exploring the field of cultural heritage (Anderson et al., 2010; Mortara et al., 2014). Serious game have also been developed for training in other critical condition, such as fire service training (Williams-Bell et al., 2015) and aviation. Military and defense

operations are, of course, among these critical scenarios. One video game that is frequently reported as an effective example (Laamarti et al., 2014) of serious game is America's Army (U.S. Army, 2002). America's Army is a free-to-play first-person shooter game developed and first published in 2002 by the U.S. Army to encourage recruitment among players. The support was discontinued in 2022. The "serious" aspect of the game, rather that referring to the actual dynamics of real military operations, that are carefully represented and simulated, is attributable to the enrolment scope of the games. Following this interpretation, America's Army appears to be an expression of technological determinism (as it should push users to join the military forces) rather than a technological tool materializing a social interest. However, the latter is equally arguable since a society that builds its defense strategy on a strong and technologically advanced military capability needs to construct such digital infrastructure: a technology that leverages on strategies of persuasion and social influence. America's Army represents the cybernetic loop between technological determinism and social construction of technology. It shows both a form of technology determinism in its capability to persuade individuals in joining the army, and an expression of socially constructed technology since it is the materialization of a technological tool giving answer to a social need.

The ethical implications of the designer's role are deeply connected with technological innovations. The problem is not only related to military applications, but it also extends to the social impact of the digitalization. Serious games and video games provoke emotional responses in users not only recurring to narrative representation of the storytelling which are typical also of other media, such as movies, but especially through actions and choices deliberately made by the user. In fact, the peculiarity of video games is that they are an action-based media (Galloway, 2006/2022). The actions of the operator (the gamer) and those of the machine are what activate the material change, and therefore the evolution, of the system (Galloway, 2006/2022). Through design decisions and techniques, games can evoke both positive and negative emotions into players (Isbister, 2016). For example, in games like Paper, Please (Pope, 2013), players are confronted with ethical decision within an altered moral and social systems. The player is asked to allow or deny access to the fictional country of Astorzska to migrants on the bases of their documents and other available information. The player's decisions will determine who will be allowed to enter the country or not with the risk of letting terrorists with falsified passports in and rejecting innocent people who don't have the necessary documentation. As it has been pointed out, the possibility of exploring different moral behaviors through deliberate ethical choices invites to develop a critical reflection on social values (Sicart, 2019). This exploration space of possibility is determined by game designers who structure a system in which players action acquire meaning (Salen & Zimmerman, 2004). In the same way, interaction designers define a space of possibility when designing human-machine interactions that intertwine physical and digital spaces with real and virtual experiences. Also, in designing game interfaces and virtual artifacts in games, designer shape the limits of interaction and player's agency inside the virtual world. The interface of Paper, Please defines the limits of the user's ability to intervein in the system. In this case, it translates the complex moral dilemmas raised by the narrative into a straightforward basic game mechanic: allow or deny access. At the same time, it provides worldbuilding elements that materialize the frustration of an over-bureaucratized political system with the use of a basic interface that clutters with documents, notes and manuals. As the previous example, it is possible to observe the cybernetic loop between SOCT and technological determinism materialized by the designed interface of the game.

Conclusion

As new technologies are developed and introduced to the market and in design practice, video games

are changing the designers role of "dialectically mediate between needs and objects, production and consumptions" (Maldonado, 1991/2008, p.14, Author's translation). The convergence of multidisciplinary skills and professionalism that characterizes the video game industry makes it an important bearer of innovation and change. Moreover, with the intersection of many languages and models of human-computer interaction and the integration of artificial intelligence-based technologies it emerges the need to develop common methodologies and practices between the video game industry and other productive sectors. This contribution used the concept of cybernetic systems to frame the role of gamification, serious games, and video games in general in the ever-changing contemporary society characterized by technoculture. Future development of this ongoing research will explore how video games are reframing the space of designer intervention in the redefinition of alternative models of value production and exchange and how they can be used as tools for speculative enquiry and design research.

References

Abt, C. C. (1970). Serious Games. Viking Press.

Anderson, E. F., McLoughlin, L., Liarokapis, F., Peters, C., Petridis, P., & de Freitas, S. (2010). Developing serious games for cultural heritage: A state-of-the-art review. Virtual Reality, 14(4), 255–275. https://doi.org/10.1007/s10055-010-0177-3

Apperley, T. H., & Jayemane, D. (2017). Game Studies' Material Turn. Westminster Papers in Communication and Culture, 9(1), Article 1. https://doi.org/10.16997/wpcc.145

Bogost, I. (2007). Persuasive games: The expressive power of videogames. MIT Press.

Bogost, I. (2014). Why gamification is bullshit. In S. P. Walz & S. Deterding (Eds.), The Gameful World (pp. 65–80). The MIT Press; JSTOR. http://www.jstor.org/stable/j.ctt1287hcd.7

Celaschi, F. (2000). Il design della forma merce. Il Sole 24 Ore.

Celaschi, F. (2008). Il Design come mediatore tra bisogni. Il Design come mediatore tra saperi. In C. Germak, Claudio (Ed.), L'Uomo al centro del progetto. Design per un nuovo umanesimo. (pp. 19–31). Umberto Allemandi & C.

Celaschi, F., & Casoni, G. (2020). Human Body Design. Corpo e progetto nell'economia della trasformatività. Franco Angeli.

Chianella, R., Mandolfo, M., Lolatto, R., & Pillan, M. (2021). Designing for Self-awareness: Evidence-Based Explorations of Multimodal Stress-Tracking Wearables. In M. Kurosu (Ed.), Human-Computer Interaction. Interaction Techniques and Novel Applications (pp. 357–371). Springer International Publishing. https://doi.org/10.1007/978-3-030-78465-2_27

Clawson, J., Pater, J. A., Miller, A. D., Mynatt, E. D., & Mamykina, L. (2015). No longer wearing: Investigating the abandonment of personal health-tracking technologies on craigslist. Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing, 647–658. https://doi.org/10.1145/2750858.2807554

Debord, G. (2008). La società dello spettacolo. Baldini Castoldi Dalai. (Original work published 1967)

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining 'gamification'. Proceedings of the 15th International Academic MindTrek Conference on Envisioning Future Media Environments - MindTrek '11, 9–15.

Dovey, J., & Kennedy, H. W. (2006). Game cultures: Computer games as new media. Open University Press.

Feijoo, C., Gómez-Barroso, J.-L., Aguado, J.-M., & Ramos, S. (2012). Mobile gaming: Industry challenges and policy implications. Telecommunications Policy, 36(3), 212–221. https://doi.org/10.1016/j.telpol.2011.12.004

Galloway, A. (2022). Gaming. Saggi sulla Cultura Algoritmica (G. Pedini & M. Salvador, Eds.). Luca Sossella

Editore. (Original work published 2006)
Gartner. (2016). Gartner Survey Shows Wearable Devices Need to Be More Useful [Press release]. Gartner. https://www.gartner.com/en/newsroom/press-releases/2016-12-07-gartner-survey-shows-wearable-devices-need-to-be-more-useful
Graafland, M., Schraagen, J. M., & Schijven, M. P. (2012). Systematic review of serious games for medical education and surgical skills training. British Journal of Surgery, 99(10), 1322–1330. https://doi.org/10.1002/bjs.8819
Hon, A. (2022). You've Been Played. How Corporations, Governments, and Schools Use Games to Control Us All. Basic Books.
Isbister, K. (2016). How games move us: Emotion by design. MIT Press.
Jagoda, P. (2020). Experimental Games. Critique, Play, and Design in the Age of Gamification. The University of Chicago Press.
Krath, J., Schürmann, L., & von Korflesch, H. F. O. (2021). Revealing the theoretical basis of gamification: A systematic review and analysis of theory in research on gamification, serious games and game-based learning. Computers in Human Behavior, 125, 106963. https://doi.org/10.1016/j.chb.2021.106963
Laamarti, F., Eid, M., & El Saddik, A. (2014). An Overview of Serious Games. International Journal of Computer Games Technology, 2014. https://doi.org/10.1155/2014/358152
Lantano, F., Petruzzelli, A. M., & Panniello, U. (2022). Business model innovation in video-game consoles to face the threats of mobile gaming: Evidence from the case of Sony PlayStation. Technological Forecasting and Social Change, 174, 121210. https://doi.org/10.1016/j.techfore.2021.121210
Lehdonvirta, V., & Castronova, E. (2014). Virtual economies: Design and analysis. MIT Press.
Lupton, D. (2016). The quantified self: A sociology of sel-tracking. Polity.
Malazita, J., & O'Donnell, C. (2023). Introduction: Toward Critical Game Design. Design Issues, 39(1), 4–13. https://doi.org/10.1162/desi_e_00702
Maldonado, T. (2008). Disegno industriale: Un riesame. Giangiacomo Feltrinelli Editore. (Original work published 1991)
McGonigal, J. (2011). Reality Is Broken: Why Games Make us Better and How they Can Change the World. Penguin.
McLuhan, M. (2015). Gli strumenti del comunicare. Il Saggiatore. (Original work published 1964)
Michael, D., & Chen, S. (2006). Serious games: Games that educate, train and inform. Thomson Course Technology.
Mortara, M., Catalano, C. E., Bellotti, F., Fiucci, G., Houry-Panchetti, M., & Petridis, P. (2014). Learning cultural heritage by serious games. Journal of Cultural Heritage, 15(3), 318–325. https://doi.org/10.1016/j.culher.2013.04.004
Newzoo. (2022). Global Game Market Report. https://app2top.ru/wp-content/uploads/2022/07/2022_Newzoo_Free_Global_Games_Market_Report.pdf
Pilon, S., & Tremblay, D.-G. (2013). The Geography of Clusters: The Case of the Video Games Clusters in Montreal and in Los Angeles. Urban Studies Research, 2013, e957630. https://doi.org/10.1155/2013/957630
Pine II, B., & Gilmore, J. (2013). The experience economy: Past, present and future. In Handbook on the experience economy (p. 269). https://doi.org/10.4337/9781781004227.00007
Pope, L. (2013). Paper, Please [Computer software]. 3909 LLC.
Ruffino, P. (2018a). Future gaming: Creative interventions in video game culture. Goldsmiths Press.
Ruffino, P. (2018b). Life after Gamification: How I Broke Up with Nike+ FuelBand. In P. Ruffino, Future gaming:

Creative interventions in video game culture (pp. 26–44). Goldsmiths Press.
Salen, K., & Zimmerman, E. (2004). Rules of Play. MIT Press.
Schmidt, R., Emmerich, K., & Schmidt, B. (2015). Applied Games – In Search of a New Definition. In K. Chorianopoulos, M. Divitini, J. Baalsrud Hauge, L. Jaccheri, & R. Malaka (Eds.), Entertainment Computing—ICEC 2015 (Vol. 9353, pp. 100–111). Springer International Publishing. https://doi.org/10.1007/978-3-319-24589-8_8
Sicart, M. (2019). Paper, Please. Ethics. In M. T. Payne & N. Huntemann (Eds.), How to play video games. New York University Press.
Squire, K. (2008). Open-Ended Video Games: A Model for Developing Learning for the Interactive Age. In K. Salen (Ed.), The Ecology of Games: Connecting Youth, Games, and Learning. MIT Press.
Susi, T., Johannesson, M., & Backlund, P. (2007). Serious Games – An Overview. Technical Report HS- IKI -TR-07-001.
Thomke, S. H. (2003). Experimentation Matters: Unlocking the Potential of New Technologies for Innovation. Harvard Business School.
Thrift, N. (2008). Non-representational theory: Space, politics, affect. Routledge.
U.S. Army. (2002). America's Army [Computer software].
Wang, R., DeMaria, S. J., Goldberg, A., & Katz, D. (2016). A Systematic Review of Serious Games in Training Health Care Professionals. Simulation in Healthcare, 11(1), 41. https://doi.org/10.1097/SIH.0000000000000118
Williams, R. (2003). Television. Technology and Cultural Form. Routledge. (Original work published 1974)
Williams-Bell, F. M., Kapralos, B., Hogue, A., Murphy, B. M., & Weckman, E. J. (2015). Using Serious Games and Virtual Simulation for Training in the Fire Service: A Review. Fire Technology, 51(3), 553–584. https://doi.org/10.1007/s10694-014-0398-1
Wolf, M. J. P. (Ed.). (2015). Video games around the world. MIT Press.

Beyond Limits: Enhancing Creativity by Breaking Perceptual Blocks in Design Flow

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Abstract

This paper reviews perceptual blocks hindering designers' creativity in the design flow. Design flow is a problem-solving process. Designers always adopt creative thinking in the design flow. Designers' creative thinking is commonly confronted by barriers in their mind termed 'perceptual blocks'. Based on the review of breaking through perceptual blocks to creativity in the design process, this article builds a theoretical framework for enhancing creativity in the design flow. By recognizing and understanding these perceptual blocks, designers can become more aware of their limitations in the ideation phase of the design flow, surpassing their habitual ways of thinking to foster design innovation.

Author keywords

Creativity; perceptual blocks; creative thinking; design flow; problem-solving.

Introduction

With the rapid development of technology and changes in the social environment, the problems designers encounter have become more sophisticated and complex. Creativity, a widely discussed topic, is increasingly demonstrating its significance in effective problem-solving. Despite having the aspiration to generate innovative solutions, diverse cognitive barriers impede problem solvers from engaging in creative thinking. To excel in utilizing creative thinking in problem-solving, it is beneficial for individuals to remain cognizant of these obstacles and implement appropriate strategies to overcome them. By the same token, overcoming perceptual blocks in the design process benefits designers' creative thinking.

Design Flow as a Problem-solving Process

Design flow inherently constitutes a problem-solving process. A complete problem-solving cycle comprises three essential components: given state, goal state, and operation (Greeno & Simon, 1988; Ormrod, 2020). The essence of the problem-solving process is explained as problem- solvers scrutinize and transform information, operating from a starting point to achieve a specific goal (Lovett, 2006). Previous research has identified two key elements in problem- solving: (1) the problem statement, where problem-solvers articulate all the relevant information to represent the task; and (2) search strategies, which are the approaches problem- solvers employ to explore alternative solutions (Simon & Newell, 1971; Newell, 1979; Greeno & Simon, 1988). From the problem-solving perspective, the design flow encompasses two core components: defining the design problem and seeking design solutions. For instance, the double diamonds model from the British Design Council exemplifies this flow, where, after one or multiple rounds of the design process, designers strive to progress the problem by

defining the issue as a given state and searching for solutions to reach a goal state.

The Basis for Reasoning in Problem-solving

The problem-solving process, from a cognitive perspective, is rooted in reasoning. Human reasoning draws upon experience and knowledge (Maier, 1930). For example, problem-solvers often employ heuristic approaches to aid decision-making, relying on analogizing previous experiences and knowledge to address current problems (Lenat, 1982). Nevertheless, prior experience and knowledge can act as both facilitators and barriers to thinking creatively in problem-solving. Reliance on the "representativeness" and "availability" biases in mindset may yield unsatisfactory solutions (Kahneman et al., 1982; Evans, 1989). Previous content in mind cannot serve as the basis for innovation, therefore freeing designers from established domain- specific knowledge and experience within the design flow facilitates them to think out of the box (Weisberg, 2006).

Perceptual Blocks in Ideating Solution

During the ideation phase of solution generation, problem-solvers often encounter mental barriers termed perceptual blocks, impeding the exploration of potential opportunities. In the problem-solving process, solution generation can be divided into two stages: idea generation, followed by idea implementation (Basadur, 1997; Mumford, 2001). The effectiveness of idea generation, including the abundance and diversity of alternative solutions, is expanded by confronting perceptual blocks, such as removing fictitious constraints or discovering novel approaches (Shah et al., 2003). Problem-solvers employ search strategies in the idea-generation phase, and the richness of search strategies hinges on the scope of their perceptual awareness; heightened perceptual consciousness facilitates ideating solutions (Block, 2011). Despite the inherent human tendency to rely on prior experience and knowledge, proficient designers demonstrate the ability to search for 'surprise', which helps them in avoiding routine behaviours (Schon, 1983). The originality of creativity in the design process is driven by the 'surprising' part (Dorst & Cross, 2001).

Being Aware of Perceptual Blocks

Being creative in problem-solving is challenging for individuals, as harnessing creative thinking necessitates problem-solvers to consistently confront the barriers in mindset. Presented here are four frequently recurring obstacles that require careful consideration by designers.

Functional Fixedness: Impeding Insights with Assumptions

Problem-solvers encounter function fixedness when they adhere to assumptions derived from their experiences in comprehending an object's functions. The term functional fixedness, originating from the concept of 'fixation' (Maier, 1930), then it is employed to describe problem- solvers who become entangled and ultimately fail to resolve an issue (Duncker & Lees, 1945). Schooler & Melcher have depicted the limitation of function fixedness as a 'content-induced set' within the mind (1995), resulting in an 'impasse' in problem resolution (Kaplan & Simon, 1990; Smith et al., 1995). Additionally, functional fixedness can obstruct 'insight' in problem-solving, leading problem-solvers to take action prematurely, without a comprehensive grasp of the actual problem (Sternberg & Davidson, 1995; Sawyer, 2011).

Mental Set: Bound by Rigidity of Mindset

The mental set refers to the inclination to adopt a fixed approach to specific problems, based on solutions applied to analogous situations in the past (Öllinger et al., 2008). Mental set behaviours usually manifest in individuals with expertise and experience in a domain, potentially hindering the generation of innovative ideas due to their inflexible mindsets, which resist adaptation (Jersild, 1927). Problem-solvers may find themselves restricted by their domain-specific knowledge (Wiley, 1998), overlooking other pertinent information that could bear relevance to the problem.

Cognitive Miserliness: Reliance on Mental Shortcuts

During the problem-solving process, especially when grappling with unfamiliar challenges, individuals often engage in cognitive miserliness by resorting to mental shortcuts (Taylor, 1981). Cognitive miserliness is from the term "cognitive miser" which characterizes those who lack systematic processing and tend to conserve cognitive resources (Fiske & Taylor, 1991). It reflects the tendency to opt for simplicity, relying on accessible and applicable judgments (Stapel & Koomen, 1998), rather than more time-consuming and effort-intensive approaches. This inclination can lead to neglecting a comprehensive assessment of the current issue and hinder a nuanced comparison between the current and desired states, essential for identifying potential solutions.

Schematic Reasoning: Leaping to Previous Solutions for Familiar Issues

Developed through problem-solving expertise, schematic reasoning involves storing a repository of past solutions in long-term memory, thus alleviating the computational burden on short-term memory (Ericsson & Smith, 1991). Schematic reasoning plays a pivotal role for many experts in efficiently identifying and resolving problems. However, in the context presented here, the term describes problem-solvers who, when confronted with familiar issues, tend to bypass essential problem-solving processes and jump to an assumed goal stage based on prior solutions. Problem-solvers may find themselves confined by schematic reasoning, amplifying their reliance on previously acquired experiences and knowledge structures known as 'schemas' (Bartlett, 1932), potentially leading to the underestimation of other pertinent problem aspects (Hunt, 1994a, 1994b). The drawbacks of schematic reasoning may entangle problem-solvers in paradoxical dilemmas, and it can yield shallow resolutions for problem- solvers dealing with complex issues (Sternberg, 2013).

Enhancing Creative Thinking in Design Flow

Designers are often seen as creative problem-solvers, owing to their proclivity for ideation. Designers use creative thinking to have a conscious recognition of their preferred cognitive approaches, thus enabling them to transcend the boundaries of their problem-solving capabilities (Sternberg, 1999). Employing creative thinking fosters the enrichment of possibilities and the exploration of novel avenues (Treffinger et al., 2006).

Strategies to Breakthrough Perceptual Blocks

Prior research has emphasized the disruption of perceptual blocks and the cultivation of novel perspectives to foster creative thinking (Amabile, 1989). Creative thinking goes through abundant cognitive processes, however, it is worth noticing the need for people to invest scarce cognitive resources in solving the problem at hand (Mumford et al., 2012). The following paragraphs propose several thinking strategies as a theoretical framework.

For Functional Fixedness: Thinking Fluidly from a Broader Scale

Thinking fluidly on a broader scale during ideation can avoid only adopting the conventional definition of an object's functions. Previous studies have demonstrated that preconceptions about solution objects engender functional fixedness, leading problem-solvers astray (Duncker & Lees, 1945; Adamson, 1952). Problem-solvers should avoid the influence of established solution functions and approach problems with fluidity, unburdened by specific function definitions (German & Defeyter, 2000). By embracing this mindset, designers can cultivate a fresh outlook when examining solutions.

For Mental Set: Thinking Flexibly from Domain Knowledge

Overcoming mental set requires the flexible exploration of various perspectives. Despite the efficiency gains associated with mental set, it is imperative for problem-solvers to recognize the dual role that mental set plays, not only facilitating efficiency but inhibiting 'insight' (Öllinger et al., 2008). To counter the rigidity of entrenched mindsets, problem-solvers must transcend the confines of their domain-specific knowledge, surmounting the limitations of an expertise-driven mental set (Wiley, 1998).

For Cognitive Miserliness: Motivating the Cognitive Miser Facet

The metaphor of a cognitive miser underscores both the finite nature of cognitive resources and the demand for efficient problem-solving (Corcoran & Mussweiler, 2010). Addressing cognitive miserliness necessitates warning cognitive shortcuts and motivates the cognitive miser facet. Motivation serves as a pivotal factor in selecting cognitive shortcuts during the thought process (Fiske & Russell, 2010). The desire for cognition motivates the enjoyment and effort invested in cognitive activities (Amabile et al., 1994). Advancing motivation can encourage individuals to stimulate their cognitive miser tendencies (Ebenbach & Keltner, 1998). Especially, activating cognitive miserliness by enhancing intrinsic motivation can propel problem-solvers toward becoming 'chronic' thinkers who derive satisfaction from cognitive engagement (Waller, 1999).

For Schematic Reasoning: Questioning Assumptions to Accurate Problem Recognition

Challenging assumptions enable problem-solvers to explore factors being overlooked. While some problem-solvers, in the course of expertise development, resort to memorizing an array of 'schemas' to overcome limitations but cannot apply them appropriately, then these schemas become resulting in 'knowledge in pieces' (DiSessa, 1983). Overreliance on previous solutions may hinder the resolution of novel issues. Consequently, individuals need to accurately grasp the crux of problems (Hunt, 1994b) to cultivate a creative thinking style that transcends historical experiences, necessitating a perpetual interrogation of assumptions (Dewey, 2022).

Discussion

It is argued that the cornerstone of creativity lies in the generation of exceptional, original, and innovative solutions to intricate, novel, and ill-defined problems (Mumford et al., 2012). When ideating solutions, designers should be aware of the adaptability of their knowledge and experience in this intricate cognitive process.

To go beyond cognitive limits, however, the mere application of strategies in creative thinking falls short of deeply eradicating perceptual blocks. It is of greater importance that strategies to approach creative thinking are internalized into a cohesive and tangible creative thinking style. As Dewey underscores: identifying tendencies in reasoning is crucial in order to recognize one's confines (Maier, 1930; Dewey, 2013). Consequently, designers aspiring to adopt a creative thinking style require decisively to choose to go beyond knowledge and experience as their preferred cognitive approach within the design flow.

While knowledge and experience stem from the problem solver's perceptual perspective, it is also crucial to consider a broader array of factors in the pursuit of enhancing creativity beyond limitations. Various other elements influence the utilization of creative thinking: problem solvers' attitudes, encompassing the willingness to take calculated risks and tolerate ambiguity (Sternberg, 2009), as well as the presence of a supportive environment conducive to nurturing innovative ideas (Sternberg, 2003).

Conclusion

This article perceives the design flow as a problem-solving process and examines creative thinking from a cognitive perspective. It offers a deeper understanding of the prevalent perceptual blocks within the design flow and suggests strategies for their systematic identification. Overall, this review paper introduces a theoretical framework to overcome perceptual blocks that hinder creative problem-solving within the design flow.

References

Adamson, R. E. (1952). Functional fixedness as related to problem solving: A repetition of three experiments. Journal of Experimental Psychology, 44(4), 288–291. https://doi.org/10.1037/h0062487

Amabile, T. M. (1989). Growing up creative: Nurturing a lifetime of creativity. Crown House Publishing Limited.
Amabile, T. M., Hill, K. G., Hennessey, B. A., & Tighe, E. M. (1994). The Work Preference Inventory: Assessing intrinsic and extrinsic motivational orientations. Journal of Personality and Social Psychology, 66(5), 950.
Bartlett, F. C. (1932). Remembering: A study in experimental and social psychology.
Basadur, M. (1997). Organizational development interventions for enhancing creativity in the workplace. The Journal of Creative Behavior, 31(1), 59–72.
Block, N. (2011). Perceptual consciousness overflows cognitive access. Trends in Cognitive Sciences, 15(12), 567–575.
Corcoran, K., & Mussweiler, T. (2010). The cognitive miser's perspective: Social comparison as a heuristic in self-judgements. European Review of Social Psychology, 21(1), 78–113. https://doi.org/10.1080/10463283.2010.508674
Dewey, J. (2013). Logical method and law. In Logic, Probability, and Presumptions in Legal Reasoning (pp. 181–191). Routledge.
Dewey, J. (2022). How we think. DigiCat.
DiSessa, A. (1983). Phenomenology and the evolution of intuition. Mental Models.
Dorst, K., & Cross, N. (2001). Creativity in the design process: Co-evolution of problem–solution. Design Studies, 22(5), 425–437. https://doi.org/10.1016/S0142-694X(01)00009-6
Duncker, K., & Lees, L. S. (1945). On problem-solving. Psychological Monographs: General and Applied, 58(5), i–113.
Ebenbach, D. H., & Keltner, D. (1998). Power, emotion, and judgmental accuracy in social conflict: Motivating the cognitive miser. Basic and Applied Social Psychology, 20(1), 7–21.
Ericsson, K. A., & Smith, J. (1991). Toward a general theory of expertise: Prospects and limits. Cambridge University Press.
Evans, J. S. B. (1989). Bias in human reasoning: Causes and consequences. Lawrence Erlbaum Associates, Inc.
Fiske, S. T., & Russell, A. M. (2010). Cognitive processes. The SAGE Handbook of Prejudice, Stereotyping and Discrimination, 115–130.
Fiske, S. T., & Taylor, S. E. (1991). Social cognition. Mcgraw-Hill Book Company.
German, T. P., & Defeyter, M. A. (2000). Immunity to functional fixedness in young children. Psychonomic Bulletin & Review, 7, 707–712.
Greeno, J. G., & Simon, H. A. (1988). Problem solving and reasoning. US Navy, Office of Naval Research.
Hunt, E. (1994a). Comments on a theory of induction.
Hunt, E. (1994b). Problem solving. In Thinking and problem solving (pp. 215–232). Elsevier.

Jersild, A. T. (1927). Mental set and shift. st.
Kahneman, D., Slovic, P., & Tversky, A. (1982). Judgment under uncertainty: Heuristics and biases. Cambridge university press.
Kaplan, C., & Simon, H. (1990). In search of insight. Cognitive Psychology, 22(3), 374–419.
Lenat, D. B. (1982). The nature of heuristics. Artificial Intelligence, 19(2), 189–249. https://doi.org/10.1016/0004-3702(82)90036-4
Lovett, M. C. (2006). Problem solving. Encyclopedia of Cognitive Science.
Maier, N. R. (1930). Reasoning in humans. I. On direction. Journal of Comparative Psychology, 10(2), 115.

Mumford, M. D. (2001). Something old, something new: Revisiting Guilford's conception of creative problem solving. Creativity Research Journal, 13(3–4), 267–276.
Mumford, M. D., Medeiros, K. E., & Partlow, P. J. (2012). Creative thinking: Processes, strategies, and knowledge. The Journal of Creative Behavior, 46(1), 30–47.
Newell, A. (1979). Reasoning, problem solving and decision processes: The problem space as a fundamental category.
Öllinger, M., Jones, G., & Knoblich, G. (2008). Investigating the effect of mental set on insight problem solving. Experimental Psychology, 55(4), 269–282.
Ormrod, J. E. (2020). Human learning (Eighth edition.). Pearson Education, Inc.
Sawyer, R. K. (2011). Explaining creativity: The science of human innovation. Oxford university press.
Schon, D. A. (1983). The reflective practicioner: How professionals think in action. Basic Books New York.
Schooler, J. W., & Melcher, J. (1995). The ineffability of insight.
Shah, J. J., Smith, S. M., & Vargas-Hernandez, N. (2003). Metrics for measuring ideation effectiveness. Design Studies, 24(2), 111–134.
Simon, H. A., & Newell, A. (1971). Human problem solving: The state of the theory in 1970. American Psychologist, 26(2), 145.
Smith, S. M., Thomas, B. W., & Finke, R. A. (1995). The creative cognition approach. MIT Press.
Stapel, D. A., & Koomen, W. (1998). When stereotype activation results in (counter) stereotypical judgments: Priming stereotype-relevant traits and exemplars. Journal of Experimental Social Psychology, 34(2), 136–163.
Sternberg, R. J. (1999). Handbook of creativity. Cambridge University Press.
Sternberg, R. J. (2003). Wisdom, intelligence, and creativity synthesized. Cambridge University Press.
Sternberg, R. J. (2009). The nature of creativity. The Essential Sternberg: Essays on Intelligence, Psychology and Education, 103–118.
Sternberg, R. J. (2013). Thinking and problem solving.
Sternberg, R. J., & Davidson, J. E. (1995). The nature of insight. The MIT Press.

Taylor, S. E. (1981). The interface of cognitive and social psychology. Cognition, Social Behavior, and the Environment, 1, 189–211.
Treffinger, D. J., Isaksen, S. G., & Stead-Dorval, K. B. (2006). Creative problem solving: An introduction. Prufrock Press Inc.
Waller, B. N. (1999). Deep thinkers, cognitive misers, and moral responsibility. Analysis, 59(4), 223–229.
Weisberg, R. W. (2006). Expertise and reason in creative thinking. Creativity and Reason in Cognitive Development, 7–42.
Wiley, J. (1998). Expertise as mental set: The effects of domain knowledge in creative problem solving. Memory & Cognition, 26, 716–730.

The Expression of Emotional Interaction Design in Museums in the Digital Era ——A Case Study of the British Museum

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Abstract
In today's digital age, interaction design is one of great significance in museum design, emotional interaction design can also help museums collect information from visitors and improve display content to better meet the needs of visitors. Therefore, emotional interaction design is of great significance in museum display design, helping to create a better visitor experience. This article explores emotional and visual presentation methods suitable for digital media through the specific exhibition design of the British Museum.

Author keywords
Digital Age, Emotionalization, Interaction Design, British Museum

The interaction design of museums usually draws inspiration and sources from multiple aspects. Designers or curators need to understand and study the themes and types of exhibits related to museum projects to ensure that interaction design aligns with the exhibits. Curators and designers need to consider the needs and expectations of visitors to ensure that interaction design can provide meaningful experiences for visitors. In addition, designers can draw inspiration from other art exhibitions and museums to understand the latest interaction design trends and best practices, and refer to the latest technologies and methods in the fields of digital design and user experience design to ensure that the interaction design of museums is innovative and attractive. In the interactive design of museums, it is also necessary to coordinate with other design elements, such as exhibition space layout, lighting, and decoration. This requires designers to work closely with other museum staff to ensure that the interaction design is coordinated with the entire museum environment.
The British Museum is the world's first national museum open to the public. As a comprehensive museum, it collects various cultural relics and artworks from around the world, including Egyptian mummies, Greek and Roman sculptures, Chinese ceramics, African artifacts, and more, totaling over 8 million items. The research on the collections of the British Museum is a relatively important part, covering a variety of disciplines, including history, archaeology, art history, natural sciences, and so on. These studies not only help us better understand the collection itself, but also help us better understand the development and evolution of human civilization. Researchers at the British Museum often conduct archaeological excavations and research to discover and protect more cultural relics and prehistoric sites. In addition, they also use various technological means, such as digital technology and imaging technology, to research and protect their collections, ensuring that these valuable cultural heritage could be continuously appreciated and learned by researchers and visitors. The

research on the collections of the British Museum is very important, as it not only increases our understanding of human history and culture, but also provides valuable information and resources for future research and conservation work.

Specific Implementation of Emotional Interaction Design in Museums.

The definition of art in the digital age has been reinterpreted, its meaning has been continuously expanded, and its presentation forms are flexible and diverse. Traditional exhibition models are no longer suitable for displaying works. Collection management is a fundamental function of museums and a cornerstone of their various work. Collection management is a complex process that requires scientific methods and the participation of professionals. Museum displays in the digital era have shifted from past exhibitions to increased interaction and participatory experiences with visitors, which is also one of the manifestations of emotional interaction design. This transformation is aimed at attracting more viewers, while also better showcasing the exhibits, allowing the audience to better understand and appreciate them. In the display interaction design of the British Museum, the designer takes into account the needs and interests of the audience, as well as the characteristics and historical background of the exhibits, and utilizes digital technologies such as virtual reality, augmented reality, and interactive screens to increase the audience's sense of participation and interactivity. For example, in the exhibition hall, designers can use virtual reality technology to create a virtual scene, leading the audience through time and space, and experiencing the changes of history. In addition, the designers of the British Museum also used digital methods to address the issue of exhibition protection. Digital exhibits can provide viewers with more display methods and interactive experiences without damaging the original.

Using AR technology to explore and enhance reality

The British Museum adopts Augmented Reality AR (Augmented Reality AR) technology, which allows visitors to experience the virtual reality world from an emotional perspective through mobile devices such as smartphones during their visit. Visitors can also use AR devices to explore the exhibition hall, view 3D models, enter history, explore stories, and learn about and obtain cultural relics information.

Visitor computer interaction, also known as human-computer interaction, what is an interdisciplinary field between computer science and human behavior, aimed at enabling computer systems to better understand and respond to human needs, emotional states, and behaviors. It involves various ways of interaction between humans and computers, including input, output, feedback, and control, emphasizing the mutual influence and interaction between visitors and computers. The British Museum organizes and integrates the information of its collected artworks into computer devices, designs a more convenient user interface through human-computer interaction, and uses natural language processing technology to allow visitors to search for museum exhibits through voice or text, helping visitors and researchers to quickly understand the artworks of interest, improving their sense of body and visiting efficiency. The universal display screen is a common interactive device in museums, usually used to present exhibition information and multimedia content to visitors. At the Capitario Museum of Art in Rome, these screens are designed with highly customizable features to adjust to different exhibitions and themes. These screens typically use high-definition display technology to ensure clear image and video quality, and are equipped with touch screens to facilitate visitors' interaction and exploration with exhibition content. In addition, these screens can also be integrated with other devices and systems, such as audio systems, lighting systems, security systems, etc., to provide a more comprehensive and immersive exhibition experience. Overall, these universal display screens are an important component of the interactive design of the Museed ' Art Cabiotorio in Rome, providing visitors with a more diverse, interesting, and interactive exhibition experience.

In September 2020, the British Museum launched an international touring exhibition - the Egyptian Mummy: Exploring Ancient Egyptian Life Tour, see Figure 1.The Egyptian Mummies Exploration of Ancient Egyptian Life Tour is an international touring exhibition launched by the British Museum, showcasing the history and vitality of ancient Egyptian life, as well as the cultural relics and art of ancient Egypt. The audience can learn about the process of making mummies and how ancient Egyptians regarded them as eternal beings. In addition, the exhibition will also showcase the trade and handicrafts of ancient Egypt, as well as aspects of religion and social structure. This touring exhibition will visit museums and art centers around the world, showcasing ancient Egyptian mummies and their related culture and history to the audience. The exhibits on display include precious cultural relics unearthed from ancient Egypt, such as models of pyramids, jewelry, mummies, violets, and mysterious masks, as well as ancient wooden utensils, showcasing the complexity of ancient Egyptian society, religion, culture, and economic life.

This exhibition provides visitors with the opportunity to join the research team of the British Museum and introduces six mummies that lived and died in Egypt from 3000 to 1800 years ago. The British Museum has adapted to the development of the times and invited some experts to explore ancient Egyptian culture in the form of images, images, and mobile exhibition halls, allowing visitors to have a deeper understanding of ancient Egyptian culture and enriching their cultural perspective. They used a new generation of CT scanners to answer questions and solve puzzles for curious visitors. CT scanners can present complex human remains and objects beneath mummy packages with scanned images in front of curious visitors, and can more accurately determine some key information, such as the gender, age, and health status of the mummy at the time of death. The exhibition of ancient Egyptian mummies shows us the unusual funeral traditions of people here during this period, preparing for the afterlife. These traditions attract us to explore the life along the Nile River thousands of years ago. At the same time, the exhibition has set up voice recognition and intelligent assistant devices, such as Amazon Echo or Google Home, allowing viewers to interact with intelligent assistants through voice and obtain more information.

The Cooper Hewitt National Design Museum in the United States has further innovated this display method

Figure 1. Egyptian Mummies (Exploring Ancient Egyptian Life - International Tour Exhibition Exhibits)

at the British Museum, with the "The Pen" mobile device digital pen inside. As an exhibit at the Cooper Hewitt National Design Museum in the United States, it provides users with a new way of creation and expression through the use of advanced digital technology, allowing visitors to understand and familiarize themselves with the collection through emotional senses.

When using the 'The Pen' mobile device digital pen, viewers and users can create digital paintings, notes, charts, and various other types of design works, and save their interested art works to the device or share them on other platforms. The emergence of this digital pen can not only improve the work efficiency of designers, but also to some extent change the development direction of the creative industry. Interactive design can create more realistic and vivid display effects through digital technologies such as virtual reality and augmented reality, thereby enhancing the audience's sense of experience. Viewers can immerse themselves in the historical and cultural background of the exhibits, gain a deeper understanding and experience, and actively seek the best learning mode. Compared to traditional displays, interactive design guides the audience to actively participate in the display, thereby improving audience engagement and interactivity.

Using media platforms to enhance emotional interaction and communication

The British Museum uses social media to facilitate interactive communication between people, such as Facebook, Twitter, etc., allowing visitors to communicate and share experiences in real- time online, as well as obtain the latest information about exhibitions, increasing the popularity of exhibitions. By using social media platforms to assist in the dissemination of exhibitions, the British Museum can establish effective connections and interactions with visitors, researchers, scholars, as well as museums and cultural institutions around the world. The British Museum has a large number of fans and followers on online platforms such as Facebook, Twitter, Instagram, and YouTube. Use these platforms to publish relevant images, videos, articles, and other content about exhibitions and artworks, showcasing museum collections and academic exchange activities to the public. These contents have aroused the interest of visitors and researchers, thereby promoting their visits and in-depth research exploration.

Secondly, the British Museum also utilizes interactive functions on social media platforms to communicate and interact with fans and followers. For example, museums often initiate topic discussions on Twitter, inviting tourists to share their museum experiences and opinions. In addition, the British Museum will regularly hold online Q&A activities to answer tourists' questions and doubts. These interactive activities have helped establish an open, friendly, and interactive community, promoting interaction and communication between museums and the public. The British Museum also utilizes social media platforms to promote its offline activities and exhibitions. Post photos and videos related to exhibitions on Instagram, promote events and lectures through Twitter, and more. These promotional activities help museums attract more tourists and visitors, while also increasing public attention and understanding of museum work.

Overall, the British Museum has established good interaction and communication with the public through the use of social media, making it a modern, open, and interactive cultural institution.

The collections of major museums around the world contain a large number of archaeological artifacts and precious literature, which connect the process and experience of world civilization development. The use of emotional interaction design in museum display design is a reflection of comprehensive art design. In display design, emotional experience is widely applied to artistic design languages such as contrast, symmetry, and balance, so that visitors can see and feel the images of exhibits and collections in the museum space, and the colors and light reflected are effectively combined to form a unified whole. Architect Anthony said, "Only by experiencing the space firsthand, walking through it, and enjoying it with pleasure, can you truly appreciate

its inherent qualities." For example, in recent years, the National Museum of China has been committed to the construction of a smart national museum, integrating ancient Chinese traditional culture with modern technology, promoting cloud services, and creating the central kitchen of the National Museum. The cloud national museum has gathered 56 virtual exhibition halls 100 exhibition themed websites, many cultural relics and boutique exhibitions showcasing the charm of China have taken to the cloud. I.M. Pei's design of the "Louvre Pyramid" at the Louvre in 1984 was an innovation and breakthrough in spatial design in museum display design;

The Science Museum in London introduced a radio guidance system between 1960 and 1964. In 1964, visitors to the Museum received mobile radio equipment distributed by the museum, allowing them to hear targeted voice explanations. The above list demonstrates that museum display design plays a positive and balanced role in the development of museums, enabling visitors to have an idea of viewing the displayed items upon entering the museum. This is a very positive aspect of museum display interaction design.

The interactive design of art museums can enrich the meaning of space, deepen emotional experience and spatial cognition, and this experience is also more authentic and profound. When interactive design is used in art museum displays, it can provide visitors with a richer and more profound spatial experience. This is because interactive design can not only increase the participation of visitors in exhibitions, but also provide more creative and diverse display methods. Interactive design can allow visitors to have a deeper understanding of the exhibits. When visitors use interactive projection or virtual reality technology to view an exhibit, they can observe from different angles and perspectives, gaining a more comprehensive understanding of the details and characteristics of the exhibit. This interactive viewing method can allow visitors to have a deeper understanding of the story and meaning behind the exhibits, thereby improving their emotional experience and spatial cognition. Interactive design can enable visitors to participate more actively in exhibitions and bring more innovative and diverse display methods. When we visit exhibitions in museums, we often expect to see some interesting exhibits and understand their historical and cultural backgrounds. However, if the design of the exhibition is only static, it may make us feel monotonous. Therefore, emotional interactive design can bring rich spatial significance to museum exhibitions.

References

Xin Xiangyang, "ZHUANG SHI: From Physical Logic to Behavioral Logic," Decoration, (2015)Issue 1, p. 58-62.DOI: 10.16272/j.cnki.cn11-1392/j.2015.01.012.

Edited by the British Museum and the Capital Museum, "Treasures of World Civilization: 250 Year Collection of the British Museum", Beijing: Cultural Relics Publishing House, March (2006).

Written by Linda Young, translated by Tang Jingguang: "Globalization, Culture, and Museums", "Museum Newsletter", 19 issues, published by the Taiwan Museum Society, (2002).

Chen Gang, "Analysis of the Concept, Characteristics, and Development Model of Digital Museums", Chinese Museum, March (2007).

Creative Methodologies for the Development of Spatial Intelligence in Environmental Design

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Abstract

Recent environmental awareness requires a paradigm shift in space design education to one with greater focus on creativity as a capacity to cope with the complexity of our actual design challenges.The conception of new spaces requires new strategies in design education focusing not only on analytical and logical thinking but on "lateral thinking" (De Bono E. 1991), "divergent thinking" (Robinson K. 2001) and "emotional approaches" (Damasio A. 2005) fundamental for the development of spatial intelligence. These strategies can be developed through collective and individual drawing, mockups and photography to create a new environmental sensibility incorporating aspects of traditional Chinese design in the conception of new spaces.

The purpose of this contribution is to present a case study in which we worked with first grade students of Environmental Design in Gengdan Institute of Beijing University of Technology in the "Rethinking the Hutong" project (2018 and 2019). In this "project based" course students applied creative methodologies and experimental work creating a collective project redesigning and revaluing an important element of Beijing traditional architecture now endangered by urban speculation.

An important part of this teaching strategy for the development of spatial intelligence is the concept of atmosphere. We understand atmosphere when a strong experience of place and space is produced; when space evokes sensorial perceptions (warmth, light, sound…), embodiment (body mindfulness), compassion with the user (empathy) and specific cultural meaning (Pallasmaa, J. 2009). 'The essence of atmosphere is the haptic sense of being in the world in a specific place and moment, the actuality of existence' (Böhme, G. 2013).

In the development of spatial intelligence students learned that spatial definition not only depends on geometry and materials but also on light, touch, sound, smell and environmental factors. The learning shift occurs when instead of facing a project with an abstract 'concept', they start to work with real 'sensations'. For first degree students, facing a project with abstract concepts is difficult; it is easier for them to work with real sensations. Experimenting with atmospheres is very stimulating for spatial design students and we consider it fundamental for acquiring environmental design capabilities.

Keywords: Creativity; Design; Environment; Space; Atmosphere.

Introduction

Why this course? (our motivation)

The aim of this presentation is to present a case study in which we worked with first grade students of Environmental Design in Gengdan Institute of Beijing University of Technology in the "Rethinking the Hutong" project (2018-2023). In this "project based" course students applied creative methodologies and experimental work creating a collective project redesigning and revaluing an important element of Beijing traditional architecture now endangered by urban speculation.

Recent environmental awareness (climate change, pollution, city growth…) requires a paradigm shift in space design education to one with greater focus on creativity as a capacity to cope with the complexity of our actual design challenges (creation of more human environments, re-naturalization of urban spaces, new types of mobility, more efficient use of resources…)

We are on the brink of technological, ecological, social, and economic change that will fundamentally change the way we live and work. Taking into consideration that the scale of this change will be different from any that humanity has experienced before we think it is very important to train students how to think in new ways, how to be creative, how to find new connections and how to react in unstable conditions.

The development of spatial intelligence is basic to cope with these changes. Spatial intelligence in environmental design is the capacity to visualize, imagine, create and communicate space for environmental projects. Creativity as the capacity to develop new ideas with value is fundamental in the development of spatial intelligence.

Figure 1 .

Student proposals rethinking traditional Chinese house

China has a very rich cultural heritage reflecting a powerful sensitivity towards space design. The importance and special use of light and color, the use of perspective and visual structure, wooden construction systems, garden design, are some of the many elements of traditional Chinese space design. In the last years many of these design principles have been forgotten due to economic growth and fast urban development introducing standardized and foreign models of environmental design alien to Chinese culture.

We consider of great importance to teach through the development of creativity and space intelligence how students can rethink their traditional culture for new and modern environmental design requirements.

Methodologies

1.Learning the transition from two-dimensional to three-dimensional

Development of spatial thinking through freestyle drawing and collage. The exploratory drawings of abstract concepts develop the imagination and help students finding 2D patterns and structures that can become interesting spaces.

Figure 2 .space exploratory drawings made by students

2. Learning by doing

The transition between 2D and 3D was made by students exploring with their own hands and with different materials.

They produced individual and collective mockups which were photographed alongside cutouts of human figures to develop new environmental sensibilities.

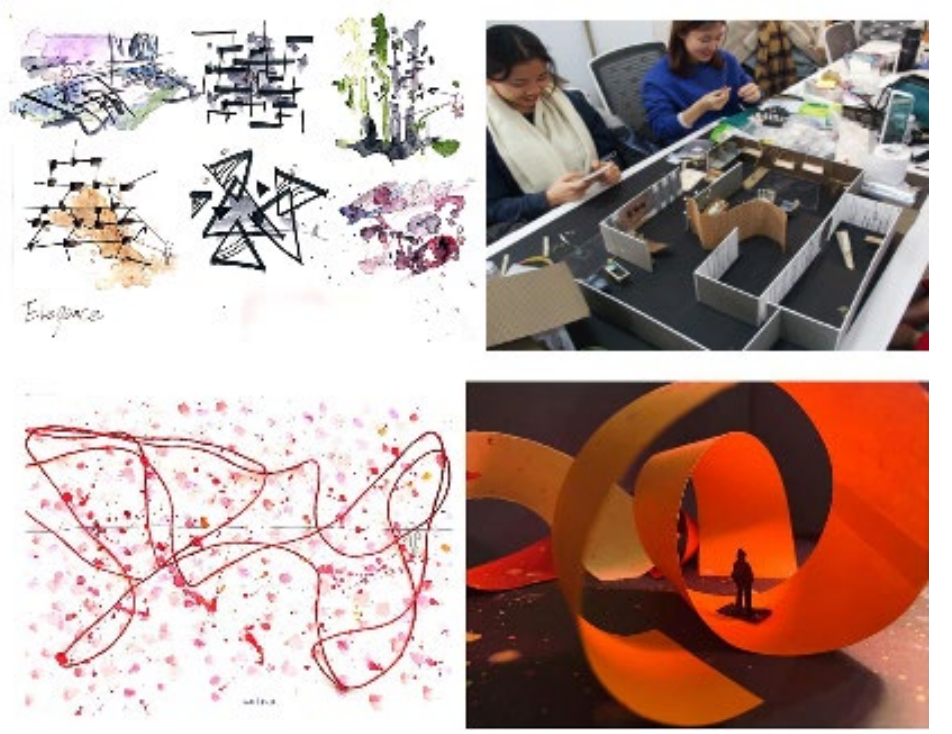

Figure 3 . Working with the hands

3. Dynamic methodologies of active interaction

Students were always active participating in collective activities like making big drawing with ink about their feelings regarding environmental design problems or making personal presentations of their research.

Figure 4 . Students realizing a collective 'sensory'drawing

4. Enhance the experience of space

The development of a heightened sensitivity towards the utilization of space is fostered as students explore how their bodily movements generate spatial dimensions through drawing.

Figure 5 .Explore space with body painting

5. Learning by solving real problems

Students are dealing with real problems: the loss of traditional culture , the destruction of historical heritage, the lack of social interaction in modern cities, the homogenization of modern commercial space, etc.)

Considering and debating these aspects of our actual environment gives meaning to what they are learning.

Figure 6 . Discussing the pros and cons of Beijing environment

6.Experiential learning

Considering and discussing about students personal experiences (interests, values, tastes, hobbies, etc.) was very important in optimizing the learning process. Student fell more motivated and make their project as part of themselves.

Experiencing new sensations in the design process was also very important in the realization of moodboards with different materials.

7. Emotional learning

The process of working with atmospheres in the development of new spaces, through drawings, photographs, and mockups, engages students in a sensorial learning experience that encompasses warmth, light, sound, embodiment (body mindfulness), and empathy towards the user.

Figure 7. Students express emotion with light

Figure 8 . Creating atmospheric values in space design
Specific cultural meaning incorporating aspects of traditional Chinese design. The students carried out sensory activities related to traditional Chinese culture (tea ceremony, writing with Chinese ink, etc.)

Figure 9 . Exploring space with Chinese ink-based writing

Figure 10 . Student making a demonstration of Chinese tea ceremony

8. Continuous assessment and feedback

The students always knew about their evolution and about the group evolution through personal and collective feedback.

Figure 11 . Group feedback

9. Result orientation with focus on the process.

The goal of the course was to redesign part of the old city that was suffering important destruction due to urban speculation. The final result was a collective model product of the process of integrating individual designs.

Figure 12. Different stages in the realization of individual designs

Conclusions

Teaching is more difficult for teachers because working with real problems, experiences and emotions implies dealing with complexity and uncertainty.This kind of teaching means more work for the teachers preparing and organizing materials and spaces for different activities.

This kind of teaching in not linear (not cause-effect, not one solution but different solutions…etc.) and this is a great difficulty for some Chinese students.We consider this 'uncertainty mood' as something positive for the development of creativity because many times certainty in design is a barrier to the development of new ideas.

Most of the students were very satisfied by the results of the first exploratory exercises and this motivated them to continue researching on different areas.Through drawing, collage, model, and other exploration attempts, freshmen learn to break with linear education.

In the development of spatial intelligence students learned that spatial definition not only depends on geometry and materials but also on light, touch, sound, smell and environmental factors. The learning shift occurs when instead of facing a project with an abstract 'concept'， they start to work with real 'sensations'.

Experimenting with atmospheres is very stimulating for spatial design students and we consider it fundamental for acquiring environmental design capabilities.

At first, creating atmospheres is difficult for students with a strong rational approach to the project. Once they change to a more sensory approach they discover a wide range of possibilities to link their project with the environment.

Working with 'sensations' instead of 'rational abstract concepts' has been a positive change for students in the first stages of the project.

References:

Böhme, G. (2013) Encountering Atmospheres, a reflexion on the concept of atmosphere. Oase Building atmosphere, No 91, 93-100.

Damasio, A. (2005) Descartes Error: Emotion, Reason, and the Human Brain. London, England: Penguin.

De Bono, E. (1991). Lateral thinking. London, England: Pelican Books.

Pallasmaa, J. (2009). The Thinking Hand: Existential and Embodied Wisdom of Architecture.

Chichester, England: John Wiley & -sons LTD.

Robinson, K. (2001). Out of our minds: Learning to be creative. New Delhi, India: Wiley India Ltd.

A Study of Cultural Space Construction in Small Town Centers in Northwest China in the Context of Urban Renewal

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Abstract

This study explores the construction of cultural spaces within small towns in Northwest China, focusing on the unique challenges and opportunities presented by this distinct urban context. The paper identifies that these towns generally have a mix of commercial and residential areas, often characterized by a lack of infrastructure, parking facilities, and public transportation. The paper argue that the transformation of these spaces is often handled in a superficial manner, resulting in a lack of integration with the surrounding area and a loss of material and intangible culture. In response to these issues, this research proposes a shift towards a more sustainable and organic approach to urban renewal, one that respects the historical and cultural context of these towns. The paper presents an in-depth analysis of the concept of cultural spaces, the dynamics of organic renewal, and the int erplay between these two aspects. It asserts that cultural space is not only the spiritual core of urban development but also a key strategy for urban revitalization. The paper concludes with a discussion of the implications of these findings for urban planning and policy-making, emphasizing the importance of cultural identity in shaping the perception, understanding, and design of built environments.

Keywords: Cultural Space Construction, Small Towns in Northwest China, Urban Renewal, Organic Renewal, Urban Cultural Identity

Introduction

Cultural space creation is linked to the historical accumulation and lineage of urban and rural development, representing not only works with a long history, but also the evolution of urban and rural development in modern times (Vale, 2018). Cultural spaces differ substantially between large
cities, small towns, and villages, and their types and qualities are not the same (Grodach, Foster, & Murdoch, 2019). The general norms and general problems of the cultural space features of small town centers in Northwest China are the subject of this research.

At the moment, small towns in northwestern China generally have mixed commercial and residential areas with "stores in front and houses at the back, and stores at the top," most of which are located in the center of small

towns, which show a low-level, chaotic, and congested spatial form in urban landscape, and at the same time, there are many problems such as lack of infrastructure support, parking facilities, public transportation, and so on (Tan & Li, 2018; Song, Zenou, & Ding, 2018). The renewal and transformation of small town centers are mostly protected by the "cage type" against the backdrop of the excess of the "incremental era" to the "stock era," that is, ignoring the integration of development with the surrounding area, focusing on the remodeling of street style or façade renovation, and ignoring the regeneration of material and intangible culture; or adopting rough overthrow and reconstruction, local residents resettled in other places (Huang & Tao, 2021; Wu & Zhang, 2017). Based on this, this paper changes the predicament of the cost limitation of small town renovation, the policy pressure of prohibiting forced demolition, and the social problems of demolition and resettlement of aboriginal people by changing the previous pattern of floating on the surface. When combined with the development status quo of small towns' center areas, it creates cohesion and symbiosis between the renewal area and the periphery, becoming a cultural identity card in the course of the city's modern development (Carter & Butler, 2021; Zhao & Zu, 2019).

Rational Analysis of Urban Organic Renewal under Cultural Orientation

Cultural spaces

Cultural space, i.e., the space of culture, is identified as a place where folk and traditional cultural activities are concentrated, but also as a period of time that is generally characterized by a cycle (period, season, schedule, etc.) or an event (Vale, 2018). After the 19th National Congress report, cultural confidence was proposed as the "fourth confidence" of socialism with Chinese characteristics, following road confidence, theoretical confidence, and institutional confidence, marking the culmination of the construction of space in the context of cultural prosperity.

These spaces, which add a humanistic flavor to the city and countryside, have become significant development objects. They are inclusive of public cultural space, urban cultural space, and community cultural space, together forming the city's local cultural characteristics system. They play a crucial role in safeguarding cultural diversity and have significant implications for gentrification and urban transformation processes. These processes often involve the displacement of arts and cultural industries, leading to potential alterations in cultural identity (Grodach, Foster, & Murdoch, 2019; Carter & Butler, 2021).

In the context of China's rapid urban expansion and landscape transformation, the development and preservation of these cultural spaces have become essential (Tan & Li, 2018). The regeneration of urban villages, for instance, can significantly impact neighborhood cohesion and cultural identity (Zhao & Zu, 2019). Additionally, strategies for housing renewal and reconstruction are pivotal for maintaining these cultural spaces and ensuring their sustainable development (Huang & Tao, 2021).

Organic Updates

Organic renewal, as proposed by academician Wu Liangyong, and Shalainen's theory of organic growth both refer to the city as a living creature. This perspective is reflected in more recent urban studies, which often draw from biological metaphors to understand the complex dynamics of urban development (Vale, 2018; Wu & Zhang, 2017). Wu Liangyong believes that organisms are organically linked from the city to the building, in accordance with the city's internal order and law, and in accordance with the dynamic growth of the city's texture and trends. Adopting an acceptable urban scale, suitable building and space scales, and correctly handling the relationship between the present and future, as well as the relationship between the audience, based on the content and requirements of the renewal, are all key considerations in this organic approach. It

investigates the renewal and growth of the city on the basis of sustainable development, continuously enhances the quality of urban planning, and makes the environment of the urban renewal area consistent with the overall environment of the city. The role of cultural identity in this process is particularly critical, shaping the perception, understanding, and design of built environments (Carter & Butler, 2021).

critical thinking

Interplay of cultural space and organic regeneration

(1) Cultural space is the spiritual core of urban development

The city consists of spaces carried by different functions for different groups' needs, and various needs, functions and spaces are divided into different levels according to scales, including urban areas, urban zones, urban units, urban neighborhoods, urban residences, and internal spaces of residences, and the units are slowly gathered and grown through the activities, interactions and behaviors of citizens' groups. In the process of aggregation, the scale of the spatial unit becomes larger, the population increases, and the functions are richer. Cultural space is the cohesive core unit of the spatial unit, which is the place for living and interacting in the neighborhood unit, and also the space for cultural identity and belonging that is shaped by the group interaction together. It is the central space of the block in the urban unit, the hub of public culture in the urban sub-district, and the representative of urban locality and inheritance in the urban area.

(2) Cultural space creation is a key strategy of urban revitalization.

Ilir Shalinen proposed "organic urban growth" in "The City: Its Development Decay and Future" in 1942, which is a type of "Adaptive Change" (Adaptive Change) with high flexibility to adjust to the complexity of the existing circumstances. strong adaptability to deal with the current quo's complexities. Saarinen (Saarinen, 1942) Organic urban regeneration is the essential transformation of city areas that are no longer fitted to the social life of an interconnected city in order for them to thrive and prosper once more. It primarily comprises the rehabilitation and continuance of various biological habitats, spatial environments, cultural environments, aesthetic environments, and recreational settings, among other things. Redevelopment, rehabilitation, revitalization, and historical preservation are the four modes of urban organic rejuvenation. Among these, physical space building primarily serves to compensate for a lack of infrastructure and public service facilities. To complete the process from primary perception to deep cultural identification, the creation of urban spiritual culture necessitates the construction of cultural space. Of course, social value is the primary evaluation indicator of urban renewal (see Table 1), and it is ultimately responsible for making the urban renewal region blend with the city as a whole.

Tab.1 Social indicators in urban renewal projects

Design standards	Norm	quantitative analyses	qualitative analyses
Local character preservation/ improvement	Whether local features appreciate in value	√	
	Updating the uniqueness of the region		√
Cultural Identity Shaping	Spiritual and cultural values, cultural identity of citizen groups		√
City Characterization	Collective impression of the city		√
Open space accessibility	Average walking distance to nearest open space	√	
	Open space accessibility	√	
	Barrier-free facilities serving the elderly, persons with disabilities and children		√
Non-residential development to changing Adaptability of non-residential development to changing needs	Adaptability to future changes		√
	Reusability of local characteristics	√	
Cultural space construction	Spatial places with cultural interaction and cultural functions	√	

Path of building cultural space in small towns in the context of organic regeneration

According to China's National Bureau of Statistics, there were 18,746 organized towns in 2019. However, small town growth in Northwest China faces serious issues like excessive building volume, disordered styles, and monotonous skylines dominated by ultra-wide high-rises. Given these problems, urban planning should respect overall city positioning, analyze the city's spirit and culture, and build a cultural system enriching community spaces. The costs and benefits of urban renewal that conserve some modern history while improving residents' environment and belonging should be balanced. Ultimately, planning should realize the city's characteristic development aims, inherit its historical qualities, and revitalize its vitality.

Building a cultural function system

The elucidation and organization of cultural elements forms the basis for developing a functional system that aligns with the specific needs and development trajectory of small towns. This system may encompass diverse cultural components including, but not limited to, cultural centers, libraries, folklore centers, bookstores, cultural creativity districts, digital cultural experience zones, and public spaces such as cultural plazas, folklore plazas, and fitness and leisure plazas (Whyte, 1980).

This cultural function system, while grounded in the town's cultural elements, should remain adaptable and expansible, tailored to the unique characteristics and evolving needs of each small town (Montgomery, 1998). The system serves as a blueprint, guiding the design and construction of physical spaces that enhance the cultural vibrancy and social fabric of the community (Gehl, 2011). Ultimately, this approach ensures cultural assets are strategically leveraged in urban planning, fostering community engagement, enhancing quality of life, and supporting sustainable urban development.

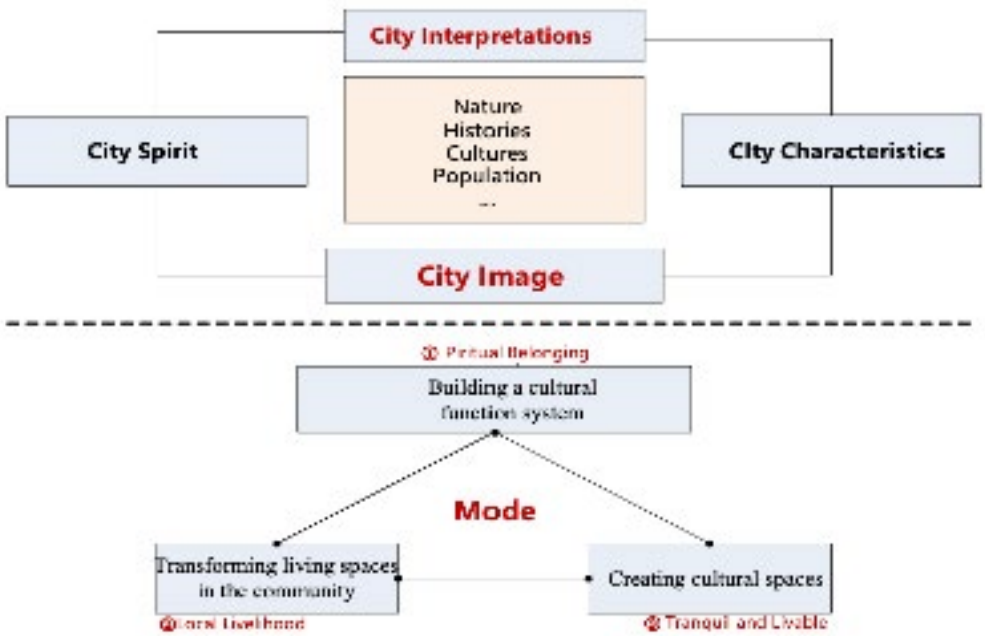

Figure 1 Path model of cultural space construction

Transforming living spaces in the community

Community living space is the main content of small town centers, and it is only by allowing urban citizens to live in peace that a greater degree of urban culture can be demonstrated. Therefore, the collective memory of local citizens and their groups should be preserved, and the places of collective memory should be appropriately remodeled and converted into living space units that are in line with the city's image and meet the needs of modern life. Retaining the form of mixed business in the community, supporting drainage, gas, heating, parking and other facilities, removing the wall and combining the externalization of the interaction space with the space for culture and nourishment.

Creating cultural spaces

Cultural spaces like small town centers encapsulate urban character, serving as public hubs and venues for folk practices within living areas (Mumford, 1961). Renewal should enhance, not eradicate these imprints shaping collective memory (Huyssen, 2003). It involves constructing spiritual places to foster cultural self-confidence from historical roots. The aim is reviving regional culture, reshaping geo-spatial networks (Lynch, 1960) and intertwining public and spiritual spaces. Effective regeneration retains inhabitants, necessitates minimal planning for enjoyable spaces, and fosters community cohesion cost-effectively (Carmona et al., 2003). Thus cultural spaces are vital not just for preserving history but also for optimal renewal strategies.

Conclusion

This study underscores the importance of cultural space construction in the context of small towns in Northwest China. The unique challenges these towns face, including mixed land use, lack of infrastructure, and superficial transformations, necessitate a fresh approach towards urban renewal. The paper advocates for an organic renewal approach, which treats cities as living organisms and emphasizes the need for urban renewal in sync with the city's internal order and growth dynamics. Importantly, cultural space is identified as the spiritual core of urban development and a key strategy for urban revitalization. The preservation of cultural spaces and their sustainable development play a significant role in maintaining neighborhood cohesion and cultural identity.

The study also underscores the importance of the interplay between cultural space and organic regeneration in urban planning, indicating that the right balance between the two can lead to more sustainable and culturally vibrant urban environments. The findings of this research hold significant implications for policy-makers, urban planners, and developers, urging them to create urban spaces that are not just physically functional but also culturally meaningful and sustainable.

Reference

Carmona, M., Heath, T., Oc, T., & Tiesdell, S. (2003). Public Places, Urban Spaces: The Dimensions of Urban Design. Architectural Press.

Carter, N., & Butler, R. (2021). The role of place identity in the perception, understanding, and design of built environments. Bentham Science.

Gehl, J. (2011). Life Between Buildings: Using Public Space. Island Press.

Grodach, C., Foster, N., & Murdoch, J. (2019). Gentrification, displacement and the arts: Untangling the relationship between arts industries and place change. Urban Studies, 56(4), 807-825.

Huang, Y., & Tao, R. (2021). Housing Renewal in Urban China: A Comparative Study of Old Community Reconstruction and Shantytown Redevelopment. Cities, 110, 103071.

Huyssen, A. (2003). Present Pasts: Urban Palimpsests and the Politics of Memory. Stanford University Press.

Jacobs, J. (1961). The Death and Life of Great American Cities. Random House.

Lynch, K. (1960). The Image of the City. MIT Press.
Montgomery, J. (1998). Making a city: Urbanity, vitality and urban design. Journal of Urban Design, 3(1), 93-116.
Mumford, L. (1961). The City in History: Its Origins, Its Transformations, and Its Prospects. Harcourt, Brace & World.
Tan, M., & Li, X. (2018). Urbanization and amenity landscape: A case study of a peri-urban area in China. Landscape and Urban Planning, 177, 92-103.
Vale, L. J. (2018). Architecture, Power, and National Identity. Routledge.
Whyte, W. H. (1980). The Social Life of Small Urban Spaces. The Conservation Foundation.
Wu, F., & Zhang, F. (2017). The Chinese City. Routledge.
Zhao, M., & Zu, Y. (2019). The impact of urban village regeneration on neighbourhood cohesion: the case of Guangzhou, China. Urban Studies, 56(8), 1531-1548.

Transferability vs. Repeatability: Consolidating the Ontological Nature of Design Research

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Abstract

Over time we have begun to build foundations for design ontology moving it away from efforts to align with a scientific rigour model based on reproducibility and generalisability towards a new direction supporting design's emergent and abductive qualities. Two of the key issues that have escaped our grasp has been a better understanding of design ontology and what equates to rigour in constructive design research. Recent work by the authors has positioned transferability as a candidate for a design ontology based on an ontological mirror along with a series of attributes addressing the rigour issues of future-forwards knowledge generation. Here we use two case studies to test the future forwards rigour of a transferability property for design knowing and speculate as to how researchers can build confidence and trust.

Author keywords

Transferability; Design Ontology, Design Futures; Design Research

Introduction

thinking by CP Snow (Snow, 1959) and Archer's claim for design as the third culture, (Archer, 1978) a number of design thinkers have suggested temporal relationships between forms of knowledge production across different domains. Herbert Simon "Design, on the other hand, is concerned with how things ought to be,⋯" (1969, p.115), John Chris Jones "⋯that which exists only in an imagined future" (1992, p.10) and finally Ranulph Glanville "⋯ there is a third kind of knowledge that converts knowledge of into knowledge for⋯ (2005, p.112) explored the idea that design has a distinctly different temporal relationship to scientific and Arts & Humanities knowledge building. This culminates in Glanville's proposition of 'design for future transformation'. It aligns with work by many others positioning design as an abductive form (Douven, 2011) of thinking imagining new futures.

The issue previously explored by the authors (Hall & Galdon, 2023) concerns rigour and more specifically how knowledge that is being generated for future transformation in a forever-forwards mode can be built upon and at some future stage perceived to be truthful and worthy of acting on. While the authors have explored theoretical avenues leading towards transformation, we also seek to test tangible examples.

Towards a Design Ontology

Several developments have come together for identifying the core foundations of knowledge generation in design research. These are substantially different to those of other domains of thinking and the call for distinct design foundations made most recently by Dixon "⋯with the potentially special approach to knowledge claiming in design, there is also the possibility that the evolution might take on a different form here too." (2023, p.127).

Dixon identified the impossibility of reproducibility and generalizability as foundations for design research and opens the door towards several other approaches.

Gaver et al (2012, 2022) have identified emergence in the context of Human Computer Interaction (HCI) as an essential quality for design research where methodologies are rarely set in advance. This contrasts to the 'preregistration movement' in HCI which seeks to evaluate the outcome of research according to a prior public registration of research aims. Here design and the sciences clearly diverge in their expectation of rigour models where one appears to view divergence as suspect and the latter sees it as essential for investigation. Koskinen and Krough (2015) inspired by Gaver (2001) explore accountability in the context of constructive design research by way of the entanglement of theory and practice. They describe the tensions of design research that builds on practice and must navigate competing interests and multiple concerns. Building on this Krough and Koskinen (2020) consider the implications for moving from a practice based to a knowledge-based discipline and how this affects research outcomes. They explore through four different epistemic traditions using the concept of 'drifting by intention' and emphasise in line with Gaver that context is crucial, and that drifting is conceived within a constructivist design research tradition and would be out of place for example in an engineering context. Binder and Redström (2006) review the three traditions of design research and described how drift can emerge in research cycles as practice uncovers new opportunities and directions. They contrast the inside and outside view of design research programs to illustrate the projected verses the perceived research experience akin to Jacob's research night and day (Jacob, 2001). Zimmerman, Forlizzi & Evenson (2007) propose relevance and extensibility as criteria for reliable knowledge production in design research. Earlier Guba and Lincoln (1985) in the social sciences point towards transformation as one of a series of trustworthiness attributes including credibility, transferability, dependability, and conformability. The context here is producing knowledge of the world via rich and thick descriptions of socio-cultural scenarios rather than knowledge for future transformation. Nowell et al (2017) extended this concept challenging that a researcher cannot know who, how and where their research may be transmitted or extended to hence a question arises as to how design researchers who initiate research can enhance their practice, anticipate transmitted context and extensibility capacity of their work. Interestingly Krough and Koskinen (2015) contend that design researchers build on the ideas, methods, and practices of other researchers rather than the objects that might be outcomes of their work indicating that 'thingness' has less influence in design research for transferability.

We can draw threads of similarity through a special approach to knowledge claiming (Dixon), emergence (Gaver et al), drifting by intent (Krough and Koskinen), extensibility (Zimmerman, Forlizzi and Evanson) and transformation (Guba and Lincoln) leading towards a proposition that if design's purpose is to create knowledge for future transformation, then transferability becomes a contender to underpin ontology. Three of these concepts have spatial relations to research outcomes in terms of direction as illustrated below in Fig.1.

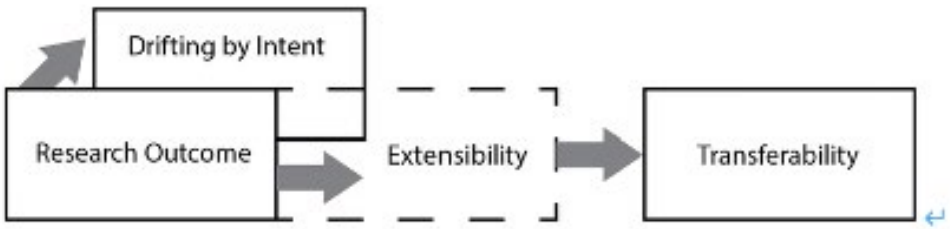

Figure 1. Candidates for core ontology attributes in the context of constructive design research

Methodology

In order to test transferability in concrete research examples we have reflected on two design research projects undertaken by the authors that deal with design futures and supports thinking that addresses the key issues above: a framework for prospective design (Galdon and Hall, 2019a), and a design for safety foresight review (Anderson, Hall, Ferrarello, Cooper and Ross, 2018). Reflecting across these publications has supported new thinking towards contributing to the ontological quality of design knowledge production, and a further consideration about what this means in terms of rigour for practice-based design research.

Case studies enable the exploration and investigation of applied research within a defined context by using a variety of data sources (Baxter et al., 2008). This methodology allows design researchers to develop and to enhance:

"…the capacity of comprehension and analysis of real problems, the capacity to propose and evaluate alternatives for the improvement of the problem considered, to work collaboratively, [and facilitates] their capacity of information management and synthesis of problems" (Herrera et al, 2016).

In this context, we will use comparative studies. According to Bukhari (2011) a Comparative Study analyses and compares two or more objects or ideas to examine, compare and contrast them to show how two or more subjects are similar or different.

Transferability Case Studies

We have selected two case studies from the research projects of the co-authors to test diverse transferability motivations, methods, mediums, and audiences for research. Neither of the case studies were created with the express purpose of facilitating transferability or making a case for ontological significance and we have approached the comparison of the cases to operate on a critical basis to develop a preliminary set of criteria for considering transferability factors. Therefore, our approach is retro-speculative.

Case Study 1 – Prospective Design

Prospective Design differs from other forms of future design studies, such as Critical and Speculative Design, in its focus on systematic and relational ideation. Prospective Design aims to design on behalf of the user to shape frameworks and mitigate unintended consequences. Its focus, building on Nigel Cross's work (1983), is on building preparedness, readiness, and appropriateness. This methodology repositions the designer as an expert in future-led technological potentialities aimed at reducing risks and protecting citizens/users. The success of the output is determined by its potential to affect change, which depends on the weight of the actors involved within the system. This future-led, mixed-methodology aims to design trust and incorporates trajectories, probabilistic extrapolation, asymmetries, consequential analysis and counter-fictions to design novel strategies to mitigate unintended consequences in prospective technological developments.

The methodology was developed in the context of artificial intelligence (Galdon, Hall, & Wang, 2019a). Four publications (Galdon and Wang, 2019b: Galdon and Wang, 2019c; Galdon and Wang, 2019d; Galdon and Wang, 2019e) were submitted to the National Data Strategy board for review. The committee accepted all four publications as pieces of evidence to inform the development of the framework which will determine the use of artificial intelligence (AI) in the UK. This framework was synthesised, adapted, transferred, and implemented in the context of publication aimed at future covid-19 type events (Rodgers, Galdon, and Bremner, 2020) to build preparedness, readiness and appropriateness. Building from the work conducted in prospective design, the covid-19 work also made use of time via longitudinal studies, the adaptation of probabilistic extrapolations via evolutive traces, and the execution of a concrete output via the generation of a book supported by the Arts and Humanities Research Council in the UK. This adaptation mirrored the process developed in prospective design. This project is an example of the synthesis, flexibility, contextual adaptation, and transferability process in which

design operates. Currently, we are implementing a new case study to further synthesise, adapt, transfer, and implement prospective design in the context of regeneration and sustainability via the development of deep products (Galdon and Hall, 2022).

Case Study 2 – Design for Safety Foresight Review

The Design for Safety (DFS) Foresight review (Anderson, Hall, Ferrarello, Cooper and Ross, 2018) was a strategic design research project commissioned by the Lloyds Register Foundation (LRF) following the successful design for safety grand challenge that focussed on saving lives at seas working with ship's pilots and the Royal National Lifeboat Institution (RNLI) on the river Thames (Hall, Ferrarello and Kann, 2017). The LRF is a charity funded from profits derived from business operation by the Lloyds Register surveying ships with remit of improving safety and have commissioned and published a series of strategic reports on diverse safety areas from fishing and ferries to robotics and critical infrastructure. The DFS research team at the Royal College of Art were commissioned to develop a DFS foresight review that would identify the top global risks from the perspective of DFS and identify any gaps in knowledge and capability.

The foresight review consisted of an international questionnaire and a two-day symposium with an international representation of geographies and safety critical industries. The review was focussed through a DFS matrix which identified the capability gap. A series of strategic mapping exercises were conducted during the symposium including mapping safety case study examples from each expert to ask where should design operate and what is missing from design; design future scenarios based on future forecasting techniques, which outlined future global risks that cross-sectors experts need to tackle through design; a strategic session where experts prioritise future design risks. Following a second one-day symposium with lead researchers and the Lloyds register foundation an onion diagram was developed to communicate the gap in capability and knowledge related to future global DFS issues. These were a DFS gap in ethics and principles, safety culture and safety practices.

Comparison

Case study 1 (CS1) contains several transfers from the original project into four papers for the UK AI Data Strategy Review Board and separately another strand supports a research publication aiming to improve design systems response to future pandemics. Case Study 2 (CS2) has developed a number of publications including one on emergent methodology (Hall, Ferrarello, Anderson, Cooper, Ross, 2019). The DFS project informed a new research project also in the marine environment seeking to support a new economic model for the world's oceans.

Both case studies take a 'knowledge for' future transformation approach from different directions. The prospective design case study (CS1) develops a philosophical perspective on futures and develops a methodology for prospective design that encourages stronger feedback loops from future projections allowing us to 'design in' preferred futures taking a collaborative directional role rather than a passive anticipatory stance. Design for safety (CS2), on the other hand, takes an applied approach of evidence gathering and collaborative activity in a two-day symposium followed by a second one-day event with a group of around 40 participants transferring knowledge through socially facilitated sessions, foresight and documents.

Comparing the two case studies we have proposed an explorative comparison with criteria selected to identify rigour, type, medium, audience and indicators of transferability in the context of generating knowledge for future transformation. When comparing criteria, we see that the case studies diverge in their aims, building a new approach to design futures and uncovering design for safety issues and limitations of design methods for tackling future global issues. Neither form of knowledge calls for repeatability or a retesting of its findings, yet both place emphasis on forward facing future action for 'knowing what to do next' in the context of knowledge for future transformation. The intended audiences diverge between academics, practitioners, industry and government.

Discussion

The case studies take place in complex dynamic environments tackling wicked or even very wicked problems (Alford & Head, 2017) and hence deal with 'unknowable problems' that prevent repetition. The intricacies of working with systems present a significant challenge for designers. Traditionally, these issues were framed around the concept of wicked problems, developed by Horst Rittel and Melvin Webber in the 1970's to deal with complex social issues (Rittel & Webber, 1973) and led to the challenging of fixed step-by-step models of the design process. Wicked problems are complex and interconnected, sometimes they are nested or overlapping and often involve conflicting demands from various stakeholders with different perspectives making them impossible to fully solve.

As we look towards the future, we must also consider the critical role of contextuality. The output of a design projects will be subject to contextual forces such as economic, social, and environmental factors, and its value will be determined by a posteriori exchange based on these factors. Moreover, the intersection of complexity and contextuality gives rise to two additional variables: ambiguity and uncertainty. These elements prevent repeatability and create an environment in which contextual transferability demands design frameworks with flexibility to adapt to different contexts.

Vectors

Based on the spatial and directional needs of transferability we propose vectors to understand the relationship of the core ontological design research practice and its fundamental differences to the sciences and arts and humanities. We envisage vectors describing the adaptability of knowledge and its transferability as a form of 'future rigour in the making' that could potentially satisfy the challenges that require design's collaborative response to global challenges.

Specifically, we propose vectors for how we might understand the interactions between the future forwards potentials for more successful inter-domain collaborations. We make the case that a vector-based concept improves the potential for inter-domain collaboration. This leads us to the concept of transferability as directionality and a key domain knowledge quality for design which we compare (mirror) to repeatability in the sciences. In terms of rigour, we discuss the qualities of transferability that could address issues for practices which are often validated a posteriori. In our model rigour refers to integrity (collection of original data, material, findings), rather than being disciplined in the implementation of a method (repeatability).

We can see internal vectors from within the researcher's projects in CS1 and CS2 moving into knowable transfers. Agreeing with Binder and Redstrom we can see transfer vectors that are internal and external to the project (knowable) and agreeing with Nowell recognise that some may be unknowable hence impossible for the researchers to build on, predict or trigger. We could also speculate that relevance (Zimmerman et al) provides a retro-speculative connection for both knowable and unknowable vectors. Krough and Koskinen's assertion that design researchers tend to follow the ideas, methods and practices of other researchers rather than the objects indicates that we will have to revisit what we view as research outcomes and their influences.

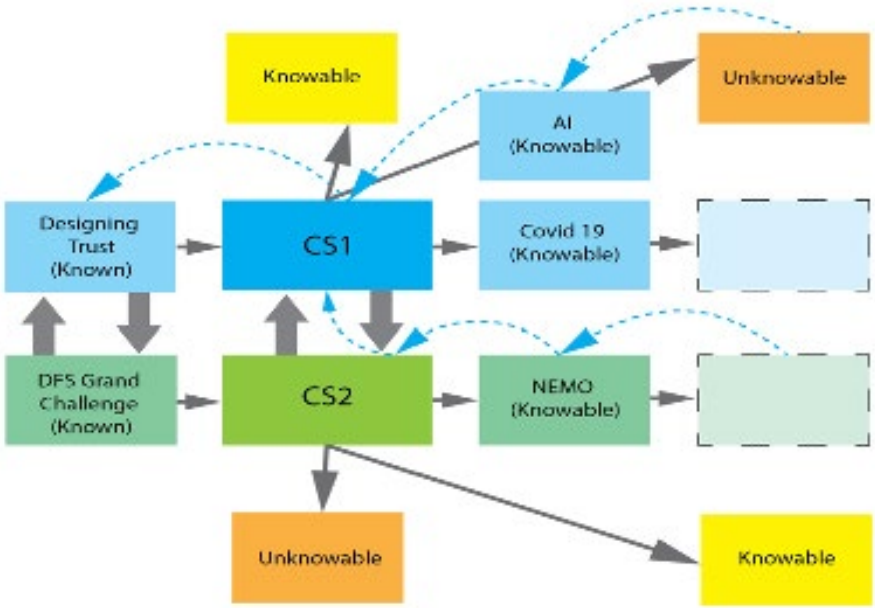

Figure 2. Vectors emerging from case studies.

Vectors that are knowable to the researchers are indicated by grey arrows while blue arrows show reverse retro-speculative trajectories linking to rigour claims. Further vector possibilities are indicated by the additional dashed boxed on the right to infinity. Many more cascading vectors and reciprocal transfers are possible even between indirect contact as in CS1 and CS2 where the authors who were not involved in both case studies yet exchanged other research activities.

Many questions remain and a more extensive analysis of the vectors from other more extensive research projects including knowable and unknowable transfers could provide greater confidence and trust in design research as a constructive special approach to knowledge claiming. Some of these questions include how we can navigate the knowable/unknowable transfer contexts, who decides what success looks like (if success is a consideration in a constructive context)? Are the outcomes traditional research forms (artifacts or the equivalent in practice-based research) or is the researcher practice influence, methods and concepts a 'cultural' research transfer? And how do vectors cascade through knowable, unknowable, external and internal to the researchers? Ultimately the vector network takes on the form of a cultural production.

Although it can sometimes seem like design research is continually flooded by adjacent fields and disciplines these also provide insights for shaping the foundations of design research. Most value seems to be gained for advancing the special approach to claiming knowledge in design research when we 'rub up' against related areas ranging from HCI to design engineering, philosophy, and the social sciences amongst many others.

Conclusions

In comparing our case studies, we have found that diverse approaches to design futures research ranging from rigour, type, methods, audience, output, and indicators offer some potential in supporting an idea of knowledge for future transformation supporting an argument for an ontological design claim for transferability as a key ingredient. The concept of vectors allows us to begin to spatialise these relations of forward knowing whether the relations are past, present or future. In this context, we introduce the factors that make possible transferability; Synthesis, Flexibility, Contextuality, Adaptability, and Comprehensibility.

We offer this as a potential contribution to design ontology as an experiment emerging from a theoretical argument. There are of course alternative, contradictory, and complementary arguments for a design ontology and our thinking here is based on an initial set of comparative criteria applied to a pair of case studies. Other methods may elicit alternative arguments and propositions however we believe the temporal arguments made by Simon, Chris Jones, Glanville still hold and point towards a more radical position of design ontology which we support here. Further research is anticipated towards detailed investigation of the factors for successful transferability and how this can build towards a framework.

References

Alford J & Head B.W., (2017) Wicked and less wicked problems: a typology and a contingency framework, Policy and Society, 36:3, 397-413, DOI: 10.1080/14494035.2017.136163

Anderson, P., Hall, A., Ferrarello, L., Cooper, R., Ross, C., (2018) Foresight Review on Design for Safety, Lloyds Register Foundation, London.

Archer, B. (1978). Time for a Revolution in Art & Design Education. RCA Papers: 6. London, UK: Royal College of Art.

Baxter, P., & Jack, S. (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. The Qualitative Report, 13(4), 544-559. https://nsuworks.nova.edu/tqr/vol13/iss4/2

Bukhari, S. A. H. (2011). What is Comparative Study (November 20, 2011). Available at SSRN: https://ssrn.com/abstract=1962328 http://dx.doi.org/10.2139/ssrn.1962328

Cross, N., (1982). Designerly ways of knowing, Design Studies Vol. 3, No. 4 October 1982, pp. 221-227.

Douven, I. (2011). "Abduction", The Stanford Encyclopaedia of Philosophy (Spring 2011 Edition)

Galdon, F., Hall, A. & Wang, S. J. (2019a). Prospective design: A future-led mixed methodology to mitigate unintended consequences. Proceedings of the International Association of Societies of Design Research Conference IASDR2019, The University of Manchester, UK

Galdon, F., & Wang, S. J. (2019b). From apology to compensation; A multi-level taxonomy of trust reparation for highly automated virtual assistants. In: Proceedings of the 1st International Conference on Human Interaction and Emerging Technologies (IHIET 2019) conference August 22- 24, 2019, Nice, France.

Galdon, F., & Wang, S. J. (2019c). Addressing accountability in highly autonomous virtual assistants. In: Proceedings of the 1st International Conference on Human Interaction and Emerging Technologies (IHIET 2019) August 22-24, 2019, Nice, France.

Galdon, F., & Wang, S. J. (2019d). Optimising user engagement in highly automated virtual assistants to improve energy management and consumption. In: Proceedings of the 2019 Applied Energy Symposium AEAB Conference Proceedings, MIT, Boston. 22-24 May 2019.

Galdon, F., & Wang, S. J. (2019e). Future development of AI Virtual Assistants (VAs) in Energy management and consumption. In: Proceedings of the 2019 Applied Energy Symposium AEAB

Galdon, F., and Hall, A. (2022) Deep products via undisciplined stewardship: Towards an environmentally- led design pedagogy for the 21st century, in Lockton, D., Lenzi, S., Hekkert, P., Oak, A., Sádaba, J., Lloyd, P. (eds.), DRS2022: Bilbao, 25 June - 3 July, Bilbao, Spain. https://doi.org/10.21606/drs.2022.455

Gaver, W., Hooker, B., & Dunne, A. (2001). The presence project. London, UK: RCA CRD Research Publications.

Gaver, B., (2012) What should we expect from research through design? CHI '12: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pp 937–946, https://doi.org/10.1145/2207676.2208538

Gaver, B., Krogh, P. G., Boucher, A., Chatting, D., (2022) Emergence as a Feature of Practice-based Design Research. In: Designing Interactive Systems Conference. ACM, New York, USA, pp. 517-526. ISBN 9781450393584

Glanville, R., (2005) "Design Prepositions." In: The Unthinkable Doctorate, 1–9. Brussels, UK and Australia:

Cybernetics Research, American Society of Cybernetics.
Guba, E., Lincoln, Y.S. (1985) Naturalistic Inquiry, London, Sage.
Hall, A, Galdon, F., (2023) Transferability: Exploring ontological properties for design knowing,
CUMULUS, CAFA, Beijing.
Hall, A, Ferrarello, L., Kann, M., (2017), Safety Grand Challenge: Safe Ship Boarding and Thames Safest River 2030, Report for the Lloyds Register Foundation, pp 128. ISBN: 978-0-9561364-3-5
Herrera, S., Cruz, C., Ramírez, Y., & Cisternas, L. (2016). Conceptual process design for Boric Acid: A case study for engineering education. 26th European Symposium on Computer Aided Process Engineering, 1437–1442. doi:10.1016/b978-0-444-63428-3.50244-
Jacob, F., (2001) From night bustle to printed quietness. Treballs de la Societat Catalana de Biologia: 11–13.
Jones, J. C. (1992). Design methods. New York: Van Nostrand Reinhold.
Krogh, P.G., Koskinen, I. (2020) Drifting by Intention, Design Research Foundations, Springer, https://doi.org/10.1007/978-3-030-37896-7_3
Koskinen, I., & Krogh, P. G. (2015). Design accountability: When design research entangles theory
and practice. International Journal of Design, 9(1), 121-127.
Rodgers, P., Galdon, F., Bremner, C. (2020). Design Research-in-the-Moment: Eliciting Evolutive Traces during the Covid-19 Crisis. Design Research Journal 13(3):18. https://doi.org/10.4013/sdrj.2020.133.02
Rittel, H, Webber, M. (1973) Dilemmas in a General Theory of Planning, M.M. Policy Sci 4: 155-169.
Simon, H. (1969) The Sciences of the Artificial. Cambridge, MA: MIT Press.
Zimmerman, J., Forlizzi, J., Evenson, S. (2007) Research Through Design as a Method for Interaction Design Research in HCI, CHI 2007, April 28–May 3, 2007, San Jose, California, USA.

Street Markets as Places of Value Creation in Neighborhoods: A Case of Hasanpaş a Bazaar Place

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Abstract
Throughout the history street markets have long been regarded as essential for meeting the needs of the people and considered as the public spaces where the most intense trade was made. Bazaars were held around significant locations of the cities where the local people could easily access. By bringing together customers and sellers, bazaars facilitate shopping experience and enhance community interaction. In this sense, bazaars which have long been popular for local shopping became the places where co-creation of value emerged. With this study, it was aimed to examine how value creation has emerged in street markets nowadays. In this direction, the Hasanpaşa Bazaar was chosen as a case study, because of its history of about one hundred years and bringing together different actors in one place. In order to gather data, observations and semi structured interviews were conducted with various stakeholders of the bazaar. The outcomes of the field study were examined and discussed in the scope of the social innovation framework, especially with a focus on social practice theory. At this stage, the findings of the study were categorized under three different sub-headings: (i) Being Seller in the Bazaar, (ii) Being Customer in the Bazaar, (iii) Interaction Elements in the Bazaar. Eventually, the result of the study revealed that the Hasanpaşa Bazaar as a social structure, affects human activities and creates various values in the neighborhood while it emerges a new ecosystem and its own behaviors. It also showed that the bazaar as a socially constructed space, transforms the dynamics of society and maintains social bonds among people through the interactions between different stakeholders.

Author keywords
street market; social innovation; value creation; social practice theory

Introduction

The fundamental of the social practice theory is that social life is seen as a manifestation of planned actions by numerous individuals, which are linked and distributed in both time and space. Although there is no single theory of practice (Bourdieu 1977; Giddens, 1984; Schatzki, et al., 2001; Shove et al., 2012), this perspective offers valuable insights into understanding the complexities of social interactions. In this scope, everyday life can be defined and characterized by the rise, transformation and fall of social practices (Shove, Pantzar, and Watson, 2012). Consumption patterns are one of the important dynamics which are affected by the reproduction and transformation of social practices (Shove et al., 2012). In this regard, the street market as a significant component of everyday life where social practices emerged; can be evaluated as examples of consumption patterns dynamics that have changed and evolved in everyday life.However, traditional street markets are not only economically based structures, but also urban spaces that reflect the daily life practices, culture, traditions, and customs of the society (Uzungören, 2021). There are many studies in the literature that demonstrate the role of street markets in daily life and neighborhoods both globally and in Turkey (Evers and Seale, 2015; Göktaş, 1994; Morales, Balkin and Persky, 1995; Özgüç and Mitchell, 2000; Topçu, 2006; Shepherd,2009; Sherry,1990;Stillerman,2006;Tümerte

kinandÖzgüç,1998;Uzungören,2021; Virani, 2020; Watson, 2009). They are places which create mutual benefits for both users and non-users of the market and serve economic and social function; its features like low fees, easy accessible locations, being accessible to everyone and being historical places where traditions still continue make the shopping from street markets a social and cultural experience for both buyers and sellers (Morales, et al., 1995).

When the studies on street markets are reviewed, it is seen that there is a gap in the literature; although street markets are considered as public places where everyday life practices and socialization take place, these concepts are not examined in the scope of social innovation. In this regard, to be discussed in the social innovation approach, the Hasanpaşa Bazaar was chosen as a case study to gain a better understanding of the interactions and value creations, due to its over one hundred year history and potential to bring together various actors in one place. In order to achieve this objective, the main research questions of this study were specified as (i) What kind of values are created and shared in the Hasanpaşa Bazaar? and (ii) How and in which steps value creation emerged in the bazaar? In order to examine these questions in detail, the field study was conducted through participant observations and interviews with various stakeholders in the field.

Method and procedure

In scope of the field study, first field selection was made. The Hasanpaşa Bazaar was designated as a study field which is a historical and popular street bazaar with a history of approximately 100 years, located in the Kadıköy district of Istanbul. The semi-enclosed market area is constructed with a reinforced concrete and steel system, offering an area 32 thousand 300 square meters, and the upper cover part of the structure was membrane (Karaaçar, 2022). From 2019, the Hasanpaşa Bazaar opens three times a week with different concepts which is operated by İSYÖN (Istanbul Management and Renewal Inc. served by Istanbul Metropolitan Municipality). On Tuesdays, it offers a general wet market and it continues its traditional and historical theme. As a second concept, on Fridays it opens as a flea market. With the different concept, on Sundays, bazaar brings various types of actors together: (i) cooperative societies ; (ii) antique and second hand products and (iii) women's sale of handiworks (Figure 1). Thus, it was decided to choose a Sunday theme for the field study.

As the first category, there are different types of cooperative societies in the bazaar. These communities sell their own local products and seasonal fruit and vegetables from all over the Turkiye. As a second category, antique and secondhand product vendors sell various and attractive types of products such as brochettes, cloth, carpet, old boxes, vases, tableware, tapes, stamps, coins, instruments, etc. They have the biggest area in the bazaar. As the third and last category, womens take part with their handiworks.

After defining the field, data collection process is conducted through qualitative research

methods. In this scope, as the first step, participant observation was made on Sundays in the field for two times during the bazaar hours. These observations were made to identify usage of spaces and interactions. During these observations which are supported with photography and videos, the field map also constituted a deeper understanding of interaction between various stakeholders. As the most important phase, semi-structured interviews have been conducted with

Figure 1. (a) Cooperative societies; (b) Antique and secondhand products; (c) Women's sale of handiworks

various stakeholders from different perspectives, namely organizers, sellers and customers from the bazaar. Moreover, all the sellers who were interviewed, looked into their social media accounts and made unobtrusive observations on how they represented themselves. While selecting the participants, the snowball method was used, and asked interviewees to direct us to their different contacts in the bazaar. In this way, we reached 10 participants (which will be shown by using abbreviations P1-P10) from different positions. Five of them were sellers from different categories such as, handicraft, antique and second hand products, and cooperative societies. Two of the interviewees were responsible for the management of the bazaar. Also, three of the stakeholders were selected from customers according to their representation of different seller's categories. After the data collection is completed, the patterns of the textual and visual data obtained were analyzed by qualitative content analysis and categorized by thematic analysis method.

Findings

In the light of the literature review and the field study, it has been observed that the interactions between stakeholders in the market have led to different value creations. These value creations need to be examined in the context of each stakeholder, the specific elements of the Hasanpaşa Bazaar and its surroundings in urban scale. Accordingly, the findings of the study are categorized under three different sub-headings: (i) Being Seller in the Bazaar, (ii) Being Customer in the Bazaar, (iii) Interaction Elements in the Bazaar. Being seller in the bazaar

The sellers characterize being in this bazaar with different keywords like color, surprise, energy and synergy, inspiration, solidarity spirit, positive side of Istanbul, open communication, and so on. These keywords represent that the bazaar has various meanings for sellers and indicates that there is socialization and solidarity among many stakeholders. It was observed that there is strong solidarity and support between sellers. For instance, sellers overcome the challenge of not being able to leave their stands for daily needs by entrusting their stands and products to one another. Especially, women's handicraft's seller mentioned that they feel secure in Hasanpaşa Bazaar thanks to İstanbul Volunteers which is the main organizer of the women's handicraft category: "Istanbul Volunteers ensure equality in the bazaar, so I pay particular attention to going to markets organised by Istanbul Volunteers; I trust them." (P1)

Moreover, every seller's stand and their location in the bazaar is pre-determined and controlled by the bazaar's management. As observed, both sellers and customers are happy and feel secure in being in this well-organized place and they think that these kinds of regulations and controls are necessary for better shopping experience.

The observations and interviews showed that the bazaar place is not just a workplace but also a socializing place for sellers where they can meet new people and create networks. The majority of the sellers we interviewed stated that they appreciate the vibe of this venue, that they have fun together, and that they continue to interact with one another through social media even after the bazaar days: "Turning on music, dancing and singing are our favourite activities. We are having fun here together, it doesn't have to be a profit. Having fun is the best part." (P2)

Another insightful finding is that antique sellers provide a big advantage for the whole bazaar. It attracts local and foreign tourists to the bazaar thereby increasing the overall rate of purchase and sale in the bazaar. As various sellers have declared, most people are unaware of cooperatives and women's handicrafts categories in the Hasanpaşa Bazaar. They usually notice

women's products when they come here for antique products. The antique market helps other sellers to be noticed and has a positive impact on sales. The Hasanpaşa Bazaar raises awareness about agriculture in Istanbul and brings producers and customers together thanks to cooperatives. It is also interesting to see that cooperative societies do not see themselves as a seller. During the interviews, cooperative societies emphasized that "we are

producers, not sellers!" (P5)

It was also observed that the Hasanpaşa Bazaar is physically set up, while sellers and customers interact virtually through social media. Many sellers have Instagram profiles where they advertise and make announcements, aiming to maintain interaction with customers: "I have regular customers, customers who bring customers. We keep in touch with many of them through Instagram and social media. Otherwise, it would be very limited. When we announce on Instagram that we are here, people who know us come." (P1)

Being customer in the bazaar

When examining the motivation of the customers who are regular visitors of the bazaar, it is seen that there are several reasons. One of them is, they prefer Sunday's bazaar because it is less crowded and better structured compared with other markets. People are drawn to this location by this state of the market and the availability of sellers from all categories. Moreover, people see this place not just as a shopping place, but as an activity and socializing space. The bazaar place is pet and toddler friendly and it is available for everyone and in all weather conditions.

For instance, the opportunity that it is an area where they can spend time with the family in the children's playground on the upper floor increases the preference of this place. In addition, having eateries, its central location and surroundings customize the market area and enable it to host people from different social backgrounds as an antique product seller mentioned:

"Different layers of Istanbul come here, collectors from Feriköy, all kinds of people from different socio-economic segments from Fikirtepe and Caddebostan." (P3)

The bazaar's proximity to the recently opened Museum Gazhane has efficiently attracted customers from the surrounding districts to this neighborhood and the bazaar. It has transformed into more than just a shopping destination, evolving into a cultural center: "There is also the significant impact of the Museum Gazhane being here. Actually, this place has become a Sunday event for us" (P9). Furthermore, Hasanpaşa Bazaar differs from other street markets due to its touristic value. Foreign tourists, in particular, prefer this bazaar for both shopping and visiting because of its historical significance. Local tourists from different cities in Turkey also visit this bazaar for shopping, as it offers better product quality, safety, and even more affordable prices compared to supermarkets.

Interaction elements in the bazaar In the field study, it was observed that in addition to the interaction between people, the interior design of the space, non-human elements and the organizers directly affect and shape the functioning of the market. For the first highlight, the environmental and non-human aspects of the bazaar were analyzed. It was observed that metal wall hangers in the bazaar serve various purposes, such as storing personal items and showcasing products. Circular seating benches around the construction units have different functions for different stakeholders. Vendors use them to store their belongings behind their stands, while customers use them as resting spots. However, due to the insufficient seating areas for sellers, they often bring their own camping chairs or repurpose fruit and vegetable crates to create comfortable spaces for resting throughout the day.

As the second highlight, it was founded that Bazaar Cafe is an important networking place for both sellers and visitors. Beside serving street food (traditional street bazaar foods, like Turkish pancake) and beverages, it creates communication and interaction between all stakeholders

For most customers it is part of the bazaar ritual: "When we come here, we definitely sit and eat Turkish pancakes." (P10) It has also been observed that since the sellers cannot leave their stands easily, they mostly meet their tea, coffee and even food needs with the help of peddlers. In this sense, peddlers have also developed different methods to provide fast service, such as using different trolleys and shopping carts. Sellers and peddlers

can communicate with one another with intuitively created hand and body gestures.This type of communication method can provide important insights about the bazaar community. All of the above-mentioned interaction elements and patterns in the bazaar were drawn and described in detail in the map below (Figure 2) which shows the flow of interaction and highlights the location of non-human elements.

Conclusion

Human activity and the social structures that shape it are recursively related (Giddens, 1984). From this approach, it can be assumed that Hasanpaşa Bazaar as a social structure and its neighborhood affects each other recursively. It is seen that, being together with various stakeholders in one place, allows rapid interaction among members, establishes patterns of mutual obligation, and thus creates new values for the neighborhood. These value creations which emerge in the Hasanpaşa Bazaar are summarized from three different categories; being seller; being customer and the elements of interaction.

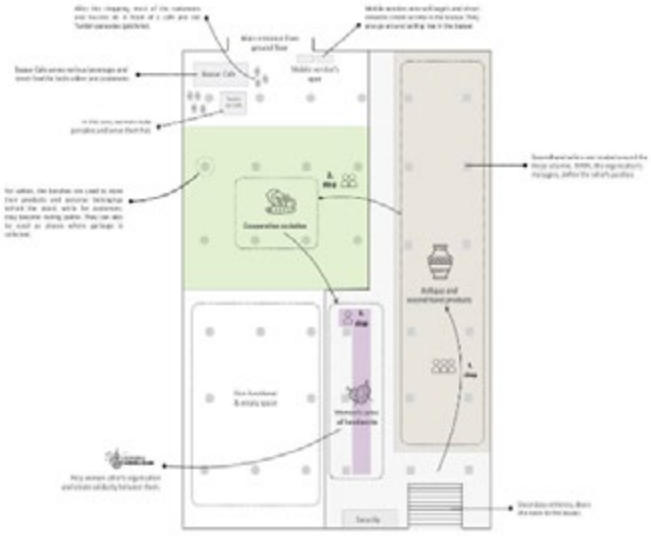

Figure 2. The map of interaction elements of the bazaar.

From the sellers perspective, the Hasanpaşa Bazaar becomes a socialization and solidarity place between different stakeholders. As seen in the being with antique seller situation, being together in the marketplace increases their recognition, and while enhancing their powerful sides, eliminating their weaknesses. In order to understand the ecosystem in the bazaar, it is seen that there is a need to specify how sellers define themselves. For instance, cooperative societies do not define themselves as sellers; instead, they prefer to be perceived as producers. This can change the whole ecosystem in the bazaar and this ecosystem creates its own behaviors, beliefs and values. For instance, it is seen that almost every seller uses social media for advertisement and sustainable interaction with customers. This tendency can be seen as a special solution that has emerged spontaneously with the impact of technology. Another promising finding was that sellers and peddlers' communication with one another is intuitively created by hand and body gestures. This type of communication method can provide important insights about the bazaar community. From customers' perspective, the bazaar is seen as not just as a shopping place, but as an activity and socializing open space where customers can spend their free time with their families and friends and even they can walk with their pets. The bazaar's central location and its popular surroundings directly influence customers' interest in the bazaar. As the last category, it can be highlighted that besides the interaction between people, the interior design of the space, non-human elements, seller's setting, cafes, and other peddlers all have a direct impact on and shape the functioning of the market. The Bazaar Cafe, which is not predefined and arose as a spontaneous formation, as a component of the bazaar ecosystem facilitates interaction and creates networks between all stakeholders.

When all these values created in the marketplace are evaluated holistically, it is concluded that the Hasanpaşa Bazaar cannot be considered only as a shopping place, but should be considered as public spaces where social innovation takes place. Although it has several shortcomings and disadvantages; the living social structure and special ecosystem of the Hasanpaşa Bazaar, where it functions within itself, constitutes a good example. This

initial study explores the emergence of value creations at different stages in Hasanpasa Bazaar case. For further studies, these identified value creation elements can serve as a base for examining social innovation in other case studies.

References

Bourdieu, P. (1977). Outline of a theory of practice. Cambridge, U.K.: Cambridge University Press. https://doi.org/10.1017/CBO9780511812507

Evers, C., Seale, K. (2015). Informal urban street markets. International Perspectives. https://doi.org/10.4324/9781315756431

Giddens, A. (1984). The constitution of society: Outline of the theory of structuration. University of California Press.

Göktaş, U., (1994). ☒Semt pazarları', Dünden Bugüne İstanbul ansiklopedisi, Kültür bakanlığı ve tarih vakfı ortak yayınları Cilt:6.

Karaçar, P. (2022). Evaluation of Kadıköy Salı Bazaar in terms of Environmental Space Design Criteria of Bazaars. Journal of Environmental and Natural Studies, 4 (2),147-156. https://doi.org/10.53472/jenas.1165633%20s

Morales, A., Balkin, S., Persky, J. (1995). The value of benefits of a public street market: The case of Maxwell Street. Economic Development Quarterly, 9(4), 304-320. https://doi.org/10.1177/089124249500900402

Özgüç, N., Mitchell W. (2000), "Şehirlerin Alternatif Alışveriş Mekânları: İstanbul'da Ha

The Stage Art Design Flow Under Critical Design Thinking

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Abstract

Stage art design has been a comprehensive and evolving discipline throughout its developmental history, drawing extensively from various artistic fields such as painting, sculpture, architecture, industrial design, and folk art (Pavis, 1998). With the changing times, stage art design has evolved beyond being a mere backdrop for performing arts. Exploring how to harness the dynamism and proactiveness of design, promoting and innovating the aesthetics of design to keep it in sync with the times has become a prominent research theme. This article, rooted in the specifics of the field, expands the design process of stage art by incorporating interdisciplinary perspectives. It addresses current developmental trajectories and existing issues, employing methodologies from critical design, such as imagination, counterintuitive thinking, and humor to optimize the stage art design process, ultimately enhancing audience resonance and engagement. Finally, concrete practical case analyses serve as the research method, utilizing surveys as the data source. This approach helps verify the innovation and rationality of the proposed design process while discussing the challenges and future trends that lie ahead.

Author keywords

Stage Art Design; Critical Design; Design Methodology; Sociality.

Introduction

Stage art design is an indispensable element in performing arts, encompassing scenery, props, costumes, makeup, and lighting to create a comprehensive visual experience (Brewster & Shafer, 2011). The primary task of stage art design is to use various artistic techniques to shape the physical environment, external appearances, and overall atmosphere according to the performance's content (Cao, 2019). In the early stages of its development, stage art design was considered a necessary support for performing arts, serving as the executor of the director's and playwright's creative vision. However, in the 21st century, there has been a shift in the terminology used to describe this field. International organizations like OISTAT (International Organization of Scenographers, Theatre Architects, and Technicians) have adopted the term "performance design" to reflect the evolving identity of stage art design (Chen, 2021). With the expansion of interdisciplinary theoretical research, advancements in design techniques, and the increasing sophistication of audiences' aesthetic sensibilities, new demands have emerged for stage art design. The need for design to be more proactive, immersive, and socially engaging has become apparent. Richard Schechner, a theater theorist, has argued that theater extends beyond the stage and into everyday life, emphasizing the importance of cross-cultural, cross- genre, and interdisciplinary research in the field (Schechner, 2017). Given the capacity of critical design to guide designers in addressing

social issues, attracting audience participation, and challenging conventional design, it is recommended that this design methodology be
incorporated into the four stages of the stage art design process. This integration can help broaden designers' imaginations, encourage the use of counterintuitive design methods, employ humor and satire in presentation, and facilitate open assessment and reflection. By emphasizing a "challenge society" and "engage the audience" approach, critical design can enhance the expressive power of stage art design and create a more immersive and engaging experience for audiences.

Overview of Traditional Stage Art Design

Stage art design, as a crucial element in the realm of performing arts, serves as a significant conduit for communication, emotional fusion, and intellectual interaction between actors and audiences. Its principal characteristic lies in the demand for designers to employ diverse, comprehensive, and holistic creative means within a unified conceptual framework established by the entire creative team, based on the script's performance requirements (Qiao, 2019). The aim is to create artistic representations of spatial environments and character portrayals that effectively convey the overall performance ambiance and stimulate thoughtful reflection among viewers. Es Devlin, a British stage art designer, encouraged stage innovation during the U2 – Experience Innocence Tour 2018. She utilized new technologies to create unique stage settings, breaking through conventional design boundaries. Devlin emphasized audience interaction with the stage, enhancing the audience's sense of participation and immersion (Medina, 2020). Italian polymath director Stefano Boda dedicated his life to aesthetic research in music, movement, stage settings, and costumes. He harnessed the power of design in the opera "Teatro" as a means of expressing characters, eras, emotions, and ideas, presenting rich visual artistic content (Zhao, 2018). As design concepts and technologies continue to evolve and audience aesthetic standards rise, there is an increasing demand for innovation, social relevance, and interactivity in stage art design.

However, in the current landscape, stage art design faces certain challenges, primarily related to outdated conceptual thinking, hindering the creation of contemporary "original" works (Jin, 2021). These challenges are notably evident in both theoretical education and practical design. Firstly, existing courses in stage scenic art history still adhere to 1980s art and painting theory, which is no longer aligned with contemporary standards (Gao, 2011). Secondly, although the current level of design proficiency is high and stable, it often prioritizes visual aesthetics over innovative ideation. There's an emphasis on the artistic aspects of works while overlooking the societal aspects of thinking (Sun, 2011). The reinterpretation of classic plays sometimes exhibits a formalized trend, failing to fully integrate advanced design concepts and techniques, and consequently, failing to emotionally resonate with the audience.

In summary, despite its vitality and potential, stage art design grapples with issues like formulaic design thinking, a lack of societal perspective, and challenges in eliciting emotional resonance from audiences.

The Critical Design of Stage Art Design

Definition of Critical Design

Critical design, introduced by Anthony Dunne and Fiona Raby in the late 1990s while teaching in the field of interaction design at the Royal College of Art in the UK. Critical design as a design methodology. The aim of this design approach is not to create practical, usable products or solve specific problems but rather to pose questions (Dunne & Raby, 2009). It seeks to stimulate thought, provoke audience discussion, and challenge issues in areas such as society, culture, technology, using imagination, counterintuitive methods, and humorous design approaches (Dai & Cui, 2020). This design thinking model places emphasis on sociocultural topics, audience engagement, and the challenging of traditional design or societal practices. Consequently, it prompts reflection on conventional design thinking and generates commentary on social and cultural phenomena (Dunne & Raby,

2013). Currently, critical design is predominantly applied in

creative fields such as design and the arts, including industrial design, social innovation, education, environmental design, and sustainability, among others (Liene,2017).

Based on the concept of the "Critical Design Lab" proposed by Dunne and Raby, they developed a series of works using this methodology, including the 2009 design work "Designs for an Overpopulated Planet: Foragers" (Dunne & Raby, 2010). This work prompted the public to reflect on contemporary social phenomena such as overpopulation and food scarcity. In 2013, Dunne and Raby co-authored a book titled "Speculative Everything," introducing the concept and positioning of critical design to help the public understand it (Dunne & Raby, 2013). Matt Malpass, a lecturer at Central Saint Martins, has also been continuously exploring this field in his book "Critical Design in Context" (Malpass, 2019). In 2008, the project "Life Support" undertaken by the UK-based studio of Revital Cohen and Tuur Van Balen aimed to contemplate the coexistence of service-oriented animals with patients, establishing a natural life community (Cohen & Van, 2008). This design initiative integrated the principles of critical design with the realm of social innovation, challenging conventional social services and solutions. In summary, critical design, to a certain extent, opened new avenues for exploring issues, took the first step in critiquing design thinking, promoted diversified modes of thought, and further inspired comprehensive contemplation on design culture and behavior.

The Critical Design in Stage Art Design Works

In some classic design works from the past, elements of critical design thinking have already been incorporated. Outstanding stage art designers have effectively integrated sociocultural themes and audience engagement into performances by manipulating the dynamics between the audience and the performance space. This approach has resulted in more immersive experiences for the audience and a heightened awareness of societal issues within the context of the performance.

1. Performance Spaces. "Site-specific performances" are highly conducive to critical social awareness in the realm of theater. Designers choose a non-theatrical space for the performance, using the environment to indirectly convey a part of the performance's narrative (Andrew, 2013). This allows the audience to deepen their imagination of the space and experience it as if they were there, gradually transforming from passive spectators to active participants (Makeham, 2005). For example, the Greek "Experimental Theatre of Thrace" productions "Tea Time" and "Eat Time EUROPE," first performed in 2014, have received numerous awards. These performances directly address the pressing refugee crisis in Europe and were staged in unconventional locations such as the Evros River Delta and the Evros border region between Greece and Turkey (Archivio, 2020). Focused on shifting performances to the present environment through unique theater settings, fostering critical social awareness among the audience within the performance space (Pearson, 2017).

2. Spectatorship Relationship. In his work "Postdramatisches Theatre," (Lehmann, 2006) German professor Hans Thies Lehmann highlighted that the entire stage space forms a unified visual composition, with distinct meanings assigned to various spatial areas. This approach breaks away from traditional delineation and division of theatrical space, as well as rigid prescriptions for audience gaze and actor positioning. It emphasizes autonomy and agency. "Punchdrunk" a theatre founded by British director Felix Barrett, premiered "Sleep No More" in London in 2003 (Worthen, 2012). In this production, actors were dispersed across six levels of the "McKittrick Hotel," which comprised 90 performance rooms. Actors moved between different performance spaces, and each audience member wore a white mask, engaging in "close-distance" interactions with actors and freely following their trajectories within the space. This "immersive" form of audience engagement fundamentally challenges the traditional proscenium arch theater experience. In terms of narrative, it employs illogical and unconventional

thinking, breaking away from linear storytelling and opting for a parallel, multi-threaded performance approach.

Designers can create immersive stage environments that stimulate active audience participation, making the audience an integral part of the theatrical work, thereby evoking emotional resonance and critical reflection (Cohen, 2002).

The exemplary design cases mentioned above, to a certain extent, applied the design logic of imagination and unconventional thinking inherent in critical design, unleashing boundless creativity, breaking free from conventional thought patterns, and generating design diversity. However, these design solutions have not yet fully and systematically demonstrated the stage art design process based on critical design principles.

Innovation Flow in Stage Art Design

Based on the common characteristics of various disciplines within stage art design, four fundamental design steps can be summarized. In these steps, traditional stage art designs often take place within a controlled space, with extensive "known" research carried out based on the director and playwright's intentions to optimize the design. In contrast, the design process under critical design thinking is characterized by uncertainty. It involves continuous imaginative exploration to investigate issues, employing unconventional design methods to analyze problems, and using humor and satire to present the design concept, ultimately creating socially resonant works. The outcomes of these two design approaches cannot be judged as better or worse; they represent different thinking modes in the study of the stage art design process，see Figure 1.

Analyzing the impact of critical design thinking on the stage art design process from four design stages, we can elucidate the changes it has brought to the design flow.

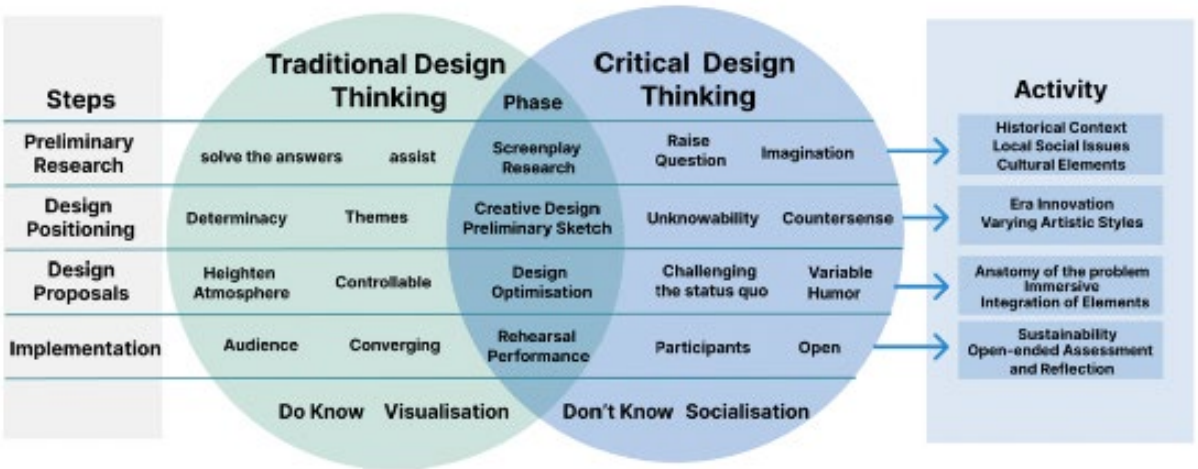

Figure 1. Traditional and Critical Design Approaches in Stage Art Design Patterns.

1. Preliminary Research. Begin by understanding the overall theme, background, and plot of the performance, as well as the vision of the actors and director for stage art design. Incorporate the nourishment of critical design thinking, fostering a more imaginative expansion of critical thought. Use historical context, local social issues, and cultural elements as entry points to gain a deeper and more innovative understanding on a conceptual level.

2. Design Positioning. Utilize critical thinking to challenge traditional stage art design decisions and explore innovative design directions. Recognize that the thoughts and destinies portrayed in theater vary across different eras, requiring stage art design to innovate accordingly. In addition to traditional realism and romanticism styles,

consider the symbolism, absurdity, and identity politics theories that have emerged in theater.

3. Design Concepts. Apply critical thinking and employ humor and satire in presentation. Promote different design concepts, visual elements, and sustainable materials. Combine various elements of stage design, such as sets, props, costumes, and lighting, in innovative ways (Dragasvic, 2005). Explore unique and expressive design concepts. Additionally, consider cross-disciplinary integration with other art forms like painting, sculpture, and photography to create immersive visual effects.

4. Implementation. After completing the design, engage in open evaluation and reflection promptly. Communicate with the director, actors, and other team members. Consider involving the audience or professionals in the assessment process to gather diverse feedback and opinions.

Case study

This design case involves a practical performance course lasting approximately 15 minutes, with the participation of 5 teams and a total of 22 students, see Figure 2. The preparation phase spanned approximately one month. I formed a design team with three students, and we divided responsibilities based on the critical design thinking framework. Following the conclusion of the performance, we distributed questionnaires to both participants and audience members and subsequently analyzed the survey results.

1. Preliminary Research. This project primarily focuses on the contemporary global issue of refugees, conducting divergent research enriched with ample imagination and exploring historical backgrounds. It encompasses divergent research methods and explores historical contexts. Based on the 1951 "Convention Relating to the Status of Refugees," it is understood that most refugees exist in a state of constant displacement, lacking a stable source of income, permanent housing, access to clean water, and food security. Frequent relocation becomes a routine aspect of their lives, often requiring them to carry all their belongings with them (Goodwin-Gill, 2001).

2. Design Positioning. The project adopts a "symbolism style" approach, using famous paintings as a point of entry for critical design, aiming to shed light on the refugee issue. The design draws inspiration from John William Waterhouse's painting "The Lady of Shalott", created in 1888 based on a narrative poem (John, 1883). The painting depicts a young woman longing for the love of Sir Lancelot but cursed to be trapped on an isolated island. In the design process, the narrative poem is adapted into dialogues, symbolically suggesting that while the lady is imprisoned by love, the confinement of the isolated island serves as a critical metaphor for refugee habitats.

3. Design Proposals. Costumes and props are often referred to as the "actor's second skin" and the "actor's second hand," holding significant importance in stage art design. Innovative costume design should focus on the innovation of costume style and craftsmanship. The fundamental purpose of this innovation is to shape both the internal and external aspects of characters, reflecting their era and personality, and even hinting at their destinies (Qiao,

Figure 2. A photo of some designers.

Figure 3. Sketches of Costume Design.

Figure 4. The costume making process.

Figure 5. Live show photos.

2019). In the costume design process, see Figure 3, you can clearly see the use of unconventional design methods to turn what should be glamorous costumes into tattered pieces wrapped around the actors. Environmentally sustainable fabrics were chosen, and traditional Chinese hand-dyeing techniques were used to process them, see Figure 4, creating a unique texture that represents the harsh life of refugees, critically implying the constraints and hardships faced by the actor.

4. Implementation. In the final performance, see Figure 5. The metaphorical scenography theory proposed by modern stage art designers Adolphe Appia and Gordon Craig was employed, incorporating projection image devices to create visual effects related to water, rendering the entire performance more conceptual and fluid (Cohen, 2002). The actress, dressed in heavy clothing, at times gazes into the distance with a sense of bewilderment, while at other times, she recites humorous and satirical lines, engaging in dialogue and conflict with the audience. She leads the audience into contemplation, as if both the audience and the actress are trapped on an endless sea, with no hope for the future yet a lingering sense of anticipation.

Table 1. Under Critical Design Flow Course Teaching Questionnaire.

No.	Questionnaire content	Project Staff Mean	udience Mean
Qu.1	*How do you think this performance does in conveying social messages?*	4.13	3.93
Qu.2	*Did you feel more engaged and immersed after watching this performance?*	3.54	3.5
Qu.3	*Did the performance provoke you to think about and discuss social issues or themes?*	3.95	3.22
Qu.4	*Do you think the show presents novel design concepts or innovative visual elements?*	3.77	3.27
Qu.5	*Would you like to see more theatre arts design works using critical design concepts in the future?*	4.04	3.81

After the performance, a total of 44 questionnaire surveys were collected and analyzed using the Likert scale. Overall, the feedback scores received were in line with expectations. Questions 1 and 5 indicate that the audience could perceive the social messages conveyed by the performance and were eager to watch more stage art design works with critical design concepts.

Conclusion

In this paper, based on the traditional stage art design process, we address issues such as a lack of audience resonance, overly formulaic performances, and a disconnection from contemporary relevance in current stage art design works. We propose the introduction of the concept of critical design, employing methodologies like imagination, counterintuitive thinking, and humor and satire from critical design thinking. This approach

enhances the proactive nature of design, moving away from being a mere "supporting role" for directors, playwrights, and actors. It stimulates designers' social awareness and critical thinking to avoid falling into conventional thinking patterns. Through design, it aims to gather audiences for public discussions, provoke conflicts, and encourage the expression of genuine thoughts. Furthermore, future research could delve deeper into designs related to social issues and identity politics. It could also expand into immersive virtual performances, encouraging audience participation and interaction.

Designers need to strike a balance between exploring social issues and expressing artistic diversity. This requires a significant investment of time and effort to stay attuned to theories in fields like society, culture, and art. Additionally, designers must confront the multiple challenges posed by production companies, audiences, and the industry in terms of acceptance and understanding.

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References

Archivio, Z. (2020), "Requiem-Antigone" available at: https://www.archiviozeta.eu/ (accessed 16 July 2022).

Andrew, H. (2013). Site-Specific Art: Performance, Place and Documentation by Nick Kaye (review). Modern Drama (1). doi:10.1353/mdr.2003.0050.

Brewster, K., & Shafer, M. (2011). Fundamentals of Theatrical Design: A Guide to the Basics of Scenic, Costume, and Lighting Design. Skyhorse Publishing Inc.

Cao, L. (2019). The contemporary concept of "grand choreography" and the future trend of "holistic. design. Theatre (Journal of the Central Academy of Drama) (01),86-98. doi:10.13917/j.cnki.drama.2019.01.009.

CNGCW (2007), "Reflections on the reform of design education with Chinese characteristics", available at: https://www.cbi360.net/hyjd/20180402/124345.html (accessed 15 September 2022).

Cohen, R. (2002). Theatre. Test view percentage.

Cohen, R., & Van Balen, T. (2008). Life support.

Crumpler, T. P. (2005). The role of educational drama in the composing processes of young writers. Research in Drama Education, 10(3), 357-363.

Chen, Yuqing. (2021). From traditional stage art to performance design. Art Ocean (01),34-37.

Dai, Zhuoyin & Cui, Hua-chun. (2020). Enlightenment of Critical Design Creative Thinking on Cultural and Creative Product Design. Packaging Engineering (24), 280-285. doi:10.19554/j.cnki.1001-3563.2020.24.042.

Dragasvic, D. (2005).Meyerhold, Director of Opera: cultural change and artistic genres (Doctoral dissertation, Goldsmiths, University of London).

Dunne, A., & Raby, F. (2009). "Designs for an Overpopulated Planet : Foragers" available at: https://dunneandraby.co.uk/content/projects/510/0 (accessed 20 March 2022).

Dunne, A., & Raby, F. (2010). Designs for an Over-populated Planet, No. 1: Foragers.

Dunne, A., & Raby, F. (2013). Speculative everything: design, fiction, and social dreaming. MIT press.

Gao, S. (2011). Teaching research on stage art history course of stage art design major. China Science and Education Innovation Guide (04), 209.

Goodwin-Gill, G. S. (2001). Article 31 of the 1951 Convention relating to the Status of Refugees: Non-penalization, Detention and Protection.Refugee protection in international law: UNHCR's global consultations on international protection, 185-25

Jin, F. (2021). A History of Chinese Theatre in the 20th Century III. Taylor and Francis.

John, W. W. (1883), "The Lady of Shalott", available at: https://en.wikipedia.org/wiki/The_Lady_of_Shalott_(painting).(accessed 11 November 2021).
Lehmann, H. T., & Jürs-Munby, K. (2006). Postdramatic theatre. Routledge.
Liene Jakobsone.(2017).Critical design as approach to next thinking. The Design Journal(sup1). doi:10.1080/14606925.2017.1352923.
Malpass, M. (2019). Critical design in context: History, theory, and practice. Bloomsbury Publishing.
Malpass, M. (2015). Criticism and Function in Critical Design Practice. Design Issues, 31(2), 59–71. http://www.jstor.org/stable/43829380
Makeham, P. (2005). Performing the city. Theatre Research International, 30(2).
Medina González, M. (2020). La magia de la escenografía según la mirada de Es Devlin.
Pavis, P. (1998). Dictionary of the theatre: Terms, concepts, and analysis. University of Toronto Press.
Pearson, M. (2017). Site-specific performance. Bloomsbury Publishing.
Qiao, H. (2019, October). Research on the Stage Art Design in Drama. In 2nd International Conference on Contemporary Education, Social Sciences and Ecological Studies (CESSES 2019) (pp. 661-664). Atlantis Press.
Schechner, R. (2017). Performance studies: An introduction. Routledge.
Sun, D. Q. (2011). Thinking about the teaching reform of stage art and design. Arts Education (11),34-35.
Worthen, W. B. (2012). " The written troubles of the brain":" Sleep No More" and the Space of Character. Theatre Journal, 79-97.
Zhao, Yan. (2018). Opera Stage Design as a Whole Work of Art - Stefano Boda's View of Opera. Opera (12), 60-65.

Research on the Application of Data in the Process of User Journey Mapping Construction

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Abstract

In recent years, the organization and analysis of user journey maps have provided enterprises with crucial insights into understanding users and gaining a competitive advantage in the market. Data serves as a essential basis for the construction of user journey maps, however, there is no established systematic framework for guiding the application of data in this context until now. This study comprehensively employed methods such as surveys, interviews, and workshops to investigate the research requirements of design teams concerning the use of user journey maps and to outline data application objectives at different stages. Against the backdrop of merging quantitative and qualitative data, three strategies for applying different types of data in the construction of user journey maps are proposed. These strategies include using extensive background data to establish a shared understanding in the team, utilizing coherent behavioral data to depict the experiential journey, and employing multidimensional measurement data to assess user experiences. These strategies aim to enhance the comprehensiveness, efficiency, and objectivity of constructing user journey maps, thereby increasing their application value in service optimization and innovative experience design. In turn, assisting designers and enterprises in gaining more innovative insights and making more globally informed design decisions.

Author keywords

User journey map; Data application; User research; Experience design

1 Introduction

User journey maps, regarded as a "service experience modeling tool," are widely employed in the fields of service and user experience design due to their ability to facilitate empathy among researchers, provide profound insights into user behavior, and promote cross-departmental communication and collaboration. The accuracy of data application during its construction process largely determine its value. However, with the complexity of user experience scenarios in the new era, the challenges of copious and convoluted data have led to many dilemmas that researchers often face when applying user journey maps to clarify more comprehensive user experience scenarios, such as which data should be collected to support the construction of user journey maps? How to efficiently and objectively condense this data and integrate it into a user journey map? Concurrently, the era of big data has ushered in a data-driven mindset, which has become a driving force in various academic disciplines.

Big data analytics can aid in uncovering insights into user experiences (Holmlund et al.,2020). Therefore, this study, founded
on the integration of data-driven thinking and design principles, proposes a systematic approach to the multichannel application of data within user journey maps. This approach combines the efficiency advantages of big data with the insightful advantages of qualitative research, thereby empowering designers and businesses to gain more innovative insights and make more globally informed design decisions through user journey maps.

2 Overview of the user journey map

User journey maps, born in the era of the experience economy, serve as tools for visualizing the current-state or future-state experiences of users (Stickdorn et al., 2018). Their origins can be traced back to the field of marketing, where they were initially employed to analyze moments when customers are most likely to be influenced during product or service purchases. At that time, they were referred to as "cycle of service mapping" (Court et al., 2009). With the broadening scope of applications, user journey maps have found extensive use in various research domains, including healthcare service systems (Li and Jiang, 2021), product-service system improvements (Shiratori et al., 2021), museum experiences, and the design of their cultural derivative products (Wu et al., 2021; Jiang and He, 2023).

Regarding their structural forms, there are several notable examples exist. In 2009, Bruce D. Temkin created a user journey map for a visit to the LEGO company, featuring key elements such as "user personas," "user journeys," and "user experience assessments." Another example is the Starbucks user experience journey map established by Beckman in 2010, structured around "user personas," "user journeys," and "factors influencing experiences." The Nielsen Norman Group, a U.S. user experience research institution, introduced a user journey map construction framework in 2010 comprising three sections: "lens area," "experience area," and "insights area." In 2011, Adaptive Path, a customer experience design company, created a European railway user journey map that encompasses all stages of the user journey, interactive behaviors, experience needs analysis, experience assessments, and design opportunities.

As the forms of constructing user journey maps become increasingly diversified, specific, and comprehensive (Li, 2019), data from various channels have emerged as pivotal foundations for supporting this construction process. Canfield and Basso (2017) introduced an innovative way to constructing user journey maps by amalgamating users' cultural backgrounds and satisfaction data. In the context of big data analytics, Yang Huan (2019) devised a novel pathway for deriving user insights through data analysis, encompassing the creation of user personas, analysis of user experience journeys, and scenario analysis. Alvarez et al (2020) integrated observational data, explicit data (such as gender, age, motivations, abilities, and knowledge levels obtained from user perception and self-reports), and implicit data (including task completion and task performance derived from EEG and skin conductance tests) within user journey maps, thereby holistically portraying the storylines and experiential states of users installing new entertainment electronic devices.

A comprehensive review of the aforementioned studies reveals that while there is a substantial body of research mentioning user journey maps, much of it applies this tool as a design instrument in specific user experience studies. These studies predominantly focus on presenting the finalized mapping results, with limited descriptions of the construction process itself and the specific data sources. For individuals intending to utilize user journey maps , a detailed, systematic, and up-to-date guide on data application is notably lacking. Furthermore, in the current process of constructing user journey maps, data from qualitative research such as field surveys are still dominated. This methodology is no longer able to adapt to the sudden changes in business needs and the efficiency requirements of product iterations.

3 Investigation of data application content in user journey maps

In the first phase, we utilized questionnaires (75 responses) and conducted in-depth interviews (Fig.1) to gain insights into the fundamental understanding of user journey maps among designers. Additionally, we explored the current utilization of data in the process of constructing user journey maps (Fig.2) and identified the data application requirements at each stage. This enabled us to summarize the data application needs and objectives for the three stages of user journey map construction: design background awareness, experience journey routing, and user experience metrics. In total, we derived 17 key points (Table.1).

In the second phase, we invited five expert users, comprising three individuals with over five years of professional experience in the industry and two master's graduate students with involvement in household appliance product experience design projects, to construct a user journey map with the theme of user experience optimization design for a brand of smart air conditioner, using the different types of data information mentioned in the previous section. Then, we assessed and validated the rationality of data applications, subsequently refining data application strategies.

Ultimately, this study aligned the distinct categories of data and key points of data application within the user journey map to generate a design direction for data application(Fig. 3).

4 Data application pathways in the construction process of user journey maps

Drawing upon a comprehensive literature review and survey results, this study presents three pathways for the application of data in the process of constructing user journey maps(Fig.4).

4.1 Using extensive background data to establish a shared understanding in the team

In the initial phases of user journey map construction, all participants, including designers, product managers, and operations personnel, need to establish a shared understanding at the cognitive level regarding the application objectives of user journey maps, the current state of the design object, and target users. Therefore, collecting extensive data concerning business requirements, product information, and user characteristics is crucial. Building upon this foundation, it serves as a knowledge framework to facilitate collaborative efforts in subsequent user journey map analysis. These data sources can be categorized into four specific types:

(1) Clearly defining targeted business data lays the foundation for the direction of journey map design. The genesis of the user journey map construction task often originates from the demands of enterprises for product business development. This necessitates that all members of the research team are capable, as a preliminary step, of deciphering the business objectives data derived from decision-makers or product managers. This enables a clear understanding of the requirements and purposes, forming the initial conceptual framework for the construction of the journey map.

(2)Establishing a product knowledge framework through comprehensive product data. Products, whether tangible goods or intangible services, serve as pivotal links between businesses and users. Gaining a comprehensive understanding of the product's overall landscape can assist researchers in identifying critical experiential stages when constructing user journey maps. Therefore, participants should gather data regarding product characteristics, core values, current stage (existing features and future plans), and industry trends from various sources, including enterprise business systems, internal organizational members, partners, and industry reports. Simultaneously, addressing knowledge gaps in their understanding of the product arising from limitations in their job roles.

(3)Gaining insight into fundamental user needs through evaluative feedback data. After attaining a comprehensive understanding of the product, the team should proceed to swiftly discern the focal points of

user experiences from a user perspective. Researchers can leverage big data crawling techniques to extract and analyze user-generated product feedback data on online platforms (e.g.:text, images, and videos), in order to set up a fundamental understanding of the current sentiment, typical user opinions, and emotional tendencies related to the product. It facilitates a more precise delineation of the design framework for the user journey map and its key experiential phases.

(4) Refining tag-based data as needed to create target user personas. User personas should enable researchers to gain a clear understanding of target users' behaviors, aspirational visions, and underlying values, aligning this knowledge with the interpretation of experiential scenarios within their journey. Thus, data originating from various heterogeneous sources such as business backends, product terminal records, third-party data service platforms, containing information regarding user attributes (e.g., age, gender, occupation, geographic location), behavioral preferences (e.g., active periods, product feature usage frequency), and personal social networks (e.g., interests, skills), can assist designers in crafting refined, labeled virtual user personas within the user journey map.

4.2 Utilizing coherent behavioral data to depict the experiential journey

The construction of a user journey map involves the process of transforming multidimensional behavioral data of users into a comprehensive narrative of their entire experience journey. This process necessitates the ability to enable researchers to gain a clear overview of key events that occur from the beginning to the end of the user's experience, the behavioral patterns followed, and any exceptional experience points encountered. So, at this stage, on the one hand, it is imperative to collect macro-level narrative data to build the behavioral framework of the user journey. This can be achieved through a combination of user interviews and storytelling methods to obtain scenario-based descriptive data about user experience events. On the other hand, considering specific experiential contexts, interaction details data between users and the product can be gained through product sensors, web tracking, and similar means, allowing for a more refined depiction of users' specific experiential behaviors within the journey map. Lastly, distill, reorganize and arrange these data to form a coherent user experience narrative.

4.3 Employing multidimensional measurement data to assess user experiences

The involvement of multichannel data provides researchers with a broader perspective and possibilities for observing the quality of the user experience throughout the entire process. These data enable a more intuitive quantification of users' diverse experiential dimensions and the evaluation of design value. At this stage, the content of data application primarily includes the following aspects: Firstly, deriving ideal experiential metrics based on project objectives to establish an experiential measurement baseline. This baseline is used to assess the degree of variance between user experience quality and design goals after the implementation of design solutions. Secondly, collecting multidimensional data on users' actual usage and assessments, including data from product log collection systems, questionnaire surveys, among others. This data is then compared with the target values in the measurement baseline to analyze experiential issues and guide the iterative direction of experience design.

Conclusion

In the context of service innovation and experience, any design tool or design concept requires constant refinement and development within the framework of the evolving societal landscape, user demands, and the open nature of design disciplines. This research systematically introduces the application methods and forms for the application of data from various channels in the process of constructing user journey maps. On the one hand, this effectively bridges the data gaps that design researchers face during the creation of user journey

maps, enhancing their comprehensiveness and precision. On the other hand, the utilization of multi-channel data enhances the depth of interpretation of user experiences within the journey maps and widens the insights at both macro and micro levels of research perspectives. We hope it can aid researchers in better constructing user journey maps, gaining a deeper understanding of the reasons behind user behavior, and producing more valuable design insights in user experience innovation decisions.

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References

Alvarez, J., Léger, P. M., Fredette, M., Chen, S. L., Maunier, B., & Senecal, S. (2020). An enriched customer journey map: how to construct and visualize a global portrait of both lived and perceived users' experiences?. Designs, 4(3), 29.

Canfield, D. D. S., & Basso, K. (2017). Integrating satisfaction and cultural background in the customer journey: A method development and test. Journal of International Consumer Marketing, 29(2), 104-117.

Court, D., Elzinga, D., Mulder, S., & Vetvik, O. J. (2009). The Consumer Decision Journey. Harvard Business Review.

Holmlund, M., Van Vaerenbergh, Y., Ciuchita, R., Ravald, A., Sarantopoulos, P., Ordenes, F. V., & Zaki, M. (2020). Customer experience management in the age of big data analytics: A strategic framework. Journal of Business Research, 116, 356-365.

Jiang, Y., & He X. (2023). Research on Cultural and Creative Product Design of Shenyang Palace Museum Based on User Journey. Development & Innovation of Machinery & Electrical Products(02),169-172.

Li, F. (2019). Omni-channel customer journey experience mapping - An integration study based on user profiling, customer experience mapping and customer journey mapping. Technical Economics, 38(05), 46-56.

Li, Y., & Jiang, K. (2021). Research on the Design Of Intelligent Diagnosis-Guiding Robot Service System Based on Epidemic Background. Design(14),121-123.

Shiratori, E. K. A., Trevisan, A. H., & Mascarenhas, J. (2021). The customer journey in a product- service system business model. Procedia CIRP, 100, 313-318.

Stickdorn, M., Hormess, M. E., Lawrence, A., & Schneider, J. (2018). This Is Service Design Doing: Applying Service Design and Design Thinking in the Real World. O'Reilly Media, 113.

Wu, L., Li, Y., & Dong, S. (2021). Museum Experience Design Based on Service Design Thinking and Method. PACKAGING ENGINEERING,2021,42(18):341-350.DOI:10.19554/j.cnki.1001- 3563.2021.18.043.

Yang, H.(2019). The Integration of Data and Design: The Innovation Path Research of User Requirement Insight Through Big Data Analysis. Zhuangshi,2019(05):100-103.

Appendix

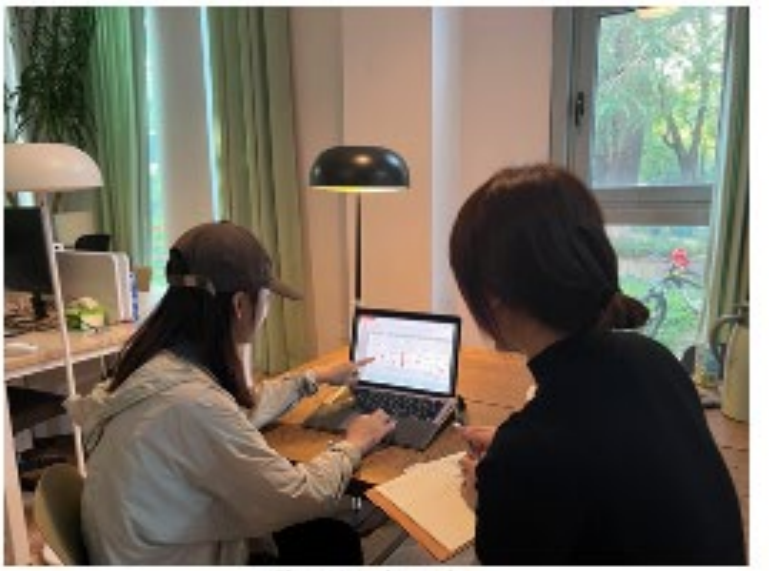

Fig.1 User interview

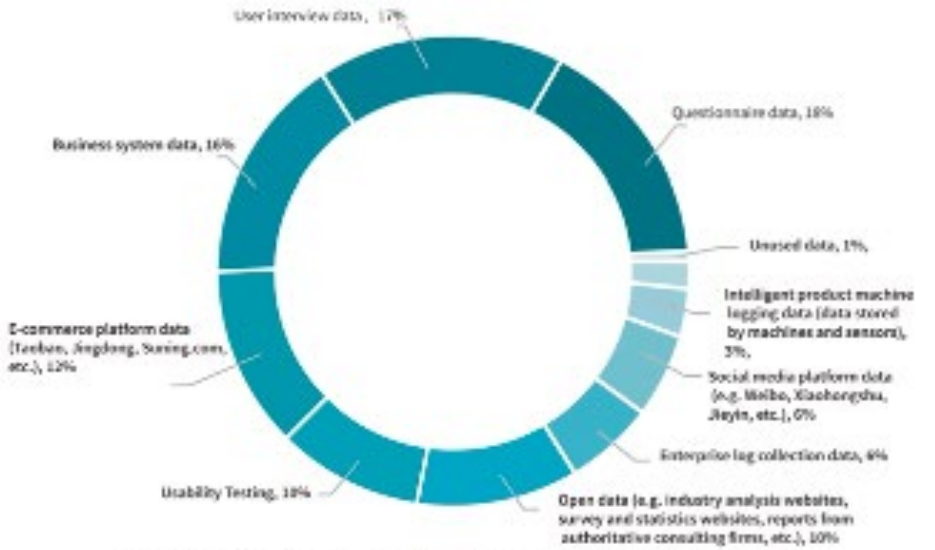

Fig.2 Survey on the Current Usage of Data in User Journey Maps

Table.1 Data application demands and targets for different construction phases

Stage Breakdown	Data application demand points summarised	Data application targets
Design Background Awareness	All participants could agree on the overall goals, needs and tasks of user journey mapping	Understanding the project background
	Capture more comprehensive data on the status of products and services	Get the full product picture
	Various sources, both internal and external of the organisations, provide broad access of data and information about the design object	
	Find out about the core values of the product, user needs and usage scenarios to which it responds	

	Collect data profiles of target users to develop user personas	Getting the full user picture
	Determine the layers and content to be included in the user journey map	Focused Journey Mapping Key Research
Experience Journey Routing	Rapid and holistic access to large amounts of data on user behaviour across the entire experience	Capture and handle user behaviour data in an automatic manner with the help of a technological platform
	Capture users' experiences online and offline	
	Ability to capture all the information about the user experience scenarios from the collected user data	Increase in comprehensiveness of data content
	Comprehensive understanding of the channel through which the user contacts the organisation during the experience journey	
	Build realistic and plausible user experience scenario stories	Assist in programming a coherent experiential journey
	Identify anomalous behaviours in the user experience	Exploring unusual experiential behaviours
User Experience Metrics	Measurement of the actual quality of the user's experience	Quantifying the subjective user experience
	Analysing the achievement of design goals at each stage of the user experience through data analysis	Link design goals and user experience
	Constant tracking and updating of data on the quality of the user experience	Improved advancement of journey map data

The strategic design process: a case of improving inclusiveness in China's public sector

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Abstract
Building a smart transportation system always challenges public service designers to design innovative and inclusive services to meet the residents' diverse lifestyles. This case study examines a strategic design project in China that applied human-centered design (HCD) approaches, which are new to most Chinese city governments, to improve inclusiveness in the pre-planning phase. In the project, the design researchers successfully inspired designers to generate viable and inclusive service concepts by effectively interpreting the vulnerable users' needs. As a result, we identified three design activities useful in aligning stakeholders, increasing participation, and defining the inclusiveness scope within a complex collaborative context.

Author keywords
Human-Centered Design; Public sector; Service design; Inclusive design

The context

A smart city is a trending concept in China with the rapid urban population growth. Benefiting from the Chinese government's 13th Five-Year Plan development strategy, Gui'an New District (GND) has drawn much investment from the Data industry. The city government planned to build an Intelligent transportation system (ITS) as the core of the city infrastructure. ITS refers to the transportation system deploying new-generation information technology to optimize the management and operation capacity, including the resource allocation capability, public decision-making capability, industry management capability, and public service capability. Design and innovation in the public sector usually need to consider all the citizens, including all kinds of vulnerable groups, to access the space or the service. The ITS aims to create new public spaces and introduce new technology to end-users' lives. To the extent of inclusiveness, it not only focuses on ensuring accessibility for disabled people but also needs to consider local residents' digital literature to comprehend new-gen services.
Moreover, the city economy's growth may draw many future immigrants. Those factors increase the complexity of design requirements for this public service design project. However, fulfilling a human-centered design process requires clearly defining the users' characteristics and specific needs from experience in the private sector, which is extensive and ambiguous in such a public design context.

The shift form of human-centered design (HCD)

The value of the human-centered design process has gained acknowledgment in addressing complex problems

(Buchanan, 1992) , and the principle of "putting humans in the center" has extended its domains beyond traditional design (Norman, 1998; Jordan, 2002). Brown (2005) and Martin (2009) pushed the design boundary to a strategic level with the term design thinking. Meanwhile, design approaches are seen as the government's innovation tools for consciously creating meanings and values for citizens (Bason, 2010). Through further integration into city service design, the design's role in public-sector shifts towards facilitating co-creation work, guiding the team with a holistic picture of the complex problem, and providing prototyping and visualizing skills to make the abstract concept tangible (Buuren et al., 2020; Hyysalo et al., 2023; Mariotti et al., 2023; Villa Alvarez et al., 2022). The shift of design applications leads to the adaptation of design flow accordingly. For instance, by analyzing design activities in Helsinki city administration organizations, researchers identified six types of design activities. The "Design in participation and collaborative work" type emphasizes the designer's role more on facilitating the process and testing ideas rather than delivering concrete solutions (Hyysalo et al., 2023). When it comes to China's public context, applying HCD approaches is a fresh experiment that needs to adjust the process to really play a part in increasing citizen engagement in government-led projects.

Design flow adaptation challenges

To make the public transportation system well support the residents' lives, the first challenge was defining whose demands should be meet first. How to balance the conflicting needs between different groups of residents to keep equity? Further, the nature of a government administration as the client creates a design management challenge in term of reach a consensus. It takes effort to bridge the information gap both within the organization and across the stakeholders internally and externally. To accomplish these challenges, the adaptive design flow emphasizes increasing residents' participation, demonstrating holistic view of the complex system to facilitate collaboration across multi-disciplinary teams, and generating a visual tool to inform and evaluate ideation activities. In the next section, we examinate the design process of the case, which was aiming to narrow the design focuses to balance between the inclusiveness and the system efficiency. In the next section, we will analyze the case in three aspects: the adaptation of the process, the strategic considerations, and the effectiveness of the deliverables.

The case: process, consideration, and deliverables

Applied human-centered design process

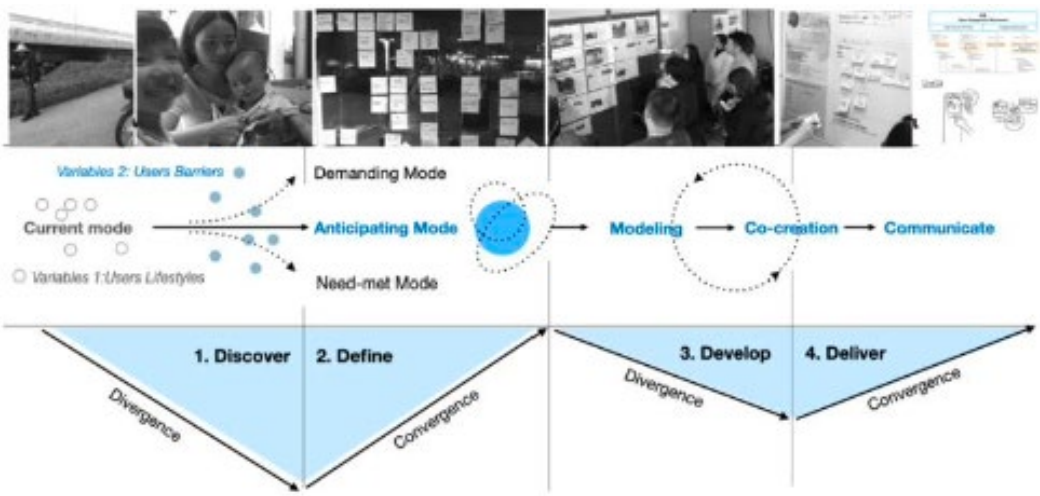

Figure 1. Design activities in the project compared with the design thinking process

In practice, the design researchers followed the "double diamond" design process model (The British Design Council 2006), derived from the studies on innovation projects in the private sector. IDEO has a similar HCD approach framework, including four stages (discover, define, develop, and deliver). Both design processes commonly integrated design thinking methods to transform thoughts from divergence to convergence to convert human needs into viable innovative ideas, see Figure 1.

In the traditional working process, the first "divergence to convergence" course usually works on capturing specific needs arising from the fieldwork. In this context, individual users' specific but fragmented needs were not persuasive enough for the administrators to distribute the resources. Thus, the research goal switched to identifying the intermediate variables between the users' mobile needs and their anticipating life mode, which set the transportation system under the city life quality context. In this case, "barriers to mobile in the city" and "mobility to stay a lifestyle" were the two intermediate variables to sort and cluster the needs under anticipating transportation experience modes. This tactic avoids the stereotype of describing users as disabled people or illiterate women, which creates tension in needs priorities. We believe that new technology applications could create a temporary disabled situation for any of us, like a city dweller in China running out of a phone's battery could mean losing access to a bus due to the highly developed mobile payment network. The "modes" treated each resident's life satisfaction equally while specifying inclusiveness levels under each mode depending on the resource availabilities. This structured information was fed to the second "Divergence to Convergence" course, providing several easy-to-follow emphasizes for the residents, designers, and administrations for ideation and evaluation. With convincing and simplified design targets, the government administrators and service designers could collaborate toward the same goal rather than in an "Appeal-Gratification" mode. As a result, the designers received affirmative and elaborate user needs to generate concepts; the government decision-makers had valid criteria to evaluate the viability of those ideas.

Three important considerations in the strategic level

Stakeholders' interrelations analysis

Freeman(1984, p. 46) defined stakeholders as "any group or individual who can affect or is affected by the achievement of the organization's objectives," which broadens the remit of stakeholder management beyond the company shareholders (Littau et al., 2010; McGrath & Whitty, 2017). Stakeholder analysis as a tool has been used widely in police making, health management, and business management field (Brugha & Varvasovszky, 2000). In this project, to align stakeholders, we develop research tools to map their interrelation. The preliminary types of stakeholders arose (investors and supervisors, service providers, and end-users). See Figure 2. The residents were the end-users of this project, as well as external stakeholders. The government's functional departments are investors and supervisors. The exclusive service contractors comprised state-owned enterprises (SOE) (e.g., bus companies) and authorized private enterprises (PE) (e.g., online car-hailing platforms). The service providers and supervisors/investors were treated as internal stakeholders in the current transportation system. And the service providers usually helped to filter the end-user's demands based on their serviceability. However, the innovation of ITS would dramatically change this structure by enabling all three stakeholders to communicate freely, which means that the design requirements should follow a different product proposition of the ITS. By mapping stakeholders, designers played a strategic consulting role to shift the design direction. The considering as to ITS's proposition is describing in the next section.

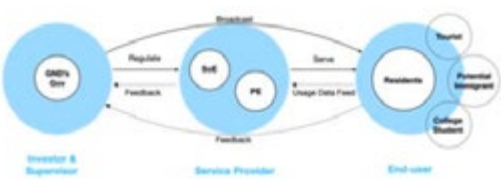

Figure2. Interrelations among ITS stakeholders

ITS proposition as to the stakeholder's interest

As the core city infrastructure, ITS carries the resident's future life qualities. By 2030, Gui'an is foreseeing great changes in demographics and infrastructure, with the urban population growing by 690% and the rural population decreasing by 30%, according to the GND Development Plan 2013. The advanced technology has great potential to create various futuristic service scenarios. As mentioned, the stakeholder's interrelationship landscape would change after it is embedded. What could that be? What kind of value is ITS responsible for creating? To facilitate the information flow freely among the three parts, ITS uses its data potential to create a communication circulation with interfaces to communicate with the stakeholders. See Figure 3. The proposition of the interfaces is the service touchpoints located. In general, ITS is an enabler, using data management to support all service touchpoints, such as data-driven policy-making and design based on user data monitoring. The value brought by ITS is the capability to be dynamic and iterative for the city transportation system. The inclusive scope is considered in the next section to specify the design criteria further.

Figure 3. ITS enables stakeholders with a dynamic and iterative infrastructure

Inclusive scope: a framework for needs induction

Eventually, designers need a clear scope to concept inclusive service. Whose demands should be met by the diverse resident types? How do we set rational standards for the decision-makers to reference? In this case, the design researchers refer to the theory of the "Human Needs Pyramid." Maslow (Maslow, 1943) describes human needs in five hierarchical levels. The physiological conditions are at the bottom of the hierarchy, followed by safety, social, and esteem needs. The top level is self-actualization. Later, the two lower levels are added to cognitive and aesthetic needs, and one higher level is added above-self-transcendence (Maslow, 1998). This project's physiological conditions are security and efficiency. See Figure 4. Those fundamental conditions are suited for universal design principles meant to meet the needs of all people, young and old, able and disabled (Nussbaumer, 2011). Yet, the users are less willing to pay the extra service fees. Then, the cognitive and aesthetic needs equal the need for comfort and predictability to ITS. Users consider them the key elements regarding the user experience and are likely to pay some extra fee for the operational services. So, the inclusive dividing line floats up and down within this zone. On the top, the needs like protecting social images and some kind of privacy. They do not consider them a "must-have" feature in the public transportation system, but they should be available for advanced and premium service systems. Based on this "human needs" ladder, it is easy to correlate the specific user needs with the data potentials and then generate design principles.

Viable concepts evaluated and delivered

I In this project, the deliverable is a part of the design process rather than a document at the end since the influence is considered the first. The findings and the frameworks mentioned before were communicated to other teams in several workshops. The delivery activities started even before the second course of the HCD process. So that the groups could be involved and co- create on the second course, see Figure 1. To sort and modify the ideas into the final concept design phase, the multidisciplinary teams use the need's hierarchy framework as the guideline to consider three categories simultaneously: inclusiveness scope, data technology involvement, and service design innovation.

Moreover, as an innovation design planning, the concepts were evaluated by three attributes: viability, desirability, and feasibility. Finally, as a public infrastructure, ITS must cover all the hierarchical levels of need. See

in Figure 4. Through synthesizing and final development by the service designers, the implementation concepts are visualized in Figure 5. Those concepts have been written in the development agreement to implement with the consent of all stakeholders in the project.

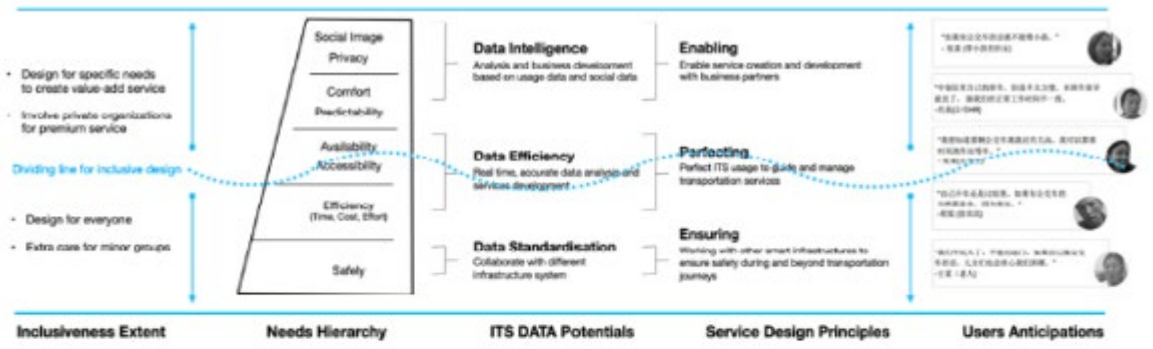

Figure 4. Needs hierarchy to inform inclusive design features

Figure 5. Selected concepts for implementation (Asian Development Bank, 2019)

Discussion and Conclusions

Innovation ideas generated in the pre-planning phase usually need many adaptations before implementation. How to stay human-centered along with the process is always challenging for innovation designers. That is why many creative ideas hardly go beyond the innovation labs or the academics. In this case, design researchers work as strategic planners to define challenges and explore opportunities. Their considerations are responsible for the project outcomes-the resident's satisfaction with ITS. In the project reflection, the three considerations are seen as critical activities to ease designers/design researchers to play strategic roles in such a context:

1. Understand the stakeholders' interrelations.
2. Clarify the project proposition for all players involved.
3. Set the design criteria to smoothen the rest of the human-centered design process.

Though this analysis is limited to one case study, the applied HCD approach in China's public sectors is rare. The strategic activities emphasizing stakeholder analysis and project proposition are expected to be tested by more HCD practitioners and strategic designers in the public sector.

Acknowledgments

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References

Asian Development Bank. (2019, August 19). Human-Centered Design Underpins New Intelligent Transport System in PRC City (China, People's Republic of) [Movingimage]. Asian Development Bank. https://www.adb.org/news/videos/human-centered-design-underpins- new-intelligent-transport-system-prc-city

Bason, C. (2010). Leading public sector innovation: Co-creating for a Better Society (1st edition). Policy Press.

Brugha, R., & Varvasovszky, Z. (2000). Stakeholder Analysis: A Review. Health Policy and Planning, 15, 239–246. https://doi.org/10.1093/heapol/15.3.239

Buchanan, R. (1992). Wicked Problems in Design Thinking. Design Issues, 8(2), 5. https://doi.org/10.2307/1511637

Buuren, A. van, Lewis, J. M., Peters, B. G., & Voorberg, W. (2020). Improving public policy and administration: Exploring the potential of design. Policy & Politics, 48(1), 3–19. https://doi.org/10.1332/030557319X15579230420063

Freeman, R. E. (1984). Strategic management: A stakeholder approach. Pitman.

Hyysalo, S., Savolainen, K., Pirinen, A., Mattelmäki, T., Hietanen, P., & Virta, M. (2023). Design types in diversified city administration: The case City of Helsinki. The Design Journal, 26(3), 380–398. https://doi.org/10.1080/14606925.2023.2181886

Jordan, P. W. (2002). Designing Pleasurable Products: An Introduction to the New Human Factors. CRC Press. https://doi.org/10.4324/9780203305683

Littau, P., Jujagiri, N., & Adlbrecht, G. (2010). 25 Years of Stakeholder Theory in Project Management Literature (1984-2009). Project Management Journal, 41, 17–29. https://doi.org/10.1002/pmj.20195

Mariotti, J., McGrath, T., Kwasny, J., Cox, S. F., Alengaram, U. J., Darvish, P., & Soutsos, M. (2023). Connecting citizens through participatory design activities: Lessons from Kuala Lumpur, Malaysia. The Design Journal, 0(0), 1–17. https://doi.org/10.1080/14606925.2023.2201490

McGrath, S., & Whitty, J. (2017). Stakeholder defined. International Journal of Managing Projects in Business, 10, 00–00. https://doi.org/10.1108/IJMPB-12-2016-0097

Norman, D. A. (1998). The Design of Everyday Things. MIT Press.

Nussbaumer, L. L. (2011). Inclusive Design: A Universal Need (1st edition). Fairchild Books.

Villa Alvarez, D. P., Auricchio, V., & Mortati, M. (2022). Mapping design activities and methods of public sector innovation units through the policy cycle model. Policy Sciences, 55(1), 89– 136. https://doi.org/10.1007/s11077-022-09448-4

Ecological Speculative Design Methodology: Four Shifts - A Case Study of the "Unqualified" Factory

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Abstract

The global value chain is in flux, driven by the confluence of the 2020 COVID-19 pandemic, climate crisis, and globalization's restructuring. Amid these trends, designers must respond with an ecological mindset, addressing the reshaped global value chain's profound implications. This article presents the "ecological-speculative-design" methodology, using the case study of the "Unqualified Factory" to illustrate four key shifts: (1) Shifting the design subject from "leather" to "leather value chain"; (2) Moving the design context from "consumer trade" to unveiling "ecological contradictions"; (3) Transforming the design method from " designing objects" to "ecological speculation" using multimedia Design; and (4) Advancing the design goals from "problem solving" to "public awareness transformation". By embracing these shifts, designers can inspire public dialogue and influence systemic change, thus contributing to a more sustainable future.

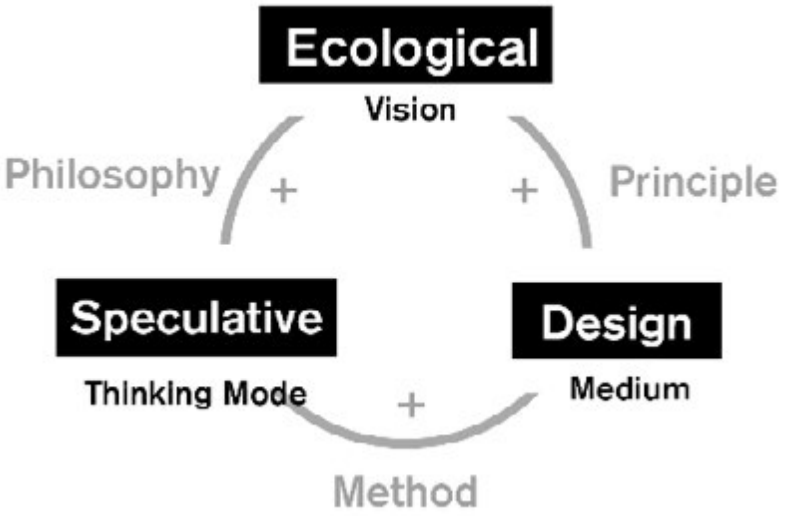
Author keywords

Ecological design; Speculative design; global value chain; ecological crisis; sustainability; environmental impact; public awareness

Introduction

The tense interplay between the 2020 COVID-19 pandemic, climate crisis, and the global economic landscape has reshaped the distribution of the global value chain. This transformation is driven by three major trends: the continuous advancement of emerging technologies, the growing urgency of global climate issues, and the restructuring of globalization. The consequences of this transformation are profound, impacting individual lives, corporate strategies, and national approaches to sustainable development. Simultaneously, the global climate crisis has compelled stakeholders, including governments, civil society, and businesses, to recognize the imperative of environmental sustainability and take action.

Designers, on one hand, bear the responsibility of social and ecological stewardship, applying a more "global" and "ecological" mindset to tackle global challenges within the context of reshaping value chains. On the other hand, the evolving global value chain presents designers with fresh perspectives and avenues for intervention. This article employs the work "Unqualified Factory" as a case study, utilizing the "ecological-speculative-design" methodology as a research lens and tool. The design methodology undergoes four critical shifts, focusing on "leathering its value chain." It delves into and elucidates the underlying ecological contradictions, employing multimedia design techniques for ecological speculation, thus fostering a transformation in public crisis awareness.

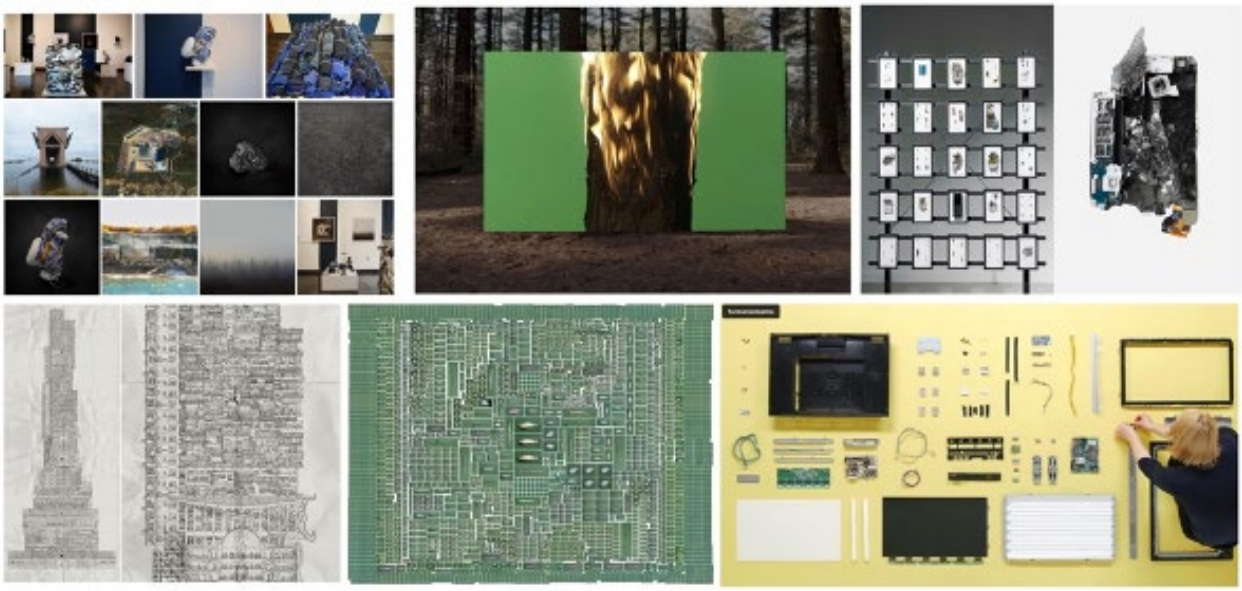


(The figure shows the author's diagram of the "ecology-discernment-design" research relationship)

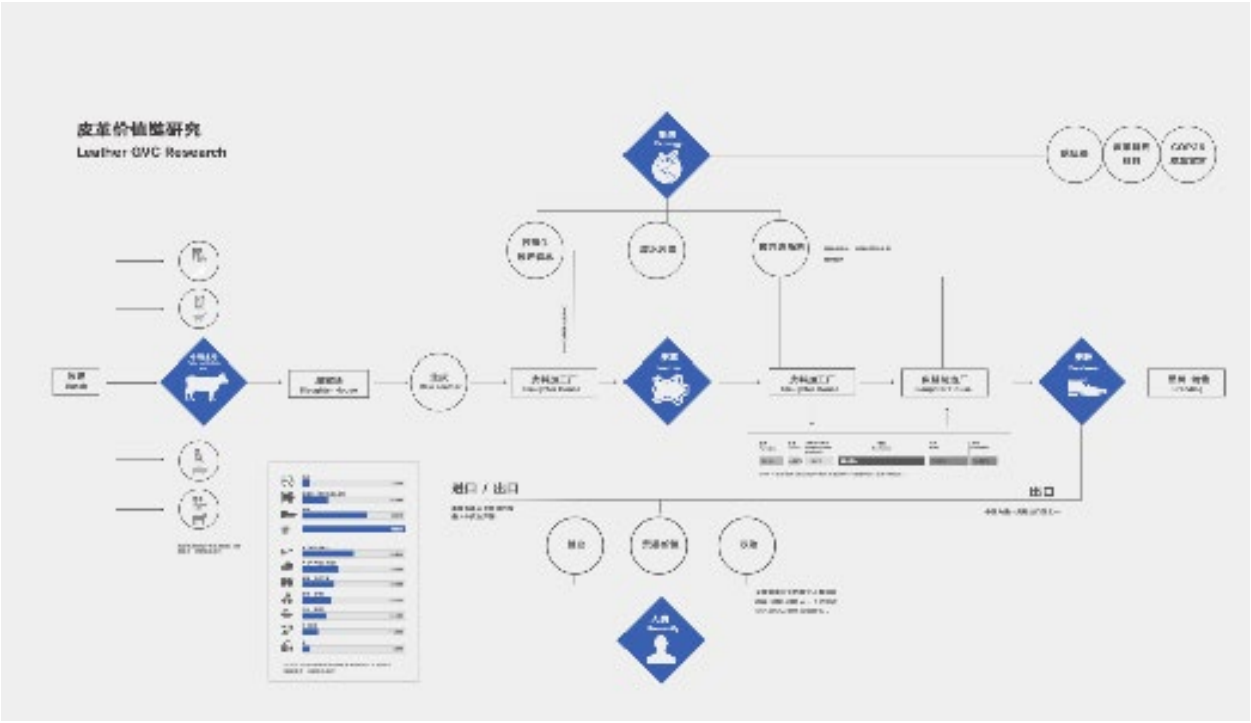
1.Shifting the Design Subject from "Leather" to "Leather Value Chain"

Traditionally, designers were tasked with creating high-quality products or services using raw materials. However, design extends beyond the immediate product or outcome; it encompasses the entire value chain and resource dynamics that shape the design's formation, presence, distribution, or dissolution. To adopt a more ecologically conscious mindset and comprehensive design principles, we must shift our focus from isolated materials to the systems and industries underpinning design. Many designers have explored primary materials or components as entry points in their research. For instance, Mary Mattingly's work "Cobalt" investigates the production, distribution, and use of the metal element "cobalt." Similarly, Formafantasma's exhibition "Cambio" centers on the wood industry and its trade. These designers have recognized the significance of materials in broader supply chains, providing crucial insights into complex systems. This shift from material-centric to value chain-centric design allows us to comprehend the intricate networks behind resource utilization, facilitating discussions on ecological and social challenges arising from human resource consumption.

In this context, I embarked on research in my hometown, starting with representative industries in Wenzhou, China. I chose the leather value chain as my research subject. Leather serves as a central object connecting animal welfare, ecological impact, commodity output, and human trade. It functions both as a primary material and a continually processed commodity component. Leather and its industry have existed for centuries, evolving from early records and subsistence needs to becoming an integral part of daily life. Leather's durability and texture have made it ubiquitous in human existence. Moreover, the leather industry's close ties to natural environments, human life, and global trade confer it with special significance. The leather value chain, comprising cattle, hides, leather, and leather products, constitutes an integrated system, with each stage mutually influencing the others. Leather, more than any other material, embodies the complex relationships between humanity, nature, and life. Based on this analysis, I shifted the design and research focus from "leather" to the "leather value chain" and its associated systems.



(From left to right, top to bottom: Cobalt, Cambio, The Global Souvenir Shop, Bitter Pagoda, Equivalence - The Ecological Footprint of Fish, Ore Streams, images taken from the artist's website)



(The image is an infographic of the leather value chain study drawn by the author)

2.Shifting the Design Context from "Consumer Trade" to "Ecological Contradictions"
As the climate crisis looms ever closer, respecting the limited resources of the material world and taking proactive

measures have become more critical than ever. The design context has shifted from the globalized production and consumption systems within the global value chain to the ecological impacts arising from the extraction, processing, shaping, assembly, distribution, disposal, recycling, or reuse of raw materials. The exhibition "Cambio," initiated by the Formafantasma design studio, presents an ongoing investigation into the management of the wood industry, revealing the complex network of illegal timber sources discovered at EU customs, thus exposing the intricate web of illegal international trade. By tracing the colonial history of the timber industry and its current operation methods, the exhibition highlights the ecological impact of design and the wood industry, prompting a reconsideration of the industry's existing practices. Designers play a critical role in our environment, analyzing the global value chain through an ecological lens, scrutinizing and subverting irrationalities within the chain, thereby embracing their responsibility to transcend boundaries.

I conducted field visits to more than ten local farms, slaughterhouses, leather processing factories, and leather product factories in Wenzhou. I interviewed twenty professionals from the leather industry and worked in a leather production factory for three weeks, learning the entire leather processing workflow. During this process, I observed the various stages of leather production, from slaughtering and skinning cattle to the multiple processing steps involved. Compared to the consumer trade system of leather, the life industry's quantification, dissection, and underlying ecological contradictions become more apparent.

The leather production industry faces two unavoidable issues: ecological degradation and animal welfare concerns. Sustainable Apparel Coalition data reveals that leather ranks as the third-most environmentally impactful material in terms of production. Leather production often involves chrome tanning, which, if wastewater treatment is inadequate, can lead to significant environmental pollution and water resource consumption. Additionally, the rearing of cattle for both beef and leather is a major driver of deforestation. A January 2022 study by Stand.earth demonstrated the links between mainstream and luxury brands and Amazon deforestation. The production and trade of leather are inextricably linked to forest destruction and environmental consequences. Furthermore, the welfare of animals in the leather industry raises ethical concerns. Cattle are reared not solely for meat consumption but also for leather, leading to overcrowded farms and poor animal living conditions. These ecological and ethical issues exemplify the ecological contradictions present within the leather industry.

(Image on the left taken by the author of Wenzhou cattle farms, slaughterhouses, tanneries, shoe factories in January-April 2022)
(The image on the right is an infographic of the leather value chain study drawn by the author)

3.Shifting the Design Method from " Designing Objects" to "Ecological Speculation" Using Multimedia Design

Designers have long employed storytelling as a powerful tool for transmitting ideas, fostering empathy, and sparking public discussion. Yet, as environmental and ecological concerns gain prominence, storytelling alone may not suffice in addressing the urgency of ecological crises. Designers must go beyond storytelling and embrace "ecological speculation." This speculative approach investigates potential ecological scenarios, instigating forward-thinking and proactivity in dealing with environmental challenges.

In my project "Unqualified Factory," I integrated multimedia design elements to create an immersive ecological experience. By doing so, I sought to raise awareness of the ecological contradictions within the leather value chain. Through a series of multimedia installations, I invited visitors to participate in an ecological speculation journey. This journey guided them through the life and death of cattle, the leather production process, the consequences of environmental degradation, and the societal implications of leather consumption. With each multimedia installation, I encouraged visitors to consider the various ecological impacts associated with leather, from deforestation and pollution to animal welfare concerns. This immersive approach aimed to provoke a visceral response and stimulate proactive thinking about ecological sustainability.

(Image of the work "The Unqualified Factory" in a book of images)

Shift 4: Shifting the Design Goals from " Problem Solving" to "Public Awareness Transformation "
Designers possess the capacity to influence public opinion, mobilize collective action, and steer societal transformation. While individual awareness of ecological issues is essential, effecting meaningful change requires the dissemination of knowledge and the activation of public consciousness. As ecological speculation unfolds,

designers must transition from cultivating private awareness to fostering public awareness. The power of collective awareness can shape policies, redirect corporate strategies, and influence consumer choices, thereby driving systemic change.

In the case of "Unqualified Factory," I employed a variety of strategies to transition from private to public awareness. The project was exhibited in public spaces, including art galleries, museums, and community centers, to maximize its accessibility. Additionally, I organized workshops, panel discussions, and educational programs to engage the public in discussions about the leather value chain's ecological implications. By inviting participation and dialogue, I aimed to empower individuals with knowledge and inspire them to advocate for change. Furthermore, I collaborated with local environmental organizations and policymakers to amplify the project's impact and advocate for more sustainable practices within the leather industry. Through these collective efforts, the project extended beyond the realm of private awareness, contributing to a broader discourse on ecological transformation.

Conclusion:

The "Ecological-Speculative-Design" methodology, as demonstrated through the case study of "Unqualified Factory," offers a powerful framework for addressing ecological crises within the context of reshaping the global value chain. By undergoing the four critical shifts—shifting the design subject from "leather" to "leather value chain," shifting the design context from "consumer trade" to "ecological contradictions," shifting the design method from " designing objects" to "ecological speculation" using multimedia Design, and shifting the design goals from "problem solving" to "public awareness transformation"—designers can play a pivotal role in fostering collective awareness, influencing systemic change, and contributing to a more sustainable and equitable future.

Through ecological speculative design and engagement with ecological contradictions, designers can catalyze discussions, inspire action, and ultimately shape the trajectory of the global value chain towards greater ecological responsibility and resilience. The "Unqualified Factory" project illustrates the potential of ecological speculative design to ignite public awareness, encourage dialogue, and drive positive ecological transformations within complex, interconnected systems. As designers continue to grapple with the challenges of the 21st century, the ecological-speculative-design methodology offers a promising path forward, one that leverages creativity and critical inquiry to address the pressing ecological issues of our time.

References

1. Finbarr Livesey. (2018). Post-globalization Era [后全球化时代]. CITIC Publishing House.
2. Marc Levinson. (2020). Outside the Box: How Globalization Changed from Moving Stuff to Spreading Ideas [集装箱改变世界]. Princeton University Press.
3. Zhao Yan. (2021). Reflecting on Globalization: Contemporary Art and Technological Rationality in the Post-Globalization Era [反思全球化——后全球化时代的当代艺术与技术理性]. World Art, 2021(02), 23-32. DOI: 10.13318/j.cnki.sjms.2021.02.003
4. Wang Zigeng. (2016). The Reproduction and Narrative of Globalization Infrastructure Issues in the "A Beautiful Country" Trilogy ["A Beautiful Country" 三部曲全球化基础设施议题的再现与叙事]. Times Architecture, 2016(02), 46-53. DOI: 10.13717/j.cnki.ta.2016.02.009.
5. Song Ting, Huang Beila, Luo Yetao. (2022). The Future Factory of SSS: Creating a New Model for Modern Industrial Green Smart Manufacturing [sss 未来工厂：打造现代工业绿色智造的新典范]. Decoration, 2022(01), 32-

35. DOI: 10.16272/j.cnki.cn11-1392/j.2022.01.008.
6. Mao Weimin, Wang Kaiping. (2020). Materials: The Cornerstone of Human Social Development [材料：人类社会发展的基石]. Metal World, 2020(05), 19-26.
7. Yang Changhe, Zhao Mengchen. (2022). Connecting Responsibility and the Future: A Review of the "Living Things: Materials and Design in the Post-Oil Era" Exhibition [" 万物生息——后石油时代的材料与设计 " 展览评述]. Art Observation, 2022(01), 26-27.
8. Philip Ursprung, Li Yun. (2008). Art Production and Globalization: Olafur Eliasson's Studio in Berlin [艺术生产和全球化——柏林的奥拉夫·埃里松工作室]. Decoration, 2008(05), 18-23. DOI: 10.16272/j.cnki.cn11-1392/j.2008.05.014.
9. Maujot, V. (2016). Design in the Age of Everyone: An Introduction to Social Innovation Design [设计，在人人设计的时代一—社会创新设计导论]. Electronic Industry Press.
10. Liang Ting, Mann Zi Ni. (2006). The Way of Sustainability: Design and Exploration of China's Sustainable Lifestyles [持线之道：中国可持线生活模式的设计与探讨]. Lingnan Fine Arts Publishing House.
11. World Economic Forum. (2022). Reshaping Global Value: Technology, Climate, Trade – Global Value Chains under Pressure. Retrieved from https://www.weforum.org/whitepapers/future-of-manufacturing-and-production-report
12. World Economic Forum. (2022). The Global Risks Report 2020. Retrieved from https://cn.weforum.org/reports/the-global-risks-report-2020
13. Apple. (2022). 2021 Apple Environmental Progress Report. Retrieved from https://www.apple.com/environment/pdf/Apple_Environmental_Progress_Report_2021.pdf
14. Stand.Earth. (2022). Nowhere To Hide: How The Fashion Industry Is Linked To Amazon Rainforest Destruction. Retrieved from https://www.stand.earth/publication/forest-conservation/amazon-forest-protection/amazon-leather-supply-chain
15. Wang Junmei. (2022). Globalization Entering a New Stage: Interview with American Economist Marc Levinson. Retrieved from https://baijiahao.baidu.com/s?id=1711111030803492720&wfr=spider&for=pc
16. UNDP. (2022). United Nations Sustainable Development Report 2021. Retrieved from https://unstats.un.org/sdgs/report/2021/
17. Formafantasma. (2022). Cambio. Retrieved from http://www.cambio.website/
18. Mary Mattingly. (2022). What happens after. Retrieved from https://marymattingly.com
19. FAO. (2022). World Statistical Compendium for Raw Hides and Skins, Leather and Leather Footwear 1999-2015. Retrieved from https://www.fao.org/publications/card/en/c/2bb7ce63-da1b-4d89-9510-afc725b5e960/
20. Anthony Dunne, Fiona Raby. (2017). Design, When Everyone Designs: An Introduction to Social Innovation Design [设计，在人人设计的时代一—社会创新设计导论]. Jiangsu Phoenix Fine Arts Publishing House, Phoenix Publishing Media Group.

From the perspective of cultural anthropology, The cause of variant characters in the Ma Wang Dui silk manuscripts

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Abstract

The Chinese character system, created in social groups and applied to social groups, is doomed by its origin, development and scope to be bound by strict rules and laws. However, due to the complexity and variability of human groups, the contradictions between rules of Chinese characters have changed, resulting in heterogeneous characters. Chinese characters with different characters are the window of dynamic changes in the formation and development of Chinese characters, from which we can see the function of Chinese characters in the specific history, environment and society. Therefore, the comprehensive analysis of different characters is the study and analysis of the smaller regional society and the larger human society in the context of the evolution of Chinese characters. From the perspective of cultural anthropology, starting with the basic structural elements of the font, this paper traces the historical and cultural origin process of Mawangdui variant characters, makes an in-depth analysis of the factors affecting the generation of variant characters, and makes an in-depth explanation from four aspects: regime change, font transition, cultural transition and tool evolution. This paper discusses the development of font design flow in the historical context from the perspective of interdisciplinary.

Author keywords

Cultural anthropology; Heterologous writing; Mawangdui Bamboo Slips and Silk; seal character； Li-Calligraphy

Introduction

The emergence of writing is an important symbol of the birth of human civilization. In Ancient Society, published in 1877, American scholar Morgan said that civilized society "began with the invention of the phonetic alphabet and the use of writing." In the study of the origin of civilization, the region where early characters appeared corresponds to the cradle of early human civilization, and the evolution of characters in different regions constantly reflects and displays the requirements of aesthetic taste and the changes of inner spirit of corresponding cultural groups. As an important symbol of the Chinese nation, Chinese characters have engraved the record traces of the Chinese nation in practice, which has shown obvious gradual change in different historical periods. Since the Shang Dynasty, Chinese characters have undergone the evolution of oracle script, Jin script, seal script, official script and regular script. There must be a transition period between different fonts. With the changes of font structure and writing mode, the original font gradually transitioned to another font until a new font was born. In this special transitional period, people with different social status, cultural level, dialect area and professional identity will use Chinese characters, and they will transform and even create glyphs according to their own understanding and habits. These newly created Chinese characters are updating and destroying the structure of the original Chinese character system at any time【1】. In this kind of coexistence and struggle between new and old structures, different characters should be born.

variant characters in the Ma Wang Dui silk manuscripts

The most historical significance of Mawangdui silk manuscripts is the 28 silk manuscripts unearthed in Mawangdui No. 3 Han Tomb in Changsha, Hunan Province in early 1974, with about 120,000 words, covering a wide range of contents, including books on war, mathematics, six arts, various categories, Daoshu, and maps. This batch of silk manuscripts were written at different times, as early as the end of the Qin Dynasty, and as late as the Western Han Dynasty, and the typeface is mixed, showing a distinctive transitional period of Chinese character font replacement. Domestic scholars have studied and discussed the development of Chinese characters based on the collation of these cultural relics. Starting from the "dispatch book" study of Mawangdui No. 1 Han Tomb, Qiu Xigui analyzes the problems of Han and silk script in Mawangdui, points out the characters of ancient scribe and the relationship between ancient scribe and Qin seal style and cursive script. Wang Guiyuan's Study on the Formation System of Mawangdui Silk Texts makes an exhaustive analysis of Mawangdui Silk texts from the perspective of the conversion of ancient and modern Chinese characters, and deeply breaks down the transitional character of the formation system of Chinese characters. Chen Songchang's "Mawangdui Jian and Silk Text Compilation", published by Cultural Relics Publishing House in 2001, compiled the silk texts and bamboo slips (including the book, medical slips and wooden plates) from the Han tomb of Mawangdui, sampled according to the original photos, and included a total of 3226 single characters, 9566 heavy texts, 15 combined texts, and 39 doubtful characters. On the basis of Mawangdui Jian and Silk Text Compilation, Wei Xiaoyan organized and studied the heterotypic characters of Mawangdui. There are 1826 heterotypic characters, which are called heterotypic groups, of which 1715 are heterotypic groups, accounting for 93.92% of heterotypic groups. It shows that the font structure of different characters in Mawangdui slips and silks has been relatively stable in the process of Li transformation【2】.

Analysis on the cause of the evolution of variant characters in the Ma Wang Dui silk manuscripts

The alternation of political power in Qin and Han Dynasties brought about many innovations in economic system, ideology and culture, resulting in rapid changes in writing fonts, writing instruments, and the communication environment of fonts. From the perspective of cultural anthropology, this paper expounds the reasons for the formation of different characters by Ma Wang, and discusses how font users in the late Qin and early Han Dynasties were affected by the historical environment. Thus changing the writing, and how the result of writing acted on the development of typeface.

Font transition

According to the Record of the Grand Historian, the Book of Zen, Emperor Wudi of Han Dynasty "had an ancient bronze vessel, asked Shaojun, Shaojun said: 'This vessel is ten years in the Bai bed of Duke Huan of Qi. What has been done is done according to its engraving, and the fruit is Qi." The "ancient text" here refers to the bronze inscriptions of the pre-Qin period. In the study of ancient characters, the Chinese characters before the Qin Dynasty are usually called "seal style", which belongs to the ancient characters. The Chinese characters after the Qin dynasty are called "official style", which belongs to the modern script【3】. The silk slips unearthed in Mawangdui mainly come from the early Western Han Dynasty, which is the node of the conversion of ancient and modern characters, and also the transition period of seal script to official script. During this period, a large number of phonetic characters appeared, and the synthesis of sound and meaning became the main mode of configuration. The combination of strokes and the layout of components started from the perspective of writing convenience, and the factors such as side side unitization, stroke shape simplification, stroke length, straight, broken and oblique were greatly changed. The phenomenon of assimilation and alienation of components increased significantly, and a large number of different characters emerged along with the trend.

Wang Guiyuan sorted out 1779 single characters in his study on the Chinese Character Configuration System in Mawangdui Silk Manuscripts, of which 1609 were combined characters and 1161 were combined characters based on sound and meaning, accounting for 73.52% of the combined characters. The phonograms synthesized by sound and meaning are composed of shape characters and phonograms, and the components of word formation need to converge with each other to control the font. This kind of control, condensed to the tip of the pen in the process of transmission, the small differences produced by the long, short, fat, thin, positive and oblique strokes, accumulated micro and huge, so that the original structure of Chinese characters began to change, the original structural motivation gradually collapsed, forming a prelude to the transformation. In the process of Li change. Different characters appear a lot in the transition period of fonts, which is the inevitable result of simplifying the font and improving the efficiency of text use. Although the transformation of seal script is the internal evolution of the font system, the contradiction of the straight strokes, the contradiction of the density of the structure, and the contradiction of the number of characters are amplified in the social communication, which promotes the metabolism of the development of Chinese characters.

Regime change

The change of regime led to a change in the official script. After the unification of the Qin Dynasty, the feudal political system began to mature, and the usage and application of characters expanded rapidly. In order to strengthen the centralization of power and facilitate the dissemination of information and written communication, the Emperor of Qin asked his Prime minister Li Si, who was good at calligraphy, to implement the policy of "writing in the same style". Based on the original big seal style, the small seal style was simplified and created. The small seal strokes are horizontal and vertical, the lines are round and even, and its rigorous and unified style is the embodiment of the strict order required after the unification of Qin.

In civil occasions, official script, which is more convenient to write, is in circulation. After the fall of the Qin Dynasty, the political power supporting small seal script disappeared, and the winding small seal script could not adapt to the needs of The Times and was gradually eliminated. Official script began to spread rapidly and replaced the seal script as the mainstream font. The regime is uncertain, the text starts from the wind, the folk weight is newly standardized as a new standard, and the different font characters appear frequently in this iteration.

The slips and silks unearthed in Mawangdui mainly come from the early Western Han Dynasty, and the early official script evolved just at this time when the Qin and Han dynasties changed. In order to stabilize the situation, the rulers of the early Han Dynasty implemented the state policy of rest and recuperation, light corvee and low taxes. After several generations of rulers, they have independent political and military rights to maintain the stability of the country, build water conservancy and develop agricultural handicraft industry at home, and the productive forces and economic conditions have been substantially recovered, which is called "rich at home and rich national power". In such a stable and prosperous social situation, characters needed to adapt to the development of political power and economic conditions, and abandoned the difficult from the easy in practice. The official script, which was originally only popular among the folk and easy to write, re-established its position in the new dynasty and became the mainstream font. It can be seen from the first copy of Laozi, the second copy of Laozi and the first copy of Yin-Yang and Five-Element Classic in Mawangdui Slips and silk that the seal script structure left over from the Qin Dynasty is gradually disintegrating. Although the combination of many characters and the brushwork still have the seal meaning, the brushwork form has gradually taken on the characteristics of

official script.

Cultural downward movement

During the Spring and Autumn Period, princes fought for hegemony and wars were frequent. New class forces overthrew the old system and ruling order and established a new system and ruling order. The slave society gradually disintegrated and the feudal society began to take shape. In this overwhelming storm of social change, social production relations underwent great changes, class contradictions became increasingly fierce, the old slave-owning class disappeared, the new landlord class rose, and the handicrafts and freed peasants formed asset merchants through asset accumulation. At the same time, the new system brought a new ideology and gave birth to a new social class, the Shi. Scholars come from all social strata and schools, and because of their different origins and different positions, they put forward different political views and ideas of governing the world. They wrote books, gathered disciples, and formed different schools. The phenomenon of "learning in the government" began to be replaced by the emerging private schools, the situation that the slave-owning class monopolized schools was broken, and education gradually went to the masses and to the people. The education target was also expanded from the aristocracy to the common people, teachers lectured everywhere, and students freely chose their teachers. Confucius, a great thinker at that time, advocated "education without class", and most of his 3,000 disciples were ordinary people. The emergence of scholars accelerated the spread of culture, making the knowledge that could only be reached by the aristocratic class move down to the common people, forming a culture move down.

The war disintegrated the monopoly of Zhou culture, and the local culture began to have a trend of localization. After the Warring States period, the use of characters can be divided into the western Qin system, the southern Chu system, the eastern Qi system, the northeast Yan system and the northern Jin system according to the region. According to the "Zuo Zhuan Zhaogong twenty-six years" records, 516 BC, the prince carries a large number of Zhou room books to flee to Chu, these books include the historical documents of the previous dynasty, the various vassals of the state's report, the Zhou dynasty lists the king's mandate documents and other precious documents. At this point, the state of Chu replaced the Zhou Dynasty, and the state of Song and Lu became the three major cultural centers at the same time.

Academic activities around the country are extremely active, educational thoughts are unprecedently liberated, and Chinese characters are increasingly accepted and used by the broad masses of the people. With the popularization and application of Chinese characters, the psychology of seeking simplicity and quickness makes people no longer adhere to the neat and beautiful shape, but dare to break the routine and develop in the direction of simple and easy to write. In the process of writing and communication, a variety of new fonts were formed due to hasty writing. According to historical records, at that time, the light "mei" character had 104 kinds of writing, and the "treasure" character had 194 kinds of writing, some of which showed traces of the shape structure of the writing, and even had individual characters similar to the official script writing. These simple writing methods may be accepted by the majority of people and become popular, and have been used by the people until the Qin Dynasty and the early Han Dynasty became the mainstream writing.

Tool evolution

The formation of font has a direct relationship with writing tools and writing materials. The unique charm of Chinese characters is largely due to its special writing tools【4】. As Zong Baihua once wrote in "Aesthetic

Thoughts of Chinese Calligraphy" : "There are two main factors that Chinese characters can become works of art, one is because the beginning of Chinese characters is pictographic, and the other is the pen that Chinese people use." The oracle-bone inscriptions of the Yin and Shang dynasties were engraved on the hard oracle bones with a knife, and the blade was not easy to change, so the font strokes were thin and square. The gold writing is cast on the bronze ware, the structure is rigorous, the writing is firm and the situation is dignified. As a traditional Chinese writing tool, the brush originated from the Yin Dynasty more than 3,000 years ago and was collectively called "brush" after the unification of the Qin Dynasty. The brush tube is made of hard materials such as bamboo and jade, and the tip is bound with animal hair. The pen tip is round and pointed, trimmed neatly and flexible. Therefore, when writing, it can be as strong as the wind, and be free. Han Dynasty official script tends to mature, in order to adapt to the character characteristics of official script, which is round and square and straight, and the momentum of stretching and spreading when writing, the length of Han Dynasty brush tube and the diameter of pen tip have increased moderately on the basis of Qin Dynasty, and they have mixed the beauty of seal script style between square inches, showing rich brushwork changes such as fat and thin, slow, thick and dry.

In addition to the use of rabbit brush pen, also popular Wolf hair, deer hair and other animal hair mixed made of "pen". "Jianli pen" adopts the "pillar method", which takes the hard rabbit hair as the pen column, and the soft wool covers the outside of the rabbit hair, so that the pen head is made, and the pen heart is strong and has strong water storage performance. Therefore, there can be more than 11,000 words unearthed in Mawangdui "Warring States Zongzong Family letters", the whole article has not seen a single bit of dry pen. The connection between the pen tip and the pen pole of the Western Han Dynasty has also been improved, the pen tip is incorporated into the bar, and the pen hair outside the cavity is shortened, which is more conducive to the tightening of the font muscles and bones when writing, and the pen edge is thick and firm【5】.

Writing materials are also crucial to the development of Chinese characters. The early official script was written on silk slips. The material of silk has an influence on the internal structure and external form of Chinese characters. By the Han Dynasty, China's silk weaving history had reached more than 1,000 years, and the government and private textile industry had a considerable scale. Weiyang Palace in the Western Han Dynasty had two weaving rooms, east and west, which still had an important economic position in the Eastern Han Dynasty. The folk textile industry is very prosperous, Shu is rich in Shu cloth, made by the odd brocade, Hexi corridor lush agriculture and silk industry developed. Silk is soft in texture, fine in texture, and ink can penetrate better. It is an excellent writing material. The manuscripts unearthed in Mawangdui, such as the second edition of Laozi, the Xiangma Classic, and the Jing Fa, all have "Zhu silk bars" formed by straight lines of red lines【6】. However, the Warring States Zongshu unearthed at the same period did not make a vermillion boundary column, and the whole text was interspersed with different crosswises, which had the beauty of nature.

conclusion

Chinese characters are based on the pictograms of things, and from the moment of their emergence, the dynamic scene it presents is the understanding and experience discrimination of the entire Chinese social group, and the dynamic result of the way of thinking produced by the Chinese people based on the land of China. It is not a symbol of instant solidification, but the Chinese people's long thinking about "objects", which permeates the emotion and value judgment of the Chinese nation.

The purpose of cultural anthropological research is to understand human groups from a cultural perspective,

and how human perceptions, actions, and the results of those actions in turn affect human thinking and human interaction with other groups, making interaction the most fundamental aspect of anthropology. Chinese characters are the product of continuous interaction with the Chinese people over a long period of history, and the dynamic scene they present is the cognitive and experiential discernment of the entire Chinese social group. Although Mawangdui Jianfu heterographs are only a small part of the history of font development, they still present a comprehensive and holistic view of society and culture, and provide a new perspective and vision for design studies to gain insights into specific civilizations in the course of historical change.

References

Geng Han. From ethnography to Design Anthropology: the co-direction of design and Anthropology [J]. Journal of Nanjing University of the Arts (Fine Arts and Design),2017(02):17-22+193.

Wei Xiaoyan, He Linying. The significance of the study on the early official script of Jian and silk [J]. Lantai World,2013(35):141-142.

Gao Ming, General Theory of Chinese Ancient Characters, Beijing: Peking University Press, 1996, p. 4.

LIU Shengmei. Study on the characters of Mawangdui Silk Manuscripts [D]. Ludong University,2012.

Zhu Sirong, Wang Xijun. Analysis on the Origin of ancient official script style in Ma Wangdui's Silk manuscript "Zongjia Shu of Warring States" [J]. Art Appreciation,2020(36):138-139.

Ouyang Cairong. Ma Wangdui Silk and stick Calligraphy [D]. Central Academy of Fine Arts,2006.

LI Lijiao. Analysis on the change of Pen Shape in Ma Wangdui's stick and silk [D]. Hebei Normal University,2015.

Hotel Smart and Healthy Guest Room Renovation Service Design

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Abstract
Service design improves user experience and service quality by planning and organizing the people, facilities, communication, materials, processes, and other related factors involved in services. This article is based on user experience to practice the smart health renovation design of hotel rooms, proposing that wisdom is the means and health is the purpose. Hotel room design should adopt situational strategies that provide appropriate feedback based on real-time sensing information for target users. With the improvement of living standards, people's demand for hardware quality and comfort in guest rooms has increased, but what guests most need is the improvement of the overall service quality of the hotel.

Keywords: service design, user experience, hotel guest room, smart and healthy

1 INTRODUCTION

XX Hotel Group was founded in South Guangdong in 2007 and is a professional industrial group under the Fortune 500 XX Group that integrates hotel planning, construction, and operation management. It has created the "N+1" model. Tianjin Dongli Lake XX Hotel is a large-scale comprehensive hotel that integrates luxurious rooms, conference butler services, complete entertainment and sports facilities, and characteristic hot springs. The Tianjin Happy Valley Theme Park is located opposite the XX Hotel in Dongli Lake, only one way away. [1,2] Due to the early planning and long construction time of the Dongli Lake XX Hotel decoration plan, the design style and facilities at that time can no longer meet the pursuit of fashion taste, personal health concerns, and aspirations for a smart life of guests.1

Due to the close positioning, scale, and business model of XX Hotel in various parts of the country, taking Tianjin Donglihu XX Hotel (its subsidiary hotel) as an example for research has a certain degree of universal promotion and application significance. This case systematically adopts service and experience design methods, clarifies different user characteristics and needs, introduces intelligent products in hotel rooms to lay out a healthy check-in environment to increase customers' overall experience, and ultimately achieves the goal of making guests A solution that is generally satisfactory to the service provider and Party A. The project team plans progress and phased goals based on time nodes, uses sociological research methods to obtain qualitative and quantitative data, clarifies the optimization design direction, and provides solutions based on factors such as user demand priority, Party A's planning, and field limitations. This article explores the application of service design in this practical case.

2 RELEVANT CONCEPTS IN THIS STUDY

Intelligent Hotel is a new generation of information technology that utilizes the Internet of Things, cloud computing, mobile Internet, and information smart terminals. Through automatic perception, timely transmission, and data mining analysis of various types of tourism information within the hotel, it achieves the digitization, informatization, and intelligence of the six primary elements of "food, accommodation, transportation, tourism, shopping, and entertainment" tourism in the hotel, Ultimately, providing passengers with comfortable and convenient experiences and services (Beijing Tourism Development Commission, 2012). [3] According to the "SB/T 10582- 2011 Technical Specification for Healthy Guestrooms", healthy guest rooms are designed with environmental protection, energy conservation, safety, hygiene, and comfort. They comprehensively improve the indoor environment, sleep quality, lighting, drinking water, and service items, providing consumers with a new accommodation environment. [4]

Service design improves user experience and service quality by planning and organizing the people, facilities, communication, materials, processes, and other related factors involved in services. Service design aims to design and plan a series of easy-to-use, satisfactory, reliable, and effective services for customers, widely used in various service industries. The output of service design can be tangible or intangible. Service design integrates people with other factors, such as communication, environment, behavior, materials, etc., and embodies the people-oriented concept. [5] Service design emphasizes the collaborative creation of stakeholders such as users and institutions and the active participation in the design output, delivery, and development process. Service design optimizes the comfortable experience at the user level by improving channels, touchpoints, and necessary visualization through design. At the institutional level, sustainable and meaningful value creation can be achieved by designing and optimizing processes, interfaces, and internal personnel experiences to coordinate internal operations and development. [6]

Experience design is a perspective aimed at helping stakeholders utilize the design process and products more effectively to solve problems. Using experience design as a framework for setting shared goals and standards, focusing on value creation and delivery. The purpose is to promote wise collaboration between enterprises and designers, unleash the power of design, and enable enterprises to participate, plan, and deliver customer experience based on value relationships (Patrick Newberry, 2013). [7] In service design, experience often appears as a design principle to evaluate the effectiveness of service design. The main design objects of service design are relationships and processes. In experiential design, experience exists as a design object, and the main design object of experiential design is feeling and influence. Service design emphasizes the initiative of the role of the giver, while experience design emphasizes the impact on the giver. Experience design must be distinct from the practicality and operability of service design. [8]2

3 RESEARCH METHODS AND PROCESSES

3.1 Methods of Insight into Requirements

3.1.1 Background Analysis Methods.

Firstly, it is recommended to consult a large number of relevant literatures, including papers, books, research reports, news, etc., conduct field surveys, examine the humanistic, historical, and economic environment of the participants, and visit relevant groups, critical stakeholders and experts, whose knowledge and perspectives are essential. By observing the state of an object in its natural environment through ethnography, first-hand information is obtained, and the culture of the observed object is described systematically. Researchers explain the minded people, things, behaviors, and environment from the perspective of the observed object and comprehensively analyze a multidimensional problem. [9] Log research is a qualitative data collection method

for user behavior and experience. In log research, data is recorded in detail by participants regarding specific activities during a specified reporting period (a relatively long period). [10]

3.1.2 Situational Observation Methods.

Observing the subject's behavior in the natural environment they are experiencing, recording their behavior, or describing their behavior in the form of self-reporting by the subject. Researchers record interviews with people and observe the differences between people's words and actions through extensive behavioral observations. [11] The observation method is where researchers directly follow the words and actions of research subjects under natural conditions with a purpose and plan and analyze their psychological activities and behavioral patterns. The content of observation records includes basic information on the observation purpose, object, and time, as well as qualitative data such as the observed object's words, actions, and expressions. In addition, there is a comprehensive evaluation of the observation results by the observer. Unlike laboratory observation, natural observation (on-site observation) refers to the observance of research objects in real situations by researchers who do not attempt to influence what happens in that environment. It can be divided into participatory observation and non-participatory observation.

3.1.3 Subjective Investigation Methods.

The surveys can be used individually for descriptive, explanatory, and exploratory research. [12] Survey research is an essential tool in social research and is widely used in experiential design research. A questionnaire survey is a research tool composed of questions to collect information from respondents. Questionnaire surveys effectively measure the behavior, attitudes, preferences, viewpoints, and intentions of a relatively large number of participants, which is cheaper and faster than other methods. The interview method is a method in which the interviewee controls the conversation process based on the research purpose and collects information about the interviewee's motivation, attitude, values, and other aspects through conversation. The interview method should have a clear research purpose, focus on considering the method's validity, and the interviewer should control the implementation process. Focus group research aims to understand and determine the scope of individual thoughts and preferences. Participants are usually asked open-ended questions without answer restrictions and are hosted by skilled hosts in a comfortable and permissive environment. The problem is generally straightforward, brief, one- dimensional, and controversial.

3.1.4 Clue Tracking Methods.

The clue tracking method refers to the use of physical traces and archival data to collect data, and the way to obtain information is more covert, with participants usually not present. Physical traces include material signs and artifacts left over by behavior. The physical traces in design refer to the traces of use and the product, and the traces of use refer to the physical evidence retained by people after using or not using an item. Products refer to human creations, namely artificial objects such as architectural relics, paintings, and daily necessities. Archival data refers to various activity records or literature materials sourced from governments, institutions, individuals, and other groups. Archival data means a rich source of information to discover clues, validate hypotheses, and test validity. Designers try to integrate multiple methods as much as possible to reduce or avoid problems caused by a single research method, making the research results more convincing.

This project uses the above research methods to analyze stakeholder needs.

3.2 Design Process

The British Design Council (2003) created the Double Demand Model, which describes the mindset used by designers and maps the divergent and convergent stages of the design process. Design thinking starts with a trigger, which may be an idea, some insights, market changes, macroeconomic changes, etc. [13]

Stage 1: Identify issues. From understanding phenomena and current situations, this stage is divergent and

exploratory, exploring new problems. Through research methods such as observation and inquiry, customer behavior and business drivers will be revealed, and opportunities for further reflection will be identified.

Stage 2: Define the problem. Starting from a preliminary understanding, synthesize information and knowledge into insights. Define the real problem, focus on the most attractive opportunities, which are stages related to a shared vision and plans, evaluate the feasibility and impact of the project, and decide how to measure success or effectiveness.

Stage 3: Develop exploration. When the conceptual plan has a vision and goals, it is time to explore the best solution. Through investigation and verification, finding the best way to achieve goals is a divergent iterative process, ultimately evolving the correct answer into an executable development solution.

Stage 4: Delivery Plan. Analyze and validate all potential solutions from the previous stage individually and select the most suitable one or more. After the plan is determined, the delivery plan begins to be implemented. Discoveries during the execution process still affect policy changes.

The service design process cannot be separated from defining and solving problems. In this study, a double drill model was used to set the goals needed at each stage, but in practical operation, there were iterations and iterations.

3.3 Implementation Process

3.3.1 Insight and Discovery.

Not all research needs to start from scratch. When the research team wants to understand users and their experience with the product, wise use of publicly available information and interviews with professional consultants can save time and effort. We use theoretical and technical dimensions to understand the latest technology and application status, as well as the knowledge points that scholars pay attention to in academic research, from the official publication of articles, books, research reports, statistical data, and other materials. We put this part of the content in the "Smart Home Special Research" and "Green and Healthy Building Special Research" research reports, which will not be repeated here. A good background research is a good starting point for experiential design.

In addition, effective use of expert experience can gain sensitivity to user needs, and the value of reusing knowledge and expertise reflects the efficient operation of the industry. For professional consultants, there is generally no need for a complete formal invitation application. The author concisely describes the interview content through a simple email or WeChat in advance and then schedules a one to two-hour conference call to explore the details, saving both parties time and quickly collecting essential research elements. Experts provide opinions and suggestions based on personal experience and industry expertise, clarifying the research direction. The author conducted telephone interviews with three experts, Lin X from Shanghai ETU Interface Design Co., Ltd., Qi X from Beijing CCTV Market Research Co., Ltd., and Huang X from Shenzhen Tencent Micro Architecture Open Platform. They have provided essential reference suggestions for our research direction, problem definition, and research methods from the perspectives of intelligent technology, market status, and public demand.

As a social commodity, hotel services are in a competitive market ecological environment. Understanding the strengths and weaknesses of competitors is crucial as it can help one discern strategic direction, positioning, and effectiveness. Direct competitors refer to products (business areas) with the same target users and similar content that constitute direct competition; Indirect competitors refer to target users who have certain commonalities and lack or cover content modules (business areas); Transferred competitors refer to specialized domain analysis (design domain) conducted as specific products with different target users. Based on the dimensions of positioning and hardware, we have selected 25 competitive hotels in first-tier developed cities such as Beijing, Shanghai, Nanjing, Hangzhou, and Chengdu from the existing competitive hotels in the market. Subsequently, we

conducted a survey, analysis, and comparison from six aspects: their concept, market positioning, characteristics, strategic planning, target audience, and media control.

Dongli Lake XX Hotel's room renovation project belongs to the product development and evolution redesign stage. Competitors can be used as implementation prototypes for specific ideas to experience and test, and competitor research can also assist in answering design feasibility questions. Through public information and field research, we can obtain competitors' positioning and current situation, the application of new technologies and concepts, the disadvantages of competitors and our opportunities, the advantages of competitors, and our development direction. Competitive research, as one of the most compelling research methods, does not simply focus on the shortcomings and mistakes of competitors but helps us clarify our positioning and identify differentiated innovation opportunities.

A large amount of competitive hotel information was obtained through desktop research and telephone inquiries. Two typical competitive hotels, Orange Crystal Hotel and Purong Health Hotel were selected for a transfer competitive hotel tour. We extensively record the location, price, facilities, services, and guest evaluations of competitive hotels, then analyze competitive hotels' positioning and user groups. On the one hand, it helps team members enter this project's research status; on the other hand, it helps us define the scope and dimensions of the research. The competitive product inspection uses the physical evidence method to start with hardware layout and functional analysis, software information architecture, and visual analysis and experiences the actual check-in service with the mentality of users and researchers (see Table 1).

Table 1: Competitive Hotel Walkthrough (Drawn by Shangqing GAO)

	橘子水晶酒店	蒲绒健康酒店
目标人群	都市青年 公司白领	高端白领 商务人士
市场定位	中低端艺术主题酒店	中高端健康服务酒店
服务理念	酒店成为生活方式的再造	守护健康
服务特点	将城市建筑二次改造，使酒店融入当地生活，增强顾客的体验感	通过健康管家、智能硬件、体检等服务，为住客提供个性化的健康管理解决方案
设施情况	设备实现部分智能化（窗帘、光控、门卡等），面板或遥控操作；通过华住会App进行住房预定	配备直饮水、净化器等健康设备；智能光控、蓝牙音响；智能马桶；酒店App主要功能为住客健康管理
产品优势	客房设备简约 智能感应	考虑特殊人群 用户个性化定制

Orange Crystal Hotel focuses on fast hotels in cities, suitable for fast-paced white-collar companies or urban freelance youth who pursue fashion. The interior of the guest rooms is partially intelligent, and the equipment is more innovative than some 5-star hotels. The door card in the elevator can identify the floor, making residents feel safer. Swipe the card without inserting it to enter the room, and place it in the card slot to receive power. Welcome mode combines curtains, lighting, and music, displaying exclusive service information and regular programs on the ultra-clear, large-screen TV. Purong Health Hotel focuses on the physical examination and treatment of high-end white-collar workers and business professionals around the technology park, with guest rooms positioned as auxiliary accommodation environments for physical examination and treatment. There is a dedicated direct drinking water and drainage system inside the guest room, and a variety of tea leaves, humidifiers, induction trash cans, floor drying racks, air conditioning and purifiers, Bluetooth speakers, and four lighting modes (functions and buttons are not clear) are provided for free in the freshness box. The toilet is equipped with toilet side supports and shower folding chairs for seniors or patients, and the high-end rooms have sweat steaming rooms, calligraphy tables, chairs, and utensils. The project team members drew guest room building diagrams, hardware facility layout diagrams, equipment panel plans, and software information architecture diagrams. At the same time, interviews were conducted with lobby managers, room managers, and servers regarding the hotel's service characteristics, customer characteristics, and needs. The two hotels have provided positive guidance and negative avoidance experiences for our design output from the perspectives of wisdom and health.

Next, we started to sort out the questions of the online questionnaire. We conducted several rounds of tests on our social media, reviewed the questions, and then modified and optimized the questionnaire to determine the target audience. We used paid questionnaire stars to conduct precise surveys of target customers and completed qualitative analysis based on quantitative data. It was found that in the hotel room scenario, the physiological and safety needs in Maslow's hierarchy of needs are still widely concerned, such as clean and humid air, purified drinking water, dried clothes, sound insulation, safety of the room, etc. Due to the increasing number of households purchasing intelligent products, such as smart toilets, body lights, smart televisions, electric curtains, etc., these independently running intelligent devices have gradually become people's basic and expected needs, and the timely user scenario intelligent linkage product function may become a charming (exciting) demand.

At the same time, the author uses text analysis to analyze the existing pain points of residents in Dianping. Conference group users whose institution bears the cost of accommodation s seldom give evaluations on online platforms, and business individuals with high service requirements usually communicate directly with hotel managers to solve problems or dissatisfaction. The platform's evaluation users are mainly individual family guests, and most of the pain points are generated during the booking, check-in, and check-out process. For example, the platform did not notify hotels of reservation changes; The platform invoice needs to be consistent with the hotel's detailed official seal; Waiting time for check-in and check-out is too long; Problems caused by poor front desk service attitude or low efficiency. As for hotel rooms, the main issue is the hardware and usage issues in the room, bathroom, and balcony areas, such as poor WIFI signal; air conditioning only adjusts air without cooling, the unreasonable layout of the bathroom, control knob electrostatic problem; the outdoor balcony causes mosquito bites; problems caused by the lack of facilities such as cribs. Guests evaluate real-life issues based on a brief personal experience and cannot provide forward-looking suggestions. They can only offer points like phenomenon-level problems for improving hotel services. Gradual optimization needs to be carried out according to the classification and priority of the responsible department.

During the Dongli Lake XX Hotel field survey, a user survey was conducted by combining shadow observation, offline hotel experience, on-site survey questionnaire, and offline room service statistical table. Different

stakeholders have different positions and perspectives, and choosing suitable interviewees within a limited time frame is essential. However, more than listening to users' one-sided opinions is required to support design decisions. Following the principles of interaction and co-creation in experiential design, we conducted in-depth interviews with the hotel's business department manager, front office manager, housekeeping manager, maintenance manager, and room attendant (see Figure 1) after a comprehensive and detailed tour of all buildings in the hospital, including the accommodation building, sports center, entertainment center, hot spring club, catering center, and conference center. We gained a comprehensive understanding of the service content of each department in the hotel, provided information on user types and routine needs, conflicts and contradictions with different frequencies, and conducted multiple follow-up visits during the design process to obtain professional opinions and suggestions to iterate the design plan.

(a) Interview with Business Manager (b) Interview with Housekeeping Manager Figure 1: Interview with

Practitioners (on-site Interview Photos)

The research determines the target users: 60% for conference groups, 25% for family individual customers, and 15% for business individual customers (including 10% for protocol individual customers). The conference group has the maximum quantity of people, driving the overall income of catering, accommodation, and entertainment through the conference. However, each individual participating in the conference group is passive consumption, with almost no secondary consumption demand, and the consumption of room equipment and items is relatively high. In addition, such guests are severely affected by policies, and political activities or major celebrations can result in hotels being unable to accommodate such guests for several months. Family individual guests mainly stay during holidays, winter, and summer vacations, and their stay time does not conflict with conference group guests. The purpose of their stay is for the hotel's hot springs in winter and Happy Valley amusement in summer (Happy Valley is a large entertainment park located across the street from the hotel). However, the guest room services are complex, and many items are needed; the family guests are an active consumer group. Their consumption attitude is rational, and they generally believe that the hotel's catering fees are too high. Business individual guests have relatively high quality, primarily executives and businessmen, on official business trips. They have high requirements for room environment, require high-quality service, and consume less equipment. Although the number of such guests is small, they are the expected customers of the hotel and play an essential role in improving the overall service of the hotel. Combining research methods such as questionnaires, observations, and interviews, we identified these three types of target users' characteristics, needs, and pain

points and design directions (see Table 2).

Table 2: Analysis of Target User Behavior Needs (Drawn by Shangqing Gao, Zuwe Li, Chengzhong Chen, and Tian Gu)

	会议团建	家庭散客	商务散客
人员情况	企业公司人员 体量大	带孩子或者三代出游	公司高管 商务人士
出行情况	进行团建、会议、餐宿	度假、亲子游 以自驾为主，节假日出游	自驾或出租
预订方式	直接与酒店商务部沟通，进行预定	官网或者第三方平台预定	官网或者第三方平台预定
需求情况	几乎无额外消费 客房配备物品消耗较多	餐饮服务 增加加湿器、净化器 物品配送，卫生	客房环境要求高，高品质服务，配备物品消耗少 个性化服务
酒店评价	用户评价较少	部分产品操作不灵，客服认为酒店餐饮收费过高	网上用户评价较少
政策影响	遇到重大政治事件导致酒店不能正常接待	二胎政策，对儿童服务需求的增加	国家发改委、国家旅游局、国家工商总局联合规范酒店客房价格
总结	被动消费，要求少 带动酒店餐饮、住宿、娱乐等整体收入	主动消费，消费态度理性 服务频率高	客源稳定，有更多利润潜力 可提升酒店整体服务能力

3.3.2 Definition and Expression.

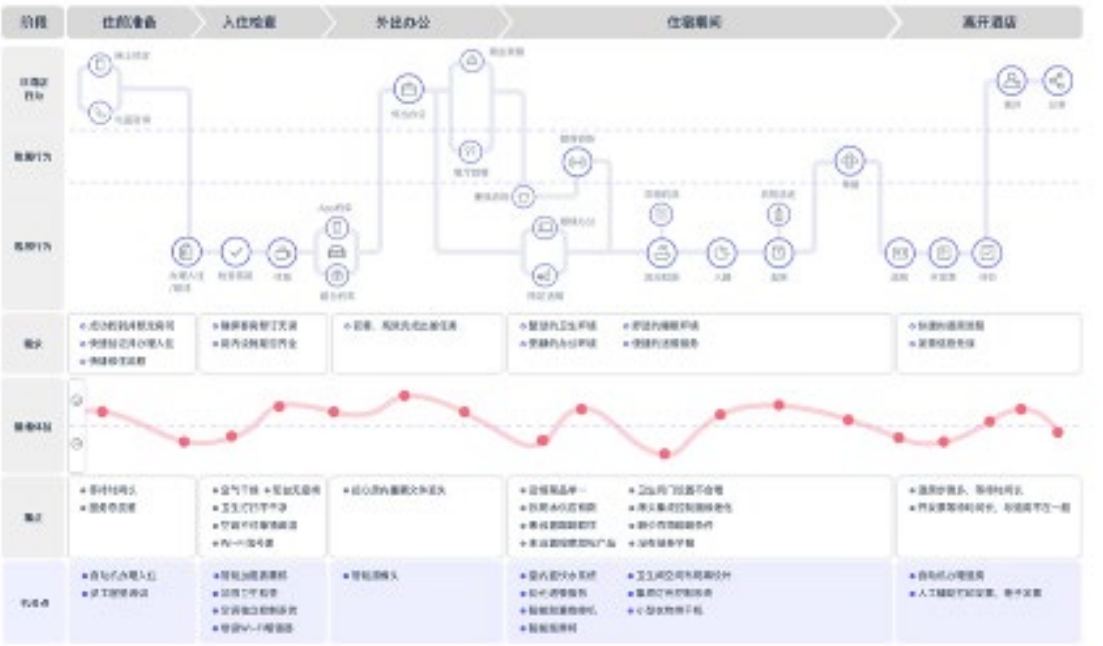
According to the experience design method, define and express the design of three types of hotel target users using service design tools such as user persona, experience journey map, and storyboard. Establishing personas for three categories of users (see Figure 2 for a simplified version) can help us pay attention to the differences in their needs and goals. When building solutions centered around users, we consider the differences in the requirements of each category of users, from general to particular, and provide specific implementable strategies from the primary to secondary levels.

Figure 2: Three Types of Target User Persona (Drawn by Jiali Ma and Shangqing Gao)

Requirements define experience touchpoints and process design. By systematically analyzing the experience process of each type of user (conference group users, family individual users, and business individual users), we identify the pain points brought by the current service contacts to users, clarify the needs of users at different stages of the experience process, and extract opportunities for service optimization based on specific contact needs (See Figure 3).

(a) Journey Map of Conference Group Users

(b) Journey Map of Family Individual Users



(c) Journey Map of Business Individual Users

Figure 3: Target User Experience Journey Map (Drawn by Yang Hongwei and Shangqing Gao)

Requirements determine the design of experience contexts, relationships, and behaviors. We described the current experience situation of three target users through storytelling methods, expressing the difficulties that users may encounter in vivid visual language, and how service providers interact with them (see Figure 4). Due to the significant differences in the experience processes of the three types of users, storytelling methods make it easier for team members to empathize with each user's experience and needs. As our team was mainly responsible for the hardware layout of guest rooms based on their needs, we payed special attention to the user's behavioral experience in the guest rooms to clarify design issues.

[c] Storyboard of Family Individual Users

Figure 4: Target User Storyboards (Drawn by Yang Hongwei and Yunqin Dong)

After sorting out the many pain points of users, we transformed them into feasible solutions (in line with our team's task scope): First, Plan the layout of product facilities; Second, Optimize the product control panel; Third, Build a mobile service platform (see Figure 5).

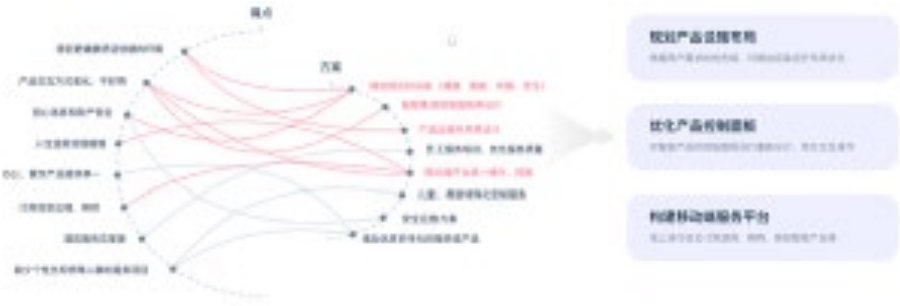


Figure 5: Design Direction Matching the Pain Points & Needs (Drawn by Shangqing Gao)

4RENOVATION CHANNEL DESIGN OF SMART AND HEALTHY GUEST ROOM

The increasingly mature intelligent technology, the popularization of the Internet of Things and the Internet, and more affordable prices have led to the gradual entry of smart home products into ordinary people's homes. Smart home products can create personalized scenes and experiences by learning people's behavior habits at home. Like a person's five senses conveying information from the outside to the brain, making corresponding thinking and feedback, smart home is a systematic and holistic solution. There are three main ways to achieve intelligence in smart home products: directly obtaining human voice, gestures, and interface touch commands, which receive human body data through sensors, external data through the Internet, and internal data from other intelligent products through local area networks. The urgent needs of users for product experience and interaction are "interactivity," "security," and "scenario-based," which requires intelligent products to be interconnected and solve user accommodation problems comprehensively.

The initial renovation of some guest rooms and the purchase of some intelligent products by Party A of the project have caused many limitations and impacts on our subsequent design output. If the selected smart

health mattress is too luxurious, many functions are unnecessary for the target user's hotel scenario. Through interviews with the guest room manager, it was learned that beds filled with sensors and wires will increase room attendants' requirements. Room attendants will flip the mattress every three months to maintain elasticity and cleanliness, while smart mattresses are single-sided and cannot work after flipping over. In addition, hotel guests are concerned about personal sleep or sexual-related confidential data leakage exploited by unscrupulous merchants. Based on the above reasons, we suggest using intelligent health pillows instead of smart mattresses for free rental by residents. The smart health pillows can adjust the comfort of the cervical spine appropriately and monitor sleep data (such as sudden death alarms) with music, temperature-assisted sleep, and small-range massage functions. Compared to smart mattresses, the pillows are cheaper and more usable.

In addition, an on-site investigation found that the information exchange protocol among the smart items purchased in the early stage was not fully established, and there were inevitable conflicts between the related smart controls of various brands. If the guest opens the door for the first time and enters the room, the TV welcome interface and speaker welcome message will make people feel more friendly, but the welcome message appearing every time the guest enters the door will make people feel at a loss. For energy-saving, the vacant rooms usually have curtains closed and electrical appliances turned off. Guests entering the room trigger the curtains to open and shine in the sunlight. This application scenario may be suitable during the day but not at night. If the companions in the room are sleeping or changing clothes, the related actions between the door and the curtains are unsuitable. Guests can control their electrical appliances or answer simple questions through the smart speaker in the room. While watching TV, listening to music, or chatting, the voice or noise often triggers inappropriate responses from the speaker, such as "I don't understand what you mean" and "Please repeat it," making people pull a wry face.

Based on extensive research work in the early stage and balancing the needs of stakeholders, the hardware for the renovation of smart and healthy hotel rooms is divided into three priority levels. The first-level products can meet most conference group and family guests' room needs. In contrast, business individual guests, as the ideal target users of hotels, have clearly defined their unique needs for intelligent health products (see Table 3). Complete the layout of all hotel room types, including lighting, touch panels, and smart hardware products (see Figure 6 and Figure 7), as well as the design of mobile software functions, information architecture, and interfaces (see Figure 8, Other design outputs can be found in the project report).

In addition to sorting out relatively straightforward general requirements,

user research has also found that some detailed issues need to consider the interests of all parties to make choices, as listed below. Older people among individual family guests highly recognize the physical buttons and knob control panels in hotel rooms. It is due mainly to the habit of using commonly used physical buttons at home, and physical feedback, such as the position and sound of the physical buttons, allows older adults to clarify their operating results. But we found on site that some buttons or knobs in the guest room are no longer usable, and there are often "thugs" or even "sparks." The maintenance manager reported that the air in the north is dry, and chemical fiber carpets, fiber decorative surfaces, etc., in the room are prone to electrostatic reactions, causing a short circuit in the control panel. Frequent pressing and rotating can also cause the wires to detach from the control panel, forming a circuit breaker. In addition, due to the replacement of the fresh air system in the guest room and the plan to add intelligent electrical equipment, multiple control panels with different shapes are no longer suitable for the systematic needs of guest room control. Therefore, we have redesigned the touch panel (see Figure 7) and arranged it in an appropriate position on the room wall according to the general behavior of users in the guest room, which also serves as the entrance for sound collection. We design handheld touchscreens based on the commonly used functions of customers and follow the principle of functional visibility to design touchscreen button icons. In field research, it was found that almost all hotel room curtain remotes make it challenging to distinguish the front and back/up and down positions of the inner and outer curtains and window screens on the control panel. What is even more challenging to understand is the use of vertical "<>" "><" icons to represent the opening and closing status. Therefore, the scheme optimized the icons for curtains and window screening' opening and closing status.

(a) Hotel Room Wall Touch Panel (Distributed Voice Entry)

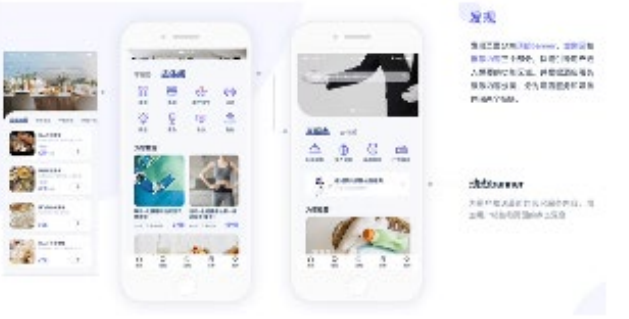
(b) Conventional Scenario Remote Control

Figure 7: Touch Panel Design (Designed by Zuwei Li)

Some smart products in the guest room can be controlled through sound, such as opening and closing curtains, opening and closing TV or speaker, and other simple actions. Customers need to use standard Mandarin to pronounce keywords, which may be difficult for some users. Smart product sensors obtain environmental and user data and can predict user needs through system programs. For example, Customers open the night door while hall lights turn on and curtains get closed. For example, when someone opens the door while closing the curtains or turning on the TV, it does not trigger the opening of the curtains or the start of the TV greeting program for relatively complex settings such as the air conditioning fresh air system and specific scenario modes (work, sleep, romance, entertainment, etc.), which can be done through touch panels or mobile software. Remote control, such as temperature setting before returning to the store and opening doors for others when going out, can be achieved using mobile software.

The mobile software design has optimized the information architecture and interface design by combining the primary needs of three types of target users in experience journey analysis. The functions of booking rooms, querying historical orders, and managing invoices are integrated into the "orders" menu. The display and control functions of guest room equipment status are integrated into a "smart control" menu; The hotel services and activities, surrounding life, and other functions are integrated into a "discovery" menu. The information set closely related to the users becomes the 'My' menu (see Figure 8). The software interface design style is concise, the icon meaning is clear, and the interaction process meets user expectations and operations.

(a) Information Architecture



(b) Interfaces Design

Figure 7: Touch Panel Design (Designed by Shangqing Gao, You Zhou)

5 CONCLUSION AND DISCUSSION

With the improvement of people's living standards, the demand for travel and accommodation quality is increasing. Guests may think that star-rated hotels without intelligent products have outdated equipment and are less comfortable than their homes. However, compared to life scenarios, smart rooms have more singular and numerous users, and each user has few learning opportunities in smart products. In comparison, updating smart devices in hotels is also slower, and the system implementation cost is high. Although an individual's credit system is online and available for national departments to access, personal information such as physiological characteristics, behavioral habits, and preferences is not suitable for being "interconnected" by various institutions regarding morality and ethics. There is a certain contradiction between the convenience and comfort needs of smart and healthy rooms and residents' strong privacy protection needs from the perspective of "intelligence." Wisdom is the means, and health is the purpose. The hotel room intelligent control system is different from the hotel room scene. It is more suitable to adopt a situational strategy of real-time sensing information to provide appropriate feedback. What guests most need is to improve the hotel's overall service quality.

REFERENCES

[1] Hengda Hotel Group. Hengda Hotel Group "Healthy Guest Room" Opens a New Concept of Healthy Hotels. Retrieved Jan. 18, 2019 from https://www.meadin.com/196289.html

[2] Hengda Hotel Group. About Us. Retrieved March 3, 2019 from https://hotel.evergrande.com/other/detail/id/1.html

[3] Beijing Tourism Development [2012] No. 44. 2012. "Beijing Smart Hotel Construction Standards (Trial)". Beijing Tourism Development Committee, Beijing, China.

[4] Focus Perspective. Hengda Hotel's Healthy Guest Rooms Go Online, Opening the Experience of Green Vacation with Clean Air and Wellness. Retrieved Jan. 18, 2019 from https://www.sohu.com/a/228935713_762728

[5] Wang Y., Xin X., Yu H., Luo J. 2021. Visual Analysis of Service Design Literature Metrics. Fine Arts and Design. Nanjing, China. 2, 99-105. DOI:10.3969/j.issn.1008-9675.2021.02.019

[6] Wang Y. 2022. Research on Experience Design from the Perspective of Needs. PhD Thesis, Design Department, Jiangnan University. Wuxi, China.

[7] Patrick Newbery, Kevin Farnham. 2013. Experience Design: A Framework for Integrating Brand, Experience, and Value. Wiley & Sons, Hoboken.

[8] Wang Y., Xin X., Yu H., Cui S. 2020. Simplicity on Different Paths: A Study on the Origin of Experience Design. Decoration. Beijing, China. 5, 92- 96. DOI:10.16272/j.cnki.cn11-1392/j.2020.05.019

[9] Liu J., Wang T., Gu C., et al. 1992. Dictionary of Propaganda and Public Opinion Studies. Economic Daily Press. Beijing, China.

[10] Kim Salazar. Diary Studies: Understanding Long-Term User Behavior and Experiences. Retrieved Jan. 18, 2020 from https://www.nngroup.com/articles/diary-studies

[11] Adrian Slywotzky, Karl Weber. 2013. Demand: Creating Great Business Legends. Zhejiang People's Publishing House. Hangzhou, China.

[12] Earl R. Babbie. 2018. Social Research Methods (Eleventh Edition). Huaxia Publishing House. Beijing, China. 243-283.

[13] Design Council. Double Demand Model. Retrieved May 27, 2023 from https://www.designcouncil.org.uk

Towards Digital Culture Ecosystem: Platform Enables the Flow of Chinese-Style Culture Data

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Abstract
The flow and linkage of culture data create the foundation for the digital culture ecosystem. In the process of establishing a digital culture ecosystem in China, the platform holds a unique and pivotal position. This paper will begin by providing a concise analysis of the key concepts: culture data and digital culture ecosystem. Subsequently, it will address the challenges currently faced in the construction of China's digital culture ecosystem and explore how platforms can offer potential solutions to these issues by introducing a platform oriented towards Chinese-style culture and examining two design cases that have emerged with its support. To conclude, the paper will outline the role and mechanisms through which platforms facilitate the flow of culture data within the digital culture ecosystem.

Author keywords
Digital culture ecosystem; culture data; platform; Chinese style

Introduction

In the Internet era, digital space has emerged as the primary arena for cultural communication and competition. Chinese-style culture, representing China's rich historical heritage and national identity, stands at the forefront of global cultural competition. To strengthen China's cultural influence, addressing various challenges that arise when integrating Chinese-style culture into the digital culture ecosystem is imperative. These challenges encompass issues like the "isolation" of cultural databases, the lack of breakthroughs in cultural experiences, and the limited competitiveness of cultural products. These problems largely stem from the inadequate flow of Chinese-style culture data. In this context, digital culture platforms assume a crucial role within the digital culture ecosystem. A comprehensive exploration of platforms and their role mechanisms can contribute to enabling the flow of Chinese-style culture data and, consequently, help to identify and resolve the aforementioned challenges.

1.1 Culture Data

Culture data is the most basic element of digital culture ecosystem. Culture data are digital representations of culture, which can be defined as a collection of objects that reflect the behaviours, knowledge, facts, ideas, and norms of human collectives (Birukou et al., 2013). Transformative technologies such as Generative AI and Machine Learning (ML), combined with the data-driven design paradigm, have made it possible to extract new content from culture data (Cantamessa et al., 2020; Zheng & Cheng, 2022).

According to how it is generated, culture data can be divided into two types: digitalised culture data and digital-native culture data. The former is the result of digitalising non-digital culture objects, i.e., transcoding continuous analogue signals into discrete numbers (Rab, 2007), such as digitally recorded songs, 3D models of ancient furniture, and motion capture of intangible cultural heritage (skill, dance, etc.). The latter refers to culture data generated directly in digital environments, such as Disney cartoons, digital paintings, VR games, and so on. Both types of culture data should be complemented by metadata, which contains essential descriptions and serves as

an indispensable tool for comprehending, decoding, and editing culture data (Manovich, 2020).

In addition, Kumar (2020) expanded the scope of culture data to include data generated in all relevant socio-economic activities. Therefore, this paper suggests that the following types of data should be included in the research framework of culture data (as shown in Figure 1). (1) Cultural knowledge. The outcomes resulting from knowledge production activities based on cultural objects. It involves works such as the exploration of historical facts, comparative analyses of artistic styles, and the interpretation of cultural values. (2) Cultural products and experiences. The results of creative design activities based on cultural objects, such as texture design inspired by traditional crafts, VR games based on folklore activities, etc., which can be classified into two categories: cultural products and cultural experiences. (3) Evaluation and feedback. The records related to the distribution of culture data and the feedback received from the market. Metrics such as view counts, reposts, comments, and instances

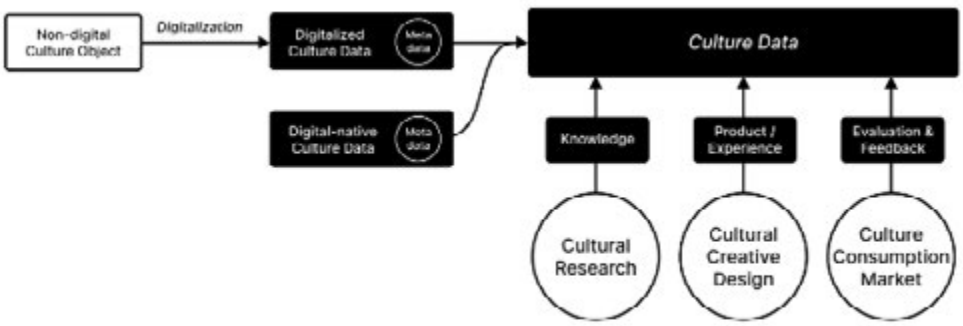

Figure 1. The concept of culture data

of recreation contribute to evaluating the effectiveness of culture data distribution.

1.2 Digital Culture Ecosystem

Presently, cultural content is both generated and consumed in digital data format, aligning with Negroponte's foresight in Being Digital that all cultural content would shift "from atoms to bits" (Negroponte, 1995). This transformation results in a universally connected body of culture data, constituting a digital culture ecosystem.

The digital culture ecosystem has evolved to be complex, open, diverse, and interconnected. It now encompasses intricate physical networks, digital protocols, and data interfaces that establish connections between databases, platforms, consumers, and content, enabling the continuous flow of data among them. In recent years, with phenomena such as video replacing text as the predominant medium, there has been a substantial surge in the volume and velocity of data generated by the creative and cultural industries (Kumar, 2020).

1.3 Problems in The Digital Culture Ecosystem of China

China's digital culture ecosystem is experiencing robust growth. Over the span of 10 years, the number of Internet users in China has surged from 600 million to well over 1.1 billion, with a predominant portion accessing digital culture products via mobile Internet. Among the 193 major listed Internet companies, more than half of them engage in businesses related to social networking, gaming, audio/video, and other facets of digital culture data (CAICT, 2022).

These statistics reflects China's solid foundation in establishing a digital culture ecosystem, namely. However, compared with the western digital culture ecosystem, which has a global influence, China's current digital culture ecosystem is still at a considerable disadvantage in several aspects:

(1) Innovation capacity. In 2022, China produced 160 TV series, while Netflix produced 398 TV series; In terms

of 3A games (e.g., Black Myth: Wukong), Chinese game companies typically grapple with significantly longer development cycles in comparison to their north American counterparts. This reflects the absence of a professional data service chain in China's digital culture ecosystem.

(2) Standards system. In China, the lack of an effective and unified standards system hampers co-operation between the various sectors of digital cultural production. Committees formed by leading digital media companies wield considerable influence in setting standards for digital music formats, film profiles, storage media specifications, and so on. In general, data standards can help control the quality and format of culture data, thus improving the universality and usability.

(3) Governance and regulation. In recent years, copyright controversies and value-oriented disputes over digital cultural content have occurred repeatedly, and the trend of declining digital content quality and aesthetic vulgarity has been widely discussed. Ensuring the appropriate use of data and the timely removal of low-quality and harmful content is essential to the surviving of high-quality content.

(4) Culture display channels. The current culture display model, which is dominated by mobile devices, has its limitations in terms of realizing the inherent value of culture data and enhancing its visibility. However, when it comes to cultural exhibitions, creative performances, cultural experience equipment and public cultural services, there remains a noticeable gap between China and more developed nations.

2. Case-study: Platform Enables the Flow of Chinese-Style Culture Data

2.1 Design-oriented Chinese-style Digital Culture Platform

The "Chinese Design Style Classical Culture Elements and Archetypes Database" platform stores more than 20,000 entries of Chinese-style culture data in 10 categories, including over 2,000 entries of high-quality data that can be accessed through the Internet, covering high-definition 3D models, vector patterns and so on.

Figure 2 shows the platform's homepage, data browsing page and typical data display page. With the help of an easy-to-use interface, semantic search and smart recommendation, designers can quickly find the required

Homepage

All culture data showed in Masonry layout (also called "Waterfall layout")

A typical culture data page featuring 3D model of a ceramic pot

Figure 2. "Chinese Design Style Classical Culture Elements and Archetypes Database" platform pages

cultural knowledge and design materials.

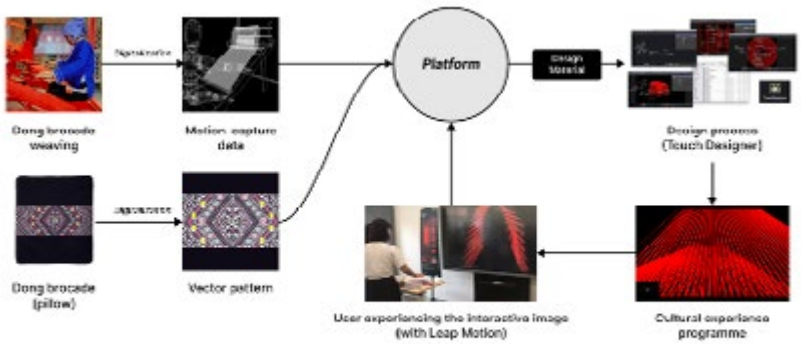

Figure 3. Data flow between the platform and design project "Interactive Image Design Based on The Weaving Technique of Dong Brocade".

The platform collects culture data from multiple sources. (1) autonomous collection: cultural objects are digitalised using equipment such as 3D scanners; (2) online collection: culture data made publicly available by cultural institutions around the world are collected via the Internet; (3) data collaboration: by collaborating with cultural institutions and museums, the platform brings together cultural data dispersed in various databases. In addition, the platform has linked thousands of cultural creative design cases by connecting with the "Pinwall" platform, and has enriched the inventory of cultural knowledge by including related research papers, reports, news, and so on.

The data standard established by the platform is compatible with common standards (e.g., DC, CDWA, etc.). Additionally, it augments metadata entries with elements specifically beneficial for creative design endeavours, encompassing details like colours, functions, and usage scenarios. In terms of data regulation, the platform ensures the authenticity of the data by means of professional revisions.

2.2 Design Enabled by the Platform and Culture Data

The first design case is an interactive video experience based on the Dong brocade weaving technique (a national ICH). The platform collects motion capture data of many ICH skills and folklore performances, including Dong brocade weaving, which can be used to dynamically reproduce the details of the skills and performances in a 3D environment. The designer obtained motion capture data from the platform, applied it to the development of interactive video. With the help of Leap Motion (a motion-control device), users follow the guidance to imitate the movements of weaving Dong brocade, meanwhile learning and enjoying. Figure 3 shows the path of culture data flowing between the platform and the cultural experience design.

The second design case is a mobile phone CMF design developed based on a variety of Song Dynasty ceramics. The platform's culture data inventory contains a large amount of ceramic data, including high-definition pictures, 3D models with texture, and descriptions of ceramic manufacturing processes. The designer researched the different artistic characteristics of Chinese ceramics in different historical periods through the platform, and selected Song Dynasty ceramics as the design object. Using the above materials as reference, the designer used Adobe Substance software to create PBR material so that it could be virtually applied to the surface of a mobile phone, while being visually realistic. Figure 4 shows the path of culture data flowing between the platform and the cultural creative product design.

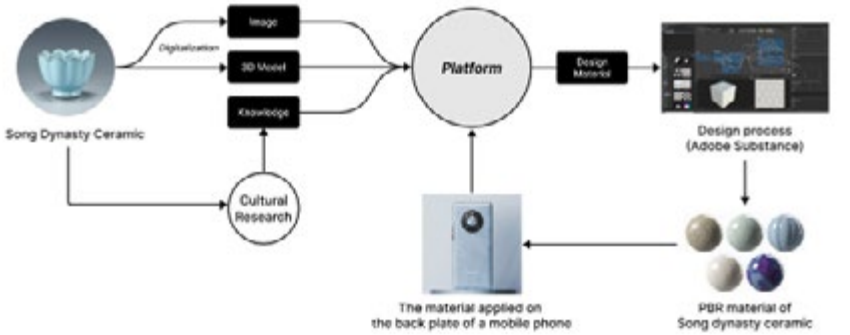

Figure 4. Data flow between the platform and design project "The Creation and Application of Procedural Song Dynasty Ceramic Material"

The above cases illustrate that the platform can enable the flow of culture data, to allow cultural data to be stored aggregately, and streamlines designers' access to essential design materials and cultural knowledge. Consequently, this contributes to improved efficiency in the creation of cultural experiences and cultural creative products, ultimately yielding benefits for the digital culture ecosystem.

2. How Platform Enables Data Flow and Benefits the Ecosystem

In digital culture ecosystem, most data exchanges, user behaviours and social connections take place on platforms (Dijck et al., 2018; Luo, 2022), which Poell et al. (2022) define as "data infrastructure". On this basis,

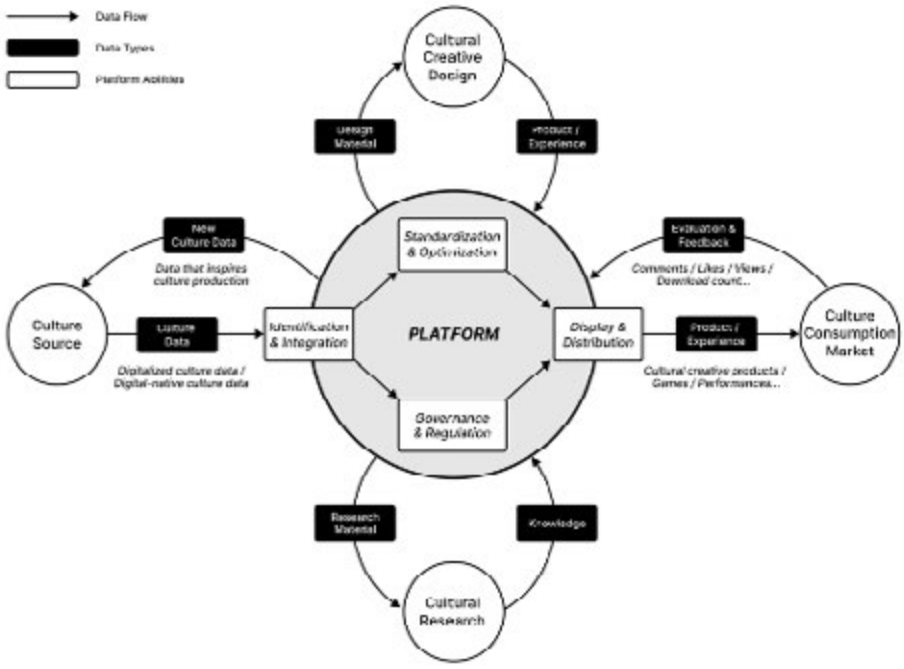

Figure 5. Model of digital culture platform enabling the culture data flow

scholars have pointed out that the "platformisation" model of cultural production, in which platforms are centralised for integrating resources and conducting data flows, has become mainstream (Nieborg & Poell, 2018).

The evolution towards a platform-centred model indicates that the digital culture production and consumption has evolved from a one-way, one-to-many behaviour to an interconnected, many-to-many system. From the above case study, complemented by reviewing of literatures from Xiang (2022), Liu and Wang (2022), Nieborg and Poell (2018), the role of platforms in digital culture ecosystem can be summarised in four main capabilities. Through these capabilities, the platform can enable the flow of culture data from the data source to the consumer market and support activities such as cultural creative design and cultural research (as shown in the model in Figure 5).

(1) Data identification and integration. Digital culture platforms can identify and integrate cultural data. This capability can improve the disorganised and fragmented situation of culture data within the digital culture ecosystem, thus helping to build a data service chain, thereby enhancing the efficiency and coherence of digital culture production processes. For example, platforms like Epic Marketplace and Adobe Stock provides a large amount of pre-processed, curated, and categorised tools and materials, saving creative workers a lot of time and labour.

In addition, there are more specialised culture data providers such as Epidemic Sound, Artlist and Motion Array. These data services are important pipeline of culture data distribution, providing resources for creative work, improving the accessibility of culture data.

(2) Data standardisation and optimisation. The digital culture platform standardises culture data by establishing a standard system to facilitate data application and analysis. For example, it repairs missing data, supplements metadata, and converts data formats. The platform's ability to improve the quality, versatility and usability of culture data can provide support for the extensive linkage of culture databases, thereby solving the problem of "isolation". For example, the EDM standard has enabled Europeana platform to achieve the aggregated storage of about 60 million entries of culture data from more than 3,000 cultural organisations.

(3) Data governance and regulation. Digital culture platforms are the main body to implement data regulation, and they are obliged to review the cultural data incorporated to ensure that harmful and erroneous data do not contaminate the entire ecosystem. DRM, Blockchain and other technologies enable the platforms to register and trace data flow, thus providing a stable environment for the circulation of high-quality culture data.

(4) Data display and distribution. The digital culture platform is an important intermediary between the cultural production end and the cultural consumption market. At the same time, platforms can enhance the visibility of cultural content by analysing user needs and preferences to make distribution more accurate.

4. Conclusion

Based on the analysis of the key concepts: culture data and digital culture ecosystem, this paper analyses the role mechanism of digital culture platform in enabling the flow of culture data in digital culture ecosystem. Additionally, this study scrutinizes the prevalent challenges in the ongoing development of China's digital culture ecosystem, explores the potential solutions offered by digital culture platforms by examining two design cases (one cultural experience design and the other cultural and creative product design) produced with the support of the "Chinese Design Style Classical Culture Elements and Archetypes Database" platform.

Digital culture platforms function as intermediaries bridging the gap between the culture data production end and the culture consumption market, relying on four core capabilities: identification and processing, standardisation and optimisation, governance and regulation, display and distributiown, while supporting activities such as cultural creative design and cultural research, thus benefiting the digital culture ecosystem.

References

Birukou, A., Blanzieri, E., Giorgini, P., & Giunchiglia, F. (2013). A Formal Definition of Culture. In K. Sycara, M. Gelfand, & A. Abbe (Eds.), Models for Intercultural Collaboration and Negotiation (Vol. 6, pp. 1–26). Springer Netherlands. https://doi.org/10.1007/978-94-007-5574-1_1

CAICT. (2022). Operation of China's Internet listed enterprises in the fourth quarter of 2022.

Cantamessa, M., Montagna, F., Altavilla, S., & Casagrande-Seretti, A. (2020). Data-driven design: The new challenges of digitalization on product design and development. Design Science, 6, e27. https://doi.org/10.1017/dsj.2020.25

Dijck, J. van, Poell, T., & Waal, M. de. (2018). The Platform Society. Oxford University Press.

d'strict. (2021, September 16). PUBLIC MEDIA ART 'WAVE'. https://www.dstrict.com/ART/?q=YToxOntzOjEyOiJrZXl3b3JkX3R5cGUiO3M6MzoiYWxsIjt9& bmode=view&idx=8005064&t=board

Kumar, V. (2020). Defining Cultural Data Science.

Liu, Q., & Wang, X. (2022). Key issues, response strategies, and implementation paths of cultural industry digitisation: A study based on cultural industry innovation ecosystem. Journal of Southwest Minzu University (Humanities and Social Sciences Edition), 43(8), 150-156.

Luo, L. (2022). Status quo, focus and countermeasures of high-quality development of digital culture industry. Television Studies, 2, 68-71.

Manovich, L. (2020). Cultural Analytics. The MIT Press.

Negroponte, N. (1995). Being Digital. Knopf Doubleday Publishing Group.

Nieborg, D. B., & Poell, T. (2018). The platformization of cultural production: Theorizing the contingent cultural commodity. New Media & Society, 20(11), 4275–4292. https://doi.org/10.1177/1461444818769694

Poell, T., Nieborg, D. B., & Duffy, B. E. (2022). Platforms and Cultural Production. Polity Press.

Rab, Á. (2007). Digital culture – Digitalised culture and culture created on a digital platform.

Xiang, Y. (2022). Integration mechanism of high-quality development of digital culture industry: connection, empowerment, and symbiosis. People's Forum-Academic Frontier, 23, 32-39. https://doi.org/10.16619/j.cnki.rmltxsqy.2022.23.004

Zheng, Q., & Cheng, Y. (2022). Digital ecology and high-quality development path of cultural industry. Nanjing Social Science, 1, 155-163. https://doi.org/10.15937/j.cnki.issn1001- 8263.2022.01.0017

Sustainable Cultural Tourism: Gamification Experience Design of a Mobile Augmented Reality Application for Hongkong Tourists

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Abstract

Hong Kong's tourism industry faces new challenges and opportunities in the post-epidemic era due to evolving consumer needs and technological advancements. To address these changes, the government aims to promote innovation, digitize tourism products, and enhance service intelligence. This study uses augmented reality (AR) and artificial intelligence (AI) technologies to develop a mobile application design strategy that optimizes visual performance and user experience. A mixed-method approach was employed to analyze tourist needs, including questionnaires, field research, user interviews, participatory workshops, and usability testing of urban tourism applications. The experimental study involved developing a gamified guided interactive interface prototype based on three tourist attractions in Yau Ma Tei, Hong Kong, using AR technology. The final application design aims to enhance the competitiveness and sustainability of the Hong Kong tourism industry by immersing tourists emotionally in the local culture, promoting cultural characteristics, and strengthening regional cultural confidence. This paper concludes that the mixed-method approach to analyzing tourist needs and applying AR and AI technologies, such as the "Layered Hong Kong" design, can significantly enhance the tourism experience. The study validates the method's applicability and provides valuable references for similar research endeavors.

Author keywords

experience design; mobile augmented reality application; cultural tourism

1.Introduction

Hong Kong, a dynamic city known as the Pearl of the Orient, has faced significant challenges in its tourism industry due to social unrest and the COVID-19 outbreak (Zhang et al., 2021). To revitalize the industry, the government has focused on strategies targeting the younger generation, who seek unique and personalized experiences. However, current tourism apps need more integration with local culture and creativity, highlighting the need for innovation (Eugenio-Martin et al., 2006).

Gamification, applying game mechanics beyond their original domain, has shown potential in engaging customers, enhancing brand awareness, and fostering loyalty towards destinations. However, academic research on gamification in tourism is limited (Xu et al., 2017). Another technology, Augmented Reality, has been found to significantly enhance the tourist experience by providing valuable information, creating engagement, and offering commercial benefits Cranmer, (Cranmer et al., 2020). Successful implementations of AR in cultural heritage tourism sites have been observed in countries like South Korea (Aluri et al., 2017) and Ireland (Lantos et

al., 2012), providing immersive experiences connecting tourists to historical buildings and local culture (Richards et al., 2006).

However, there needs to be more research on Mobile Augmented Reality (MAR) applications for cultural tourism in Hong Kong. Existing MAR applications, such as the 'Hong Kong Disneyland - Magic Access' Mobile App and 'Discover Hong Kong' Mobile App, must exhibit cultural creativity, personalization, or real-time updates, often providing a poor user experience. To meet the demands of modern tourists, there is a need for a gamification-based MAR application that effectively integrates travel information, enhances visual and immersive experiences, and better caters to user needs in cultural tourism design (Wood et al., 2012).

2. Methodology

2.1. The gamification experience design process

This study's overall experience design process, as depicted in Figure 1, involved several phases. In the first phase, an initial concept for the Mobile Augmented Reality (MAR) tour was

developed. The second phase focused on user research, including questionnaires, field trips, and interviews. Participatory workshops were also conducted to gain insights into user needs and experience goals. The third phase involved the analysis of user needs using collected data, which was then translated into application design requirements. In the fourth phase, the MAR experience design process was derived based on the previous phases' findings. Phase five encompassed the development of the information structure and interaction prototyping for the application design. The final phase involved usability testing to evaluate the application's user experience.

Figure 1. The six-phase of the experience design process.

2.2.Survey Design

A survey was conducted among 124 participants aged 19 to 56, including mainland and local visitors—the survey aimed to gather quantitative information, comprising 26 online questions. The Questionnaire Star tool was utilized to collect specialized needs, including demographic information such as name, age, and gender, as well as data related to the demand for Mobile Augmented Reality services and preferences for using applications during travel. Based on the collected data, it was found that approximately 68% of Hong Kong tourists still need to visit Yau Ma Tei (Figure 2a). Among those who have yet to visit, 81% indicated that the main reason is the lack of attractiveness of the area (Figure 2b). Furthermore, around 60% of users expressed dissatisfaction with the existing tourism applications in the Hong Kong market (Figure 2c). Regarding attitudes towards MAR tourism applications, 76% of tourists expressed willingness to try new tourism methods based on augmented reality technology (Figure 2d).

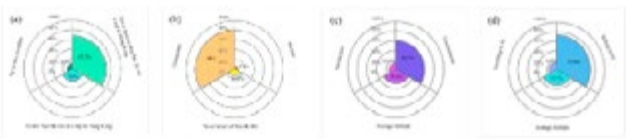

Figure 2. The proportion of tourists' views , (a) Proportion of visitors to Hong Kong who have been to Yau Ma Tei; (b) Factors affecting Hong Kong visitors to Yau Ma Tei; (c) User satisfaction with current Hong Kong tourist applications, (d) Acceptance level MAR Travel.

The study assessed factors influencing users' travel experiences and their demand for MAR tourism application functions using the Likert scale(figure 3). The results indicated that clear route guidance was the most significant factor, with 90% of respondents considering it necessary. Basic physical needs (80%) and language accessibility (70%) were also identified as influential factors. Regarding preferred information in tourism applications, 95% of respondents favored recommendations for local characteristic attractions, while 80% sought interesting travel routes and itineraries. Accurate traffic and navigation information were desired by 75% of participants. Other important expectations for MAR tourism included user feedback (72%), accessibility of information (64%), the excitement and pleasure of experiencing new technologies (87%), barrier- free travel experiences (71%), and access to official information and authentic travel experiences.

Figure 3. (a) The Likert Scale of User Needs Analysis in Hong Kong Tourism. (b)The diagram of the field study to Yau Ma Tei.

2.3 Field Study

A field observation was conducted to understand why Yau Ma Tei is unattractive to most
Hong Kong tourists. Interviews with 20 tourist groups focused on destinations, travel preferences, local cultural tourism, and knowledge and expectations of Mobile Augmented Reality (MAR) travel applications. Each interview lasted 30-50 minutes, followed by a 20-30 minute preliminary concept evaluation, as shown in Figure 3b.

During the interviews, participants expressed significant interest in MAR tourism and provided positive feedback on their experiences in Hong Kong. Here are the key findings:

1) Factors affecting the user experience of Hong Kong tourists:

- Language and payment barriers with merchants and attractions were cited as detrimental to the experience.
- Difficulties in locating restrooms and ATMs were mentioned.
- Navigating Hong Kong's complex road system caused some visitors to feel lost.

2) Information preferred in tourism applications by Hong Kong visitors:

- Visitors desired better promotion of local cultural attractions, particularly in Yau Ma Tei.
- Tourists reported unfamiliarity with tourism applications for specific attractions.
- Disappointment arose when attractions were not operational or overcrowded during peak hours.
- Existing sources like the Red Book must be deemed adequate for effective travel planning.

3) Expectations of Hong Kong tourists regarding MAR Tours:

- Respondents wanted AR assistants to plan routes and provide travel tips.
- Switching to voice guidance and providing engaging content were suggested to understand historical attractions' local characteristics better.

2.4 Analysis

A participatory workshop was conducted with five participants, including designers, university students, and tourists. The workshop began with an introduction to the study's topic, research direction, and learning objectives. Participants brainstormed based on collected user research data and developed design solutions for various user needs (Figure 4a). Feedback was encouraged, including first impressions and the practicality of different ideas (Figure 4b).

Figure 4. Selected phases in the participatory workshop, (a) Brainstorming phase, (b) Conceptual functional cassessment phase (c) Affinity diagram from user needs to design factory.

Each user can vote for the solution they think is the best. A total of 3 votes were allowed. Finally, based on the feedback from the participatory workshop, the user requirements and corresponding design features of the MAR HONG KONG cultural tourism app were identified, as shown in Figure 5c.

3. 'Layered Hong Kong' MAR gamification design strategy development

The MDA model provides a systematic approach to game design (Hunicke et al., 2004), dividing game systems into Mechanics, Dynamics, and Aesthetics. Both extrinsic and intrinsic motivations should be considered when designing MAR gaming elements, as shown in Figure 5(a).

Extrinsic motivation enhances user satisfaction and immersion, emphasizing the value of extrinsic information and engagement through narrative or the five senses. Intrinsic motivation is driven by personal determination and autonomy. (Garone et al., 2019).

According to the "Layered Hong Kong" MAR gamification design strategy, the functions of external and internal game elements are added to the application information framework. The application's main functional pages and jump logic were sorted out in Figure 5(b).

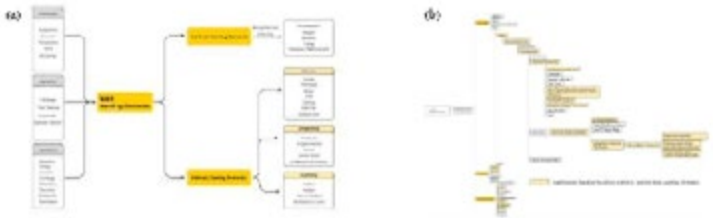

Figure 5. (a)The gamification design process of the 'Layered Hong Kong' MAR application; (b)The diagram of the application information structure

4. Design implement

4.1 User testing based on Interactive Prototype

The app was designed as a mobile augmented reality application, enabling tourists to experience Hong Kong's local cultural characteristics and achieve Yau Ma Tei's adventure experience and tourism goals. A preliminary interaction prototype was designed based on the application information framework as shown on Figure 6(a).

Figure 6. (a)The Framework of Interactive Prototype. (b) Usability testing on the Interactive Prototype

Testing was conducted in April 2023 with four visitors to Yau Ma Tei, comprising two males and two females aged 20 to 39 from Mainland China. The testing took place in a comfortable café setting and involved semi-structured interviews. The goal was to gather user feedback on the application, including interaction, content formation, gameplay elements, and other relevant aspects. Optimize the app's user experience in terms of interface elements and interactions.

Participants were introduced to the application and its interactive prototype during the testing, as shown in Figure 6(b). The app provided access to tourist information and other users' opinions through a game, offering an engaging and immersive experience. Any encountered issues or problems were recorded for further analysis and design optimization.

User testing results provided valuable insights for prototyping High-Fi interactions in MAR tourism apps. Key findings include:

1) Flexibility and Autonomy: Personalized recommendations and customizable routes enhance user motivation and control.

2) Social Interaction: Users value social features for connecting and sharing experiences.

3) Entertainment Adventure: Game-like elements, exploration modes, and storytelling create a sense of adventure and accomplishment.

4) Ease of Use: Simplified visuals and interactions in AR views are preferred to minimize distractions and facilitate understanding.

5) Cultural Heritage: The app deepens users' understanding of Hong Kong's history and culture, fostering a stronger connection and appreciation. Gamification elements motivate exploration and knowledge acquisition.

4.2 Programme evaluation

Upon the user's initial login, they can select interest tags based on their travel preferences (Figure 7a). Regarding social interaction features, the backend system utilizes user preferences to push popular travel guides. Users can explore these guides on the designated page, express their liking or comment on them, and engage with other users by following them or interacting with their content. Additionally, users can view their travel itineraries. Clicking on a guide card allows users to access the detailed page, where they can customize their travel route based on the existing itinerary (Figure 7b). When users embark on a journey following a specific route, they can switch to an augmented reality (AR) map navigation mode for viewing and assistance with location (Figure 7d). These functionalities highlight the flexibility and user autonomy within the system.

Figure 7. "Layered Hong Kong" MAR application Interactive Interface.

The users can click on any attraction card within the travel itinerary to view detailed information about that attraction. For instance, they can access user ratings, real-life photos, attraction descriptions, operating hours, peak periods, and reservation contact details (Figure 7e). When the users arrive at the attraction, they can engage with an AR assistant and participate in interactive games, leaving their virtual footprints (Figure 7f). Additionally, they can listen to AR- guided narratives featuring interesting stories shared and selected by local users and government sources. Users can also receive personalized and customized postcards by interacting with the AR assistant and checking in at the attraction (Figure 7g). When the user completes some tasks or explores particular attractions, the platform will give rewards, including coupons and discount cards. The clear visual interactive guidance reduces the learning curve for users. The interaction with the AR assistant, engaging in games and narratives, stimulates users' desire for adventure and exploration, thereby deepening their cultural and spiritual connection with the attraction. These features satisfy the Entertainment Adventure, Ease of Use, and Cultural Heritage characteristics of the application, as intended.

5. Results

In April 2023, the study conducted an evaluation study involving six participants (two females and four males) in low-fidelity prototyping. The study aimed to evaluate and test the Layered HK MAR application. Participants' interactions were observed and reflected upon during the testing process. The objective was to verify whether the design of the MAR travel application met the pre- set user experience objectives and enhanced their traveling experience. In addition, we sought to understand further the sustainability implications of this design for Hong Kong's tourism industry.

Figure 8 More tourists gave us experience and feedback on the "Layered Hong Kong" MAR application during their Hong Kong travel journey; the use of the application could help them better understand the history and culture of Hong Kong, which in turn could stimulate their interest and enthusiasm in exploring Hong Kong.

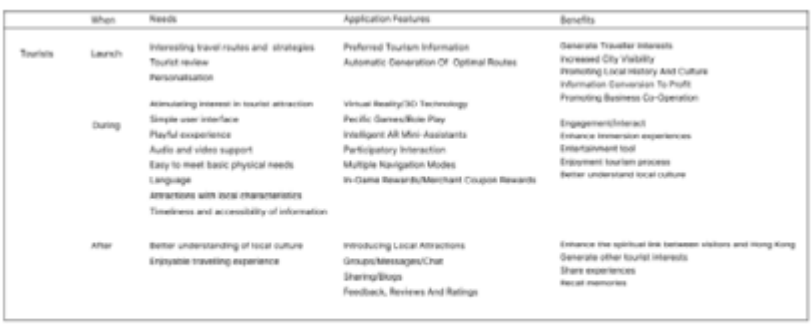

Figure 8. User feedback on the "Layered Hong Kong" MAR application

6.Discussion

It is essential to acknowledge the limitations of this study: (1) The sample size for user research was relatively small, with only 8 participants involved in interviews and 6 in the final evaluation. Although observations during user research were conducted in the natural environment of Yau Ma Tei, the small scope of the design means that it may only represent some tourist attractions in Hong Kong. (2) Most of the participants in the interviews and prototype evaluations were mainland Chinese students in the university, which may limit the generalizability of the findings. Regarding methodology, the IMI scale used to measure intrinsic motivation and internalization potential does not have clear reference values. (3) The IMI scale was not used in the early iterations of the design process, so it is difficult to determine which specific design elements are related to high intrinsic motivation.

More extensive and diverse samples should be recruited to address these limitations in future research, and observations should be conducted in a broader range of tourist attractions in Hong Kong. Alternative measurement tools or reference values should also be considered to improve the reliability and validity of the findings. Finally, the IMI scale should be used from the early stages of the design process better to understand the relationship between design elements and intrinsic motivation.

7.Conclusion

Innovative MAR travel apps have the potential to provide immersive travel experiences and promote Hong Kong's local culture. This study aims to identify essential elements of MAR tourism apps, enhancing users' autonomy and competence, stimulating curiosity and adventure, and deepening their cultural-spiritual connection with attractions. The goal is to attract more tourists to Yau Ma Tei and achieve sustainable tourism development in Hong Kong. Findings indicate that mobile AR offers adventure and autonomy, allowing users to explore Yau Ma Tei at their own pace. Combining gamification with sustainable cultural tourism principles can enhance the user experience and promote cultural exchange and sustainable tourism. Future work will expand user research and cover more Hong Kong attractions to drive cultural tourism's sustainable development.

References

Zhang, H., Song, H., Wen, L., & Liu, C. (2021a). Forecasting tourism recovery amid covid-19. Annals of Tourism Research, 87, 103149.

Eugenio-Martin, J. L., Sinclair, M. T., & Yeoman, I. (2006). Quantifying the effects of tourism crises: An application to Scotland. Journal of Travel & Tourism Marketing, 19(2–3), 21–34.

Xu, F., Buhalis, D., & Weber, J. (2017). Serious games and the gamification of tourism. Tourism management, 60, 244-256.

Cranmer, E. E., tom Dieck, M. C., & Fountoulaki, P. (2020). Exploring the value of augmented reality for tourism. Tourism Management Perspectives, 35, 100672.

Richards, G., & Wilson, J. (2006). Developing creativity in tourist experiences: A solution to the serial reproduction of culture?. Tourism management, 27(6), 1209-1223.

Aluri, A. (2017). Mobile augmented reality (MAR) game as a travel guide: insights from Pokémon GO. Journal of Hospitality and Tourism Technology, 8(1), 55-72.

Lantos, A. (2012). Dublin Street Museum A Responsive Website Designed Using Mobile First.

Wood, L. C., & Reiners, T. (2012). Gamification in logistics and supply chain education: Extending active learning.

Hunicke, R., Leblanc, M., & Zubek, R. (2004). MDA: A formal approach to game design and game research. Paper presented at the in proceedings of the challenges in games AI workshop. 19th national conference of artificial

intelligence.
Garone, P., & Nesteriuk, S. (2019). Gamification and learning: A comparative study of design frameworks. Digital Human Modeling and Applications in Health, Safety, Ergonomics and Risk Management. Healthcare Applications, 473–487. https://doi.org/10.1007/978-3-030- 22219-2_35

Characterisation and Scenario Creation of Landscape Bridges on the Jincheng Greenway under the Perspective of Tour-Art-Learning

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Abstract

As the first place to propose the concept of Park City, accelerating the construction of a beautiful and livable park city is the strategic goal of Chengdu's development. In the construction of a park city, scene building is one of the core strategies. By analyzing the concept of Tour-Art-Learning, combining with a large number of design practices in Jincheng greenway bridge landscape, this paper sums up the three impression characteristics of landscape bridges, discusses the scene construction and construction methods of Jincheng greenway, and discusses the ideas and methods of park landscape bridge planning guided by the concept of Tour-Art-Learning.

Author keywords

Tour-art-learning; Park city;Bridge landscape; Scene construction

Introduction

Since the reform and opening up, China has accumulated many environmental problems in the process of over-developed urbanisation. "We should highlight the characteristics of park cities and take ecological values into account", General Secretary Xi Jinping proposed the concept of "park city" for Chengdu for the first time in February 2018 [1]. Since Chengdu proposed to build a park city that practices the new development concept, people have been placed at the forefront of urban and industrial development. Scene theory fills the fault between people and city and industry, and makes "people, city and industry" become a smooth development trajectory [2]. From the "first place" to the "demonstration area", innovate the "greenway + scene" mode, encourage the innovation of "park +". New forms and modes are encouraged to create diversified park scenes to meet the diversified needs of the public and create a beautiful new life for the public. Therefore, the creation of diversified scenarios in park cities occupies an important position in urban planning.

Research Background

Park city is a modern urban form with a high degree of harmony and unity among people, city, environment and industry, a new model for sustainable urban construction in the new era, and a new process for the development of China's human habitat [3]. In the context of the park city, Chengdu Jincheng Greenway is given a new theoretical core and create a new goal, the scene of the bridge landscape creation as a new direction of exploration, in order to better explore the bridge landscape planning new theories and methods, to create a new scene of diversification of the bridge of the park greenway.

Throughout the past and present, landscape design from not for the public and gradually to the public and

design changes, today's landscape design needs to fully take into account the needs of different levels of people. Bridge landscape is also the same, in order to meet the people's recreation and aesthetic needs, bridge landscape gradually from the connection of traffic and gradually to the integration of humanities, the establishment of the city's image of the symbol of change. Comprehensive research results at home and abroad, there is a relative lack of theoretical research on the bridge landscape scene, so it is of great practical significance to take the bridge landscape as a way to create the scene.

The concept of Tour-Art-Learning

Figure 1. Philosophy Model for Tour-Art-Learning.

"Tour" refers to recreation (Recreation), with the purpose of travel excursion behaviour, it makes people feel free and happy, to obtain the experience of satisfaction, and more and more become the explicit or implicit needs of our aspirations for a better life, is the modern society, people relax the spirit and the body of a way of leisure [4]. Jincheng greenway is an important part of the ring city ecological park is quite characteristic, from the perspective of spatial form, for the "travel" and "tour" the whole process of experience, should actively explore the characteristics of human recreational behaviour and demand, the greenway landscape bridge in its linear ribbon type The greenway landscape bridge in its linear ribbon type makes it assume the function of connecting and carrying the ecological corridor of the ecological park around the city, improves the accessibility of open space, and meets the explicit or implicit needs of the leisure users. Greenway landscape bridge in the greenway system to become a point and point interconnection, point and surface mutual fusion, will be a region and another region connected, making the whole ring ecological park into a whole, rich spatial connotation at the same time to meet our aspirations for a better life.

Bridge Art - Recognisability

"Art" refers to the context of the new era, aims to create a unique regional culture, artistic atmosphere, or express the pursuit of a certain mood of life, can meet the current social diversification trend downstream of

the physiological and psychological needs of the people, for these symbols with a strong cultural significance, not only enhances the recognisability of the scene, but also inspire the The sense of belonging and identity of urban residents [5]. Bridges and other types of buildings have common aesthetic attributes, which can reflect the humanistic connotation of the place and society [6]. Bridges must be recreated through the traditional art of regional culture from beauty to beauty and commonality, and must be innovated through the interactive art of behavioural psychology from man-machine engineering to human factors engineering, aiming to create a unique regional culture and artistic atmosphere.

bridge learning - with significance

"Learning" means to get something, to gain something. The "learning" here means that the "art of travelling" has a subtle role in education, so that travellers can learn through the "travel" and "travel". The "beauty" of object design and scene creation in "travelling" and "touring" can be used to construct and promote the knowledge of travellers in a variety of subject areas, and these processes will make the learners more engaged, and produce more meaningful and transferable knowledge in them. In the process of "travelling" and "touring", the interaction of characters and situations is achieved through the creation of scenarios. These processes will make the learners more engaged, and produce more meaningful and transferable knowledge in the learners, which will enable the travellers to achieve a healthy state of body movement, and at the same time, continue and promote the cultural characteristics through landscape design. Make travellers through the bridge landscape physical sense design and regional cultural scene to create in the subtle influence and education, broaden their horizons, cultivate their sensibilities, to meet the culture of leisure, entertainment, leisure and other psychological, activity requirements, to meet the demand for care and care of travellers psychological recovery. At the same time, the bridge to the city's beautification, living environment, especially for the improvement of recreational environment and ecological environment to play other urban landscape irreplaceable role.

Characterisation of the Bridge Scene of Tianfu Greenway under the Threshold of "Tour-Art-Learning"

Overall Distribution

The project is located in the centre of the city on both sides of the roundabout expressway, is an important part of the "three rings" of the Tianfu greenway system, 100 kilometres of first-class greenways, the whole ring closed, the whole ring line has been built across the road or across the river as many as 78 pedestrian bridges, all completed will be strung together with 121 featured gardens, strung together with the green space of Chengdu, strung together with the park city! Park City and a happy life. The landscape design style of the bridges along the whole ring road is divided into 3 kinds, the bridge design style in the west area is mostly ancient

Sichuan style, the bridge design style in the south area is mostly modern style, and the bridge design style in the east area is mostly natural style.

Figure 2. Distribution of completed landscape bridges in the Ring Road Ecological Park.

Characterisation of the "playfulness" of bridges in greenway landscapes

Table 1. Greenway Landscape Bridges Combine Aesthetic "Tour-Art-Learning" Characteristics.

characterisation	Bridge Information		
Traffic "Tour" Characteristics of Greenway Landscape Bridges Linking Open Spaces.	 Cheng yu'an Bridge.	 Over Airport Expressway Bridge	 No. 1 across the Qingshui River Bridge
Greenway landscape bridge combined with the aesthetic "Art" characteristics of culture and art.	 Cross Jiannan Avenue Bridge	 Chuan-Shan Road Bridge	 Rhinoceros Road Bridge
Greenway Landscape Bridges Promote Interactive 'Learning' Characteristics of Environmental Education.	 Jiang'an River Bridge	 Wenchang Road Bridge	 Bacchus Road Bridge

The author selects the bridges with the most characteristics of "Tourism, Art and Learning" in the Ring Road Ecological Park for analysis. It can be divided into the traffic "tour" feature of greenway landscape bridges connecting open space, the aesthetic "art" feature of greenway landscape bridges combining culture and art, and the interactive "learning" feature of greenway landscape bridges advocating environmental education. "characteristics.

Design Practice of Landscape Bridge Creation under the Threshold of "Tour-Art- Learning"

In order to confirm the feasibility of the above theories and methods, this research team, under the advice and guidance of experts, takes the planning and design of the bridge of the first-level greenway of the North Lake of the Circular Ecological Park as an example of the spatial scene creation of the bridge landscape of the project.

Project Overview

Figure 2. Distribution of bridges on the North Lake Level 1 Greenway of the Circular Eco-Park.

Table 2. Bridge statistics table.

position	number	name	reach	Property of land use	Existing bridge renovation	New bridge
First-class greenway bridge	1	Bridge over Dongfeng Nullah	nine tags	ecological restoration area	36m	
	2	Bridge over Drainage No. 2	nine tags	ecological restoration area		93m
	3	Bridge over Drainage No. 3	nine tags	ecological restoration area		25m
	4	Cross Tong Lok Main Row Bridge	nine tags	ecological restoration area		10m
	5	Bridge over North Branch Canal	nine tags	ecological restoration area		25m
	6	Lion Lake Trail Bridge	nine tags	ecological restoration area		360m

The project is located in the wedge-shaped green area between Rongdu Avenue and Chengjinqing Expressway, which is the characteristic area of the eastern section of the Circum- City Ecological Park. Ring City Ecological Park is a ring-shaped landscape ecological space laid out along both sides of the Round City Expressway in the Tianfu Greenway system of "one axis, two mountains, three rings and seven belts" in Chengdu [3], which is the largest city centre park in the world, with a total area of about 133 square kilometres. Beihu Area inside the first level of greenway by the ring along the highway to connect to the third ring road, this project to collect six bridges that are located in the Beihu Area on top of the first level of greenway, is the first level of greenway across the river across the line, to ensure the continuity of key nodes, but also the Beihu Area landscape style and culture is an important carrier of the display.

Table 3. Bridge design programme table.

 Bridge over Dongfeng Nullah	 Bridge over Drainage No. 2	 Bridge over Drainage No. 3
 Cross Tong Lok Main Row Bridge	 Bridge over North Branch Canal	 Lion Lake Trail Bridge

Design proposal

The six bridges in the design scheme have extracted Chengdu's regional culture for upgrading in different forms, shapes and materials. For example, the extraction of koi, pandas, bamboo, Yinxing and other elements, optimising the shape of the elements, highlighting the beauty of the bridge, so that visitors in the tour process, can experience the beauty of the scene creation, so as to achieve the needs of visitors in the tour process.

Conclusion

Through the analysis of the concept of playfulness, with "people-oriented" as the core, we aim to summarise the three major impression characteristics of landscape bridges, and explore the feasibility and necessity of the concept of playfulness in parks and urban recreational landscapes. In this paper, through the practice of planning and designing landscape bridges in the North Lake area of the Circum-City Ecological Park, we achieve the purpose of exploring the design of playfulness, actively exploring the new practice of harmonious integration of people and the environment, constructing the concept of sustainable development of green ecology, creating a diversified park scene, meeting the diversified needs of the public, and drawing a new scroll of the people for the better life in the new era.

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Southwest Jiaotong University Experimental Teaching Research and Reform Project 20221305

References

[1] Zhu Zhijun,Gao Mengwei.The Scene-making Pattern of Old Town Community in the City Park Context: A Case Study of Chengdu Old Town.Shanghai Urban Planning Review,J.2018,0(4):43-49, DOI 10.11982/j.supr.20180407.

[2] Wang Zhe,Wang Wei.Empirical Study on the Role of Ecological Green Catering Landscape in Brand Perception--The Case of Margaux Manor in Tianfu Boiling Town.China Market,J.2022(7):121-123,DOI:10.13939/j.cnki.zgsc.2022.07.121.

[3] Chen Mingkun,Zhang Qingyan,Zhu Meian.Exploration of Landscape Architecture Practice Strategy under the Goal of Chengdu Beautiful and Livable Park City Construction.Chen Mingkun;Zhang Qingyan;Zhu Meian,J.2018,34(10):34-38.

[4] Xiao Gui-rong,Song Wen-li.Structural Optimization of Urban Recreational Space in Dalian.China Polulation. Resources and Environment,J.2008,18(2):86-92.

[5] Xiao Rong.Artistic Features of Contemporary Jiangsu Residential Landscape.Artistic Features of Contemporary Jiangsu Residential Landscape,J.2013(5):94-95.

[6] Gao Zong-yu,Zhang Qiang,Long Tao.Humanistic Implications of Bridges.Bridge Construction,J.2006(5):44-47.

Research Review of Human-Machine Interaction Design and Intelligent Vehicle Cockpits

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Abstract

As an industrial product that combines the most advanced technologies, the part of automobile that generates user interaction is often reflected in the interior of the cockpit. With the continuous development of science and technology, the automobile cockpit has experienced two major stages: the mechanical era and the electronic era, and nowadays, with the progress of intelligentization and automation technology, the intelligent cockpit is covering the traditional automobile cockpit in a meaningful way. However, after combing through the current research status of intelligent cockpit, it is found that the number of Chinese high-level research literature on intelligent cockpit is extremely small, which is in obvious contrast with the number of English literature, which indicates that there is still a lot of research space in the field of intelligent cockpit in the Chinese academic field. This paper collects a large amount of Chinese and English literature through China Knowledge and Web of science, and carries out visual measurement analysis with the help of Citespace software, and summarizes the similarities and differences of the research trends of domestic and foreign researchers on intelligent cockpit and human-computer interaction design by means of comparative research, aiming to provide valuable references for researchers in the field of intelligent cockpit.

Keywords: intelligent vehicle cockpit; human-machine interaction; meaning overlay; interaction technology; interaction relationship

Introduction

Amidst the continuous evolution and development of the automotive industry, four emerging trends have become prominent: electrification, intelligence, interconnectivity and sharing (Ren Weiqun, 2021). Such trends demonstrate that the automobile industry is undergoing a profound
and revolutionary change, with a shift towards a completely new stage of development. Vehicles have transcended their traditional role as mere mechanical products. Specifically, future automobiles are poised to transform into intelligent mobile spaces, playing a pivotal role in steering society towards the advancement of intelligent communities. Intelligent cockpits will remain central in shaping the overall vehicle user experience within the extensive transition towards intelligence-focused advancements. This trend will have a wide and profound impact not only on the automotive industry itself, but also on other fields such as urban transportation,

energy systems, sustainability and trip modes.

The evolutional path of intelligent cockpits

The mechanization era: Mechanical instrument panels and basic audio playback devices were mainly adopted in vehicle cockpit products in this period, with relatively simple functions and structures. Here, physical buttons were relied on for operations. Thus, only limited information was presented.

The electronization era: In the early 21st century, vehicle cockpit products underwent a notable shift from mechanical functions to electronic ones. Although traditional mechanical instruments were still present, small-sized center-control LCD displays gradually became popular. enhanced to provide drivers with more information and entertainment experience.

Meaning overlay in the context of the intelligence era

The intelligence era of cockpits, as represented by intelligent cockpits, can be described as a meaning overlay on the preceding electronization and mechanization eras. In terms of industrial products, intelligent cockpits exhibit a high degree of integration. Their evolution can be conceptualized as a progressive process whereby, through the ongoing integration and fusion of new technologies, the meanings and functionalities of previously disparate products are continually consolidated and superimposed.

"Technical overlay" serves as the foundational catalyst propelling the progression of meaning overlay. This evolution primarily hinges on shifts in user behavior and lifestyles triggered by advancements in technology. Meaning overlay can be comprehended as a process for humans to continuously evolve and cognitively upgrade modern life in the context of the times. In the context of meaning overlay, the essence of "meaning" becomes evident through the externalization of the evolution of product values and is likewise manifested in the externalization of cultural value's evolution. In essence, cultural value involves providing users with unique identifiers, so as to facilitate the expression and realization of their individualized meanings.

Hence, the research on intelligent cockpits finds its external manifestation in the study of the iterative development of technologies related to intelligent cockpits. However, the crux of the research lies in the exploration of the iterative evolution of users' demands within the context of the intelligence era. Such research also delves into how cockpits can establish a novel type of relationship with users through interactive behaviors.

Export and analysis of literature data related to HMI design and intelligent cockpits

The essence of intelligent cockpits lies in intelligent human-machine interaction (HMI). As a novel component in the early stage of the intelligence era, intelligent cockpits have not been extensively explored in high-level research in China, which can be attributed to a number of reasons. Intelligent cockpit concepts emerged relatively late in China, and research in this field is primarily driven by automotive companies. This industry-focused approach has posed challenges in terms of sharing academic research findings more widely. Conversely, a different trend is evident in other countries where a significantly larger volume of high-level research literature on intelligent cockpits has been produced compared to China. Therefore, by collecting a large amount of literature related to automotive HMI and intelligent cockpits from core journals both in China and other countries, the expectation was to learn and summarize the commonalities and differences in the research directions and content between domestic and international studies.

To ensure the quality of literature, the selection criteria for core journals in CNKI was set to SCI, PKU Core Journals, and CSSCI, while that of Web of Science was set to SCI-EXPANDED, SSCI, and AHCI. Ultimately, a total of 553 articles on vehicle cockpits and human-machine interaction were collected from these core journals, and a

visual quantitative analysis was conducted on the retrieved data using Citespace software.

Fig. 1 shows the keyword co-occurrence network map for intelligent interaction design of vehicle cockpits. As shown, "interaction design" was identified as the largest node in Chinese literature, followed by "automotive interior" and "user experience". "Design" was the largest node in English literature, followed by "human-machine interface" and "autonomous vehicle". "Automotive interior," "interaction design," and "intelligent cockpits" in Chinese literature, as well as "driving simulator," "human-machine interface," and "autonomous vehicle" in English literature, demonstrated strong connections with other influential keywords. These terms frequently serve as pivotal nodes in the communication pathways to other keywords, fostering a positive impact on the inter-citation relationships in the literature. From the obvious keywords shown in the figure, an observation can be made that most of the Chinese literature about HCI design largely concerns the technology of cockpits. In contrast, as shown by the keywords of "driver", "trust" and "behavior" in the English literature, international researchers pay more attention to the study of users.

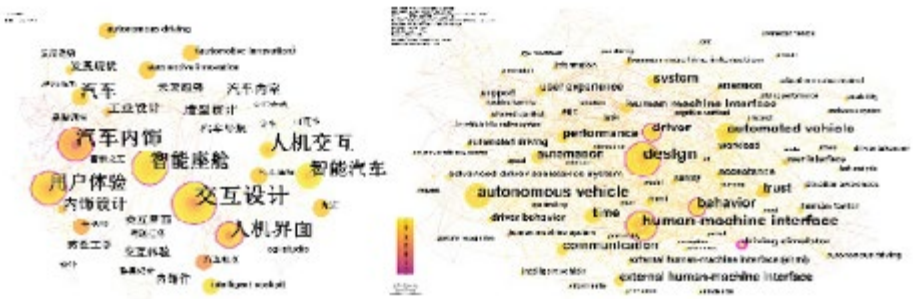

Fig. 1. Co-occurrence map of HMI keywords

Based on the frequency and centrality of the keywords, The most prominent keyword for intelligent cockpits in Chinese literature was "human-machine interaction," underscoring that HMI is the central research focus in the intelligent cockpit field. Additionally, "vehicle-road synergy" and "artificial intelligence," among others, represented secondary research hotspots.The research hotspots in English literature primarily revolved around keywords such as "design," "system," "driver," and "model." Fig. 2 leads to the following conclusion: Chinese literature predominantly emphasizes research on "interaction technology," whereas English literature centers more on "interaction relationship" within the field of intelligent cockpits

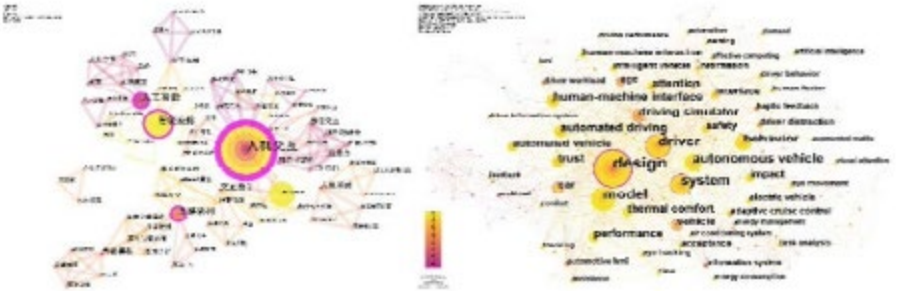

Fig. 2. Co-occurrence map of intelligent cockpit keywords

Technical overlay in intelligent interaction

Fig. 3 illustrates the core technologies included in intelligent cockpits, which mainly contains three major sections: software, hardware, and interaction technology. Here, HMI technology is involved in connecting and driving the hardware and software in cockpits, the main function of collecting the physiological, psychological and interactive information for drivers.

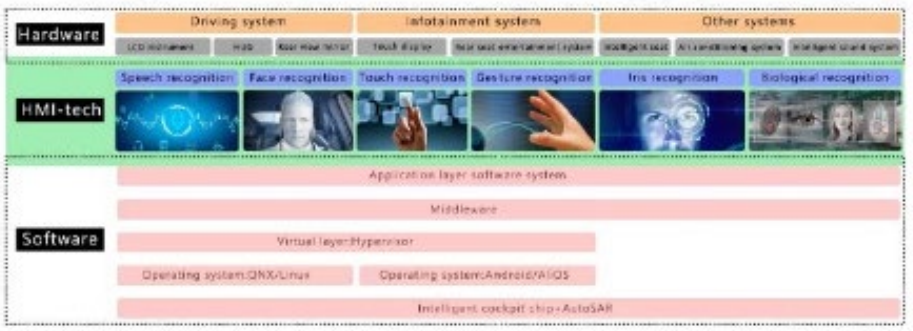

Fig. 3. Core technologies in intelligent cockpits and the relationships

In 2020, Tan, Z. and his team suggested certain core issues that deserve further exploration, including: the acceptance level of ICV technology, the quality of ICV(in-vehicle human-vehicle interaction) human-machine interaction, and the ICV user experience. (Tan, Z., 2020). In the development path of efficiency-oriented HMI design, the utilization of bioelectrical signals can enable real-time synchronized communication between humans and machines. This approach provides real-time control interfaces and has the potential to control multiple functions simultaneously. With minimal human intervention required, this process can greatly enhance control efficiency (Singh, H. P., & Kumar, P. 2021). Z. Hu proposed a new concept, Driver Digital Twin (DDT), in 2022 (Z. Hu, 2022), intended to bridge the gap between the existing autonomous driving systems and fully digitalized systems, thereby facilitating construction of a complete driving-human cyber-physical system.

At present, information presentation has become complex and varied, including road-condition- based natural displays, assisted driving, multi-screen displays, interior and exterior information displays, and integration with mobile devices (Hao, T., 2019). The growing volume and complexity of information necessitate intelligent vehicles to provide ample space for effective information presentation. A team represented by Zhu, Y. designed a driver-specific interface that takes into account autopilot contexts, users' information needs, and their preferences for display areas. (Zhu, Y., 2023). Notably, their results underpin the feasibility of glass projection display, laying the theoretical foundation for the development of a human-machine interaction system utilizing window glass as a carrier within intelligent cockpits.

Relational overlay in intelligent interaction

Since the 1960s, the rapid development of information systems has been the driver for an extensive range of HMI research, which is aimed at designing human-machine interfaces with ergonomic properties, the research and optimization of human-machine interaction relationships have emerged as a significant topic in the field of intelligent cockpit interaction design.

In 2004, Lee, J. D. and See, K. A. integrated the research on trust automation through a conceptual model, the dynamic nature of trust, the role of environment on trust, and the impact of display characteristics on trust

were revealed. (Lee, J. D., 2004). In a study on airplane cockpits, Wenhai, W. U. and his team found that in a dynamic and rapidly changing environment, such design would only play a significantly weakened role or even a counterproductive role (Wenhai, W., 2016). Thus, an observation can be made that cockpits with a machine-takeover mode do not necessarily impose a positive impact on the human-machine interaction relationship, enhancing the adaptability between humans and machines is poised to be a future developmental trend in the field of human-machine interaction (Hoc, J.M., 2000). Shucong Yu et al. proposed a test and evaluation system for intelligent cockpits in 2022, which can quantify the user interaction experience of intelligent vehicle cockpits with a high degree of accuracy. It serves as a robust tool for assessing the performance of intelligent cockpits (Shucong Yu, 2022). To tackle the multifaceted aspect of human-machine interaction design in intelligent cockpits, a research team led by Li, W, in a 2022 study, proposed that human-machine interaction involving emotional perception is a forward-looking and demanding research area for the future. (Li, W, 2022). In 2018, Niu D, Terken J and Eggen B. suggested that one crucial aspect warranting comprehensive investigation regarding people's trust in automated systems is anthropomorphism. Anthropomorphizing information can elevate the perception of autonomous vehicles as social entities, thereby bolstering trust in these vehicles (Niu D, 2018).

Conclusion

The aim of the present study was to illustrate that the advancement of intelligent cockpits goes beyond straightforward technological upgrades and efficiency improvements. Its fundamental characteristic resides in the continuous iteration and cultivation of users' cognitive aspects. Primarily occurring at the lifestyle level, this process is poised to exert a profound influence on the predominance of users' mental factors. The success of meaning overlay relies largely on the enhancement of users' cognition and their satisfaction with experience, since this is directly engaged with users' needs and expectations in the context of different eras. Findings were made that Chinese literature on HMI design for intelligent cockpits primarily concerns "interaction technology", while English literature largely pertains to the "interaction relationship". Technical overlay is the fundamental driving force for the evolution of meaning overlay. The interaction relationship comprises numerous factors, namely the emotional connection between users and systems, the patterns of interaction, and the complexity of information transfer. Such factors can directly shape the user experience and system effectiveness. Therefore, the core of progress and advancement in the field of HMI in intelligent cockpits lies in the evolution of interaction relationships.

Intelligent cockpits are a significant carrier for the integration of emerging technology. As to future research in the field of intelligent cockpits, Chinese researchers should place more emphasis on the new human-machine interaction relationship generated with the integration of technologies, and should take into account the comprehensiveness of user experience, including emotional factors, trust, and ergonomics of cockpit systems. The ethics surrounding new technologies should be examined through a human-centered approach to ensure the ethical and sustainable progression of intelligent cockpit technologies.

Reference

Ren Weiqun;Du Chang-qing.System Simulation in Automotive Industry with the New Technological Trends[J]. Computer Simulation,2021,8(7):1-6.

Tan, Z., Dai, N., Zhang, R., & Dai, K. (2020). Overview and perspectives on human-computer interaction in intelligent and connected vehicles. Computer Integrated Manufacturing Systems, 26(10), 2615-2632.

Z. Hu, S. Lou, Y. Xing, X. Wang, D. Cao and C. Lv, "Review and Perspectives on Driver Digital Twin and Its Enabling Technologies for Intelligent Vehicles," in IEEE Transactions on Intelligent Vehicles, vol. 7, no. 3, pp. 417-440, Sept.

2022, doi: 10.1109/TIV.2022.3195635.
Hao, T. , Jia-Hao, S. , Dai-Song, G. , Mo-Li, Z. , Jian-Ping, Q. I. , & Ying, Z. . (2019). Development trend of human-computer interaction in intelligent vehicles. Packaging Engineering.
Zhu, Y. , https://orcid.org/0000-0003-4354-6399, Information, V. F. A. , Geng, Y. , Information, V. F. A. , & Huang, R. , et al. Driving Towards the Future: Exploring Human-Centered Design and Experiment of Glazing Projection Display Systems for Autonomous Vehicles.
Lee, J. D. , & See, K. A. . (2004). Trust in automation: designing for appropriate reliance. human factors, 46(1), 30-80. Human Factors the Journal of the Human Factors & Ergonomics Society, 46(1), 50-80.
Wenhai, W. U. , Yuanyuan, Z. , Jintao, L. , Siyu, Z. , Dan, M. , & Branch, Q. . (2016). Overall architecture design of new generation intelligent cockpit. Acta Aeronautica Et Astronautica Sinica.
Hoc, J. M. . (2000). From human – machine interaction to human – machine cooperation. Ergonomics.
Shucong Yu,Jian Meng,Bin Hao. Research on Ergonomic Evaluation of Driver-based Intelligent Cabin[J]. Automotive Engineering, 2022, 44(1): 36-43.
Li Wenbo,Tan Ruichen,Xing Yang,Li Guofa,Li Shen,Zeng Guanzhong... & Cao Dongpu.(2022).A multimodal psychological, physiological and behavioural dataset for human emotions in driving tasks. Scientific Data(1). doi:10.1038/S41597-022-01557-2.
Niu, D. , Terken, J. , & Eggen, B. . (2017). Anthropomorphizing information to enhance trust in autonomous vehicles. Human Factors and Ergonomics in Manufacturing.
Zatori, A., Smith, M. K., & Puczko, L. (2018). Experience-involvement, memorability and authenticity: The service provider's effect on tourist experience. Tourism Management, 67, 111-126. https://doi.org/10.1016/j.tourman.2017.12.013

A Semantic Expression Approach to Artifact Design from the Perspective of Embodied Cognition

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Abstract

Nowadays, the theory of embodied cognition has gradually become a hot topic in design research. It emphasizes the unity of body, mind and environment, and designers can make use of embodiment, Contextualization and dynamics to give meaning to artifacts, and "decode" them through users' behaviors to realize the conveyance of embodied semantics. This paper applies the theory of embodied cognition to the design of Chinese artifacts, and proposes an idea of embodied design: to locate the design boundary by analyzing the user's self-recognition, usage behavior, environment experience and cultural identity, and to "encode" it with the help of the four means of design: anthropomorphism, sensory perception, imagery schema, and behavioral experience, so that it can be "encoded" with the user. With the help of the four design tools, the design is "coded" to produce perceptual, cognitive and behavioral associations with the users, and realize the embodied semantic expression. The design practice of three Baijiu drinking utensils is used as an example to verify the practical value of the design idea and provide designers with an in-depth excavation of the embodied design method.

Author keywords

embodied cognition; design; Chinese artifacts; embodied semantic; embodied design method; Baijiu drinking utensils.

Introduction

In recent years, embodied cognition has been increasingly emphasized in the field of design. Its core idea is that the body is the origin of thinking (Xie, 2020) and intervenes in the cognition process through intuitive reliance, bodily functions, rational thinking, and motor ability(Guo & Sun, 2022). In 1979, Gibson put forward the theory of perceptual ecology, pointing out that mind and cognition are embodied, formed in the interaction between brain, body, and environment; human behavior, mind, and environment are integrated, and cognition is intrinsically linked to embodied structures and activity schemas(Li & Sheng, 2006). Modern research on embodied cognition focuses on, among others, embodied emotion(Yao & chen, 2019), body schema(He, 2009) and the relationship between body and experience(Xie & Ye, 2019), highlighting the strong connection with the concept of "human-centered" design, which is an ideal tool for analyzing designers' intentions, understanding user behavior, and building a connection between the two.

Embodied Theoretical Foundations of Artifact Design

From a broad perspective, embodied cognition not only emphasizes the influence of the body on the cognitive process but also asserts that cognition is produced by the joint action of the body and the environment(Xie, 2020). Wang Lishen and Xie Lifang further summarized the three attributes of cognition in the embodied perspective: embodiment, context, and dynamics(Wang & Xie, 2021) as shown in Table 1. In addition, the cognitive process cannot avoid being influenced by other people. The cultural phenomenon formed by group cognition will, in turn, counteract individual cognition. Sun Yi and Wang Yuan(2021) suggest that "the cultural experiences and knowledge we acquire in our culture inevitably shape our worldview, adapting our minds to the current culture, and ultimately being reflected in human embodied behavior." (p. 136) Stimulation of the body will sometimes directly generate perceptions of things, but another part may require cultural immersion to produce perceptions. For example, Chinese people perceive the color red as joyful and pleasant, while Westerners usually tend to perceive it as angry or even evil(Zhu, 2011). This is summarized as "cultural filtering." Therefore, the embodiment, contextualization, dynamics, and cultural filtering of cognition together form an important theoretical foundation for the study of artifact design from the perspective of embodied cognition.

Table 1. Three Attributes of Cognition in the Embodied Perspective

Attributes of Cognition	Description
Embodiment	The physical structure of the body and the senses influence the formation of cognition.
Contextualization	Cognition comes from the body's experience in a given situation and is influenced by the environment. The body and the environment are somewhat intertwined. Certain components of the environment may, as people become more familiar with them, become internalized as part of the "body" used for cognition and become extensions of human sensation.
Dynamics	The interplay of time, body, and environment affects and facilitates the adjustment and development of cognition. Cognition adjusts and develops in response to the dynamics of the body and the environment, and it is possible for cognitions that have been formed to be altered.

Xie Yong summarized the three layers of association between product design and the user's embodied cognition, including perceptual-, cognitive-, and behavioral- layer associations(2021). (1) Perceptual layer association refers to the sensory migration without cognitive processing, including the material, touch, and information transfer of the product itself, which will directly affect the user's cognition. (2) Cognitive layer association refers to contextual imagination that is processed by the brain; that is, the user recognizes the shape and structure of the product and associates it with other familiar imagery, resulting in associative cognition. (3) Behavioral layer association refers to the physiological stimulation of the user by the behavior of the body and the product size. When the body interacts with the product, its shape, function, size, and resistance in use will affect the user's behavior, and the stimulation and feedback of this behavior to the body will, in turn, affect the user's subsequent behavior and thinking; that is, the behavioral stereotypes carried by the product itself will affect the user's cognition.

Accordingly, Van Rompay et al.(2015) propose four types of product design from the perspective of embodied cognition. (1) Anthropomorphism or familiarity, in which people tend to recognize human features in products, either consciously or unconsciously, and products that have a physical resemblance to people will, therefore, influence users' responses. It can be further categorized into "concrete physical resemblance (direct resemblance to humans or animals)," "more abstract resemblance (resemblance to abstract features of human gestures)," and "resemblance to human limbs or movements." (2) Embodied imagery schema is a cognitive
structure in which people process relevant experiences and information into some kind of routine based on sensation, intuition, and representation and store in long-term memory(Wang, 2006). Bodily experience can form an embodied imagery schema that is projected metaphorically into the understanding of things, which makes people comprehend the meaning or quality of things according to the spatial relationship of vision. (3) Meaningful sensory experience, where direct sensory stimulation is applied to the expression of the embodied product. (4) Embodiment of functional behavior, which affects the psychological feeling and subsequent behavior of the person using the product by designing their behavior and actions, the speed of movement, and the amount of force used when using the product.

Embodied Expression of the Semantics of Artifact Design

Embodied design of artifacts is the process of symbolizing perceptible elements and understanding and interpreting them through the act of use. In this process, designers "encode" various design elements according to the type of embodied cognition of the product and endow the artifacts with shapes, functions, and meanings; users "decode" them through various channels such as functional perception, experiential cognition, and emotional feedback, and so on. The whole process, as shown in Figure 1, includes three parts: the design means, the transfer mechanism, and the influencing factors of embodied semantics. Framework

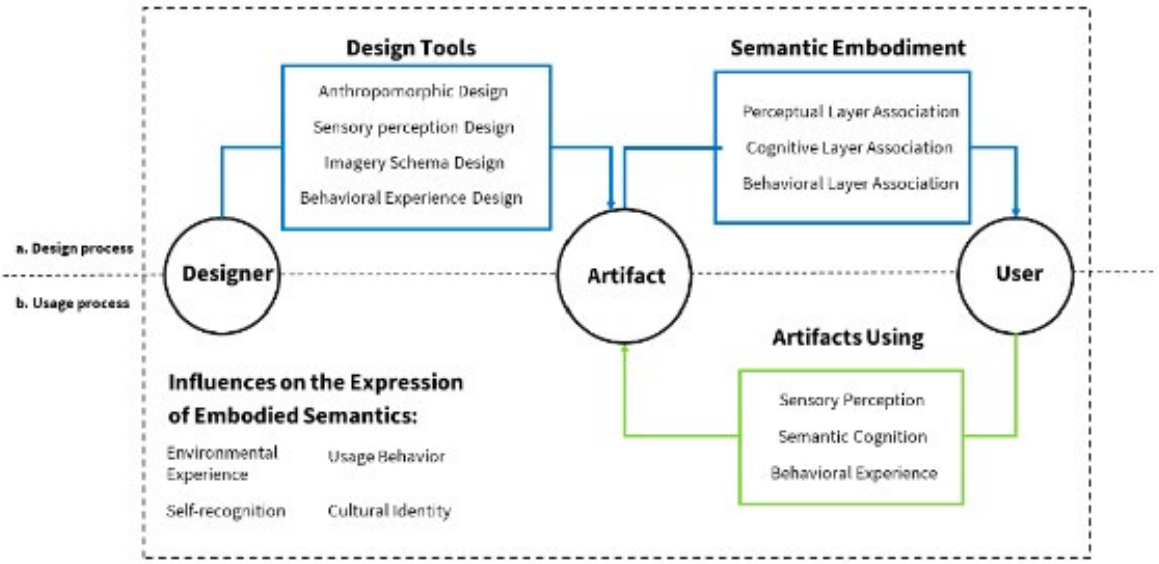

Figure 1. Semantic transfer process and mechanism of embodied artifact design

Design tools for embodied semantics

Designers, as the initiators in transferring embodied semantics, are often able to infuse design imagery into artifacts through four means: anthropomorphic, sensory perception, imagery schema, and behavioral experience designs, which correspond to the type of embodied cognition of the product, as shown in Figure 1(a).

Anthropomorphic design

Anthropomorphic design usually simulates the body or part of the body gesture, in the design of figurative or abstract realization of semantic expression, giving objects some human psychological characteristics, so that the product has a "personality"(Liu & Xia, 2004). Designers can use it to influence user experience, allowing the user to produce emotional and psychological feedback in line with expectations. For example, the Dulcinea standing lamp designed by Mimmo Paladino, as shown in Figure. 2(a), simulates the posture of a person standing and bowing his head and is complemented by soft curves and approachable materials, which makes the user feel "gentle, safe, and non-aggressive." In addition to the role of anthropomorphism and emotional expression, anthropomorphic design also makes use of familiar things to create a sense of surprise and freshness.

Sensory perception design

Sensory perception design directly stimulates the user's sensory organs through the artifact's shape, color, material, and so on, triggering their psychological feelings or similar associative migration. These sensations include sight, hearing, touch, smell, taste, balance, movement, and so on. For instance, different textures of textiles will produce very different tactile stimuli, leading to different emotional responses(Yang et al.,2022). Touching silk gives a feeling of softness, gentleness, and delicacy, while cotton and linen fabrics appear rough, plain, and natural, as shown in Figure 2(b). Designers can weave products with unique embodied semantics by applying them in unique ways.

Imagery schema design

Imagery schema design expresses embodied semantics primarily through the spatial arrangement between the various components of the artifacts and between the artifacts and their contents. For example, artifacts that are close to each other in distance and similar in structure give people a sense of intimacy and dependency; artifacts that are surrounded by components often express a sense of security; artifacts that are gagged are often considered to be confined and contained; artifacts that are placed on top of each other in space have better quality. Designers can deal with the layout and form of components according to the design imagery and corresponding schema, giving the artifacts perceptible embodied semantics.

Behavioral experience design

Designers also regulate usage behavior through the artifact's form to produce embodied cognition and trigger psychological feedback that meets expectations. For example, the bird- shaped sake cup designed by Taki Product, as shown in Figure 2(c), employs anthropomorphic design methods in its shape to simulate the form of a standing bird; in terms of usage, the designer restricts the use of the cup by designing the handle at the bottom, so that the bird- shaped cup rests on the tip of a finger, and the sake must be consumed from the bird's beak. This design constrains the drinking behavior, subsequently allowing the drinker to maintain restraint and create a novel drinking experience.

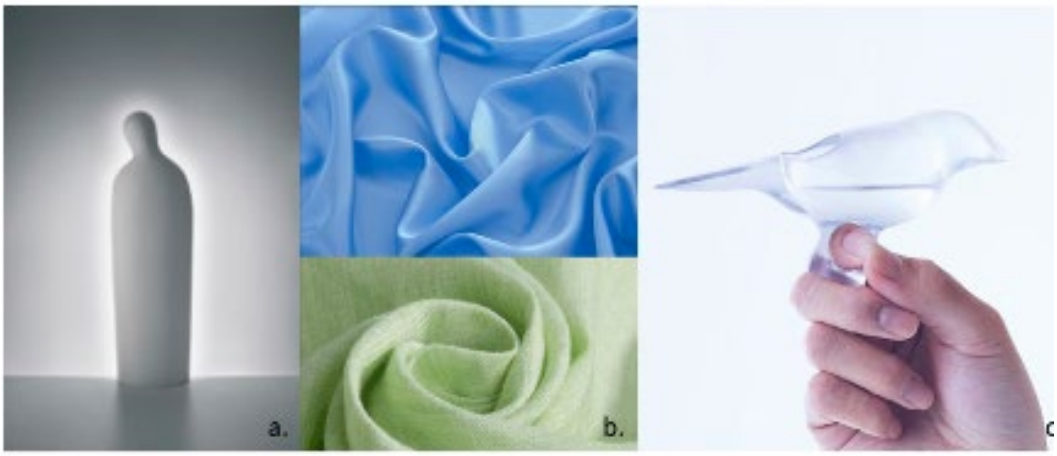

Figure 2. (a) Dulcinea lamp design; (b) Silk material; (c) Bird-shaped sake cups

Transfer mechanisms for embodied semantics

The four means combine and synergize with each other to jointly influence the semantic expression of the artifact embodiment and the cognitive effect of the user, involving three lays: perceptual, cognitive, and behavioral associations. First, perceptual association refers to the use of sensory stimuli to produce a mapping of the user's "body" that triggers embodied cognition. It often involves people's most immediate impressions and memories of the body itself. Second,

cognitive association refers to artifacts that trigger multimodal perceptions and feelings, evoke perceptual and learning experiences, and achieve mental embodiment. Finally, the behavioral association regulates the use of artifacts—people's body movements and gestures—so that the user recalls a specific scene in interacting with the artifacts and, then, generates embodied associations related to it. These three types of associations are the channels of "communication and dialogue" between designers and users through the artifacts, highlighting the results of the embodied design semantics.

The three layers of association realize the transfer of embodied semantics between designers (encoders) and users (decoders). Designers can select different means, identify elements, and carry out practices according to the design objectives to ensure that users understand their design intentions as accurately as possible and achieve the desired semantic expression effect.(1) The design of triggering the perceptual association layer is often realized through the most direct mimetic and sensory stimuli, and users can naturally recall the corresponding vestibular sensory experiences such as visual, auditory, and dermatological senses, to understand the richer and more figurative semantics. (2) The cognitive association layer triggers more reliance on people's spatial perception(Gallese & Lakoff, 2005). Designers give the shape and function of artifacts a unique form to construct imagery schema; users rely on their spatial association ability and use actions to produce embodied experience. (3) The triggering of behavioral associations is, first, influenced by sensory and cognitive factors, and the semantics are accurately conveyed to people through the norms and constraints of artifact design on the use of behavior and are reflected in the psychological feedback and subsequent user behavior.

Influences on the expression of embodied semantics

Although designers will spare no effort to ensure that users can correctly understand the design intent and realize the embodiment of semantic cognition, this process is very complex. It is directly affected by the three attributes of embodied cognition and its "cultural filtration," which includes the following four main factors: self-knowledge,

environmental experience, usage behavior, and cultural identity.

Self-recognition

Users' awareness and experience of their own senses constitute the primary source of embodied cognition. Their sensory experience and cognitive habits will directly affect the cognitive results when using the artifacts. Considering the famous poem "Liangzhou Lyrics" (凉州词), "At night, fine wine is poured into the glistening cup, before drinking, battle pipa sounds urge combat," the unique combination of wine and artifacts gives people a wonderful sensory experience in terms of color, smell, and taste. In addition, an inherent experience of drinking wine has been formed by more than 1,000 years of singing.

Environmental experience

The environment in which the artifact is used also participates in constructing embodied cognition; in other words, embodied semantics is the result of the experience of the artifact itself in conjunction with the environment. For example, in summer, people prefer the coolness of iron cutleries, while, in winter, they tend to find them too cold and avoid touching them. In this example, different usage environments affect people's experience, indicating that environment and artifacts influence each other in producing embodied cognition. In addition, factors such as ambient light and sound can also cause changes in the perceived characteristics of the artifacts, indirectly affecting the user's embodied cognition of the artifacts.

Usage behavior

Designers give artifacts different functions and expect users to use them according to their design intent. However, when users use the artifacts, they tend to understand how the artifacts are used based on their past experiences and their own usage habits. This may result in a mismatch between the user's actual usage behavior and the designer's design intent.

One of the most vivid examples is the traditional Chinese tableware, chopsticks, which have adopted a "convergent functional design"(Wei, 2021). In addition to the standard four-finger action of picking up food, chopsticks can be used to perform more than 20 other actions, such as splitting, pinching, picking, plucking, tearing, and stabbing. Depending on the type of food, chopsticks can be used in a variety of new ways.

Cultural identity

The influence of the user's cultural identity on embodied cognition stems from its "cultural filtering." It consists of the overall perception of the current environment and the cultural identity acquired through historical inheritance. They make people generate the tendency to perceive product form and semantics and filter out the combination of one-sided cultural symbols from artifacts and environment to form embodied cognition with cultural characteristics. For example, the body shape of the Qing Dynasty " 福 " wine pot imitates the shape of the Chinese character " 寿 ". When the user drinks the wine in the pot, it evokes the imagery of imbibing "divine water" infused with "good fortune and longevity" into the body and being blessed by the gods(Sugiura, 2006). This example shows that only those who recognize the Chinese character " 福 " can have an embodied experience of "blessing."

These four factors work together to shape the user's embodied experience. In addition, they influence the designer's creative process and are inherent constraints that should be carefully considered. Designers often gather information about user experiences through observation, questionnaires, and semi-structured interviews to measure the expressive effect of embodied semantics and adjust the program according to the feedback. These include the following three points. (1) sensory perception: the user's intuitive perception or association of the artifact, (2) semantic cognition: the user's recognition of the semantics expressed by the artifact, and (3) behavioral experience: the associations and feelings generated by the user behavior in the process of using the

artifact. as shown in Figure 1(b).

Design Ideas for the Artifact Embodiment

Designers can infuse embodied semantics into the shapes and functions of artifacts through anthropomorphic, sensory perception, imagery schema, and behavioral experience designs after fully understanding the use scenes, user characteristics, and cultural background of the artifacts. They can also use experience, environment, behavior, culture, and other factors to trigger perceptual, cognitive, and behavioral associations with the user to convey embodied semantics and obtain timely user feedback. Based on this, this paper proposes a process of embodied design for artifacts and attempts to put the process of embodied design into practice to verify and evaluate its feasibility.

Process of embodied design

In the design, it is necessary to, first, consider all kinds of influencing factors in the use scenario, clarify the layer of embodied semantic expression that is to be triggered, and choose appropriate design means. The process involves four steps, as shown in Figure 3. (1) The first step is to determine the specific scenarios and target users of the design. (2) The second step is to analyze the influencing factors of embodied semantics in different scenarios, including the user's own perceptual experience of this type of artifacts, their personal experience of the environment, and the possible behavioral characteristics of the artifacts when they are being used, as well as the user's cultural background and customs. This allows them to understand the limitations of the four influencing factors of self-perception, environmental experience, behavior, and cultural identity on the shape and function of the artifacts and to determine the design boundary. restrictions, and determine the design boundary. (3) The third step is to define the semantics to be expressed and correspond to the four influencing factors and, then, select the proposed triggering layers (perception, cognition, and behavior) and create the semantics using the corresponding embodied design tools, including anthropomorphism, sensory perception,

imagery, and behavioral experience. (4) The fourth step is to evaluate the design results to obtain the users' sensory perception, semantic cognition, behavioral experience, and comprehensive feelings: how the artifact triggers the embodied association with them through user descriptions, how strongly the artifact triggers the embodied association through the users' evaluations, and compare the users' descriptions with the semantic expression of embodied intention.

To verify the expression effect of embodied semantics more intuitively, this paper considers the design of drinking utensils as an example and begins from the three layers of association to design three kinds of drinking utensils in the scene of "Baijiu (liquor) Bar," which is characterized by Chinese culture; then, it evaluates the expression effect of embodied semantics.

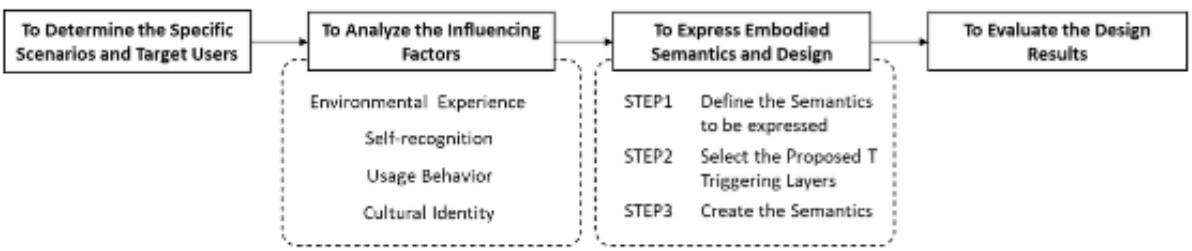

Figure 3. Embodied design flow

Embodied design practice

The Chinese have a long cultural history of drinking alcohol. In recent years, a new type of " Baijiu bar" has had a great impact on the traditional bar concept, which mostly combines Eastern and Western cultural elements to create an avant-garde drinking experience. This new scenario has changed the design of the modern Chinese Baijiu bar. Through fieldwork and observation interviews in the case of the Hope & Sesame bar in Guangzhou, as well as a review of the history and cultural development of drinking in China, we summarize the factors of cultural identity, self- perception, environmental experience, and usage behavior that influence the embodied expression of drinkware design.

1. Analysis of influencing factors

The cultural identity factors of Baijiu drinking utensils come first from the idea of traditional Chinese wine culture: "following the ritual system, respecting nature, advocating moderation, focusing on elegance, enhancing socialization, and relieving worries with wine." They also coincide with the current concepts of "table culture," banquets and socializing, and drunkenness and hangovers. Coupled with the strong cellar aroma and more stimulating taste of Baijiu, they generally bring people a self-recognized notion of "strong" and "to be drank only with meals." The "Baijiu bar" creates a quiet and unique "social environment" through dim and warm lighting design, relaxing and soothing music, and the interweaving of fabric, leather, metal, wood and other materials, as shown in Figure 4. This softens the stereotypical image of Baijiu and, simultaneously, gives new life to the norms of drinking behavior such as etiquette (e.g., Shang Dynasty bronze wine vessels), the pleasure of drinking (e.g., " 流觞曲水 ": an activity in which the literati sit in order of seniority behind a small winding creek. Wine cups are floated down the creek. When a wine cup stops, the man closest to the cup is asked to drink the wine in the cup and write a poem), and moderation and restraint (e.g., the nine-dragon goblet).

Figure 4. Hope & Sesame Bar in Guangzhou

2. Embodied semantic expression and design

The design of the drinkware for the "Baijiu bar" starts from the perspective of "reconciling" people's stereotypical impression of Baijiu with the drinking environment. Subsequently, the design of the first "Mi Zhi Hua" wine glass starts from the layer of perceptual association and applies sensory perception design means on the coaster. Wrapping rice grains in undyed burlap creates the texture of a "rice sack," allowing the drinker to have a physical association with "grain." The embodied semantics of "natural" and "comfortable" are conveyed from both tactile and visual aspects, as shown in Figure 5(a). The second design of the "Offering" wine glass starts from the cognitive association layer and applies anthropomorphism and intentional schema design to trigger cognitive associations from the shape of the wine vessel and the spatial relationship between the components. In the shape, the anthropomorphic figure, which is supported by both hands, expresses the behavioral semantics of "offering," and the spatial pattern of "up" expresses the embodied semantics of "honoring the gods" in traditional rituals and sacrifices, as shown in Figure 5(b). The third wine cup design, "Holding the Goblet in Reverence," starts from the behavioral association layer and guides the drinker to generate behavioral embodied associations by lifting the cup and clinking the cups. The "two ears" for holding the goblet are designed based on the shape of the ancient wine vessel "Yu Shang." This design not only regulates the user's drinking behavior but also differentiates it from the "gulp" style of drinking with one hand and creates a psychological feeling of "moderation" and "respect," as shown in Figure 5(c).

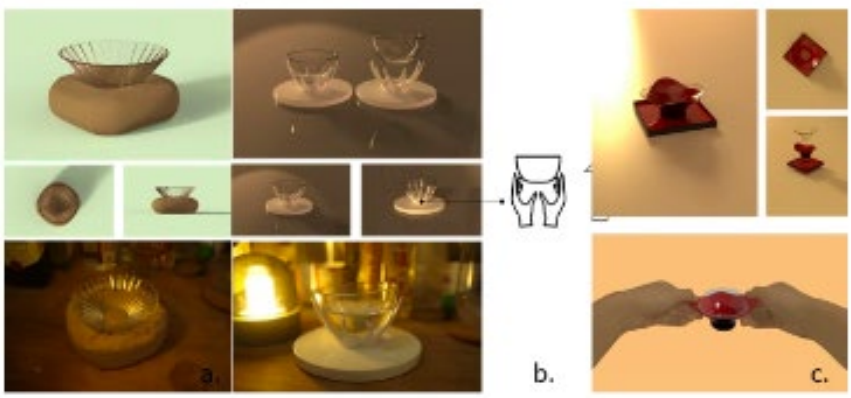

Figure 5. (a) Design of the "*Mi Zhi Hua*" wine cup; (b) Design of the "Offering" wine cup; (c) Design of the "Holding the Goblet in Reverence" wine cup

3. Semantic embodied effect feedback and evaluation

Ten subjects were invited to experience the three wine cups and evaluate the effect of their embodied semantic expressions. The collated results are shown in Table 2.

Table 2. Feedback results on the use of wine cups

Wine cup	Test no.	Expected embodied objectives	Results achieved	Feedback not achieved	Estimation
"*Mi Zhi Hua*"		The Association of "Grain"	50%	The material is softer and more reminiscent of a sofa and a little harder to associate with a rice bag.	Average
	②	"Nature"	100%		Very satisfactory
	⑧	"Comfort"	100%		Very satisfactory
"Offering"	①	"Offer with both hands"	70%	The hand imagery is a bit hard to recognize, it would be more similar to a tree branch or a water droplet and would be somewhat aggressive at certain angles.	Satisfactory
	②	"Precious wine"	60%		Satisfactory
	③	"Worship of gods"	20%	It can create a feeling of respect, but it is difficult to associate it in that direction when you may not normally have that experience of honoring the gods.	Expectations not met
"Holding the Goblet in Reverence"	①	"Moderation"	20%	"The red color is reminiscent of a dipping saucer and creates a feeling of being in a hot pot restaurant."	Expectations not met
	②	"Respect"	100%		Very satisfactory

From the test results, the wine glass designs corresponding to the three layers of association can accurately convey the semantics of embodiment. (1) In the test of the "Mi Zhi Hua" design that triggered the perceptual association, all ten subjects were able to feel the natural and comfortable embodied experience by using the wine glass, but the semantic meaning of "grain" could not be well recognized due to the bias of the designer's material choice. (2) In the design of "offering," which triggers cognitive associations, although there is a deviation in the recognition

of the imagery of "hand," the subjects were able to understand the intended meaning of "offering" and "salute" after recognizing the hand movement. This further triggered the influence on the drinking experience and the cognition of Baijiu. The semantics of "honoring the gods" is difficult to recognize because of its distance from modern thinking. (3) Triggering the design based on behavioral association, "holding the goblet in reverence" will be affected by the perception and cognitive factors triggered by the goblet itself, resulting in a deviation of the communication effect. The semantics of "salute" could only be felt after repeated use.

Conclusions and Outlook

From the perspective of embodiment design theory, this paper explores the mechanism of semantic expression and transmission of artifact embodiment and, then, puts forward a new idea of artifact embodiment design, which includes three aspects. (1) Designers can express the semantics through four different design means, including anthropomorphic (i.e., simulating the body's gesture or expression), sensory experience (i.e., influencing the senses through materials), imagery schema (i.e., affecting feelings through spatial relations) and behavioral experience (i.e., impacting cognition through the act of use). (2) After using the artifact, the user will have a semantic embodied cognition through the three layers of perception, cognition, and behavior. (3) The process of embodiment is also influenced by the user's self-perception, environmental experience, usage behavior, and cultural identity. Designers can get the user's comprehensive experience through the latter's feedback on sensory perception, semantic cognition, and behavioral experience to analyze the design's embodiment effect. Integrating the process of design expression and feedback, this paper provides designers with a methodology for embodied design and evaluation and verifies it through the design practice of three wine cups.

Through theoretical research and design practice, this paper provides a new idea to apply the embodiment theory in artifact design, which can better realize the transmission of embodied meaning and has practical value. From the actual expression effect, the specific design method and its expression effect still need to be further demonstrated. In addition, it raises further issues that need to be carefully examined with more research and practice.

Acknowledgments

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References

Gallese †, V. & Lakoff, G. (2005). The Brain's concepts: The role of the Sensory-motor system in conceptual knowledge. Cognitive Neuropsychology, 22(3–4), 455–479. DOI: 10.1080/02643290442000310

Guo Yanlong & Sun Jianbo. (2022). "Yi Ren Wei Ben" sheji shijiaoxia jushenxing chanpin sheji luoji yanjiu. Packaging engineering, S1, 31-35. DOI: 10.19554/j.cnki.1001-3563.2022.S1.006.

He Jing. (2009). Body Image and Body Schema: A Study of Embodied Cognition. Doctoral dissertation, Zhejiang University, Hangzhou, Zhejiang.

Li Hengwei & Pang Jianbo. (2006). Embodiment of cognition. Studies in Science of Science, 02, 184-190. DOI:

10.16192/j.cnki.1003-2053.2006.02.005.
Liu Xuefei & Xia Jie. (2004). A Review in the Human Design of Product. Journal of Guilin University of Electronic Technology, 1, 64-68. DOI: 0.16725/j.cnki.cn45-1351/tn.2004.01.017.

Sugiura, Kohei. (2006). YaZhou de ShuJi, WenZi Yu SheJi (Jing Yang & JianHua Li, Trans. 1 ed). Beijing: SDX Joint Publishing Company.
Sun Yi & Wang Yuan. (2021). The Dual Structure of Embodied-Cultural Effects on Metaphorical Cognition, Journal of Shenzhen University (Humanities & Social Science), 3, 136-143.
Van Rompay T. J. L. and Ludden G. D. S. (2015). Types of embodiment in design: The embodied foundations of meaning and affect in product design. International Journal of Design, 9(1), 1- 11.
Wang Shenli & Lifang Xie. (2021). A Review of Embodied Cognition Research. Journal of Shaoguan University,7, 83-87Xie Yong. (2020). Qianxi Chanping Jiaohusheji Zhongde Jushensheji. Literature Life(Next Trimonthly Publication), 30, 157-158. DOI: 10.12228/j.issn.1005- 5312.2020.30.109.
Wang Ying. (2006). The Interpretation for Cognitive Process of Language Formation. Journal of Sichuan International Studies University, 6, 53-59.
Wei Zhou. (2021). Kuaizi Lide Zhongguo Zhexue Yu Zhihui. Tong Zhou Gong Ji, 12, 51-55. DOI: 10.19417/j.cnki.tzgj.2021.12.013.
Xie Yong. Qianxi Chanping Jiaohusheji Zhongde Jushensheji. Literature Life(Next Trimonthly Publication),2020(30), 157-158. DOI:10.12228/j.issn.1005-5312.2020.30.109.
Xie Zishen & Haosheng Ye. (2019). The Comparison of Enactive Cognition and Embodied
Functionalism——How to Use the Representations.
1520-1525. DOI:
Journal of Psychological Science, 42(6),
10.16719/j.cnki.1671-6981.20190635.
Yang Mi, Li Dong & Cui Qian. (2022). Affective Function of Touch and The Neurophysiological Mechanism. Advances in Psychological Science, 2, 324-332.
DOI:
Zhu Nairong. (2011). Hongse Zai Zhongxifang Wenhua Zhong Neihan De Bijiao. Science & Technology Information, 10, 240. DOI: 10.16661/j.cnki.1672-3791.2011.10.104.

Virtual Self Care: Explorations in using immersive technology to support positive mental health and wellbeing

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Virtual Self Care

Abstract
The purpose of this paper is to investigate the potential of virtual reality (VR) technology as a therapeutic tool for the promotion of mental health and well-being in adolescent students. At a time of increasing mental health concerns among this population, this study aims to explore the effectiveness of VR interventions in addressing these challenges. Using a mixed-methods approach that combines qualitative interviews and quantitative assessments, this research explores the experiential impact of VR-based interventions on stress reduction, emotional regulation, and overall mental well-being among adolescent participants. By analysing the subjective experiences elicited during VR immersion, this study seeks to elucidate the mechanisms underlying the potential therapeutic benefits of VR for this population. Findings from this research endeavour will not only shed light on the feasibility and acceptability of integrating VR technology into mental health interventions for adolescent students but will also provide insights into how to optimise VR environments to maximise their effectiveness in promoting mental wellbeing in educational settings.

Methodology:
"Can virtual reality be a useful tool in supporting adolescent mental health and well- being?" The research aimed to assess the effectiveness, usability, or impact of VR in supporting adolescent mental health.
Participants in the study were 19 students from a London-based art college, aged 16-18 years. Participants were informed of the purpose of the study and gave their consent to take part in the research. Students discussed the

ethical implications of their use of technology and their personal experiences of mental health and well- being. The students' feedback was discussed, and the students' experiences were recorded through interviews and surveys. This data was used to create an immersive experience, which was also tested with participants.

The ethical framework of this study was influenced by prior research (Fahey 2014) on our interactions with digital technology, and how this affects us psychologically. Students were interviewed individually, with our conversations recorded and observations made in note form. Students' computer and device usage was analysed over several weeks to select a range of students for the study, with device usage ranging from low to high. Discussions with students about any potential concerns took place in the weeks before the study began. Participants were worked with over an academic year (September 2021-June 2022). Ethical considerations were approved by the Research Ethics and Integrity Sub-Committee (REISC) at Goldsmiths, University of London. Within the college, students had access to additional pastoral staff who were appointed to support students' mental health and well-being should they have any concerns.

By digitising therapeutic practices and getting participants to work on their mental health and well-being in virtual spaces, participants were given a new perspective on wellbeing. The proposed development of this research project is to explore the use of biofeedback to create virtual environments that respond to bodily functions.

Findings:

Background:

To take a Rhizomatic approach in mapping out this research project, some of the initial threads at the root of the project emerge from science fiction.

The themes presented in Ghost in the Shell (1995) are prophetic allegories for humankind's current relationship with technology and the possible future of a more cybernetic world. Haraway (2016) philosophises about the 'Spectre of the Ghost in the machine' (Haraway, 2016, p.11) stating that modern-day machines highlight the ambiguity between the natural and artificial. We currently live in a reality where machines are present in most day-to-day routines. In modern-day society, it is hard to escape the thrall of our devices, vibrating in our pockets and alerting us to an infinite possibility of connections. Virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) are some examples of technology that embody the balance between humans and machines. Research into creating human-like AI and developing more immersive virtual worlds present many ethical existential quandaries. As we become more embedded within the machine, it is fundamental that we instill technology with humanistic traits, or else we could be in danger of undermining our human nature.

Exploring Virtual Spaces:

The first research stage in the study was to introduce the students to VR with a familiar experience. Each participant experienced different virtual worlds tailored to their interests. Stage two of the research introduced the students to a range of existing well-being apps, which focused on using games and meditative experiences to calm the mind. Stage three of the research was to apply the student feedback and build a new immersive experience.

"It puts you completely in it as opposed to you trying to put yourself in it through your sight or listening to something. I think by seeing it you're kind of forced to be in it, but in a good way. It doesn't leave you any room for your mind to wander." (Student Participant)

All students reported that the experiences altered their moods, stating that they felt calmer and sometimes energised and more creative; however, some students reported that the experiences were too stimulating

and sometimes had the reverse effect. Considering that the student participants had previously had difficulty switching off during meditation, the fact that these experiences allowed them to take this practice into their lives is a strong indicator that VR therapy can extend from virtual realms and into everyday life.

Using the student feedback, the last stage of the research was to develop a new immersive experience. Working closely with therapists we developed the idea to mimic a self-hypnosis exercise called the 'control room technique' (Stagg 2015). The technique involves taking a patient down a staircase and into a relaxing space towards the control room of their mind, once the patient is in their control room, they are prompted to adjust their thinking habits to better deal with stressors or difficulties. Using a recording of a therapist talking through the control room combined with a binaural audio track, an immersive 3D spatial soundscape was generated. The

'What if a cyber brain could possibly generate its own ghost, and create a soul all by itself? And if it did, just what would be the importance of being human then?' (Ghost in the Shell, 1995, 00.42.43)

virtual world was built mainly in Unreal Engine and Cinema 4D, the design was developed to support the soundscape and to guide the participants through the experience.

Upon completing early beta versions of this experience, I realised this project was just in

the early conceptual stages, sewing a seed for themes I want to explore in more detail with further research. This process was more of a reaction than a response; the brain's initial knee-jerk towards generating an artefact inspired by the research.

Technology's role in our daily lives is becoming embedded into our physiology. Wearable devices that alter our perception of the world move us towards manifesting Haraway's cyborg;

'This cyborg is our ontology; it gives us our politics. The cyborg is a condensed image of both imagination and material reality, the two joined centres structuring any possibility of historical transformation.' (Haraway, 2016, p. 4)

Considering the embodiment of technology in modern-day society, VR will likely be equally present in the future. Concerning supporting mental health, VR appears to be a valuable tool. The existing examples of VR software focused on well-being evidence that technology can make us more aware of our mental health and well- being. VR is a relatively new technology and how it gets adopted into our daily lives is yet to be seen. The students who participated in the study could use VR to foster a positive mental state and trigger discussions about their well-being. The students might not have considered using VR to support their mental health if they explored this independently, suggesting that the framework to introduce people to virtual therapy should be more available. We currently mostly access VR for gaming; however, the different applications are advancing, 'and it would not be surprising to see a flourishing ecosystem of metaverses before long' (Chalmers 2022 p186). There is much scope here to build new software that incorporates virtual therapeutic practices.

The human mind is complex, and our mental health and well-being are exceptionally subjective; therefore, we cannot say that using VR is a cure-all solution. The research carried out in this essay and the theories presented suggest that incorporating VR with therapeutic practices has great potential and can help foster positive mental attitudes. It is essential not to remove the human element when developing VR. Through discussion with the students involved in this study, we could summarise their experiences and discuss how they perceived these virtual worlds. In response to this research project, I am developing virtual experiences that combine self-hypnosis with immersive animated sequences. I plan to continue testing these environments with my students and believe that this research is the beginning of a much more in-depth exploration into how we can use VR to support our mental health and well-being.

To conclude the study, students answered the question: What importance do you feel technology will have in your future? The responses were a range of positive, negative, and neutral opinions. One of the students' answered

"As a generation becoming more dependent on the technological world, ways of living have changed to an unchangeable stance. I believe that technology will take over humankind's work and normal life. I think
The students responded well to the immersive control room sequence
and stated that it allowed them to alter their negative thought processes.
technology will be able to save lives medically and transform ways of communication. Additionally, I believe it will allow positive changes in education and virtual learning, however, we as humans should never overstep the line of technological power." (Student Participant)

It is clear from reading the students' answers that this study has provided them with a platform to consider how they interact with technology. Despite showing optimism for therapeutic, educational, and medical technological applications, they are aware of the possible moral dilemmas surrounding being more connected to the machine. Technology has immense power over society, and there is a danger that if we misuse technology, we could create more issues in the future; however, there is also the potential for what we can achieve with future developments. Overall, I am excited about how we can adopt new technologies into society. The problem is not with technology but more with how we access it. With companies such as Meta (Facebook) monopolising VR, we must ensure that we instill these virtual worlds with the raw elements which make us human by developing virtual societies where one can better themselves online rather than reflecting a consumerist society with a myriad of immersive advertisements. VR is a space with the capacity to provide freedom, freedom from the constraints of reality. We need to use this space to promote new ideas and support our human needs. The future of technology is ambiguous, which will hopefully continue to drive research in this field toward new horizons, presenting an interesting power struggle between the potential threat presented by VR and how we best adopt this technology. Whitehead celebrates the importance of scientific discovery and the profound impact it has on culture and society, and this is the exact sentiment of how scientists and researchers should strive to develop technology to benefit humankind "It is the business of the future to be dangerous, and it is under the merits of science that it equips the future for its duties" (Whitehead, 2011)

Bibliography

Alter, P. (2020) 'Is Virtual Reality the Future of Democracy?', DataSeries, 15 February. Available at: https://medium.com/dataseries/is-virtual-reality-the-future-of-democracy-77d89aa5c8f6 (Accessed: 17 April 2022).

American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders: DSM- 5, Arlington, VA, American Psychiatric Association

Braidotti, R. (2013) The Posthuman, Polity Press, Cambridge, UK

Bostrom, N. (2014) Superintelligence: paths, dangers, strategies. First edition. Oxford: Oxford University Press.

Chalmers, D.J. (2022) Reality +: Virtual Worlds and The Problems of Philosophy, London, Allen Lane, Penguin

Coding Leap LLC (2021) Noda – Mind Mapping in VR, Oculus Quest 2

Deleuze, G. & Guattari, F. (1999) Deleuze and Guattari's Anti-Oedipus introduction to schizoanalysis, London, New York, Routledge

Descartes, R. and Hall, T.S. (2003) Treatise of Man. Harvard University Press (Harvard monographs in the history of science)

Descartes, R (1641) Illustration of Dualism, [Drawing] Retrieved 01 June, 2021, from: https://en.wikipedia.org/wiki/Mind–body_dualism#/media/File:Descartes_mind_and_body.gif

Fahey, C. (2022) Fieldnotes: Interviews with study groups Feb 2022-Mar 2022, [Unpublished]

Fahey, C. (2014) How to embed meta-learning as a fundamental element within an Art and Design pedagogy? June 2014, [Unpublished]

Falconer, C. J. Rovira, A. King, J, A. Gilbert, P. Antley, A. Fearon, P. Ralph, N.
Slater, M. & Brewin C, R. (2018) 'Embodying self-compassion within virtual reality and its effects on patients with depression' BJ Psych Open, Volume 2, Issue 1, January 2, pp 74 – 80 Retrieved 01 June, 2021, from <https://www.cambridge.org/core/journals/bjpsych-open/article/embodying- selfcompassion-within-virtual-reality-and-its-effects-on-patients-with- depression/1A1217651159D085145A7999CFFFF772 >
Gravity Sketch (2019) Gravity Sketch, Oculus Quest 2
Grimes, K. M., Fleischmann, K. R., & Jaeger, P. T. (2009) Virtual Guineapigs: Ethical implications of human subjects research in virtual worlds. International Journal of Internet Research Ethics, 2(1), 38- 56
Ghost in the Shell (1995) Directed by Mamoru Oshii [Film]. Japan, Shochiku
Haraway, D. J. (2016) A Cyborg Manifesto: Science Technology and Socialist Feminism in the Late Twentieth Century
Minneapolis: University of Minnesota Press.
How Many People Have Smartphones? [March 2022 Update] | Oberlo (no date). Available at: https://www.oberlo.com/statistics/how-many-people-have-smartphones (Accessed: 31 March 2022). Infectious Ape (2019) Kingspray Graffiti, Oculus Quest 2
Lanier, J. (2013). Who Owns the Future? New York: Simon and Schuster.
Modderkolk H (2021) There's a War Going On but No One Can See It, UK, Bloomsbury Publishing. Neubauer, A.C. (2021) 'The future of intelligence research in the coming age of artificial intelligence – With a special consideration of the philosophical movements of trans- and
posthumanism', Intelligence, 87, p. 101563.
Pies, R. (2009) 'Should DSM-V Designate "Internet Addiction" a Mental Disorder?', [online] Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2719452/ [Accesses 17 February 2021]Stagg, A.M. (2015) The benefits of the control room technique - hypnotherapy directory. Available at: https://www.hypnotherapy-directory.org.uk/memberarticles/the-benefits-of-the-control-room-technique (Accessed: 19 April 2021).
Tripp Incorporated (2019) TRIPP- A new way to meditate, Oculus Quest 2Van Rooij, M., Lobel, A., Harris, O., Smit, N., & Granic, I. (2016, May). DEEP: A biofeedback virtual reality game for children at- risk for anxiety. In Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (pp. 1989-1997). ACM. doi: 10.1145/2851581.2892452
Vunderwelten (2021) Flowborne – Breathing Meditation, Oculus Quest 2
Wankel C., & Malleck, S. (2010) Emerging Ethical Issues of Life in Virtual Worlds. NC, Information Age Publishing,
Weerdmeester, J. (2021) 'Exploring the Potential of Game-based Biofeedback Interventions for Anxiety Regulation', p. 197.
Wheeler J. A., (1989) Information, Physics, Quantum: The Search for Links, Proceedings of the 3rd international symposium on the foundations of quantum mechanics, Tokyo 354-68
Whitehead, A. (2011) Science and the Modern World, Cambridge: Cambridge University Press.

From Imitating Nature to Transforming Nature: A New Typology of Biodesign

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Abstract

By leveraging breakthrough innovations in contemporary biotechnology, biodesign—which echoes the symbiotic thinking of the 'Chthulucene'—has become one of the most popular strategies for change in light in light of the increasingly severe ecological crisis and globalization is facing challenges. Due to the diversity of human–nature relationships and the complexity of biological materials, basic research on biodesign remains scarce. In this paper, through analysis of case studies on the fields, types, and characteristics of biodesign combined with new biodesign practices and compared with traditional classification methods, a new typology of biodesign is proposed, comprised of the classifications biohacking, biomatrix manufacturing, biological hybrid interaction, and bioethical speculative, which provides differentiated positioning theories for subsequent biodesign practices and helps designers establish clearer and more accurate design practice strategies.

Author keywords

Biodesign; biomaterial; sustainability; typology

Introduction

With the flourishing of emerging technologies represented by Nanotechnology, Biotechnology, Information Technology, and Cognitive Science (NBIC) convergence and their deep penetration into everyday life, the boundaries between design that focuses on human–technology interaction and other disciplines are gradually blurring. Moreover, new disciplinary characteristics, such as identifiable de-disciplinarity, inter-disciplinarity, and non-disciplinarity characteristics, have emerged (Bremner and Rodgers 2013). These provide fertile ground for developing design practices such as biodesign, speculative design, material design, and biological interaction. In the face of the increasingly severe ecological crisis that has become a global concern, biodesign, which echoes the Chthulucene (Haraway 2015) 'symbiosis' strategies, has become one of the most popular strategies for change. By leveraging breakthrough innovations in contemporary biotechnology, designers have the opportunity to exploit novel biomolecular structures, form new biomaterials, and expand new functions, thereby exploring the research potential of living organisms as design media (Melkozernov and Sorensen 2021).

This study focused on biodesign that emphasizes biomaterial-driven design, types, and characteristics of biodesign. Based on the second generation of biodesign2, a new typology of biodesign is proposed in comparison to the first generation of biodesign classification1 that provides an epistemological basis and methodological

foundation for subsequent biodesign practices.

Definition and Significance of Biodesign

Curator William Myers was the first to define biodesign, proposing that "biodesign uses living organisms or ecosystems as an essential part of the design to enhance the functionality of the design finished work" (Myers 2012). This is the first definition describing what constitutes biodesign in terms of 'living objects' (ecosystems) and 'bodies' (organisms). Notably, the year after the book was published, Carole Collet, a contemporary British biodesign scholar at the University of the Arts London, organized an exhibition with a biodesign theme called 'Alive' (Collet 2013) and proposed five new roles for designers and the relationships between these roles and nature. This became a key resource for subsequent biodesign research. As a quintessential representative of interdisciplinary cultural practice, biodesign integrates disciplinary knowledge in the fields of design, ecology, synthetic biology, computer technology, and digital and biomanufacturing technologies, among others. With support from technology, biokinetic energy, and design narratives to provide forward-looking solutions for the constantly accelerating deterioration of the human living environment. Biomaterial is a core component of the field of biodesign; however, due to the complexity of the biological species involved and the diversity of the human and biological/natural relationship, helping designers quickly and effectively understand and categorize the many types of biodesign is a fundamental task for the discipline area.

Updates in the Classification of Biodesign

Creative practices in the rapidly growing field of biodesign involve constantly exploring new means of 'sustainability' and the development of new biomaterials. As mentioned earlier, based on the five levels of relationships between designers and nature (i.e., imitation, collaboration, programming, combination, and imagination), Collet (2013) classified biodesign innovation projects into five categories: nature as an object of imitation, nature as a partner, programming nature, nature mixed with non-living and living technologies, and the conceptualization and imagination of nature. The 2013 classification considers the new hierarchical structure of biodesign, producing a creative map that dares to imagine new relationships between nature and biology and providing an innovative knowledge model for subsequent biodesign practices. Building on Collet's classification of biodesign, Camere and Karana (2017) placed biodesign under the theme of nature as a co-worker, combining the practice methods used with different objectives in classification, and according to the way from basic research to applied research. They proposed four types of biodesign: augmented biology, biodesign fiction, digital biofabrication, and growing design. Thus, their study provides a reference standard for the classification of biomaterials for their application in biodesign. The field of biodesign continued to bloom. By studying and using the strategies and tools of living systems for design, Collet (2021) revised the biodesign categories into three by building on the five categories he had developed in 2013, producing the categories of nature as an object of imitation, nature as a partner, and nature as 'hackable' systems (Figure 1). The new categorization framework was more conducive to integration with the use of future biomaterials in practice and established two understandings of critical importance: designers should be alert to ethical issues in biodesign, and biodesign has the potential to promote sustainable practice (Collet 2021).

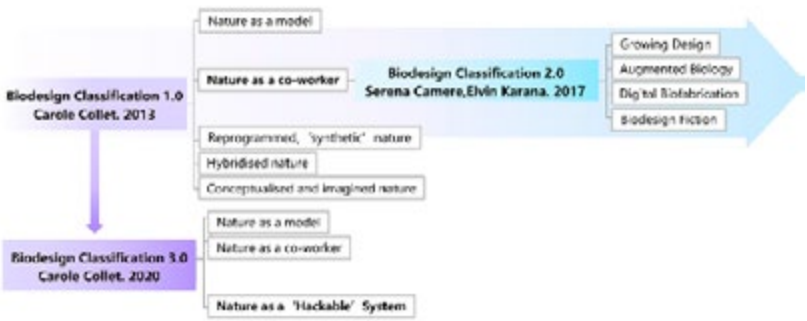

Figure 1. The classification and development of biodesign.

However, given the update and iteration of the above-mentioned biodesign classification in technological development, as well as the gradual growth of the biomaterial application field, current designers lack relevant knowledge of materials and application methods in the practice of biodesign. To better help designers deepen their understanding of the application methods and types of biodesign practice, this study analyzed existing biodesign practice cases to optimize the existing biodesign classification and propose a new typological structure that provides theoretical guidance for the practice of biodesign.

First, the collection of biodesign cases on Dezeen and Designboom design magazine website, the study sample was reduced to 15 biodesign practice cases by establishing four screening inclusionary criteria based on interaction mode, manufacturing technology, organism function, and design goal (Figure 2). Next, after collecting and summarizing the explanatory texts of the design cases, the word segmentation function of an online Word Cloud software was used to remove words with a frequency in the explanatory texts lower than 5, producing 32 high-frequency keywords related to biodesign features as classification references; frequency analysis was performed on it (Figure 3). To provide the main data support for the biodesign classification proposed later in this paper, the size of the origin area of the keyword in the figure was used to represent the frequency.

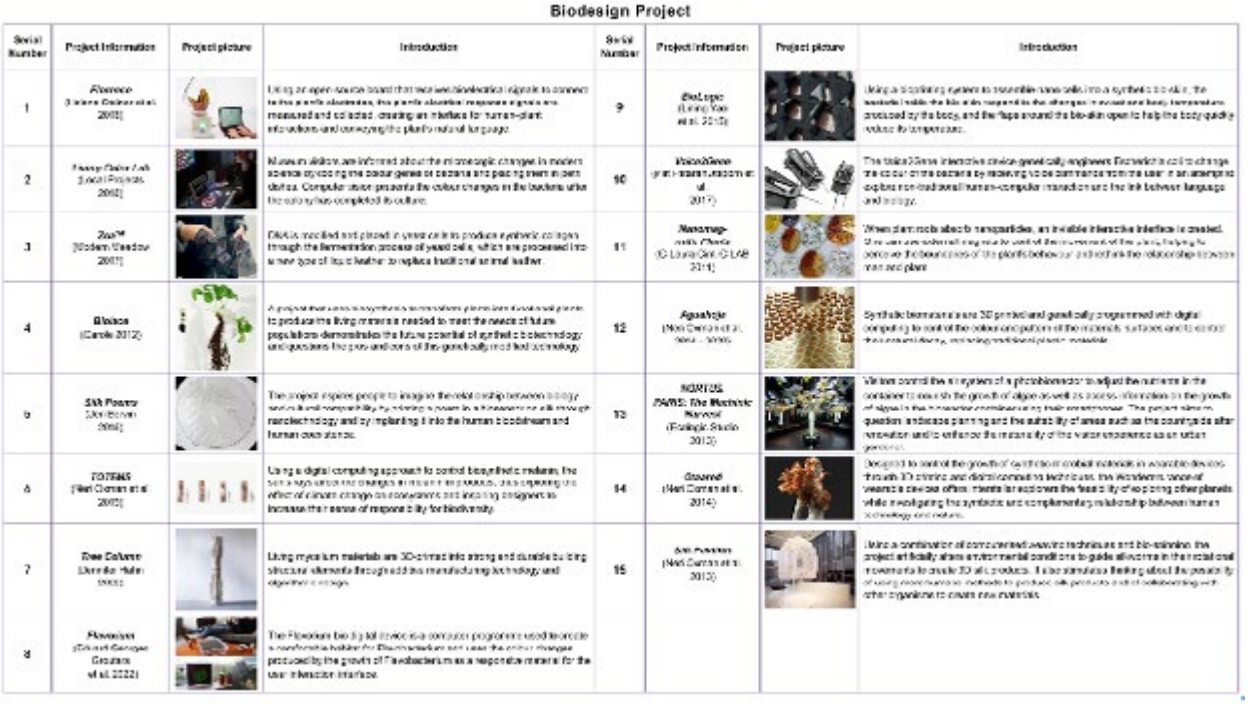

Figure 2. Practical cases of biodesign, the pictures of the cases are from the Internet.

Keywords	Frequency
Bio	62
Biomaterials	41
Plants	40
Growth	24
Bacillus	21
Aesthetics	14
Mycelium	14
Bacteria	13
System	12
Organism	10
Digital	10
Interface	9
Genes	9
Engineering	9
Synthetic	8
Space	8
Data	7
Information	7
Living organism	6
Mechanical	6
Lab	6
Signal	6
Language	6
Ethics	6
Imagine	5
Algorithm	5
Experience	5
Computers	5
Sensors	5
Speculative	5

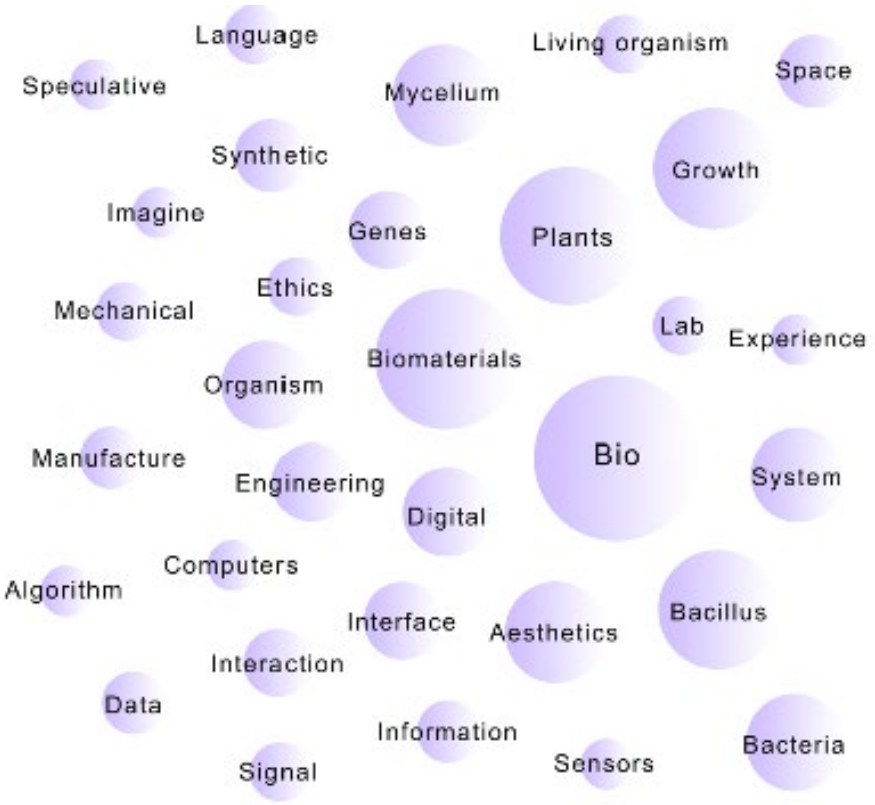

Figure 3. Frequency analysis of biodesign keywords, drawn by the author.

Based on the keyword frequency analysis of the above fifteen bio-design cases, this paper clusters 32 high-frequency keywords related to bio-design features, and it can be learned that, in terms of interaction mode, organisms act as sensors and interaction interfaces, transmitting digital signals through information units in response to changes in the user's behavior; in terms of design goals, it expanding from exploring the functional properties of organisms to reflecting on the ethical issues of biodesign In terms of production and manufacturing, there is a gradual shift from traditional mechanized production to the use of technologies such as additive manufacturing and digital computing to operate on the atomic structure of biomaterials; and in terms of design function, the genes of organisms are recorded in laboratories with the help of synthetic biotechnology as a means of generating new biomaterials and functions. Therefore, this paper proposes four new classifications of biodesign based on the four dimensions of interaction mode, design goals, manufacturing, and design functions, and then conducts a visual analysis of the keywords corresponding to these four different types and their characteristics (Figure 4), and finally get the 12 keywords of "biology, biomaterial, organism, synthesis, gene, manufacture, digital, interaction, interface, ethics, speculative, imagine" as the representative of each cluster features Key words. It is worth noting that some of the keywords in these four new categories overlap with each other, which reflects the practice features nature of biodesign as a multidisciplinary crossroads. While promoting the integration of design, organisms, and technology, Ethical issues related to biotechnology are also presented.

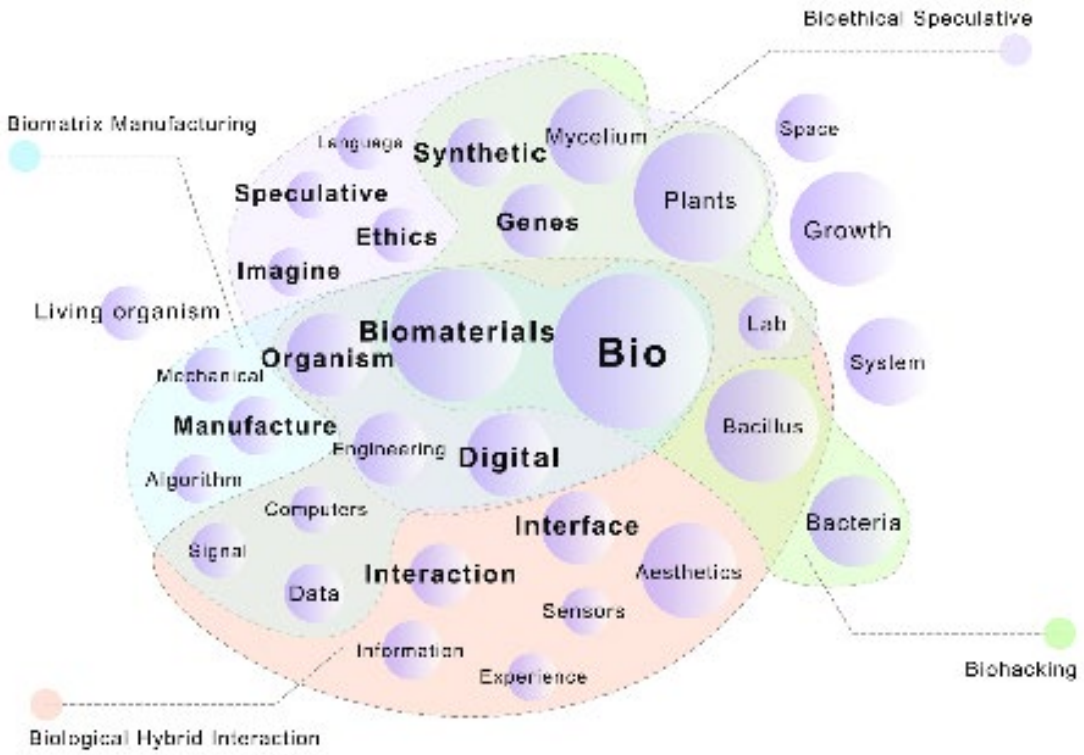

Figure 4. Keyword feature clustering for biodesign, drawn by the author.

In summary, this paper proposes a new classification of biodesign based on the third category of biodesign proposed by Collet (2020)—nature as a 'hackable' system—and combines it with the second generation of biodesign practice classification method proposed by Camere and Karana (2017). According to the differences and characteristics of biomaterial processing methods, biodesign is divided into four categories in the order of reality to future (ease of implementation) (Figure 5): biohacking, biomatrix manufacturing, biological hybrid interaction and bioethical speculative, the details of which are described below.

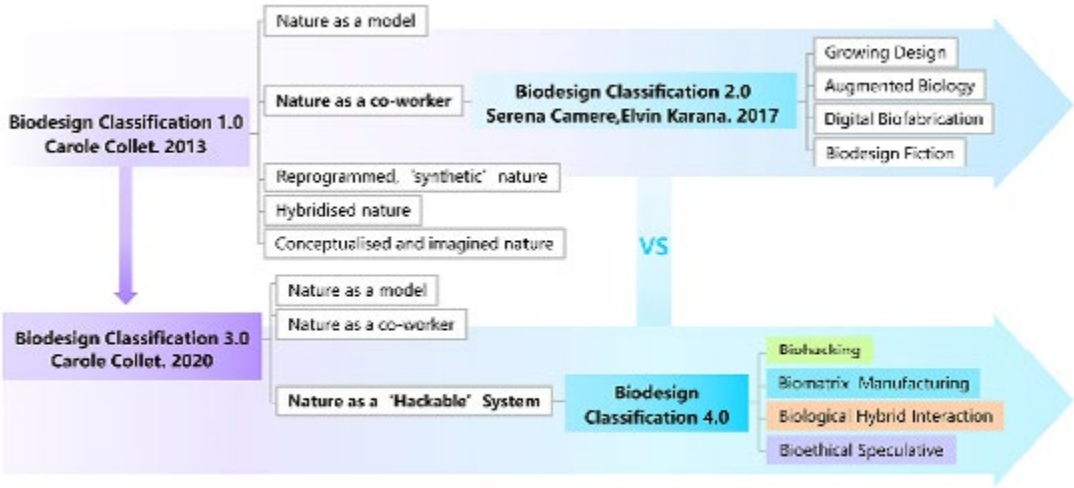

Figure 5. New classification of biodesign, drawn by the author.

The concept of 'Biohacking' means that designers use biosynthesis technology to synthesize new DNA information in laboratory test tubes, and carry out hacker-like creative programming on organisms, to change the cell structure to create new biomaterials and development of new functional modules. For example, the Modern Meadow company genetically modifies yeast DNA to produce synthetic collagen, which is processed into new liquid leather for making clothing fabrics, thus reducing the consumption of animal leather in the clothing industry (Modern Meadow 2017); 'Biomatrix manufacturing' is a concept derived from Neri Oxman's Material Ecology in 2015, which refers to the design and manufacture of new biological products by designers who make full use of digital computing and biomanufacturing techniques in a matrix system (Oxman et al. 2015). For example, the Tree Column project uses bio-3D-printed living mycelium material that forms a building load-bearing element with natural insulation and fire retardant properties (Hahn 2022), effectively reducing the contamination of concrete processes that occurs in the traditional construction industry; 'Biological hybrid interaction' is a new research direction at the intersection of materials science, computer science, and biodesign. Researchers have found that living organisms in nature play a role in systemic behavioral interactions and information transfer in the system and that microbial materials, such as mycelium and algae, can perform the sensing function of the sensor, sensing and responding to changes in the outside world (Gough et al. 2021). In terms of interaction methods, biomaterials differ from traditional passive machine interaction. As living substances, when information interaction occurs with users, they can not only respond to the users' behavior but also actively send and process biological information to the user. From a passive reception to an active response, the involvement of living organisms continues to expand the field of application of human–computer interaction (HCI) and drive the emergence of a new subfield of bio–human–computer interaction (Bio-HCI). For example, in the Florence project, the designers used electrodes attached to a plant and an open-source board to receive bioelectrical signals to create an interface between plants and the HCI, conveying the 'natural language' of plants in a way that humans can understand. The natural and digital worlds coexist harmoniously through enhanced communication (Steiner 2016); 'Bioethical speculative' is an emerging genre of biodesign typology that is generating debate and exploring the control of life. This concept first appeared in Collet's study (2021). Bioethical speculative refers to the linking of design, art, and biotechnology using biomaterials as a prop medium to construct fictional scenarios of application to stimulate public participation, dialogue, and reflection on the potential ethical issues of biotechnology (Gough et al. 2021) and to help humanity re-examine the ethics of this control over nature and its social implications (Collet 2021) to improve the increasingly severe confrontational relationship between humans and nature. For example, Collet's Biolace Project which reforms plants into performance factories through biosynthesis technology to produce the living materials needed by future populations, demonstrates the future potential of synthetic biotechnology and questions the pros and cons of genetic modification technology (Collet 2012).

Conclusion

Creative Based on the disciplinary background of the rapid development of today's cutting-edge biotechnology and material innovation technology and through knowledge of archaeology and typology research in the literature and biodesign cases, relocate and think about the role of designers in the practice of biodesign from the perspective of "crackable biological systems", and the traditional classification of biodesign has been completed and upgraded, and a new biodesign typology has been proposed. That is, Biohacking; Biomatrix Manufacturing; Biological Hybrid Interaction; Bioethical Speculative. Along with a new definition and interpretation of the four biodesign classifications, this paper also presents a preliminary picture of the interrelationships between the four biodesign practices. Designers will be able to quickly locate project types and identify project goals, and clarify

the relationship between biomaterials and design, to select appropriate practice methods and more targeted case references.

Acknowledgments

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Footnotes

1Building on the five relationships between designers and nature proposed in 2013, biodesign scholar Carole Collet adds a critical stance to examining the ethics of biodesign and the potential of biodesign to develop sustainably. In 2021, she proposed three new relationships between designers and nature. The designer uses bionic principles to learn from nature (nature as a model), cooperate with natural organisms (nature as a co-worker) and use synthetic biotechnology to modulate the genetic architecture of organisms to produce new substances (nature as a 'hackable' system).

2Serena Camere and Karana place the four categories of biodesign practice under the second category of Collet's five relationships between designer and nature—nature as a collaborator in the biomaterial design process. The four categories are growing design, augmented biology, digital biofabrication and biodesign fiction.

References

Bremner, C., and Rodgers, P. (2013). Design without discipline. Design Issues, 29(3), 4-13.

Collet, C. (2013). Alive: new design frontires. Retrieved March 10, 2022, from http://thisisalive.com/

Collet, C. (2021). Designing our future bio-materiality. AI & Soc 36, 1331–1342. https://doi.org/10.1007/s00146-020-01013-y

Collet, C. (2012). Biolace. Retrieved February 23, 2022, from http://thisisalive.com/biolace/

Gough, P., Yoo, S., Tomitsch, M., and Ahmadpour, N. (2021). Applying Bioaffordances through an Inquiry-Based Model: a literature review of interactive biodesign. International Journal of Human–Computer Interaction, 37(17), 1583-1597.

Haraway, D. (2015). Anthropocene, capitalocene, chthulhucene: Donna Haraway in conversation with Martha Kenney. Art in the Anthropocene: Encounters among aesthetics, politics, environments and epistemologies, 255-269.

Hahn, J. (2022). Tree Column. Retrieved February 23, 2022, from https://www.dezeen.com/2022/01/18/blast-studio-tree-column-mycelium-design/

Melkozernov, A. N., and Sorensen, V. (2021). What drives bio-art in the twenty-first century? Sources of innovations and cultural implications in bio-art/biodesign and biotechnology. AI & SOCIETY, 36(4), 1313-1321.

Myers, W. (2012). Bio design. Museum of Modern Art.

Modern Meadow. (2017). Zoa ™ . Retrieved May 28, 2022, from https://work-order.co/project/zoa

Oxman, N., Ortiz, C., Gramazio, F., and Kohler, M. (2015). Material ecology. Computer-Aided Design 60: 1–2.

Steiner, H. et al. (2016). Project Florence. Retrieved February 13, 2022, from https://www.helenesteiner.com/project/project-florence

Loc-globalisation Design: A New Approach to Systematically Reconciling Globalisation and Local Visions

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Abstract

The growth of globalisation has brought about dramatic changes in the lives of people around the world. It has led to economic growth, poverty reduction, and overall development in a number of countries, and has made it possible to formulate policies that take into account the interests of the wider global population. At the same time, however, globalisation has also increased global inequality, cultural homogenisation, loss of identity, increased consumption of non-renewable energy sources, increased greenhouse gas emissions, deforestation, and other negative impacts that have led to a more cautious attitude towards globalisation in recent years. In 2007, China's concept of "Ecological Civilisation" provided a clearer direction for sustainable development in various disciplines and fields. When the changes needed to address global climate disruption and social injustice are so widespread, the design discipline is contemplating how to engage more responsibly and systematically with the multiple levels of environmental and social crises in the new civilisation and how to explore design ecologies and interventions based on local natural ecologies, industries, and cultures that are more responsive to the visions of indigenous peoples and people in all regions of the world. Loc-globalisation Design (LGD) is a new field in design research, practice, and education. It is a systematic, holistic design based on the environment, indigenous people, and production lifestyles. This paper provides a comprehensive introduction to LGD, its framework and methodology, and demonstrates the application scenarios of LGD through a relevant case study. It also explores the future development direction of LGD, providing strong support and new ideas to promote the systematic localised development of the design discipline and to enable the design actions and tangible results to be acknowledged and communicated in the world.

Author keywords

Loc-globalisation design; system design; ecosystems; globalisation; design approach.

Introduction

From climate emergencies, water scarcity, wars, global pandemics, and countless inequalities, we face a multitude of solution-resistant problems that traditional design processes are inadequate to address (Rittel & Webber, 1973). Globalisation, starting in the early 1990s, has rapidly impacted economies and societies worldwide, stemming from neo-liberal ideas and trade liberalisation (Gozgor et al., 2020). This has led to

both positive changes due to increased interconnectedness and negative impacts such as inequality and environmental degradation. Developed nations often prioritise self-interest, potentially neglecting poorer countries (StudySmarter, n.d.). In the discourse surrounding global development, scholars highlight local differences and cultural patterns within globalisation, giving rise to "glocalisation", which originated as a term used in Japanese business studies in the 1980s. It provides a fresh perspective on ongoing interactions between the global and the local (Cheng & Zeng, 2023). According to American sociologist Roland Robertson (1995), the terms "local" and "global" are not opposites but interrelated, and localisation is an aspect of globalisation. Conversely, globalisation occurs through close association with the various local contexts that emerge in the process. This perspective is prominent in sociology, tourism, and business, but not extensively in design (Cheng, 2017).

In recent years, the development of the design discipline has become increasingly linked to globalisation and local cultures, production relations, and environments. While the positive impact of globalisation on connecting the world and promoting local cultures is undeniable, its side effects of potentially eroding local and regional identities and bringing about homogenisation across places and regions are becoming increasingly evident. An increasing number of design firms are expanding overseas, as expanding markets and industrial bases offer the prospect of commercial growth. "Small worlds" of different cultures are spreading across the globe, bringing with them contemporary design and advanced manufacturing techniques, while simultaneously overshadowing what used to be a distinctly unique style and flair in national design forms (Hirst, 2010). Our current phase of economic, institutional, technological, environmental, and social progress is increasingly calling for a global design that honours the ecology of local environments and indigenous wisdom, and fuses historically and geographically specific forms of design expression into a new "global style". China introduced Ecological Civilisation (EC) in 2007, aiming for harmonious coexistence between humans and nature through long-term, systematic environmental and social reforms (Wang et al., 2014; Zhu, 2016). The design discipline's challenge lies in positively facing global and local issues while aligning with EC's principles, emphasising systematic localised development, addressing environmental and social crises, and making the design achievements better meet the needs of the people in their own countries and in various regions of the world. The design field urgently requires a new approach to address these complex challenges.

In 2021, "Loc-globalisation Design (LGD)" was launched by the Loc-globalisation Research (LGR) Studio of China Central Academy of Fine Arts (CAFA). LGD is an emerging field of design research, practice, and education, which is a systematic and holistic design based on the environment, indigenous people, production, and lifestyle. Through the re-conceptualisation and deconstruction of local ecosystems and the reshaping of local relations of living, production, and life through the lens of design, LGD promotes the systematic localised development of design disciplines, expands and reshapes established paradigms through the use of local environments and wisdom, explores the potential for local design projects to have a global impact, and enables design actions and tangible results to be acknowledged and communicated more broadly around the world. LGD research is one of the practical pathways to explore Chinese-style modernisation from a design perspective.

LGD

In the process of development, human society improves the ability of production and labour by adapting to nature and transforming it, sums up the laws, and seeks a balanced relationship between human beings and the environment in which they live to achieve the purpose of species continuity and cultural inheritance. Design, as a global activity, affects the lives of almost all human beings on Earth (Hall & Cheng, 2018). In the face of the increasing contradictions and problems brought about by globalisation, the design discipline should systematically rethink its relationship with the local and global, as well as with local ecology. In recent years, the

design discipline has developed the fields of global design, local design, systemic design, transition design, and regenerative design. Global design follows a universal creative blueprint that appeals to a wide variety of people by focusing on accessibility rather than targeting a specific market. It creates an inclusive identity based on the analysis of multiple datasets to achieve a global language that everyone can relate to and understand. Local design, on the other hand, is more personalised, and one of its main aims is to emphasise the differences between individuals. This often describes and enables diversity in small details. Local design shapes the characteristics of smaller communities and develops its own design rules (Biancardl, n.d.). Systemic design is a "cross-discipline" that integrates systems thinking and design practice (Sevaldson & Jones, 2019; Systemic Design Association, n.d.). It is a diverse field (Bistagnino & Peruccio, 2014) that focuses not only on the problem to be overcome, but also on the design process of the surrounding environment (natural and man-made) as well as other systems related to the problem (Appropedia, 2022). System design means having the necessary context to make decisions and being able to switch between a holistic understanding of the system and the needs of stakeholders and users (Bouganim, 2020). Transition design, as proposed by Irwin et al. (2015), focus on the premise that societies need to make transitions to more sustainable futures and argues that design plays a key role in these transitions. Transition design is concerned with the need for "cosmopolitan localism" (Manzini, 2009; Sachs, 1999), a way of life that is locally and regionally based, but global in its awareness and exchange of information and technology. Regenerative design, as a method for designing systems or solutions, aims to complement or mimic natural ecosystem processes that return energy from less usable forms to more usable forms (Ikerd, 2021). Regenerative design utilises holistic systems thinking to create resilient and equitable systems that combine the needs of society with the integrity of nature. Each of these design approaches discusses the relationship between design and local and global ecology from different perspectives and attempts to analyse and address current crises in a more systemic way. However, when we try to apply these design approaches locally, which are based on specific social backgrounds and contexts, the existing design approaches are not fully compatible and can address the differences and complexities of specific geographical issues due to the differences in geographic environments, cultural practices, and ways of thinking in different regions. Moreover, there is a lack of sufficient practical experience to test the validity of these theories.

Figure 1. Design-led local perspectives on globalised relationships (By authors).

Figure 2. LGD Framework (By authors).

The proposed LGD helps bridge this gap. LGD believes that loc-globalisation and globalisation are symbiotic, with the development of globalisation providing the soil and research basis for LGR, which addresses the problems and results presented in the development of globalisation by combining the local wisdom environment and

the nature of things to promote the benign development of globalisation and rectify the local problems arising from homogenisation. LGR is committed to taking the local area as the carrier, dynamically supplementing and perfecting the design methodology through local practice, systematically deconstructing and reconstructing the specific problems and achievements, and, on the basis of fully understanding and respecting the local natural environment, the people's needs for production and life, and the cultural inheritance vein, promoting the systematic localised development of design disciplines with LGD methodology through cross-disciplinary participation and practice; and finding the balance and innovation between local elements and global design contexts, to make design outcomes more in line with the visions of the people in their own countries and regions around the world, promote the inheritance and development of traditional cultures, explore the unique face, methods, and values of local design, and the potential of local design projects to generate global impact, make modern technologies more flexible and adaptable to local development needs, link more LGD paradigms and outcomes, explore new design-led globalisation relationships, and thus participate deeply in EC, see Figure 1.

Framework

The balanced interaction between the local and global can be seen as the realisation of vertical linkages, within which there are other equally important linkages that can be synthetically defined as horizontal linkages. These linkages connect distinct activities; however, if properly designed, they can give rise to symbiotic systems (capable of cooperating and reinforcing each other) and economies of scope (pursuit of efficiency and effectiveness through the symbiotic integration of different activities) (Manzini, 2005). The framework of LGD revolves around local people and their mapped lifestyles and explores the symbiotic relationships within the system from a design perspective at three levels, see Figure 2. Building a design system around local individuals and their lifestyles is a central part of LGD.

The framework is divided into three levels. The first nature level encompasses the Living, Production, and Life environments of local populations. It is only after fully understanding, grasping, and respecting the nature of locality that one can think of suitable methods and paths based on its characteristics. "Living" is a general term for all things that exist in nature to maintain their existence and development, and it is the process by which an individual or a group of people maintains their basic life needs, such as obtaining food, water, and shelter. "Production" is the process by which human beings, through labour and creativity, produce goods and provide services to meet subsistence and social needs. On the other hand, "Life" more broadly encompasses people's living and production activities, including social, cultural, emotional, and value aspects that affect the overall quality and well-being of individuals and society. These three interact with each other, with living requiring production to obtain resources, and production aiming to improve living conditions for a more meaningful and fulfilling life. Their interrelationship is also the deepest design logic of LGR.

The second level of law explores the inherent and inevitable connection between things and the inevitable tendency that determines their development, including Natural Ecology (NE), State of the Industry and Sector (SIS), and Culture and Ideology (CI). Globalisation has prompted modern companies to design out of context and inefficiently produce waste streams that are seriously "ecologically destructive". The nature manual is a timeless source of information, and through its biological and biochemical systems, many problems faced by humans have been solved (Papanek, 1985). NE refers to natural systems on Earth, where various organisms and environmental elements interact and balance each other. SIS involves the organisation of human economic activities and production methods, including agriculture, industry, and services etc. On the other hand, CI includes various cultural elements such as values, beliefs, customs, and arts of society. These three interact and depend on each other, and together they form an integrated system of society that needs to summarise and make use of the laws and coordinate its development under the premise of sustainable development to achieve the

harmonious coexistence of human society and nature.

The third level represents the embodiment of the first two levels at the design level. After grasping the essence and laws, designers should incorporate these understandings into the design process and build their matching ways, capabilities, and perspectives to constitute a complete design system. Design Ways are the systematic methods, strategies and operational steps used in the design process. It covers problem analysis, concept generation, prototyping, implementation, evaluation, and other aspects, and provides designers with systematic guidance to help them transform ideas into concrete design actions. Design Capabilities include creative thinking, professional skills, spatial perception, aesthetic concepts, communication skills, material application, and other qualities, which form the basis for achieving quality design. Design Perspectives are the views and concepts of the purpose, values, and meaning of design. It involves the designer's recognition and mastery of the local society, culture, environment, technology, economy, etc., as well as a systematic understanding and orientation of design interventions, which guides the goals and visions that should be pursued by the designer in applying their abilities and approaches. These three are closely linked and together shape the designer's professionalism and creative style, playing a key role in both systematic design processes and effective design interventions.

These three levels, and the parts within each, are interconnected, influence, and complement each other, drive each other's development, and thus constitute the symbiotic system of LGD. Design involves the development of products, tools, machines, artefacts, and other devices, an activity that has a profound and direct ecological impact. The design response must be positive and unified. Design must be a bridge between human needs, culture, and ecology (Papanek, 1995).

Methodology

The "Double Diamond", proposed in 2005 (Design Council, 2015), aims to guide designers to identify the right problems and find the right solutions within a disciplined design process. The model is characterised by dividing the design process into two phases, research and practice, and applying a dispersive approach to finding opportunities and then returning to the problem by focusing on each phase. The model effectively outlines the process and characteristics of design research and practice, and has not only been widely used in commercial design and design education but has also been cited and developed by many researchers of emerging design methods. Based on the Double Diamond, LGD proposes a new approach to summarise the design process into two stages: loc-globalisation thinking (research) and loc-globalisation design (practice), see Figure 3.

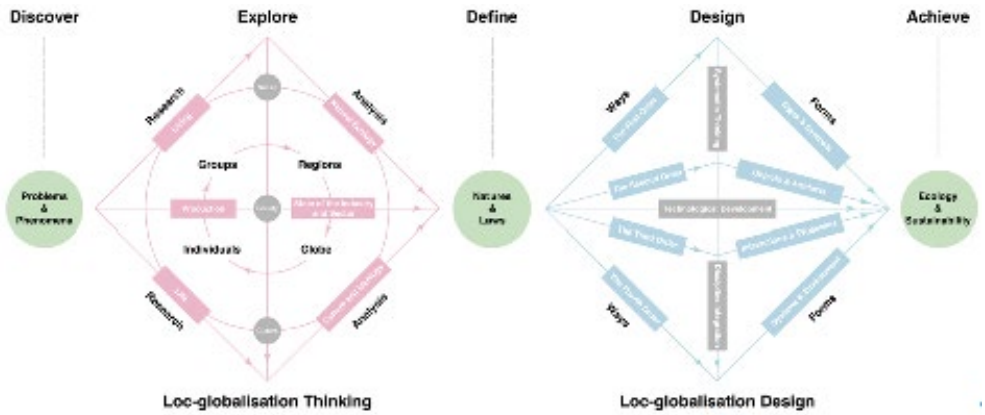

Figure 3. Design Process Model of LGD (By authors).

The first part of the design process involves the identification of problems and phenomena. The "problem" may be initiated by the design requestor, or may be a specific phenomenon observed by the designer at the beginning of the project. The "problem" may not be the "real problem" in the process, but as a start, whether the "problem" is finally solved or can be solved, can be seen as an important reference for the effectiveness of the LGD process.

The second part (Phase I) is the loc-globalisation thinking phase, also known as the research phase. The aim is to explore the "essence" behind problems and phenomena through loc-globalisation thinking and research methods. In this phase, a closed loop of four objects - individuals, groups, regions, and the globe - are located in the centre of the model, all of which are seen as participants or stakeholders in wicked problems. In traditional design, the design object is often a specific person or group of people, while LGD, based on the concept of "the differential mode of association (DMA)" in Chinese sociological research (Fei, 1992), believes that in the context of globalisation, individuals and groups, regions, and the globe form an indivisible community, and that any localised problem may be like ripples in a lake or the effect of butterfly wings that may spread to a far-reaching extent. Conversely, any link in DMA may also lead to specific problems. Therefore, at this stage, LGD takes the human living environment, production, and lifestyle, as well as regional and global NE, SIS, and CI under the scale effect as the research elements (i.e., the "three natures, three laws (TNTL)") and explores the systemic reasons behind wicked problems.

The third part is to build a design pathway based on the problems discovered and the laws and regulations summarised in the research. The "problems" here are the "real problems" discovered through the design research, which may be the conflicting interests in DMA or the unsustainability in TNTL. "Laws and regulations" are also established logically in the study of TNTL, which will become principles or inspirations in design practice.

The fourth part (Phase II) is the design output phase. Owing to the complexity of LGD, all four orders of design described in Buchanan's (2015) Design Evolution Theory can be applied to LGD practices, see Figure 4. The holistic design philosophy espoused by LGD addresses either local or systemic problems in different ways and steps, depending on the complexity of the design problem. In addition, by applying the concept of DMA, LGD is seen to be benign in the sense that it contributes to, or facilitates, the resolution of systemic problems. Thus, both traditional signage and visual communication design, materials and artefacts design, newer interaction and process design, and environmental and systems design will be common forms of LGD.

The fifth part is problem-solving, that is, realising the purpose of the design. It is not only about solving the problems posed at the beginning of the process, but also about finding the essential problems based on the research process and independent values, and contributing to the formation of a benign and sustainable ecosystem (not limited to the natural ecosystem) through the design methodology. The criteria for judgement are based on the balance and alignment of local and global interests and are relative.

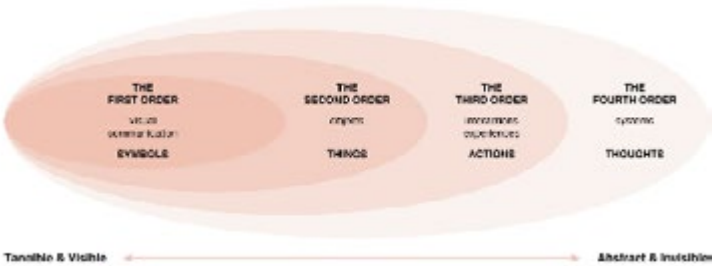

Figure 4. "Four Orders of Design" model (Buchanan, 2015, illustrated by authors)

Case Study

Based on the concept of LGD, CAFA, with the approval of China's Ministry of Culture and Tourism, established a national traditional craft workstation (NTCW) in Daoming Town, Chengdu, Sichuan Province, China in 2018, see Figure 5. The workstation analyses and researches from the perspective of the indigenous people, the dilemmas faced by their traditional way of living, production, and lifestyle in the process of modernisation and development deduce the root contradictions that exist in the region in terms of NE, SIS, and CI, see Figure 6.

Studying from the perspective of living, the indigenous people have historically made use of local natural resources, such as bamboo, lacquer trees and mulberry silkworms, to establish a way of living with regional characteristics, based on which they have continued to protect and transform the NE. However, modern aborigines are affected by the market economy and industrialisation, and an increasing number of young people are leaving the countryside. The long-standing ecological development model of aborigines adapting and transforming the natural environment for the purpose of living has encountered a bottleneck, and the development of the area by foreign populations or organisations has often neglected the long-term connection between the special local way of living and its NE, resulting in the two-way destruction of the way of living of the aborigines and the NE. From a production perspective, indigenous people's historical production activities based on their living needs have given rise to industrial projects such as Daoming bamboo weaving, Huayuan rattan weaving, Shu brocade, Shu embroidery, silver filigree, and lacquer art. These items are the focus of local intangible cultural heritage (ICH) protection, but due to the changes in the lifestyle of the aborigines and the local NE, the above items are gradually losing their basis for development. Reconstructing the links between living and production, NE and SIS are the focus of preserving and inheriting these ICH items and enabling the healthy development of their SIS. From the perspective of life, aborigines have historically led a sedentary and self-sufficient life and have built values and aesthetics of life in this stable lifestyle. However, with the accelerated development of industrialisation, the traditional way of life has been replaced by a new, fast, unstable, and market-oriented way, and the unique way of life of indigenous people and the unique cultural forms of the region have been violently impacted.

Figure 5. NTCW in Chengdu (By authors).

Figure 6. Main Projects of NTCW in Chengdu (By authors).

Based on the above research, the workstation focused on the reconstruction of the TNTL relationship. Based on the living needs of aboriginal people, we enhance the NE and infrastructure of the area through environmental design, systematic design, and architectural design, and explore the advantageous natural resources of the area to attract young aboriginal people to return to their hometown. By sending outstanding experts, teachers, and students to teach and practice in the region and inviting young aborigines to study at CAFA, the project

promotes awareness of the aborigines and establishes a local view of globalisation and sustainable development. The reconstructed way of living based on the local NE contributes to a virtuous cycle of ecological and living relationships and gradually develops the area into an ideal place for people to experience the culture and NE of western Sichuan. From a production perspective, the workstation excavates, collates, and researches the techniques of local traditional handicrafts while popularising modern processing methods and innovative concepts among the inheritors of ICH. Through material research and development, technological innovation, product design, fashion design, and branding, the workstation enables ICH items, which have been gradually detached from daily use, to return to the daily lives of locals, promotes industrial upgrading, and is guided by the concepts of loc-globalisation, expanding the radius and influence of the industry through international events, activities, exhibitions, media, and tourism. Global resources will participate in local development, and local wisdom will contribute to global innovation. New modes of production give rise to new lifestyles, and an increasing number of aborigines organically integrate their traditional lifestyles with modern lifestyles, reviving their traditional cultures and forming new regional cultural forms with the participation of new technologies, concepts, and residents.

According to statistics, in 2021, the "bamboo" of Daoming Bamboo Art Village achieved a comprehensive output value of RMB 230 million, with an average annual growth rate of more than 11% compared to 2017. Over the past four years, it has received 622,000 tourists, driven a comprehensive tourism income of RMB 190 million, driven more than 6,000 people in the neighbourhood to seek employment nearby, and increased per capita disposable income from RMB 17,500 in 2017 to RMB 39,800 (Chengdu Daily Jin Guan News, 2022).

Conclusion

This paper explores the complex issues facing the globe and analyses the impact of globalisation on the economy, society, humanity, and environment of various places, triggering the concept of loc-globalisation and emphasising the importance of LGD. LGD has been proposed to fill the gaps in existing design approaches, emphasising the integration of local wisdom with global elements to achieve the EC goal. This paper introduces the framework of LGD, including the three levels of Nature, Law and Design, and emphasises the importance of the balance of living, production, and life for design. LGD methodology proposes five parts to balance local and global interests and visions. Through a case study of NTCW, the systematic design was used to facilitate the return of indigenous people to their hometown, promote the development of ICH projects, and achieve growth in output value and social impact. This shows that LGD plays an essential role in systematically coordinating the ecological balance, cultural heritage, and technological advancement.

Acknowledgments

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References

Appropedia. (2022). Systematic design. Retrieved July 23 from https://www.appropedia.org/Systematic_design

Biancardl, D. (n.d.). Global Design vs. Local Design. Retrieved July 22 from https://nalla.co.uk/global-vs-local/

Bistagnino, L., & Peruccio, P. P. (2014). Design, an overview (A. C. Michalos, Ed.). Springer.

Bouganim, A. (2020). A case for Systemic Design. Retrieved July 23 from https://uxplanet.org/a-case-for-systemic-design-5a9465b870fa#:~:text=Systemic%20Design%20means%20having%20the,%E2%80%9Cbottom%2Dup%E2%80%9D%20approach.

Buchanan, R. (2015). Four Orders of Design. Retrieved August 11 from http://redeinovagov.blogspot.com/2015/11/four-orders-of-design-richard-buchanan.html

Cheng, W. (2017). Chinesische Esskultur im Zeitalter der Globalisierung: Das Chu-Restaurant als nationaler

Bestandteil einer globalen Esskultur. Weimar: Bauhaus-Universität.
Cheng, W., & Zeng, M. (2023). Pre-design of Cultural and Creative Product from the Perspective of Glocalization. Packaging Engineering, 44(12), 358-367. https://doi.org/10.19554/j.cnki.1001-3563.2023.12.041
Chengdu Daily Jin Guan News. (2022). These villages and neighbourhoods in Chengdu have been selected for the 2022 "National List of Preferred Projects for the Integration of Intangible Cultural Heritage and Tourism Development". Retrieved August 11 from https://baijiahao.baidu.com/s?id=1747924747289062119&wfr=spider&for=pc
Design Council. (2015). The Double Diamond: A Universally Accepted Depiction of The Design Process. Retrieved August 11 from https://www.designcouncil.org.uk/our-resources/the-double-diamond/
Fei, X. (1992). From The Soil: The Foundations of Chinese Society. University of California Press.
Gozgor, G., Mahalik, M. K., Demir, E., & Padhan, H. (2020). The impact of economic globalization on renewable energy in the OECD countries. Energy Policy, 139, 111365. https://doi.org/https://doi.org/10.1016/j.enpol.2020.111365
Hall, A., & Cheng, S. (2018). Designing Globalisation Design.
Hirst, K. (2010). The Impact of Globalization on Design, and Design's Impact on Globalization (in a nutshell). Retrieved July 21 from https://www.beautypackaging.com/contents/view_experts-opinion/2010-05-11/the-impact-of-globalization-on-design-and-des/
Ikerd, J. (2021). THE ECONOMIC PAMPHLETEER: Realities of regenerative agriculture. Journal of Agriculture, Food Systems, and Community Development, 1-4. https://doi.org/10.5304/jafscd.2021.102.001
Irwin, T., Kossoff, G., Tonkinwise, C., & Scupelli, P. (2015). Transition Design 2015.
Manzini, E. (2009). A Cosmopolitan Localism: Prospects for a Sustainable Local Development and the Possible Role of Design In H. Clark & D. Brody (Eds.), Design Studies: A Reader (pp. 448–453). Berg.
Papanek, V. (1985). Design for the Real World: Human Ecology and Social Change. Academy Chicago Publishers.
Papanek, V. (1995). The Green Imperative: Natural Design for the Real World. Thames & Hudson.
Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. Policy Sciences, 4, 155-169.
Robertson, R. (1995). Glocalization: Time-Space and Homogeneity-Heterogeneity. In Global Modernities (pp. 25-44). SAGE Publications Ltd.
Sachs, W. (1999). Planet Dialectics: Exploration in Environment and Development. Zed.
Sevaldson, B., & Jones, P. (2019). An Interdiscipline Emerges: Pathways to Systemic Design. She Ji: The Journal of Design, Economics, and Innovation, 5(2), 75-84. https://doi.org/https://doi.org/10.1016/j.sheji.2019.05.002
StudySmarter. (n.d.). Effects of Globalisation. Retrieved July 18 from https://www.studysmarter.co.uk/explanations/geography/globalisation/effects-of-globalisation/#:~:text=The%20positive%20effects%20of%20globalisation,social%20movements%20and%20greater%20transparency.
Systemic Design Association. (n.d.). Systemic Design Association. Retrieved July 23 from https://systemic-design.org/theory/
Wang, Z., He, H., & Fan, M. (2014). The Ecological Civilization Debate in China. MONTHLY REVIEW, 66(06). https://monthlyreview.org/2014/11/01/the-ecological-civilization-debate-in-china/
Zhu, G. (2016). Ecological Civilization. Retrieved July 21 from https://web.archive.org/web/20190509151612/http://web.unep.org/ourplanet/march-2016/articles/ecological-civilization

Bodily Games: A Study on Body-Centric Approaches in Digital Jewelry Teaching

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Abstract

In the contemporary digital era, jewelry design confronts unprecedented challenges and opportunities. The replicability and cost-efficient production of digital jewelry have led to a convergence and homogeneity in design forms available in the market. Many designs remain superficial, susceptible to external influences, lacking in both innovation and depth. Additionally, when applying digital technologies, jewelry designers often lack independent exploration and a systematic methodology. To address these issues, this paper introduces "Bodily Games," an innovative jewelry design teaching approach. Centering on the human body as a guiding thread, this method harnesses imaginative game to cultivate students' creative thinking. It encourages them to proactively delve into technology and establishes a structured digital jewelry design methodology. Through this approach, students can effectively transcend traditional design paradigms, venture into new realms of design, and thereby bring genuine innovation and transformation to the field of digital jewelry design.

Author keywords

Body; Jewelry Design; Teaching Approaches; Jewelry Digitization

Introduction

In the new era of digitalization, jewelry design encounters unprecedented challenges, but it also brings about expansive opportunities for growth. It's vital to recognize that due to the ease of replication and cost efficiency of digital jewelry, market designs are becoming increasingly homogenous. This not only constrains the depth and innovation of designs but also renders many designers' passive in utilizing digital technologies, lacking a systematic methodology. To address this challenge, many educational institutions and research bodies have recently shifted their focus to the unique dimension of the human body, aiming to explore new design thoughts and methods by taking the body as a reference point in courses and studies. The body is viewed not just as an educational tool but also as a source of innovative inspiration. Particularly in the field of jewelry design, the study of the body needs to closely align with its essence and characteristics, constructing theories and practical methods across disciplines. This is because the body is the first place that the jewelry touches and is the first sensual gate—to the sights, sounds, smells, tastes, body, and mind. Body is what moves the internal context of the jewelry and what brings it out (Sirinkraporn,2023). Concurrently, with the information overload and sensory challenges brought about by rapid technological advancements, designers should deepen their sensitivity and understanding of bodily aesthetics to better anticipate future design transformations.

Everyone's body is unique, conveying diverse worldviews. The tangibility of our existence passes through a revisitation of the body, understood as a field for a project exploration of both analogical nature, through the adoption of traditional goldsmith techniques and artisan production, and digital, through the use of new

technologies and computerized tools (Scarpitti, 2021). The body isn't merely an object of biological study; it encompasses multiple dimensions including emotions, culture, and society. From a biological perspective, the body pertains to human anatomy and gender differences. The body and the data it represent has become central on issues of wellbeing and selfhood (Lupton, 2014). Seen from a perceptual and cognitive standpoint, it's tightly linked with our emotions and perceptions. Furthermore, the body's
expression in culture, social interactions, and the environment holds profound significance. Within the context of art and design, bodily topics have garnered extensive attention, becoming a focal point of multidisciplinary research. Different disciplines interpret the body variably; for instance, art history focuses on the trends of embodiment, while theories on fashion evolution reflect upon the origins and societal implications of embodiment. Contemporary fashion research leans more towards methodologies rooted in the body.
Combining art and craft experimentation with digital technologies has shown great promise in benefitting previously less explored aspects of people's lives and identities. However, unlike the prominence in HCI of avant-garde practitioners in clothing and textiles home appliances and wearables, the more artis- tic exponents of digital jewelry have received less attention.
(Nantia, 2021). This paper endeavors to delve into the unique dimension of the body against the backdrop of digital jewelry design, integrating cross-disciplinary research methods to introduce novel thought processes and strategies to jewelry design education. We encourage students to approach from the perspective of the body, deepening their comprehension of bodily aesthetics to address the challenges of the digital age. This research aims to offer fresh viewpoints and strategies for jewelry design education and aspires to illuminate the field of jewelry design, propelling the industry towards a more innovative and profound direction.

Teaching Framework

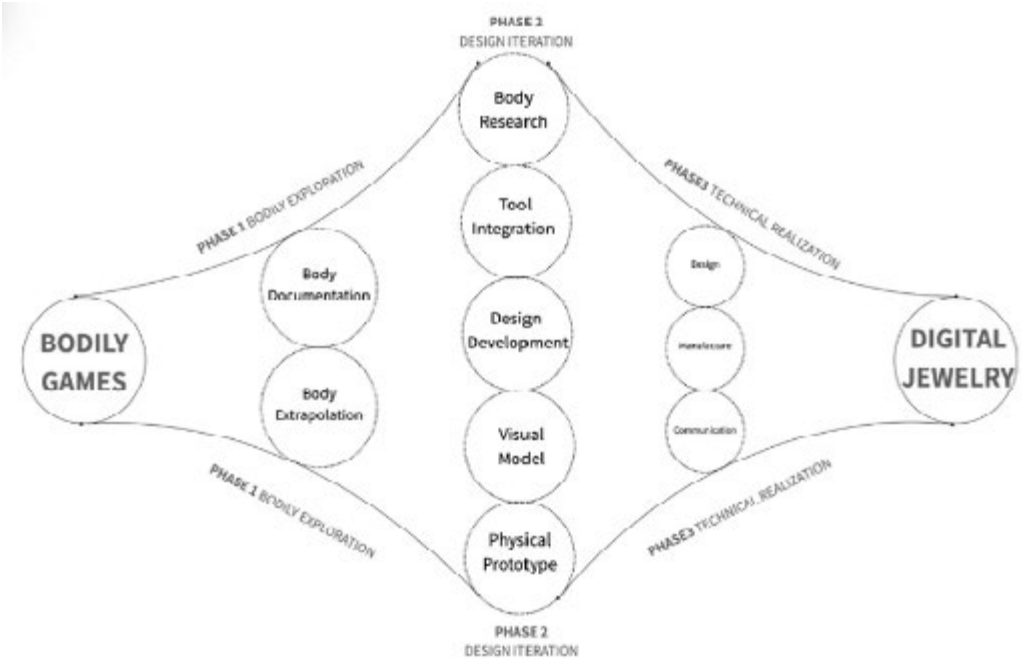

Figure 1. Teaching Framework of Body-Centric Approaches in Digital Jewelry

This paper, considering the characteristics of jewelry design education and the instructional path centered around the body, proposes a teaching framework and trajectory that progresses from "Bodily Exploration - Design Iteration – Technical Realization." The instructional model is partitioned into three phases. The initial phase is labeled "Bodily Exploration", characterized as the divergent exploration stage. Here, through a series of bodily game workshops, students are encouraged to undertake sensory explorations using the body as a guide. The subsequent phase, " Design Iteration ", is the stage of rational thought organization, comprising five steps: "Body Research - Tool Integration - Design Development - Visual Model - Physical Prototype". The concluding phase is titled "Technical Realization", where a cohesive digital technology from the
design, manufacturing, and presentation fronts is applied to finalize the design solution and its visual construction. These three stages collectively constitute the fundamental trajectory for digital jewelry design instruction centered around the body.

Phase One: Bodily Exploration

At the inception of the instructional process, a divergent exploration method anchored on the body is employed. In collaboration with interdisciplinary approaches, a series of bodily game workshops are introduced. These workshops encourage students to utilize their bodies as tools for sensory exploration, assisting them in breaking traditional thought paradigms and deepening their understanding of design fundamentals. A focus on bodily integration is crucial as it not only allows us to interact with computers in novel ways, but also might help us in understanding our bodies better, and hence, ultimately ourselves (Mueller, 2017). In the digital age, this return to a body-centric, sensory-focused design methodology will unlock more possibilities for jewelry design.

Figure 2. Images of Body exploration workshops during the teaching process.

Workshop One: Bodily Information Mapping - Documenting the Body

Method: Participants can opt for objects of varying textures and materials to amplify tactile distinctions. To chronicle perceptions, coloured pencils, watercolours, oil pastels, or other painting tools can be used, enabling participants to convey their sensations more genuinely. Content: Activities are divided into pairs. Person A closes their eyes while Person B instructs A to touch distinct items within the space. This arrangement aims to heighten perception, logging sensations and feelings towards each object. Subsequently, B prompts A to reiterate the previous touches to further reinforce the memory. At the culmination of this segment, every pair presents their sensory records as drawings and arranges them on the floor, crafting a makeshift exhibition.

Workshop Two: Body Card Game - Extrapolating the Body

Method: Use database retrieval tools and cards ingrained with body-related keywords. Paper cards, writing tools, and differently colored markers or stickers are provided to highlight and categorize diverse body-centric terms.

Content: Within this game, attendees delve into and project the multifaceted dimensions and potentialities of

the body. Ranging from basic biological constructs to the influences of emotion and socio-cultural aspects, the keyword cards serve as a medium to thoroughly explore the body's variegated facets. Discussions may arise regarding the body's interaction with technology, culture, and society and its impact on our daily lives. Through collaboration and categorization exercises, participants not only gain a refreshed understanding of the body but also propose novel perspectives and visions for its future evolution. This procedure seeks to foster innovative thinking and the exploration of the body's latent potential and cutting-edge progress.

Phase Two: Design Iteration

The second phase is defined as "Design Iteration", emphasizing deep exploration and rational integration of design concepts. It encompasses five main stages: firstly, "Body Research", delving into the relationship between the body and jewelry to gather design inspirations that resonate with the human form; next is "Tool Integration", where appropriate tools and technologies are selected to offer essential support for the forthcoming design; subsequently, we enter the "Design Development" stage, synthesizing the findings from the initial two stages to form a preliminary design scheme; in the "Visual Model" stage, design proposals are visually rendered, providing clear references for physical production; finally, the production of the "Physical Prototype" is executed, transitioning the design from a conceptual state to a tangible, touchable product, priming it for further refinement and iterations. It's pivotal to note that the entire phase underscores the importance of cyclical iterations. Design schemes are not set in stone but are subject to revisions and refinements at each stage, ensuring that every step inches closer to the ultimate design objective.

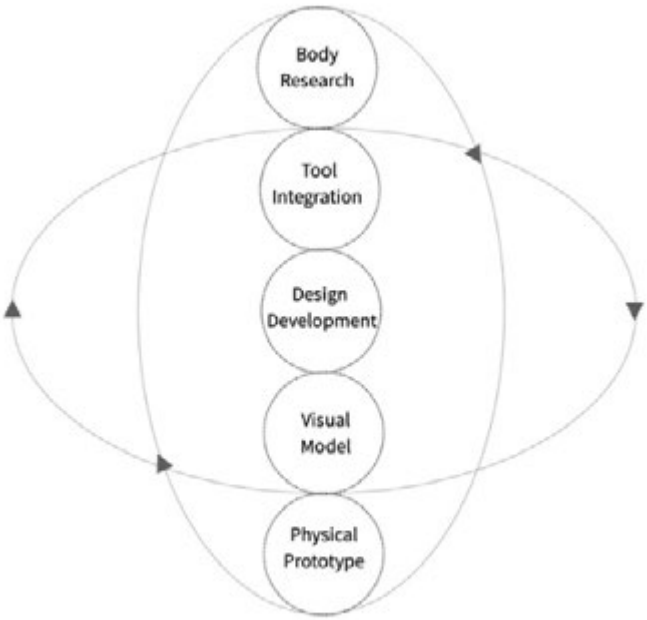

Figure 3. Circular design iteration framework.

Phase Three: Technical Realization

The third phase of this study predominantly zeroes in on the "Technical Realization" segment. Within this segment, design prototypes and concepts undergo deep integration, priming them for amalgamation with real-world scenarios; here, the application of digital technology stands paramount. Broadly, this phase unfolds around three dimensions: design, production, and communication:

Design Dimension: The focus here is leveraging two-dimensional and three-dimensional digital design tools to further refine and enhance design concepts. Such technologies allow designers to accomplish high-precision modeling, structural simulation, and parametric design, aiming to balance aesthetics, utility, and manufacturability of the design.

Production Dimension: Post design verification, the production phase commences. Harnessing contemporary advanced manufacturing technologies, such as 3D printing, CNC machining, and CNC laser engraving,

transitioning designs from the digital realm to physical entities is no longer challenging. These technologies not only ensure the precision and detail replication of the products but also facilitate rapid prototyping and subsequent adjustments.

Communication Dimension: With the completion of design and manufacturing, conveying the creation precisely to the target audience becomes pivotal. Modern technologies, like simulation

animations, virtual reality, and augmented reality, offer a new platform for immersive displays. They provide the audience with a genuine and interactive experience, deepening their understanding of the design's significance and value.

Teaching Implementation Case Studies

Case Study 1: Documenting the Body

While implementing this teaching framework, we observed impressive outcomes in digital jewelry design.

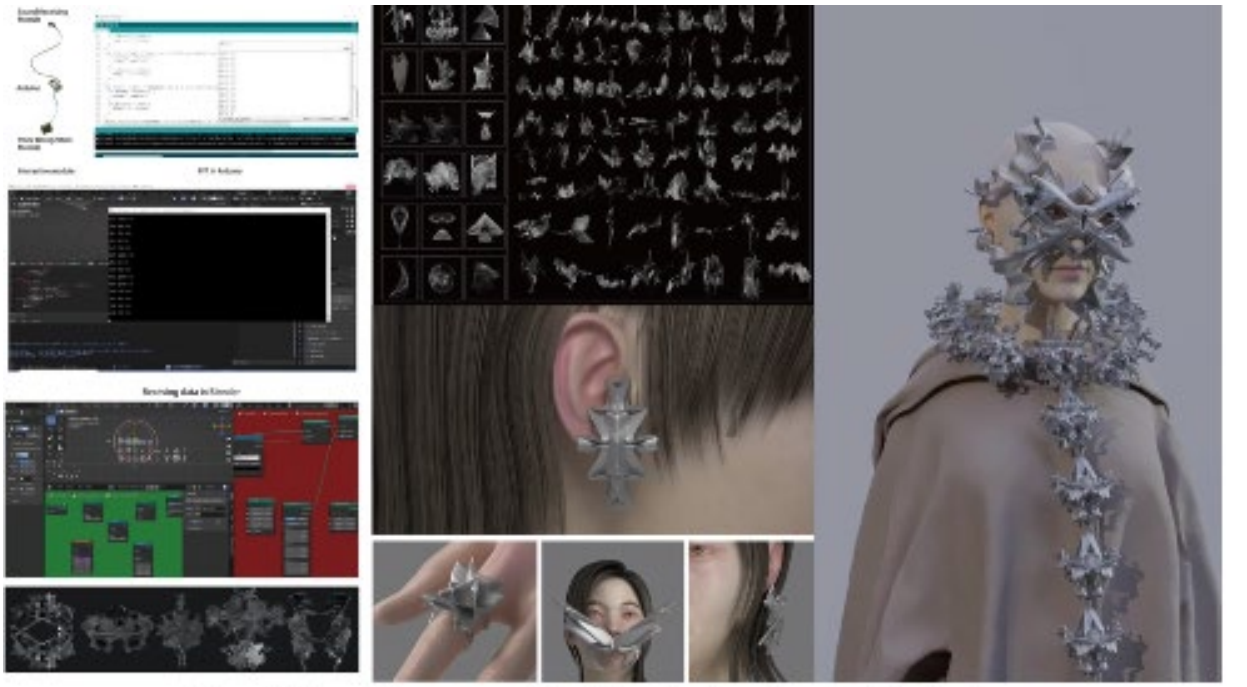

Figure 4. Case 1:The process of body jewelry based on digital technology.

Within the "Body Game" pedagogical structure, at the initial stage of bodily exploration, the designer employed participatory workshop tactics, accumulating voice data from 100 young participants as a foundational database. Subsequently, he used computer algorithms to meticulously analyze decibels, amplitude, frequency, and duration in these voices. This analysis paved the way for constructing data models in relevant 3D modeling software. Leveraging the Fast Fourier Transform algorithm, 3D models of the voice were generated in real- time. Upon the completion of these models, participants were invited for preliminary experiences and feedback, out of which a hundred prototype models were sifted. Based on audience feedback and the designer's artistic intuition, further refinements were made, ultimately selecting jewelry designs with commercial potential for physical production.

Inspired by the body, this project successfully established an interactive bridge between audiences in the physical world and digital jewelry. Digital technologies, particularly Python programming, open-source algorithms,

and data transfer techniques, emerged as potent tools for the designer to innovate in this domain. The project manifested a trajectory from the collection and application of bodily data to the interaction of virtual and tangible design, culminating in the creation of novel artistic and functional forms.

Case Study 2: Extrapolating the Body

At the onset of the teaching framework, the "Bodily Scenario Game" presented designers with a unique narrative

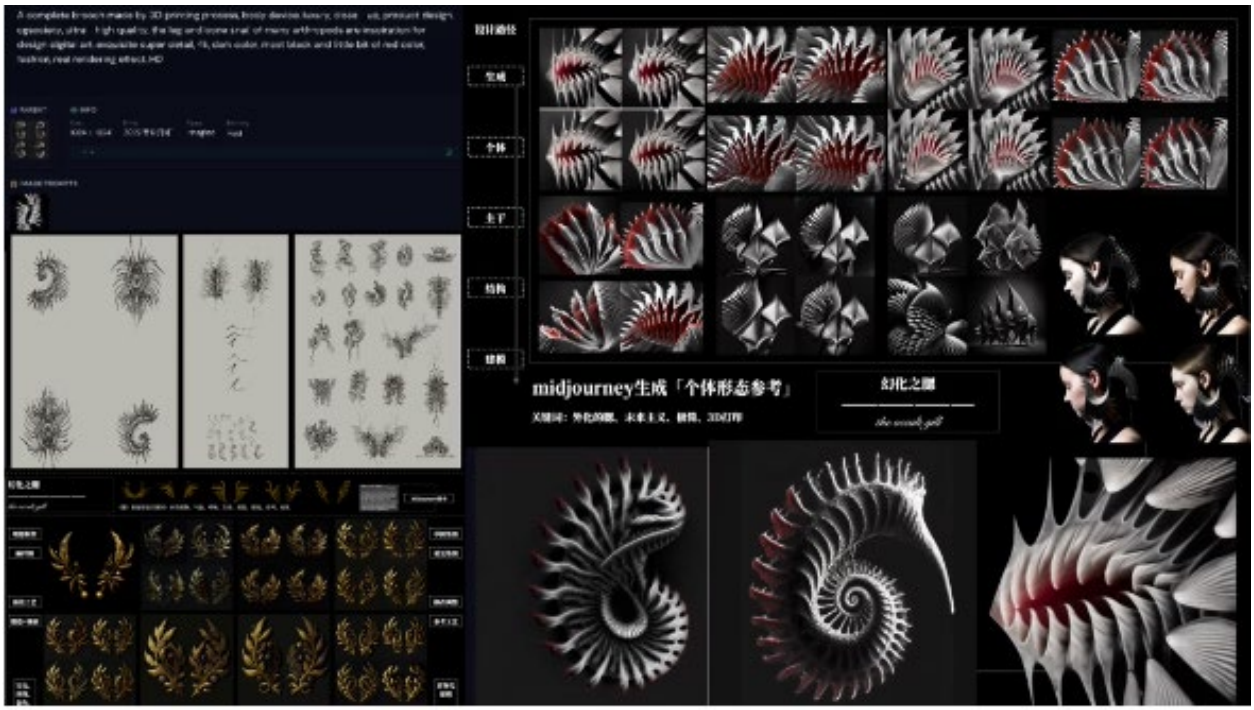

Figure 5. Case 2: the process of body jewelry based on AI image generation technology.

approach. Through narrative cards simulating fictional scenarios and real-time interactions with ChatGPT, this method enriched and refined the worldviews, narrative structures, and object design extrapolations of these scenarios. Such preliminary exploration solidified the foundation for subsequent design processes.

The subsequent design phase, ranging from bodily research to the final physical prototype, revolved around image generation technology, aiming for a collaborative design effort between humans and AI in the realm of bodily jewelry. This innovative approach, by introducing ChatGPT, crafted a bidirectional interaction with designers, intending to unearth fresh creative perspectives from a human-computer interaction standpoint, ultimately converging on the essence of craftsmanship. Throughout this phase, we witnessed the emergence of a series of narrative-driven jewelry designs and delineated the entire creation process from image sketching, instruction finalization, base image creation, to post- production adjustments of images.

Conclusion

In the context of digitalization, the dual challenges faced by jewelry design underscore the pressing need for a profound exploration of core design values. The intimate relationship between jewelry and the body earmarks the body as a pivotal entry point for design discussions. The "Body Games" proposed in this paper isn't merely an educational strategy but also a research paradigm, accentuating the profound connections between jewelry

design, the body, culture, and emotions. Surpassing the conventional perspectives on form and material, this methodology promotes an in-depth reflection on jewelry design, revealing the body's cardinal role in jewelry design. Through this fresh lens, we can holistically probe the future trajectories of jewelry design, offering new cognitive avenues for integrative innovation and diversified evolution in the field of jewelry design.

References

Sirinkraporn, S. (2023). Discourse of the postmodern jewellery: Identity and existence of contemporary aspects. Humanities, Arts and Social Sciences Studies (HASSS), 22, 21-31.

Jie, S., & Elizabeth, F. (2021). Spirit of luxury and Design: A Perspective from contemporary fashion and jewellery. Tongji University Press and ORO editions.

Lupton, D. (2014). Self-tracking cultures: towards a sociology of personal informatics. In
Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: the Future of Design. Sydney, New South Wales, Australia.

Koulidou, N., & Mitchell, R. (2021). Art digital jewellery: Practitioners' perspectives. In Proceedings of the Fifteenth International Conference on Tangible, Embedded, and Embodied Interaction (pp. 1- 11). https://doi.org/10.1145/3430524.3440648

Mueller, F., & Young, D. (2017). Five lenses for designing exertion experiences. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (pp. 2473-2487).

An exploration of visual design culture in the context of the "space fever" era

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Abstract
In the 1950s and 1960s, influenced by the Cold War mentality, political groups represented by the Soviet Union and the United States launched a fierce arms race. During this period, space activities such as spacecraft, manned rockets, and human landings on the moon aroused people's yearning for space. Under this background, the consumerist society represented by the United States has produced strong and unique product designs. The wave of design culture formed under the background of "space fever" has profoundly affected the development of modern design. This article conducts an in-depth investigation and analysis of product design under the background of the "space craze" of the 1950s and 1960s through literature research, exploring the impact of the development background of the times on design and people's lives, showing the inseparable relationship between the times and design. Starting from three aspects of clothing, film and television, and automobile design, the relationship between the times and products is explained through the analysis of design cases, which also reflects the profound impact of design under the "space fever" on the development of modern design. At the same time, we also hope to arouse reflection among designers and consumers, and hope to find a balance between design and sustainable development through the joint efforts of designers and consumers.

Keywords: Space fever; consumerism; product design; visual culture design; automobile design

"Space fever" in the context of the Cold War

After World War II, the Cold War era came. Under the fierce competition between the two giants, the Soviet Union and the United States, the aviation and arms race intensified. From the launch of the first artificial satellite by the Soviet Union in 1957 to the establishment of the human space station in the 1980s, these 30 years Humanity has experienced many very important explorations, including Gagarin, the first astronaut to enter space, and the successful Apollo 11 moon landing,as shown in Figure 1.

In the 1950s and 1960s, under the influence of the space wave, people had unlimited reveries about space. This undoubtedly accelerated the change of people's aesthetics. During this period, stimulated by people's consumer demand, various fields began to explore and imagine the future life of human beings in space, and many classic works emerged.

Figure 1 Soviet astronaut Gagarin and the American Apollo 11 successfully landed on the moon

Fashiondesignandfilmandtelevisiondesignunder "spacefever"

In 1964, Pierre Cardin had already begun to show his fantasy of cosmic clothing,as shown in Figure 2. He added plastic goggles to his helmet to imitate an astronaut's helmet. Geometric tailoring, metallic colors, leather shorts and plastic transparent dresses all added to his designs. The avant-garde feel of clothing. In 1969, the successful moon landing brought about the "Moon Landing Frenzy". Pierre Cardin was invited by NASA to visit the base and became the first designer in the world to try on Armstrong's famous space suit. Influenced by this experience, he later also designed NASA designed space suits.

Figure 2 Cosmic clothing designed by Pierre Cardin

Figure 2 shows the representative work of Andre Coureger, known as the "master of futurism". He abandoned traditional elegant female designs and used thick fabrics. In 1964, he launched
the first set of space fashion, wearing The spacesuit model was like an alien, causing quite a sensation in the French fashion circle at the time.

Audrey Hepburn's classic "Moonlight Girl" image in the movie "The Little Mermaid" is still influencing the fashion industry. The cloche hat and sunglasses in the film were made by Andre Coureger. In 1965, Andre Coulage released the "Moon Girl Look", a silver-white ultra-short striped leotard and PVC Go-Go boots, which combined sports practicality and futuristic fantasy,as shown in Figure 3.

It can be seen that the space wave at that time had a profound impact on the clothing design industry. Designers were keen to discover new materials that conformed to the science fiction style of the space age to express people's daydreams about the future and the universe at that time. Since the space age, new materials such as PVC, highly reflective, and plastic have been widely used in the clothing industry.

Figure 3 Audrey Hepburn in "Moonlight" and "Moon Girl Look" sunglasses

The "space craze" of the 1960s also spread its influence to the film and television industry. Kubrick, the master of science fiction films, created the masterpiece "2001: A Space Odyssey" from 1963 to 1966. This film is the most landmark classic in the history of science fiction films. The extremely realistic space scenes displayed and the philosophical issues conveyed in the movie aroused profound thinking. He used a large amount of classical background music to perfectly express the profound characteristics of space. The scene design, spaceships, space stations and other designs in the movie set a precedent for modern science fiction movies. Before this, American Hollywood had never involved such in-depth and highly realistic scene settings. "2001: A Space Odyssey" is undoubtedly the first science fiction movie. A good foundation has been laid for the development of the film. The spaceship in "Interstellar" released in 2014 can be seen as a tribute to "2001: A Space Odyssey". This also reflects that the film industry under the "space fever" is also profoundly affecting the development of the modern film industry,as shown in Figure 4.

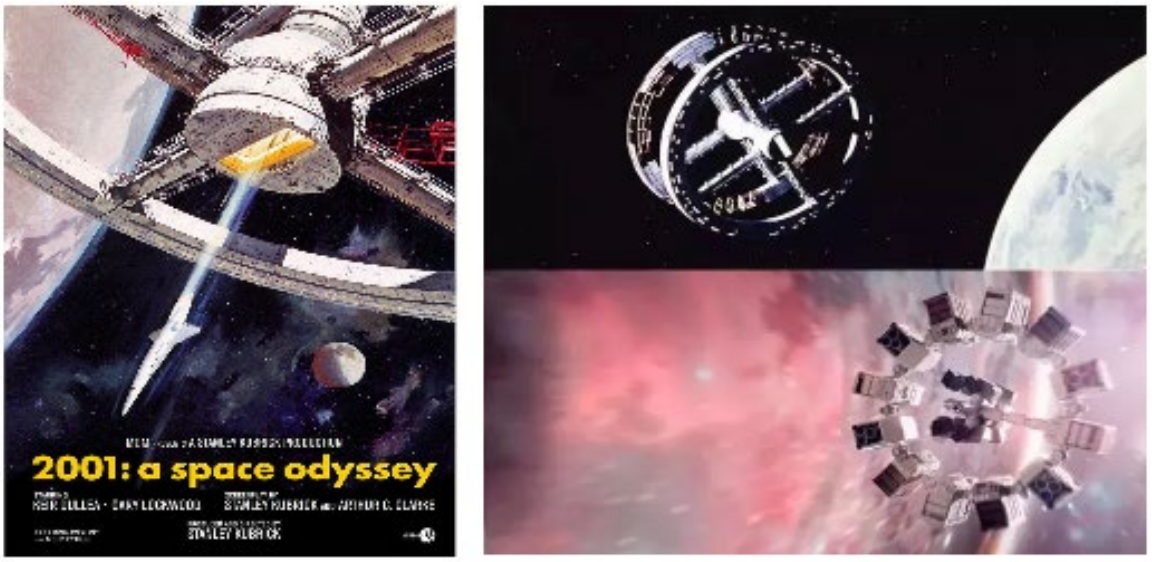

Figure 4 "2001: A Space Odyssey" and "Interstellar"

Car design under "space fever"

After the end of World War II, automobile design quickly entered the stage of consumer production. Under the fierce market competition system, because General Motors in the United States took the lead in exploring automobile styling design, Henry Ford became the world's first automobile designer. And the "planned waste paper system" he proposed is still used by major car companies today. After the United States entered the "space craze" in the 1950s and 1960s, in order to meet the needs of the social consumer market at that time, it designed and produced a large number of "space-style" cars with unique styling characteristics, which were deeply loved by the mass consumers at that time. It has become a classic of automobile design to this day.

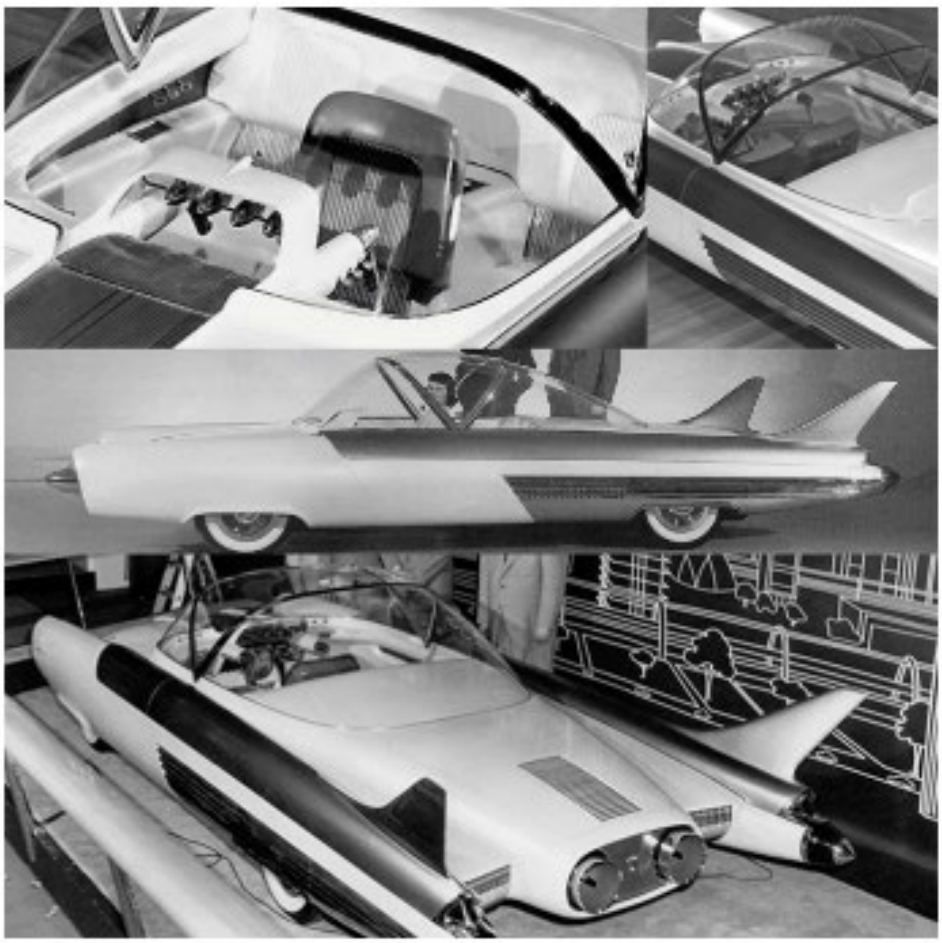

Figure 5 Ford FX Atom

The design of Ford FX Atom is like a spaceship, and the concept of interior design is very advanced,as shown in Figure 5. It has a hollow IP, a handle-type steering lever, an unprecedented layout design in which the driver's seat is in the middle and passengers are surrounded on both sides, and the minimalist partial design The empty U-shaped seat design, the fully transparent cabin, and the very voluminous doors are all so unreal, as if everything was predicted at the time, like a work created by a contemporary designer who traveled back in time. Among the many space-themed cars, the Cadillac ElDorado is undoubtedly the most representative car,s shown in Figure 6. This is a car designed with the concept of rockets and spaceships. Its exaggerated rear shape shows a high degree of resemblance to a space rocket, and the entire body is slender and very full and round. For car design at that time and even now, this shape is a very bold breakthrough. While combining space rockets with cars, hot red is also used as the theme color of the entire car body, which is very consistent with the design characteristics of the entire car.

Figure 6 Cadillac ElDorado

Fiat 600 is a multi-functional car, very suitable for family use or a group of close friends going outdoors,as shown in Figure 6. The rear space is extremely practical and forward-looking. Its space utilization is very extreme. The rear seat is a large U-shaped seat. Chair, its streamlined and soft seat features are very close to the characteristics of the space capsule at that time. Many current autonomous driving concepts and student works are quite similar to his. The picture on the right is an electric concept car released by the American new energy company Canoo in 2019. It can be seen that there are similarities in both the general layout and interior design. The place. It can be said that the interior design of cars at that time profoundly affected the development of modern car design, especially in the context of the rapid development of new energy vehicles. The near-space theme shape is undoubtedly the most representative and forward-looking design. Major new energy vehicles The brand also hopes to use such a unique design to show the characteristics of the brand.

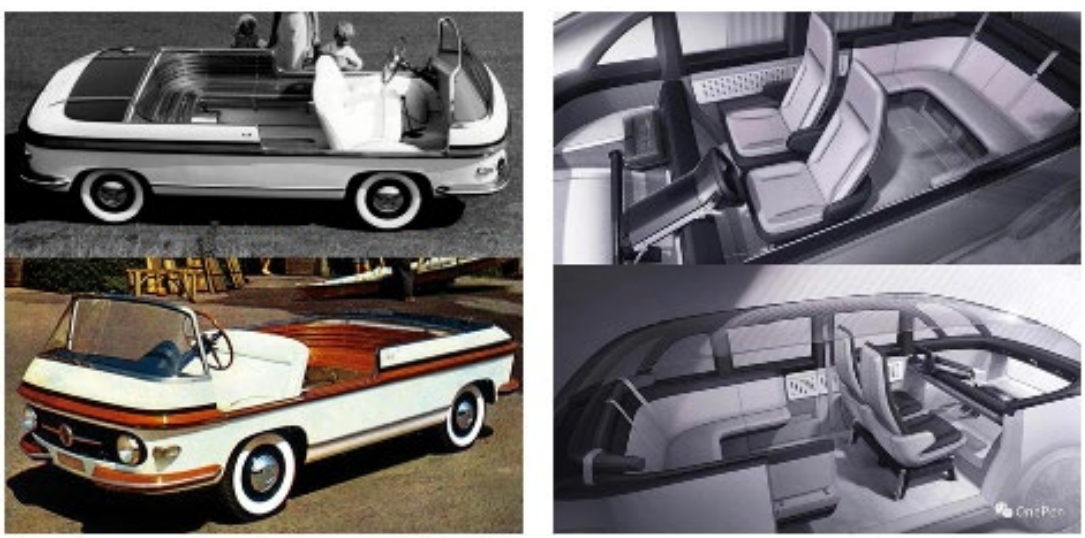

Figure 7 Fiat 600 vs. Canoo

"This is the best of times and the worst of times"

While admiring the bold car designs of the space age, we need to reflect on whether, in a commodity society, designs with unique styles are also reasonable? Is this exaggerated design for product sales a "redundant" design? After the end of World War II, under the influence of the competition mechanism of consumerist society, the United States brought cars into the palace of art and design. With the proposal of Harry Earl's "planned abolition", more and more models with unique appearance have been launched to stimulate people's consumption demand.

While people appreciate and enjoy the pleasure brought by consumption, the waste of the world's energy resources has also increased. Gradually intensify. The cars with various unique shapes produced under the "space fever" are the most representative products of the "planned abolition". The unique shapes of the cars under the "space fever" not only highlight the majesty of the aviation age, but also There is a hidden global energy crisis, and this time bomb finally broke out in the "oil crisis" of the 1970s. Under this crisis, people finally realized deeply that the unrestrained commodity consumption society has had a negative impact on global energy resources. serious harm. This awareness of energy crisis not only affects the industrial production system, but also profoundly affects the field of industrial design. Therefore, people began to constantly reflect on whether the exaggerated designs that appeared during the "space fever" period were really necessary? In addition to meeting consumer needs, are there other factors that designers should consider during the design process?

Obviously, after the oil crisis, the exaggerated car designs under the "space fever" disappeared, and were replaced by more practical and compact models that gradually occupied the main market. The outbreak of the "oil crisis" greatly increased the public's awareness of energy and fuel conservation. , family passenger cars have gradually changed the previous overly decorated and overly simple designs, making car design gradually enter the track of mature development.

Conclusion

Now looking back at the designs under the "space craze", we have found many precious designs. Due to changes in the international environment, many designs have become exclusive to that era and we, as future generations, cannot copy them. From the perspective of global energy development, the "space boom" is undoubtedly a bad era. In that era, a large amount of energy was consumed, and the uncontrolled consumption of global resources undoubtedly reflected the shortcomings of the free economy of capitalist society. But from a design point of view, the "space fever" is undoubtedly the best era. It was a period of high creativity and inspiration.

Many classic designs were born that designers today are imitating. In contrast, , Today's large number of cars are seriously homogenized, and they are gradually losing the unique characteristics of car brands. This situation also makes us reflect on whether meeting consumer needs is the only answer for designers. Perhaps how to achieve a perfect balance between multiple needs is the key to good design.

After entering the 21st century, environmental problems have become increasingly serious. The consumer market not only pays attention to the design itself, but also pays more attention to the deep impact behind the design. In this context, as a designer, you should not just focus on new technologies. When discovering and exploring materials and new shapes, we should pay more attention to the sustainability behind the product and the rationality of the design. While ensuring that the ecological impact of the design is minimized, we should try our best to organically combine the form of the product with the ecological impact. , finding the perfect balance between the two, this is the good design that today's society needs.

References

ZhangZhen.(2022).TheCulturalColdWarfromtheperspectiveof "imaginativeconsumption" — On the aesthetic characteristics of Soviet and Russian space science fiction movies. Culture and Art Research (05), 96-102+116.
Lu Chunyan. (2015). A magnificent journey in the vast space - the development trajecto ry of space science fiction movies. Contemporary Film (06), 37-43.
Cai Wanqing. (2021). On the aesthetic significance of Kubrick's "Future Trilogy" (Master's degree thesis, Xi'an Conservatory of Music). https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202201&filename=1021052467.nh

Building a new framework for service qualia evaluation: a user experience perspective

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Abstract

In the era of service economy, how to effectively improve service qualia has become an important research issue, while user experience is a key factor reflecting service qualia. Existing research on service qualia evaluation mainly focuses on quality evaluation models under the field of service management and lacks an experiential reflection and evaluation framework from the perspective of service design. Through literature review, this paper explores the relationship between user experience and service qualia, and constructs an evaluation framework of service qualia under the perspective of user experience, which corresponds to the three levels of user cognition to the three phases of pre-service, mid-service, and post-service, and finally arrives at the degree to which users' expectations are fulfilled, i.e., exceeding the expectations is surprised qualia, meeting the expectations is general qualia, and falling below the expectations is disappointed qualia. This paper further elaborates and confirms the framework by analyzing the case of service transformation of Shenzhou Pregnant Mothers' Car. The framework provides a new theoretical perspective for service qualia evaluation, supports the optimization and improvement of service processes, and contributes to the development of service design methodology in the context of disciplinary cross-fertilization.

Author keywords

Service design; service qualia; user experience; evaluation framework.

Introduction

With the rapid development of social productivity and the upgrading of industrial structure, the service industry has been vigorously developed, "service" has become a hot topic of research in various disciplines and service design has also emerged.

Service design is a design activity that considers the users as the main perspective, collaborates with multi-stakeholder to co-create, achieves the systematic innovation of service offerings, service process and service touchpoints through the comprehensive integration of elements innovation such as personnel, environmental, facilities, information, thus improving the service experience, service qualia and service value (Hu Fei et al., 2019). According to the definition, improving service qualia is one of the main purposes of service design. However, how should service providers improve service qualia, and how have users

gained different levels of experience? This process is vague and under-discussed. Therefore, this paper

comprehensively combed existing studies related to service qualia assessment and user experience metrics based on literature review, summarized the common points of the two. A new framework for service qualia assessment is constructed from the perspective of user experience, which is validated and specifically elaborated through case studies, providing new insights for practice and research in the service industry.

Literature Review

Research on service qualia evaluation

The concept of service qualia originates from service management in management science, which emphasizes the efficiency of the service, that is, the overall cognitive evaluation of the customer's expectations of the service in comparison with the perception of the service, including both the evaluation of the service results and the evaluation of the service process (Wang., 2009). The service qualia talked about in the field of service design pays more attention to feelings and experiences rather than just the quality in the physical dimension, so this paper defines service quality as service qualia. Liu (2015) proposed that "Design is to create a healthy and reasonable way of human existence, which aims to improve the qualia of life". Mapping to the field of service design, the main purpose of service design is to improve the qualia of service.

Juran (1974) categorized service quality according to the different types of quality into five parts: internal quality, hard quality, soft quality, immediate quality and psychological quality. Sasser, Olsen, and Wyckoff (1978) proposed that service qualia consist of the level of materials, the level of equipment, and the level of people, from the perspective of the service provider. Gronroos (1984) identified service qualia as including technical quality related to service outputs and functional quality related to service processes, further suggesting that the key to service success is the quality of service as perceived by the customer. Holbrook and Corfman (1985), based on the five methods of service qualia interpretation proposed by Garvin (1984), simplified them into subjective and objective methods, i.e., service qualia is divided into "human quality" and "mechanical quality".

Parasuraman, Zeithaml and Berry (1985, 1988) constructed a service quality evaluation model from the gap between customers' expectations and their perceptions and proposed a Service Quality Gap Analysis Model based on the Five Elements of Service Quality Evaluation Model. Carlton (1986) explored the relationship between service perception and service quality from the perspective of interaction between service providers and users, suggesting that service contact is a manifestation of service at the "moment of truth". Hong, C.S., et al. (2012) described the psychological influence mechanism of service qualia in interactive environments from three aspects: pre-service customer expectation and information influence, in-service customer- employee psychological interaction, and post-service customer psychological adjustment.

Research on user experience metrics

User experience, as a common basis for research in product development, interface design and service design, was first proposed by Norman, who pointed out that a successful user experience must firstly satisfy customer needs without harassing or annoying the user. Secondly, the product offered should be simple and elegant, so that the customer can use it with pleasure and delight. In addition, it should be able to bring the user additional surprises. Pine II and Gilmore (2011) advocate that the evolution of human economic activity has shifted from the simple buying and selling of products (commerce) to a more complex emotional life experience. Therefore, UX focuses on how to create a high-quality experience, and designing a "pleasurable" qualia of life is exactly where the value of UX lies (Hu, 2009).

Hassenzahl (2001) proposed that UX includes ergonomic and hedonics qualities that make up the attractiveness of a product, and later further identified hedonic needs, emotions, and experiences as key qualities of interactive products. The Usability Professionals Association (UPA) (2015) broadened the context in which UX is associated,

summarizing UX as all user perceptions comprising all aspects of interaction with a product, service, or business. In terms of the time- course division of user experience, Forlizzi and Battarbee (2004) defined user experience as a period of experience with a clear start and end time, and all the use experiences that occur during this period are called user experiences.

User experience has the characteristic of changing with the user's process of using the product, therefore, it is necessary to collect the data of user experience at different stages, mainly including the measurement of expectation experience, the measurement of immediate experience, and the measurement of long-term experience. At present, there are various effective measurement methods for user experience. Immediate experience measurement methods are usually based on questionnaires, user observation, physiological and psychological measurement, and other methods to measure the corresponding indicators. Long-term experience is more important for product or service improvement, and the measurement methods are also more systematic and diverse. Karapanos (2010) proposed the iScale method to assist users in recalling the experience process to make a self-report of the experience process over a period. Kujala et al. (2011) proposed a user experience curve measurement method to study the changes in users' experience of a product over a long period of time, and at the same time to be able to explain the reasons for the formation of user loyalty as well as to find out the reasons for the enhancement and degradation of user experience. EKarapanos et al. (2009) established a temporal model of user experience based on the qualitative analysis of DRM data , and divided the process of user acceptance and use of a new product into the stages of Orientation, Incorporation, and Identification. From the research of experience design, the implementation of user experience is from the function realization to the demand satisfaction to the higher user experience, i.e. to achieve the purpose (low) - to feel satisfied (medium) - to produce surprise (high).

The Possibility of Combining Service Qualia Assessment and User Experience Measurement

Through the literature review research on service qualia assessment and user experience metrics, this paper finds that there are many common points in the research of service qualia and user experience:

1. Both focus on the evaluation and feelings of the users.
2. Both contain instrumental (mechanical) and non-instrumental (human) dimensions.
3. Both have a timeline and a process of experience.
4. Both are closely related to the degree of fulfillment of the user's expectations.

Therefore, there exists a greater possibility of combination and exploration value of the two modeling systems, which can provide new solution ideas for the improvement of service qualia.

Meanwhile, scholars have already conducted research on the relationship between service qualia and user perception. Gronroos (1982) proposed the concept of customer perceived service qualia according to the cognitive psychology theory, that service qualia is a kind of customer perception, which is determined by the comparison between customer's service expectation and perceived performance, so the evaluator of service qualia should be the customer rather than the enterprise. In the evaluation results of service qualia, it is generally believed that the results of customer evaluation of service qualia is no more than three kinds of results:

1. The service provided by the service provider has exceeded the customer's ideal Desired Service. In this case, the customer is happy.
2. The service provided by the service provider falls in the customer's Zone of Tolerance within the area of the service qualia. At this time, the customer is still satisfied.
3. The service provided by the service provider for the customer's services failed to meet the customer's minimum service requirements, that is, failed to meet the customer's expectations of the Adequate Service. At this time, the

customer will be dissatisfied, resulting in complaints and other behaviors.

According to the previous research on service qualia, it can be found that the evaluation of service qualia depends largely on the degree of satisfaction of user expectations. With the help of the elements and framework of the existing research, the relationship between service qualia and user experience can be constructed, which is of great significance in clarifying the process of transferring service qualia, predicting the effect of transferring service qualia, and clarifying the key points of constructing service qualia.

Constructing an assessment framework for service qualia under the perspective of user experience

This paper constructs a framework for assessing service qualia, taking the commonalities identified in the literature review as the main elements regarding service qualia assessment and user experience research, with the degree of satisfaction of user expectations as the core indicator.

First, this study divides the process of service into three stages based on the user's cognitive model (cognitive-perceptual-emotional) and matches it with the before, during, and after service. The cognition of the before-service mainly focuses on the service expectation of word-of-mouth, personal needs, and experience. The perception of the during-service mainly focuses on the service qualia of the service delivery system. The emotional experience of the after-service mainly focuses on the evaluation of the service satisfaction of the user experience. Based on the above process, the final output is the degree of satisfaction of the service to the user's expectations, i.e., exceeding expectations is surprised qualia, meeting expectations is general qualia, and falling below expectations is disappointed qualia. Thus, the assessment framework of service qualia is formed (shown in Figure 1).

The model combines the theoretical research elements of service qualia and user experience, establishes the relationship and transmission path between the two, systematically integrates the existing theoretical models,

Figure 1. Assessment framework for service qualia in user experience perspective

shows the way through which the service qualia is transmitted to

the user and generates different user experiences, and thus perceptualizes, metricizes, and describes the assessment of service qualia.

Case Study: Service Design of Shenzhou Pregnant Mothers' Car

Shenzhou Private Car is a private car application platform that integrates self-driving, private car and carpooling services. It relies on its own human and car ecosystem advantages to provide users with high-end taxi services that are on call and vehicles are always on standby. Shenzhou Pregnant Mothers Special Car Service is a high-quality, customized taxi service provided by Shenzhou Special Car to address the travel needs of pregnant

mothers, a vulnerable group that requires special care. In the following, we will analyze the case to explain the service quality assessment framework constructed in this paper from the user experience perspective. According to the evaluation framework of service quality under the perspective of user experience constructed in this paper, service quality will be transmitted to users through the three stages of service before, during and after the service, in the different stages of service, users will produce different behaviours and psychological changes, and the service provider needs to provide users with appropriate service content as much as possible to meet the user's expectations of the service, and the final degree of fit between the service quality and the user's expectations will form the degree of fit between the final service quality and user expectations will form the user's overall user experience.

Before service: Preparedness to Exceed Service Expectations

In the case of Shenzhou Pregnant Mothers' Private Car, the service is aimed at pregnant women, the service provider is the Shenzhou Pregnant Mothers' Private Car platform, and the driver is an important contact point and personnel in the service. Before the service starts, the pregnant mother is in the psychological stage of cognition, understanding and judgement, and will have service expectations for the car service. At this time, pregnant mothers will learn about the reputation of the car service, the service provider and the experience level of the service provider, which will also affect the expectation level of pregnant mothers. On the service provider's side, in order to provide pregnant mothers with sufficiently intimate and on-point services, and create services that meet or even exceed their expectations, Shenzhou's special car for pregnant mothers will make sufficient preparations before they get on the car. After an order is placed by a pregnant mother, the driver of the Shenzhou Pregnant Mothers Car Service will use a virtual mobile phone number to determine the time and place of boarding and the expected arrival time with the pregnant mother, so as to provide the user with a safe, private and heart-flow experience. The driver will adjust the air inside the car in advance for the pregnant mother to keep the air fresh, to ensure that the pregnant mother gets a comfortable and pleasant air environment experience when traveling in the car. At the same time, a "pregnant woman inside" warning sticker is placed on the car to warn other vehicles encountered during the journey to ensure safe driving. These pre-service preparations take into account the needs of pregnant mothers, and provide them with a good first impression from the perspective of meeting/exceeding their expectations.

During service: Meticulous service delivery system standards

In the service, pregnant mothers will begin to formally perceive the service they receive and its quality, which will be passed on to them through the service delivery system. In Shenzhou's special car service for pregnant mothers, the service delivery system mainly consists of four aspects: driver, vehicle, service, and guarantee. The special car platform has standardized service construction for these four service elements. The standard for drivers consists of selection parameters, grooming and behaviour, which ensures the high quality of the driver's experience, professional ability, image, and reception behaviour. The standard for vehicles consists of basic parameters and vehicle appearance, the standard for services consists of driver driving, vehicle hardware, APP software and additional services, and the standard for guarantees stipulates the norms for driver guarantees, health guarantees, technical guarantees, privacy guarantees and

first companion guarantees. The detailed specification of the service delivery system lays the foundation for the service quality perception of pregnant mothers.

Table 1. Diagram of the elements of the service delivery system of the Shenzhou Pregnant Mothers' Special Service

Elements		Details
Drivers	Selection parameters	Possess at least 3 years of driving experience, good driving skills, medical assistance training, familiar with basic medical assistance knowledge related to pregnancy, etc.
	appearance	Drivers are required to wear formal attire (white shirt, tie, trousers, black leather shoes), maintain personal hygiene, neat facial grooming, etc. while in service.
	demeanour	We need to be full of energy and behave in a civilised manner. When passengers are dissatisfied with the service, we will listen to their criticisms with an open mind; when misunderstood, we will explain patiently and will not argue with the passengers.
Vehicles	basic parameter	Provide pregnant women with clean and comfortable vehicles priced at more than 150,000 yuan and new within three years; urban operation vehicles are mainly new energy models.
	vehicle appearance	Vehicle safety performance, ride space and other indicators should be significantly higher than the level of mainstream specialised vehicles, clean and hygienic carriages, providing free and convenient items for passengers, etc....
Services	chauffeur-driven	Strict adherence to norms: before picking up a pregnant woman, the windows must be opened and ventilated in advance; smooth driving, avoiding bumps and speeds of no more than 60 kilometres per hour (except in emergencies), and so on.
	Vehicle hardware	The interior of the vehicle is odourless, equipped with "pregnant woman inside" warning stickers, vomit bags, and plays foetal music at an appropriate volume.
	APP software	Exclusive functions for pregnant women's car use have been added, providing functions such as vehicle booking, vehicle use, vehicle monitoring and arrival reminders.
	Additional services	The first time you take a Shenzhou Pregnant Mum Special Car, you can get a RMB 100 mother and baby gift pack, and you can get mother and baby gifts for a cumulative number of rides without stopping.
Guarantee	Driver Protection	Physical examinations and driving ability inspections are conducted for drivers, and background information of drivers is verified in co-operation with the Public Security Department to ensure that drivers have no criminal records, etc.
	health protection	Vehicles are regularly inspected and maintained, and complete vehicle repair and maintenance files are established to ensure that vehicles are in good technical condition and have reliable safety performance.
	technical security	Installation of a vehicle system with a driving record function to achieve real-time monitoring of the vehicle's location and operating status; to avoid unsafe driving behaviour.
	Privacy Protection	Hide passengers' real numbers and go online with 170 virtual security numbers to ensure that passengers' mobile phone numbers are not leaked.

At the specific operational level, the service elements will be combined with each other to deliver service quality to pregnant mothers. Before the pregnant mother gets into the car, the driver will open the door for her, assist her, and tell her how to fasten the seatbelt in a detailed and considerate experience; and with a comfortable temperature of 22 degrees Celsius inside the car, and the adjustment of the direction of the air vents, it brings a comfortable and detailed and considerate service experience to the pregnant woman, plays foetal education music for her, and pays attention to her life as a pregnant woman, as well as equips her with vomit bags, Swallow's House and other cooperative service products, so as to enable her to obtain the exclusive and considerate service experience for pregnant mothers at the whole scenario. Pregnant mothers can use the app's OBD system to monitor the car's speed during the journey, providing them with a safe experience in the whole process. After the pregnant mother gets off the bus, the driver will pick up, carry and deliver her luggage, turn on the high beams at night to escort her to her destination, and send the arrival information to the user who booked the bus at the first time, so that the pregnant mother can get a safe, high-quality service experience with humanistic care.

After service: Qualia evaluation of the total service experience

Despite the dynamic changes in the experience of the pregnant mother before and during the acceptance of the service, when the service is completed, the previous service and experience will be synthesized into an overall service emotional feeling and form a perception of the quality of this service, which will be contrasted with the previous user's expectations, and if the pregnant mother perceives an experience that exceeds her expectations during the service, the service is presented as a surprised quality (high quality). If the pregnant mother's previous expectations are met in the service, the service is perceived as general quality (medium quality). If the pregnant mother's previous expectations were not fulfilled in the service, the disappointed quality (low quality) is perceived.

Through the analysis of the case, it can be seen that user expectation is an important reference for users to evaluate the service quality, in order to improve the service quality, the service provider should try to create a service that exceeds the user's expectation on the basis of meeting the user's needs, and in this process, the elements of the service delivery system, the standard and its practice are important delivery channels, and the service provider can enhance the service delivery system through the stipulation and optimization of the service delivery system to improve the users' service perception.

Conclusion

To promote the improvement of service qualia, this paper explores the path of improving service qualia under a new perspective. Through a literature review of user experience and service quality research, the theoretical commonalities between the two are found, from which an assessment framework of service quality under the perspective of user experience is constructed, followed by a case study of Shenzhou Pregnant Mothers' Specialized Vehicle, which further elaborates the content and application process of the framework.

This evaluation framework responds to how the service process affects the user experience through service qualia from the user experience perspective and provides a valuable reference for service industry practitioners to improve service qualia.

References

Forlizzi, J., & Battarbee, K. (2004, August). Understanding experience in interactive systems. In Proceedings of the 5th conference on Designing interactive systems: processes, practices, methods, and techniques (pp. 261-268).

Gronroos, C. (1982). Strategic management and marketing in the service. Boston: Management and Marketing.

Hassenzahl, M. (2001). The effect of perceived hedonic quality on product appealingness. International Journal of Human-Computer Interaction, 13(4), 481-499.

Hassenzahl, M. (2005). The quality of interactive products: Hedonic needs, emotions and experience. Encyclopedia of Human Computer Interaction. Idea Group.
Hong, Zhisheng., Su, Qiang., & Huo, Jiazhen. (2012). A review and current status of service quality management research. Management Review, 24(7), 12.
Hu, Fei. (2009). Focus on users: UCD concepts and practices. China Building Industry Press. P16.
Hu, Fei., & Jiang, Mingyu. (2018). Experience design research: Problematic contexts, disciplinary logic and theoretical trends. Packaging Engineering, 39(20), 16.
Hu, Fei, & Li, Wanqaing. (2019). Defining "service design". Packaging Engineering, 40(10), 15.
Juran, J.M.F., M. Gryna and R. S.(1974). Brighman Quality Control Handbook[M] (3rd Ed). New York: McGraw-Hill (pp. 2-9).
Karapanos, E., Zimmerman, J., Forlizzi, J., & Martens, J. B. (2010). Measuring the dynamics of remembered experience over time. Interacting with computers, 22(5), 328-335.
Karapanos, E., Zimmerman, J., Forlizzi, J., & Martens, J. B. (2009, April). User experience over time: an initial framework. In Proceedings of the SIGCHI conference on human factors in computing systems (pp. 729-738).
Kujala, S., Roto, V., Väänänen-Vainio-Mattila, K., Karapanos, E., & Sinnelä, A. (2011). UX Curve: A method for evaluating long-term user experience. Interacting with computers, 23(5), 473-483.
Liu, guanzhong. (2015). The purpose of design:Enhancing the quality of life. Design (1), 4.
Parasuraman, A. B. L. L., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. 1988, 64(1), 12-40.
Pina e Cunha, M., Rego, A., & Kamoche, K. (2009). Improvisation in service recovery. Managing Service Quality: An International Journal, 19(6), 657-669.
Usability Profesionals' Association (UPA) (2015). Usability Body of Knowledge. http://www.usabilitybok.org/glosary.
Wang, Xiuming. (2009). Research on Tax Service Innovation Based on Service Quality Theory. Tax Economics Research, 014(004), 38-41.

An Integrated Theoretical Framework Based on Sketch Taxonomies to Enhance Sketching Activity Flow

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Abstract

This study explores the role of sketching in the design process and addresses the need for a comprehensive sketch taxonomy. Sketching plays a vital role in design, aiding idea generation, problem visualization, and design inference. Existing sketch taxonomies fail to capture sketches' roles and diverse use cases, prompting the development of a Multi-Faceted Sketch Taxonomy (MFST). MFST is an integrated sketch taxonomy that visualizes design flow during sketch activities, facilitating better understanding and utilization of sketches in various design disciplines. The research method involves a literature review, logical reasoning, and Peirce's theory of inquiry. It aims to bridge the gap between design researchers and practitioners, providing designers with valuable insights and practical tools.

Author keywords

Integrated Sketch Taxonomy， Design Sketch， Design Flow， Peirce's theory of inquiry， Multi-Faceted Sketch Taxonomy (MFST)

Introduction

Designers typically attribute great importance to sketching, but is there a necessity for sketching in the design process? One evident reason is the persistence of traditional customs, where design deliverables were traditionally provided in drawing format, facilitating communication with other stakeholders before the utilization of high-performance 3D modeling software or sketching software (Cross, 2006).

Sketching is recognized to serve various functions in the design process, including supporting the idea generation process (Lugt, 2005), externalizing and visualizing problems (Kernohan, 1981), and promoting design inference (Do & Gross, 1996), among others.

Sketch taxonomy is a critical method for describing the role of sketches in design. Simon stated, "Understanding a set of phenomena at an early stage is the first step in understanding what kinds of things are included in that set." While there is a wealth of literature on this topic, both in academia and the design industry, a complete understanding of the role of sketches in design remains elusive. Most existing taxonomies struggle to capture the diverse use cases of different types of sketches throughout the design process, highlighting the need for a comprehensive taxonomy to address this. However, bridging the gap between design researchers and designers requires more than just developing a generic sketch taxonomy for researchers. It also involves sharing the outcomes with designers and making them usable. Therefore, in this study, we believe that the development of taxonomy can aid researchers and designers in better understanding the role of sketches in the design process, as

well as their relationship with creative flow in theoretical analysis and practical settings.

However, for novice and inexperienced designers, understanding the relationship between sketch activities and the design process, as well as interpreting the design flow reflected through sketches, can be challenging. Many rely on intuition when expressing themselves through sketches.

Therefore, this study aims to bridge the research gap in design studies and materialize its contributions to actual designers. Specifically, we aim to provide designers with a clearer understanding of design flow during sketching activities. To achieve this, the author proposed a

theoretical framework that visualizes the design flow inherent in sketch activities, with sketching serving as a design representation tool. We hope this will enable designers to comprehend better the role of sketches and how to utilize them in the design process effectively.

Research Method

Sketching is considered a typical activity in nearly every discipline related to design (Schön & Wiggins, 1992; Buxton, 2010). The focus of this research is not on specific disciplines such as industrial design, UX design, or service design but rather on any design process that incorporates sketching. Therefore, this study adopts a discipline-non-specific approach. Besides, the research methods consist of the following:

§ Literature review about design sketch and sketch taxonomy

§ A logical process involving abduction and deduction to explore how existing single- criteria sketch taxonomies can be aligned to gain a clear understanding and utilization of design flow in the design process using Peirce's cycle of abductive, deductive, and inductive reasoning.

Literature Review

Given the limited length of this paper and the brief introduction in the introduction section regarding sketch, its role in the design process, and a partial summary of relevant sketch taxonomy literature, this section will provide selective explanations.

Sketches are understood to play an intermediary role during the "sensemaking" process between designers and design tasks. They are primarily considered a form of "visual thinking" (Goldschmidt 1991, Goel 1995). Additionally, sketch communication evolves in tandem with thinking processes during sketch activities. Another approach to the concept of "sketch" views it as a means to facilitate limited human cognitive processing, serving as a tool for analyzing problems within the context of design situations through "reflective conversation" (Schön 1983).

Based on the above literature review, there are a total of 15 existing sketch taxonomies within the relevant design domains. However, these various sketch classification systems were proposed during a time when AI and digital sketching tools were less developed. In the current design context, this research suggests that existing sketch taxonomies are insufficient for a comprehensive analysis of the role of design sketches.

Peirce's cycle of abductive, deductive, and inductive reasoning

The generic sketch taxonomy in this study was proposed using Peirce's theory of inquiry. Peirce is sometimes known as "the father of pragmatism". Peirce's thought can be divided into early and later periods (Burks, 1946).

Only from the later period can it be explicitly related to inquiry, which is why this study has adopted Peirce's Late Theory of Abduction (Kruijff, 2005). Peirce considered the major premise, minor premise, and conclusion as representing RULES, CASES, and RESULTS, respectively. In the later period (Particularly in 1901, the radical change in understanding of abduction), it was here that Peirce's most mature explication of the method of scientific inquiry was born.

Fann has clearly outlined this process (Fann, 1970). This resulted in the new conception of the three types of reasoning as three interconnected and interdependent stages of scientific inquiry, the three types of reasoning

are no longer necessarily confined to the syllogism, but rather are reinterpreted as three stages of inquiry as shown in Figure 1.

Generic Multi-Faceted Sketch Taxonomy Theoretical Framework

The authors previously reviewed sketch taxonomies from different perspectives in different design disciplines and compared the similarities and differences in using sketches in traditional and contemporary design (MA, 2023). Considering that the classification criteria required by faceted theory must be tangentially related to each other, the authors chose four types of

sketch taxonomies from the existing 15 types of sketch taxonomies as the important parameters for composing the generic taxonomy (Figure 2). They are the four types of complexity, cognitive approach, intention, and function, respectively introduced in the literature. In order to distinguish it from the extant single-criteria sketch taxonomy, this study named it the Multi-Faceted Sketch Taxonomy (MFST). The parameters that make up the MFST are the four types of sketches: complexity of the sketch, cognitive approach and intention of the designer, and the function of the sketch itself.

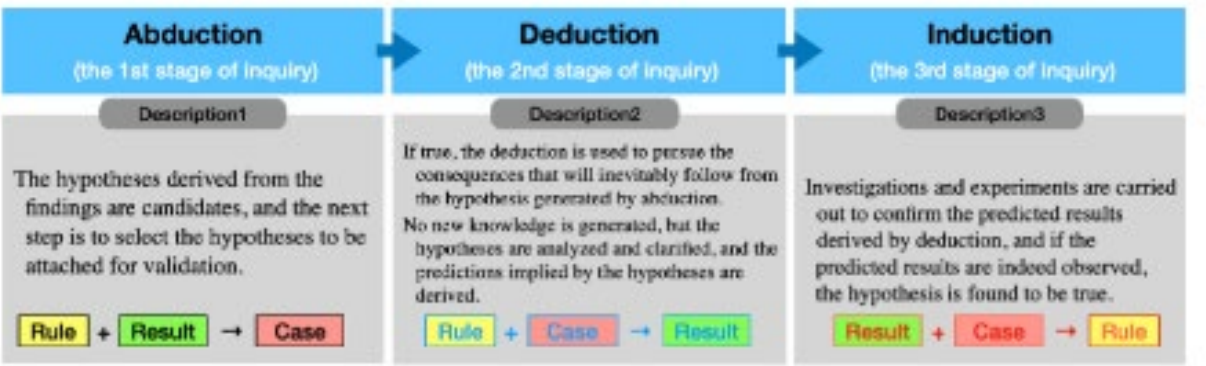

Figure 1. Peirce's cycle of abductive, deductive, and inductive reasoning in this study

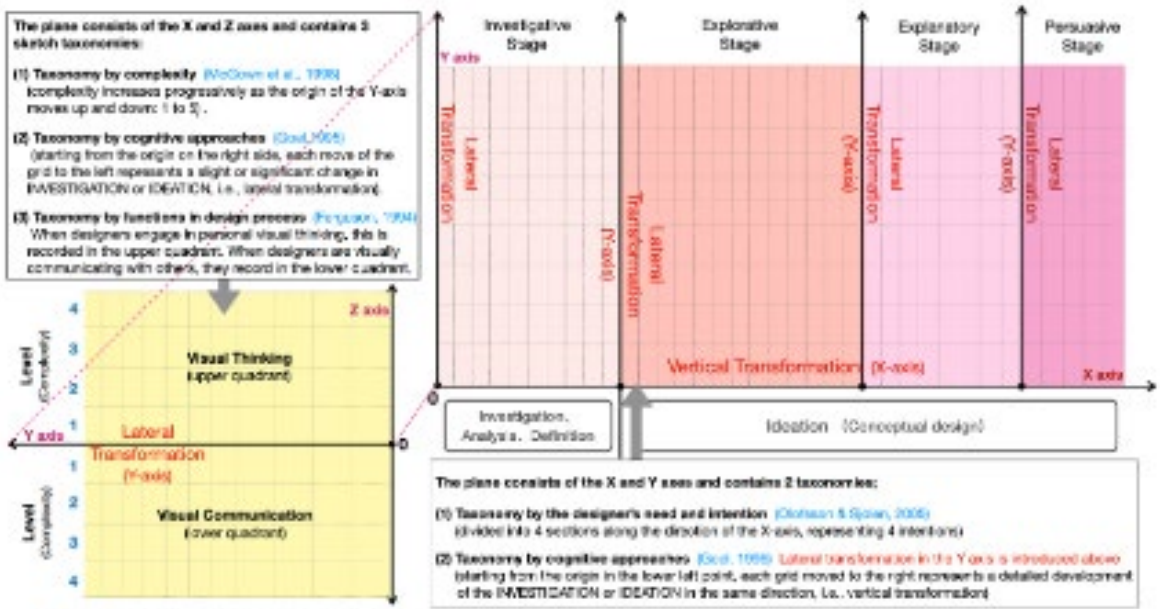

Figure 2. The theoretical framework of multi-faceted sketch taxonomy

For design researchers, bridging the gap between single-criteria sketch taxonomy dispersion and its applicability across diverse disciplinary design processes is vital. The theoretical framework offers valuable scientific insights and guidance.

However, designers, particularly novices, have yet to benefit from translating academic research into practical design industry tools and guidance.

To enhance comprehension and confidence in sketching within diverse design disciplines and among novice designers, the authors have transformed their theoretical findings into the MFST design tool. MFST, operating within a simulated 3D space, facilitates the interpretation, recording, reflection, and guidance of sketching activities in the design process flow.

As a result, this study configured these four facets in a 3D spatial coordinate system, respectively, and the construction method is shown in the figure below.

Introduction to the Use of the MFST as a Design Tool

MFST, as a theoretical framework developed from a practical perspective, can reflect the following three correlated and orthogonal parameters affecting sketching behavior in designers' sketching activities.

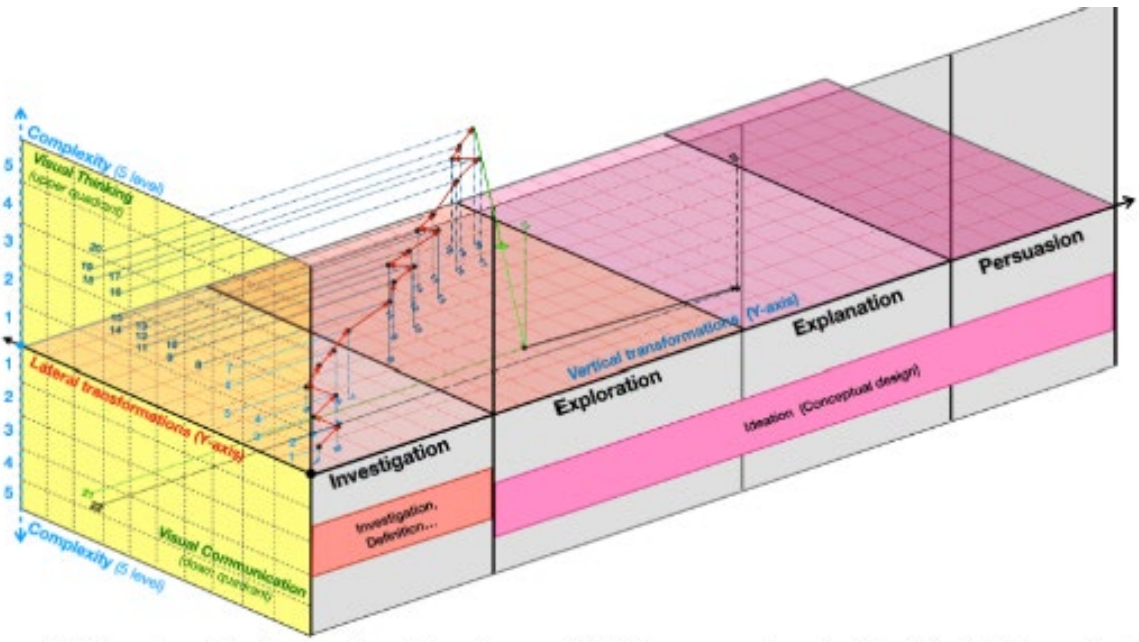

Figure 3. The simulated sample of how to use MFST to record and reflect sketching activities during the early design process

1) The authors applied Ferguson and Lugt's taxonomy of function to the X-axis and divided the X-axis into four parts.
2) Simultaneously, the lateral and vertical transformations of the cognitive method were configured on the Y-axis and X-axis, respectively. The development path of the ideas represented by the sketch is reflected in the small grid to record and represent the development trajectory of different cognitive combinations as the design process progresses.
3) ThecomplexityofthefivelevelsproposedbyMcGownwasconfiguredontheZ-axis,withthe Y-axis as the starting point, and the levels in the upper and lower quadrants gradually increased simultaneously (1 to 5).
4) Select a part of Ferguson's taxonomy of functions, namely thinking and talking. The upper quadrant represents thinking i.e., when thinking personally, and the lower quadrant represents when communicating with others.
This MFST theoretical framework can provide semi-constructive guidance and a timed recording function for how sketch is used under the multiple facets in the early and middle stages of the design process, and even in some later stages.

Conclusion and Discussion

In conclusion, this study highlights the importance of sketching in the design process and the need for a comprehensive sketch taxonomy. The Multi-Faceted Sketch Taxonomy (MFST) offers an integrated theoretical framework that visualizes design flow during sketch activities, addressing the limitations of existing taxonomies. By integrating complexity, cognitive approach, intention, and function, MFST provides valuable guidance for designers in diverse disciplines. This research contributes to a better understanding of sketching's role and enhances its utilization in the design process from different design domains. It serves as a valuable resource for both design researchers and practitioners, bridging the gap between theory and practice in design studies.
Future research should refine the MFST, considering additional parameters for usability. Empirical studies are necessary to validate MFST's effectiveness in improving design flow for both novice and experienced designers. Comparative analyses with other taxonomies can provide insights into its advantages and limitations. Exploring digital tool integration and AI in sketching can enhance MFST's adaptability to evolving design practices, paving the way for further investigation into sketching's role and practical tools for designers.

References

Burks, A.W. (1946). "Peirce's Theory of Abduction," Philosophy of Science, Vol. 13, No. 4, pp. 301– 306.
Buxton, B. (2010). Sketching User Experiences: Getting the Design Right and the Right Design. Morgan Kaufmann.
Cross, N. (2006). Designerly ways of knowing (pp. 1-13). Springer London.
Do, E. Y. L., & Gross, M. D. (1996, June). Drawing as a means to design reasoning. In AI and Design.
Fann, K.T. (1970). Peirce's Theory of Abduction, Martins Nijhoff.
Goel, V. (1995). Sketches of thought. MIt Press.
Goldschmidt G. The dialectics of sketching [J]. Creativity research journal, 1991, 4(2): 123-143.
Kernohan, D. (1981). Externalizing the design process. Design Studies, 2(1), 27-32.
Kruijff, G. J. M. (2005). Peirce's Late Theory of Abduction: A Comprehensive Account, Semiotica, Vol.153, pp. 431-454.
Ma, Z. (2023). Research on Design Sketch from Different Disciplines: Overview and Directions,
Cumulus Conference Proceedings Antwerp 2023, Nature positive/design for transformation, Antwerp, Belgium, 12th-15th April 2023, pp.37–42
Schön, D. (1983). The Reflective Practitioner: How Professionals Think in Action, Basic Books, New York, USA.

Schön, D. A., & Wiggins, G. (1992). Kinds of seeing and their functions in designing. Design studies, 13(2), 135-156.
Van der Lugt, R. (2005). How sketching can affect the idea generation process in design group meetings. Design studies, Vol. 26, No. 2, pp. 101–122.

Cross-Border conservation for socio-environmental sustainability: a complex system perspective—— Taking the Shenzhen-Hong Kong border as example

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Abstract

Under the "one country, two systems" principle, Hong Kong has maintained a high degree of autonomy, resulting in a border with mainland China. However, the border areas between Hong Kong and Shenzhen are clearly separated, with limited physical connections and restricted access for residents. This study aims to explore the development of the border area to establish new forms of cross-border connections and redefine the role of the Hong Kong Border, considering the interrelationship between the border and its residents. The research will focus on economic, social, and ecological aspects, using regional planning as a theoretical basis to propose strategies for balanced development and cooperation between Hong Kong and Shenzhen.

Author keywords

border, system, Hong Kong, Shen Zhen, FCA

Introduction

The border region can be conceptualized as an expansive domain wherein the more developed side of the city exerts dominance over the movement of individuals, commodities, sustenance, and financial activities across the border, rendering it a highly dynamic milieu. As a result, this space becomes imbued with a sense of uncertainty, facilitating the emergence of distinctive attributes in the cities on either side. Understanding the dynamics of borders opens up possibilities for various scenarios and contributes to the exploration of progressive change (Steele et al., 2013). Border area development is a multidisciplinary field that encompasses political, economic, social, and cultural dimensions (Scott, 2010), therefore, the permeability of the border has an impact on cities on both sides. Through a comparison of the

development of border regions in Shenzhen and Hong Kong, it becomes evident that the former has undergone a more significant transformation with a diverse range of land uses including factories, office buildings, and residential areas. This trend has led to steady economic growth and the availability of residential options within border areas. However, Hong Kong's border area remains largely undeveloped, consisting mainly of natural landscapes, farmland, and small settlements. Regional planning for borderland on the Hong Kong side, it plays a significant role in understanding the existence and evolving function of borders, both during their establishment and in subsequent years. It is fundamentally about anticipating and controlling the future by preparing plans that bring the future closer to the present and provide stability for citizens and the market (Granqvist et al., 2021). This approach enables the reconfiguration of future social space and fosters the exploration of combining regional planning with the border context (Ahern, 2011; Amin & Thrift, 2017). The study proposes a new approach

to develop the Hong Kong border region by system thinking, with ecological preservation, Social integration and economic development, aiming to establish stronger connections with Shenzhen and achieve mutual growth by broadening the border's scope.

Background

The border region can be conceptualized as an expansive domain wherein the more developed side of the city exerts dominance over the movement of individuals, commodities, sustenance, and financial activities across the border, rendering it a highly dynamic milieu. As a result, this space becomes imbued with a sense of uncertainty, facilitating the emergence of distinctive attributes in the cities on either side. In this project, the author propose to redefine the relationship between the border area and residents to enable mutual development and interdependence. Despite the previous implementation of a three-stage reduction plan, which saw the Hong Kong Restricted Area diminish from 2,800 hectares to approximately 400 hectares as announced in 2008, issues stemming from imperfect planning persist, and restricted zones endure. Therefore, the author propose to establish new principles that redefine the role of the restricted zone, transforming it into an area where individuals can interact with nature, develop the economy of both regions while preserving ecology, and increase collaboration for the sustainable development of the border region shared by Shenzhen and Hong Kong.

Methodology

While maintaining the regional specificity of the border area, changing the relationship between the FCA development and border residents is foucs on research. So based on the literature review, author can summarize cross-border as an interdisciplinary collaboration. Cross-border collaboration was intended to promote the resolution of regional conflicts, to promote regional development through thoughtful planning, and to ease regional problems: social, ecological, economic(Tal Yaar-Waisel, 2018). Due to the special geographical location of the borderland, the author conducted the reseach by system thinking.

Context of general framework for the systemic inquiry Systemic inquiry

Systems thinking is a holistic approach to problem-solving and decision-making that considers the interconnections and relationships within complex systems (Arnold & Wade, 2015). It recognizes that a system is more than the sum of its parts and focuses on understanding the behavior and dynamics of the system as a whole. This methods provides unique strengths that, when used together, can add value to program planning and evaluation by helping stakeholders explore systemic problems in different, but complementary, ways (Hassmiller et al., 2017). By approaching the analysis from the broadest perspective of the system (both sides of the border), it can identify leverage points(Figure 1). Consequently, it can be deduced that the three chosen areas on the Hong Kong border side will serve as the smallest scale study areas. Taking into account the interconnectedness of various elements within the system, key points are carefully selected as the pivotal areas requiring transit.

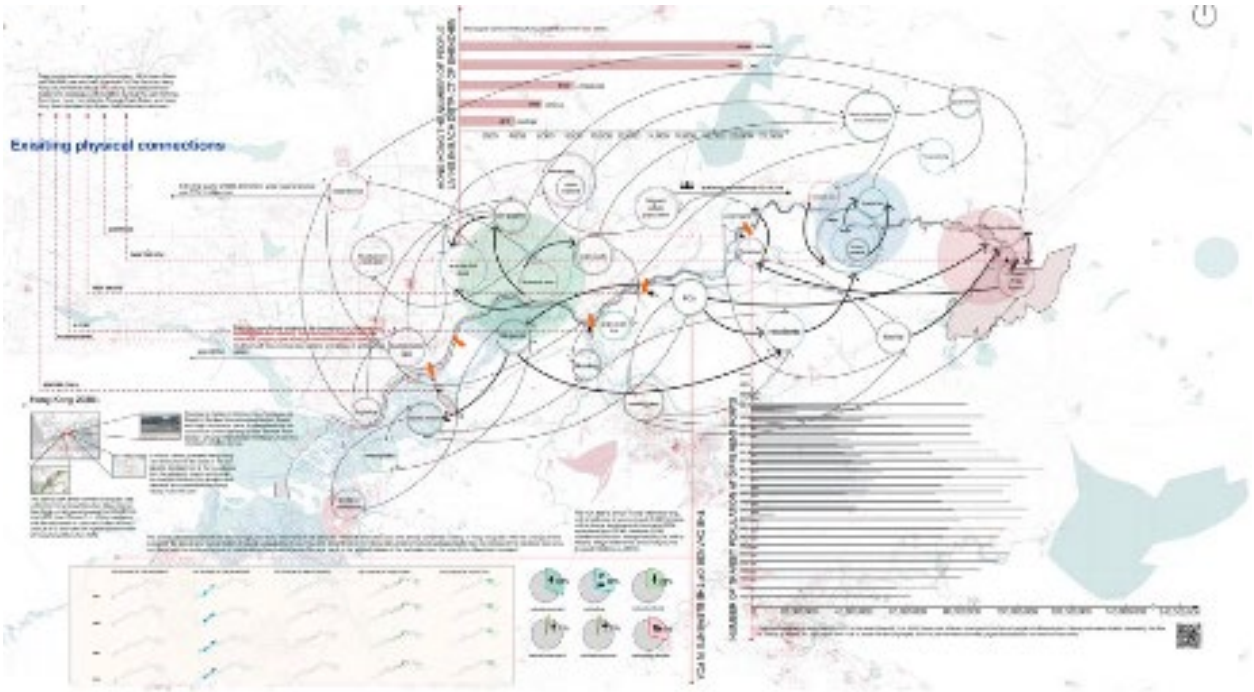

Figure 1. Border dynamic.

The whole study aims to explore the relationship between border and border residents, develop FCA in Hong Kong and narrow the gap of urban border, so as to achieve border cooperation between Shenzhen and Hong Kong and common development in the system. The authors propose different steps to achieve this vision.

According to the theory of systems thinking, different system perspectives are proposed for study areas of three different scales. In the FCA area on the Hong Kong side, the author selected three regions as the smallest scale (micro), namely Lok Ma Chau, Lin Ma Hang, and Sha Tau Kok. Strategies are proposed in the ecological, social, and economic aspects, respectively.

"Systems thinking is a discipline for seeing wholes. It is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static snapshots" (Meadows, 2008). Therefore, changing the system elements at the micro scale will affect the larger scale system (meso), which is the entire FCA area on the Hong Kong side. It can be inferred that the borderland of Hong Kong will develop in a more sustainable manner. Over time, this will also impact both sides of the border, Shenzhen and Hong Kong. The strategies under these different scales can be seen as three steps.

By combining Steps 1, 2, and 3(Figure2), a "cycle" is established within the borderland. The border of the FCA on the Hong Kong side will be developed to a certain extent. As mentioned by the author before, the border of Shenzhen is mostly factories and residential areas with pollution and resource needs. Therefore, the development of the relevant FCA can balance pollution and resource supply. Meanwhile, this state of balance will loop back to the whole system, in which the two cities cooperate and co-depend on each other, thus establishing a "cross-border" and generating new connections in the border area.

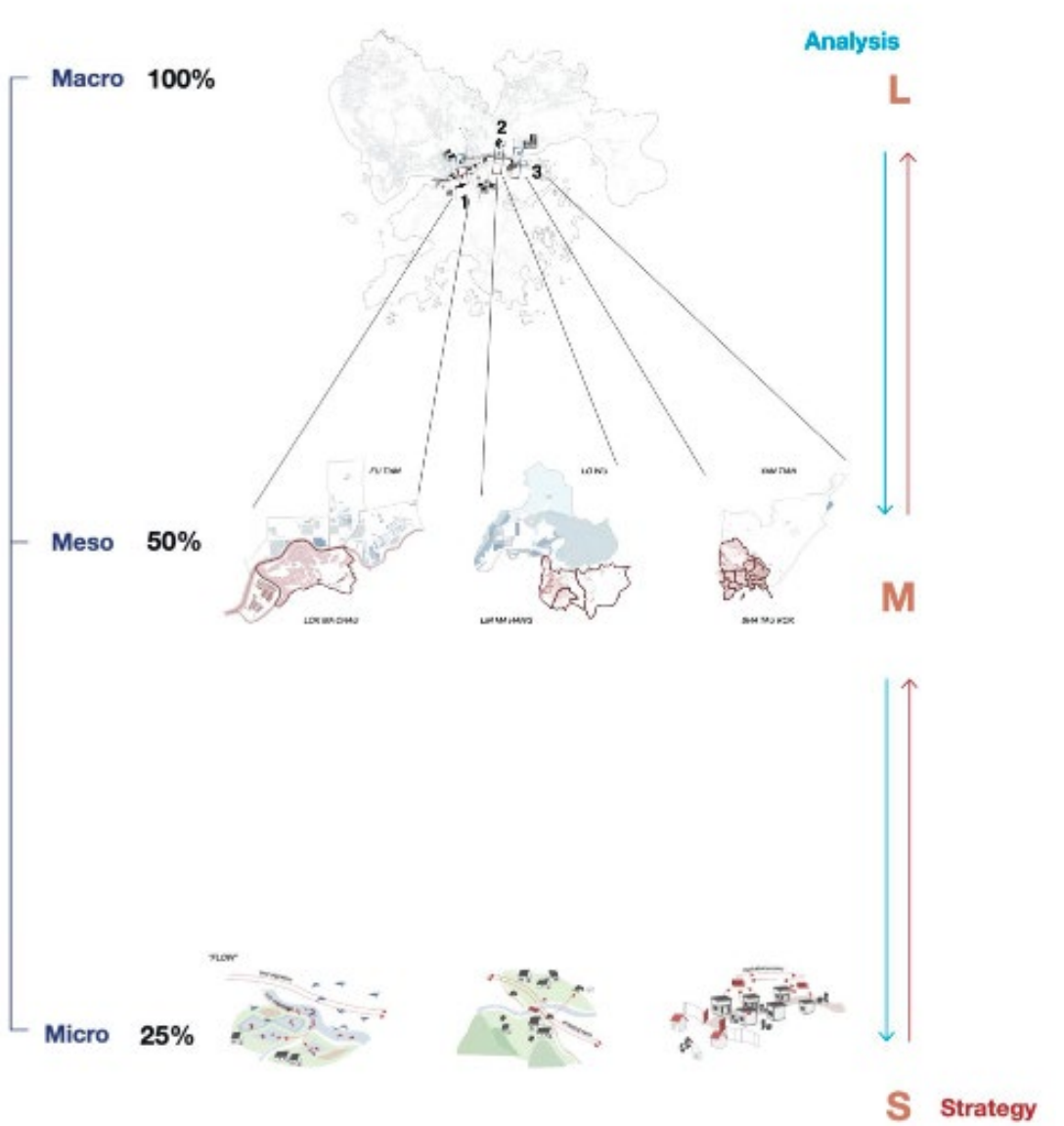

Figure 2. The framework of design flow.

Conclusion

Figure 2. The framework of design flow.

The border region can be conceptualized as an expansive domain wherein the more developed side of the city exerts dominance over the movement of individuals, commodities, sustenance, and financial activities across the border, rendering it a highly dynamic milieu. As a result, this space becomes imbued with a sense of uncertainty, facilitating the emergence of distinctive attributes in the cities on either side. When the FCA region of Hong Kong develops and a variety of urban connection modes are adopted, the quality of life of border residents will also be improved, thus alleviating the development imbalance between Hong Kong and Shenzhen. When the development degree of the two border areas is similar, the border restrictions will decrease, leading to increased border mobility. The author propose to establish new principles that redefine the role of the restricted zone,

transforming it into an area where individuals can interact with nature, develop the economy and social of both regions while preserving ecology, and increase collaboration for the sustainable development of the border region shared by Shenzhen and Hong Kong.

References

Steele, W., Alizadeh, T., & Eslami-Andargoli, L. (2013). Planning across borders Why a focus on borders? Why now? Australian Planner, 50(2), 93 – 95. https://doi.org/10.1080/07293682.2013.782788

Scott, J. W. (2012). Borders, border studies and EU enlargement. In The Ashgate Research Companion to Border Studies (pp. 11–31)

Granqvist, K., Humer, A., & Mäntysalo, R. (2021). Tensions in city-regional spatial planning: the challenge of interpreting layered institutional rules. Regional Studies, 55(5), 844–856. https://doi.org/10.1080/00343404.2019.1707791

Ahern, J. (2011). From fail-safe to safe-to-fail: Sustainability and resilience in the new urban world. Landscape and Urban Planning, 100(4), 341 – 343. https://doi.org/10.1016/j.landurbplan.2011.02.021

Yaar-Waisel, T. (2021). Bordering on the Impossible: Optimistic Planning of Border Regions. Journal of Borderlands Studies, 36(3), 389 – 404. https://doi.org/10.1080/08865655.2018.1531052

Meadows, D. H., Wright, D., Wright, D., & Wright, D. (2008). Thinking in systems : a primer. Chelsea Green Pub.

Frank, S., Spyra, M., & Fürst, C. (2017). Requirements for cross-border spatial planning technologies in the European context. Change and Adaptation in Socio-Ecological Systems, 3(1), 39–46. https://doi.org/10.1515/cass-2017-0004

Knippschild, R. (2011). Cross-Border Spatial Planning: Understanding, Designing and Managing Cooperation Processes in the German-Polish-Czech Borderland. European Planning Studies, 19(4), 629–645. https://doi.org/10.1080/09654313.2011.548464

Arnold, R. D., & Wade, J. P. (2015). A Definition of Systems Thinking: A Systems Approach. Procedia. Computer Science, 44, 669–678. https://doi.org/10.1016/j.procs.2015.03.050

Hassmiller Lich, K., Urban, J. B., Frerichs, L., & Dave, G. (2017). Extending systems thinking in. planning and evaluation using group concept mapping and system dynamics to tackle complex problems. Evaluation and Program Planning, 60, 254– 264. https://doi.org/10.1016/j.evalprogplan.2016.10.008

Synesthesia in Design: Visualizing Literary Vocabulary Online

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Abstract

The term "synaesthesia," originating from Greek, refers to the phenomenon where one sensory stimulus triggers perceptions in unrelated senses. This induces a concurrent experience. In the contemporary information-driven era, imaginative sparks are constant, accompanied by a demand for intricate experiences. This inspires diverse sensory connectivity designs and related tools, spanning various arts.

Addressing cognitive limitations in this age, synaesthesia emerges as a cognitive tool. The study examines existing synaesthetic designs, exploring generative design akin to synaesthetic logic. Practical application involves visualizing "Emily Dickinson's Complete Poetry" to understand synaesthesia's value in visual design and thinking. Synaesthesia diversifies cognitive dimensions and enhances information processing. It also introduces "partial randomness" for innovative visual design. This paper contributes to the discourse on synaesthetic thinking in visual design, fostering innovation.

Author keywords

Associative perception; Generative Design; Partial Randomization, Visualization Experiments; Literary Geography.

Introduction

Karl Mannheim said, "Human affairs are always imbued with thoughts of desire. When imagination cannot find satisfaction in reality, it seeks refuge in an ivory tower constructed of wishes." 1

Traditional graphic design's rules, materials, and techniques are waning in competitiveness and application scope. Graphic design serves information, following strict norms for precision. This study explores synesthetic thinking's facets — multisensory perception and partial randomness — to uncover novel potential in visual communication.

Trigger effects of association on the senses

Synaesthesia is a phenomenon in which sensory stimuli elicit perceptions in unrelated senses. The stimuli triggering synaesthesia are termed inducers, and the resulting sensations caused by these inducers are referred to as concurrent experiences.2

Researchers, utilizing neuroimaging techniques, have identified differences in brain structures between synaesthetes and non-synaesthetes. These disparities largely stem from innate genetic inheritance. The following table enumerates research findings by Sean Day concerning real physiological synaesthesia.3

The discussion then shifts to three characteristics of synaesthesia — stability, tangible projections, and passivity— to further differentiate between synaesthesia and association.

Following formation, synaesthesia displays strong stability and projects onto tangible objects. Concurrent experiences generated by randomly occurring inducers generally remain constant. In an experiment assessing visual segregation capacity, grapheme-color synaesthetes can swiftly identify hidden patterns within white-on-

Qin Yaya. Research on the Imagery of Chinese Utopia [D]. Guizhou University,201 7.

black text. In this instance, the numeral " 2" is concealed within the numeral "5" (left1 in Figure 1). For synaesthetes, distinguishing the triangle formed by the arrangement of the numeral "2" is highlighted through color differentiation (left2 in Figure 1). While focusing on the central object (denoted by the "+" sign), a single numeral situated at the periphery can be easily perceived through peripheral vision (left3 in Figure 1). If additional numerals surround the digit (left4 in Figure 1), they become relatively unclear for non-synaesthetes, yet synaesthetes can deduce the numeral based on the central digit's color.4

Drawing from the research across these two dimensions, synaesthesia is a naturally occurring, genetically embedded, random perceptual mechanism through which a minority of individuals experience the world.

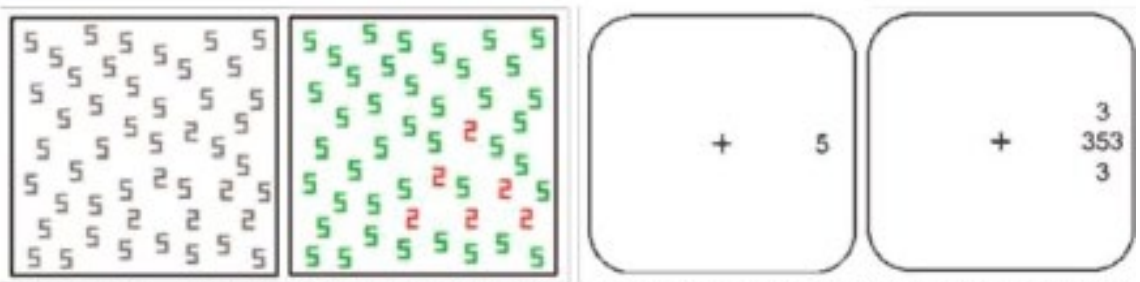

Figure 1. Experiment to determine the ability to isolate visual areas

Associative Phenomena and Generative Design

Based on the revelation that the properties of association are not based on experience, are illogical, trigger irregularity, and unpredictability, the author argues that generative design in contemporary artwork is logically similar.

The "musical dice game" was popular in Western Europe in the 18th century. For example (Figure 2). The Musical Dice Game consists of a 1 76-bar round dance, two numbered squares, and several instructions for playing the game. each bar of the 176-bar

score is labeled with the number of bars and separated by a double vertical line. The two numbered squares indicate that the game is divided into two sequential parts, and the numbers inside the squares indicate the number of bars. The game is played with two dice, the first roll of which selects the bar to be played against column A of the square, the second selects it from column B, and so on, starting with the first square and ending with the second. 5In this method of composition, the complementary elements of chance and necessity are the highlights. Musical dice games are early examples of generative art systems.

Figure 2. Musikalisches Würfelspiel | Composition Dice

Experimenting with Visual Generation as an Example of Associative Literature

Figure 3. The Complete Poems of Emily Dickinson

The Complete Poems of Emily Dickinson (Fig. 3 left), mentioned in Chapter 2 of this paper, is regarded as one of the pioneers of nineteenth- century modernist poetry, and is based on The Complete Poems of Emily Dickinson (Fig.3 left), which was compiled and published by the editor, Thomas H. Johnson, after Dickinson's death, and the translation of Fulbright scholar Prof. Pohlung. The Complete Poems of Emily Dickinson (Fig.3 right) as a blueprint to study the change of language culture and vocabulary weights after the change of time; formulate the rules with the characteristics of association, and make use of them to transform and generate the contents of the poems in line with the information age, and build an associative world belonging to the present and even to the future through the means of information visualization.

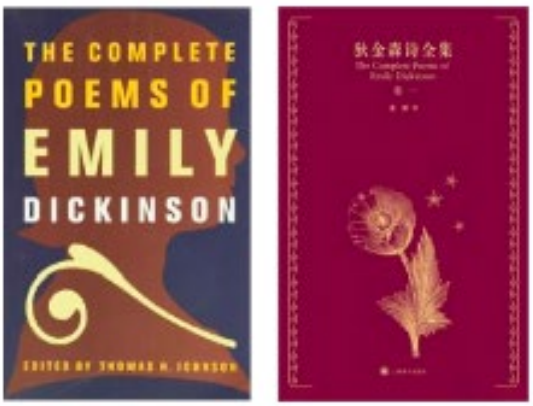

Figure 3. The Complete Poems of Emily Dickinson

Visual Transformation Rule Building in an Associative Context Quasi-association accounts for 59.7% of Dickinson's poetry, and the structure of the collection, which has a certain rule format to follow, is a creation that exerts maximum freedom within its limits. The process of building up all Dickinson's quasi-associative poems is divided into three parts: 'Recollection', i.e. imagining a subject or a concrete object image - 'Understanding', i.e. thinking deeply about the subject identified in the first stage - 'Resolution', i.e. the content derived from the second stage of understanding Emotional expressions, mostly prayers of praise, repentance and prayer, emphasize introspection on specific things, forgiveness of original sins and self-forgiveness in order to achieve one's wishes.6 In summary, Dickinson's poems follow the meditative structure of "recollection" - " understanding" - " resolution" , and if we take this as the infrastructure to complete the information visualization experiments in the twenty-first century, the process of image building can be summarized as follows: "Theme" Imagine a theme or a concrete image - "Transformation" i.e., the first stage of the process can be summarized as follows. -Transformation" is the characterization of the first stage of visual translation of the theme - "Generation" is the formulation of rules and the reorganization of the translated material based on the rules.

An experiment in the associative generation of new contexts

《The Complete Poems of Emily Dickinson 》provides a Subject Index (Figure 3), which organizes 68 thematic locations and 440 thematic words that have appeared in the entire collection of poems, and the author uses the Subject Index as a basic database to capture the material separately and regard it as a way to connect with the information age. Key Frames.

After targeting users through username search, we collect avatar information, number of fans and subscriptions. The avatar is the first face of individual public platform, and the number of fans and subscribers is the influence of their behavior and radiation range. Color extraction is used as a means of updating elements to visualize the avatar part of the me vocabulary. Taking the theme word "Air Air" as an example (Fig. 4), the color impression is preserved to the maximum extent, and the color area that accounts for the largest proportion of the word is divided out, and then the gradient technique is used to integrate it (Fig. 5). After extraction, the vocabulary fan base, the number of subscriptions and the frequency of vocabulary appearing in the collection of poems are placed into the three axes. Based on the above rules, the color image space organized by the data is completed

(Figure 6).

The concept of geography has developed to the present day, which does not only refer to the geographical environment with naturalness, but also includes the territorial environment with cultural attributes; at the same time, as a spatial concept, geography has a spatial nature, which is embodied as a physical area in the geographic sense, and involves a metaphorical space in the sociological sense, which makes the studies of literary geography and territorial literature, regional literature, literary space, and geographic criticism mutually intermingled, and also makes the This makes the study of literary geography and regional literature, regional literature, literary space, geographical criticism and so on mixed, and also makes the positioning of literary geography difficult to be unified. 7The correlation of literary and geographic space with the idea of association can be regarded as a mechanism for examining geography, in another dimension. The informational context temporarily divorces geography from its functional and physical nature, and the translated image serves as a co-expression of geography by text and vision.

By retrieving the location-specific latitude and longitude information on Google Maps, the author converted the text into data, and then compressed it according to the division of the latitude and longitude grid into the relative location mapping of the locations Figure 7. Relative position mapping of the poetry collection (Figure 7). The spatial material module is organically combined with and thematic locations. The theme vocabulary is divided into 68 groups according to the location of occurrence, and 68 groups of theme vocabulary stereo spaces are generated by the above rule of transforming the vocabulary color image into stereo image (Fig. 8); and then the same groups of stereo image spaces are respectively placed in the relative locations to complete the modern new language description of the spatial dimension.

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Figure 4. "Air" color image extraction

Figure 5. Thematic vocabulary color image

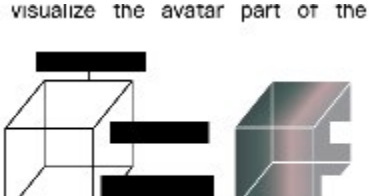

Figure 6. "Air" stereoscopic image

the relative location mapping of the locations Figure 7. Relative position mapping of the poetry collection (Figure 7). The spatial material module is organically combined with and thematic locations. The theme vocabulary is divided into 68 groups according to the location of occurrence, and 68 groups of theme vocabulary stereo spaces are generated by the above rule of transforming the vocabulary color image into stereo image (Fig. 8); and then the same groups of stereo image spaces are respectively placed in the relative locations to complete the modern new language description of the spatial dimension.

Conclusion

Amidst continual technological evolution, the image's reality has lost its once- central excellence criterion. Gradually, images settle in memory, losing freshness. In today's pursuit of rigid, outcome-driven precision, introducing randomness transforms elements from passive monomers to a macroscopic, nuanced perspective. This reinvigorates elements, replacing "construction" with "growth." Design adapts openly, enhancing adaptability and output, positively impacting graphic design's future. Responding to multisensory needs and embracing "partial randomness" in creation fosters a tool for preparatory thinking, bridging the natural and logical worlds.

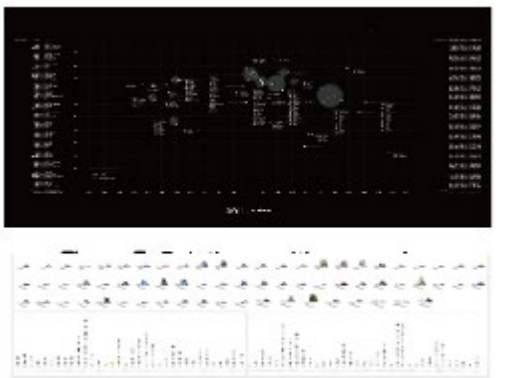

Figure 7. 68 sets of three-dimensional spaces

Design Study of Global Submarine Cable System: a Perspective of Three Types of Flow

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Abstract

"Flow" can be also understood as mobility, liquid, and similar concepts, it offers insights into the modern world. Design itself can be seen as a form of flow that influences various aspects of our lives. "Design flow" refers to a methodology for system design and represents interdisciplinary design thinking. In our rapidly changing world, the global submarine cable network, a complex and often overlooked infrastructure, has gained strategic significance. Despite the growing attention to systems and flow in design, submarine cable system design hasn't received the attention it deserves. Therefore, this study focuses on submarine cable design and tries to break down the flow behind the design into three types: it is not only a flow of material pipelines; and it also facilitates the global flow of internet data; more importantly, these materials and data will shape new global dynamics in politics, governance, and power. Through the lens of these three types of flow, we can have a deeper understanding of the complex system design behind the global submarine cable network and broaden the scope of design exploration.

Author keywords

submarine cable; system design; complex system; design flow.

Introduction: Global Submarine Cable Network as a Complex System

In 2018, Amazon, Meta, and China Mobile (3 modern technology companies) agreed to cooperate to build a transnational submarine cable connecting California to Singapore, Malaysia, and Hong Kong. However, due to a series of measures taken by the United States (US) government to hinder China's participation, China Mobile eventually had to withdraw from the alliance. In 2021, Amazon and Meta reaffirmed the project, this time with no China's investment and no connection to Hong Kong. But a year later, just because the project had earlier involved Chinese companies, the US government dismissed it outright on the grounds of information security, even though most of the 12,000km-long submarine cable had already been built, which means hundreds of millions of dollars of investment has been wiped out. [1]

The focus of this incident is undoubtedly the submarine cable. The Internet we use every day is based on a cable network that spans nearly 1.4 million kilometers above the world's seabed. This network serves as the internet's essential lifeline, carrying approximately 99% of the world's intercontinental communication data traffic. While global scholars have increasingly turned their attention to submarine cables since the 21st century, most discussions primarily revolved around the engineering and natural geography aspects related to their construction and operation. In the past couple of years, as global dynamics have shifted, political, economic, and human geography fields have started to pay more heed to the submarine cable network. Media coverage

has also brought it to the forefront of public awareness. However, as the strategic importance of the global submarine cable network becomes more pronounced, design as an interdisciplinary subject has yet to fully engage with it. In prior discussions, a research perspective of flow was mentioned by Xie Yongshun et al. (2023) in relevant discussions [2], although Flow has been a topic in design, it often refers to a style, shape, and function of small- scale design. In recent years, the attention to the keywords of System and Flow in design has continued to increase. Therefore, this paper attempts to understand the system design behind the global submarine cable network as a large-scale complex system from the perspective of material flow, information flow, and power flow.

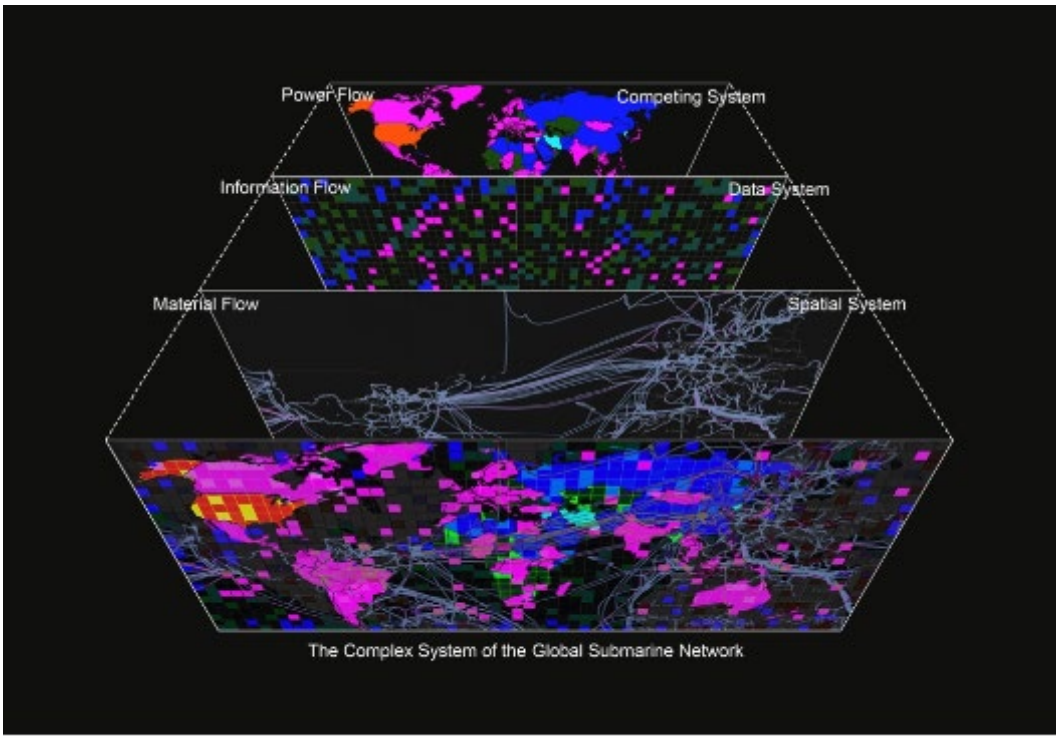

Figure 1. The structure diagram of this study, by Song Jin.

Material Flow: As a Spatial System of Ocean Reconfiguration

Submarine cables are both tangible and concealed in nature. In 2015, Trevor Paglen, a geographer and artist, led a scuba diving expedition off the Miami coast with a single mission: to capture the physical infrastructure of the Internet, the transcontinental communication cables linking continents. His dual identity as a geographer provided the theoretical and technical expertise needed for this endeavor. He utilized professional search and positioning technology to map out the search area and underwent scuba diving training and navigation education. Eventually, he embarked on the risky mission of photographing these submerged cables. [3] These streamlined pipelines run across the ocean's continental shelf, resembling deep-sea pythons that connect continents.

The global submarine cable network has its origins in the mid-19th century during the era of telephones and telegraphs. Since the successful laying of the world's first submarine communication cable in 1850, it has expanded and gradually evolved into a worldwide undersea cable network [4]. Continents, once separated by oceans, are now physically linked, enabling intercontinental information transmission through this network of

material pipelines navigating the oceanic geography. Simultaneously, nations assert their presence and allocate marine geographic space through these cables as materials. Hence, the submarine cable network primarily functions as a material-based network with connectivity attributes. Its design involves engineering principles, materials, modeling, and processes. Considerations encompass efficient data transmission, resilience against seawater corrosion and shark damage, and cost- efficiency. Beyond cable design, it extends to infrastructure design, including information collection, encoding, storage, optimization, and management. The design of the submarine cable network as a material network transcends mere stylistic choices for individual components; instead, it constitutes a large-scale system design rooted in the reconstruction of the global marine geographic space under the nation's internal surveillance as a material foundation.

Information Flow: As a Data System of Security Control

The submarine cable network, as a large-scale connectivity infrastructure and physical network, plays a critical role in facilitating global Internet communication and is closely tied to national data security. Accurate knowledge of cable locations can pose a security threat, as it enables potential disruptions and data theft. Consequently, the precise distribution of cables is a tightly guarded secret for each government, and hostile actors often go to great lengths to uncover this information. In 2014, artist Ingrid Burrington developed the interactive website "Submarine Cable Taps" to illustrate the extent to which organizations like the UK Government Communications Headquarters (GCHQ) collaborated with companies like Vodafone and BT Cable to intercept data from submarine cables. This surveillance, based on information from the Snowden Papers, highlights large-scale monitoring. [5] Data collection occurs both at sea and on land, for instance, the National Security Agency (NSA) and AT&T initiated the "FAIRVIEW" program in the 1980s, monitoring billions of emails, phone calls, and online chats of foreign citizens in the United States through AT&T's critical data access points.[6]

In today's digital capitalism era, data has emerged as the fifth factor of production. Data can be transformed into valuable information, which, in turn, accumulates capital. Mastering data equates to controlling the lifeblood of both capital and power, making it a pivotal asset in contemporary competition. Protecting data security is tantamount to safeguarding national security. Therefore, submarine cable design extends beyond physical infrastructure to encompass information and data systems built on this material foundation. This level of design is more abstract and covert than material design, focusing on the overarching system's mechanisms and pervading all facets of governance.

Power Flow: As a Competing System of National Game

In an era of technological rivalry among major powers, the submarine cable network, serving as both a physical space system and an information data system, has become entangled in significant geopolitical issues. Its precursor, the ARPANET, developed by the U.S. Department of Defense Advanced Research Projects Agency (DARPA) in 1969, was primarily military-focused. The United States has played a leading role in transitioning the Internet from a closed national military project to a global, commercialized, and civilianized entity, resulting in its long- standing dominance and even unilateral control over the Internet. [7] Notably, the United States, along with French and Japanese companies, has maintained a lasting dominance in the global cable market. However, as China entered the global market successfully, the U.S. began taking measures to prevent Chinese firms from participating in the world's Internet backbone networks, citing national data security concerns. Over the past five years, amid rising tensions and perceived "espionage risks," the U.S. has even attempted to dismantle decades-old cable networks established through international cooperation between China and the U.S. While the U.S. has managed to hinder China's ascent in the global submarine cable market, China continues to strive for a

competitive edge and focuses on expanding its influence in areas where its commercial and political power can radiate.[1]

Growing concerns and remarks about the submarine cable market potentially splitting into East and West are emerging. As April Herlevi, a Sino-U.S. foreign economic policy expert, points out, "One of the biggest risks at present is the move toward a bifurcated network. Could this lead to a fragmented system without connectivity and a quasi-Cold War between Eastern and Western groups?" This underscores that both the physical infrastructure network and the information data system mechanism, as governance tools, ultimately serve national strategies and power competitions. Above the submarine cables lie multiple carefully designed systems, with the invisible power struggle representing the top layer that governs all systems. It influences material and information systems, escalates geopolitical conflicts, and raises the possibility of a new global Cold War. However, it's important to note that these concerns have not materialized into reality; they are expressions of apprehension and caution.

Conclusion

Since the era of neoliberalism, the concept of "flow" has often been reduced to a superficial representation, masking the underlying logic that shapes today's world. This paper analyzes the global submarine cable network as a global infrastructure, where "flow" takes on three distinct forms as proposed in this study. Together, these three forms constitute a superimposed state system, akin to Benjamin H. Bratton's concept of the "Stack" [8]. This is not a simple system but a new kind of complex giant system, as described by Qian Xuesen [9]. Firstly, Trevor Paglen's work is not mere stylized creation but a profound exploration that unveils the material foundation of abstract systems. Discovering this material basis is essential to understanding today's world, and our current era is defined by flow, with material flow serving as its fundamental underpinning. The dismantling of city walls as traditional boundaries has paved the way for material flow, just as architect Cedric Price metaphorically put it, cities have evolved from boiled eggs to poached eggs and now resemble scrambled eggs[10]. People, goods, and infrastructure flow freely, forming a large-scale global material space system. Secondly, today's world is characterized by continuous large-scale data monitoring, with submarine cables serving as carriers. And the occupancy of resources is no longer just about materials, but more about data. This shift aligns with Manuel Castells' concept of "the rise of the network society," where "flowing time and space" define society[11]. The information network created by new media transcends temporal constraints, enabling synchronous communication across vast distances, imparting a more abstract nature to material space, and leading to the emergence of an information data system. Thirdly, amid the unprecedented changes of this century, competition among major powers related to the submarine cable network intensified, and this is evident in the undercurrent of power competition within the complex giant system. From a design research perspective, contemporary design research should not be confined to the scale of specific objects or a design element but should expand to the system level. The system has effectively become the foundation for shaping our real lives, necessitating a response from design. In this paper, the global submarine cable network is deconstructed into three layers of a superimposed complex system for analysis, aiming to introduce a more comprehensive, large- scale research perspective and methodology into design, thereby broadening the scope of design exploration.

References

[1] Gross, A., Heal, A., Campbell, C., Clark, D., Bott, I., & de la Torre Arenas, I. (2023, June 13) How the US is pushing China out of the internet's plumbing, Financial Times.

[2] Xie Yongshun, Ma Shiping, & Wang Chengjun, (2023) Prospect of human-economic geography research of submarine optical cable networks, Progress in Geography.
[3] Paglen, T. (2020). Undersea Cables. Retrieved from
https://paglen.studio/2020/05/22/undersea-cables/
[4] Ye Yincan. (2006) Development of submarine optic cable engineering in the past twenty years. Journal of Marine Sciences, 24(3): 1-10.
[5] Burrington, I. (2014). Submarine Cable Taps [Screenshots].
[6] Angwin, J., Savage, C., Larson, J., Moltke, H., Poitras, L., & Risen, J. (2015, August 15). AT&T Helped U.S. Spy on Internet on a Vast Scale. The New York Times.
[7] Ou Shujun (2023). In and Out of the Spirit Realm: A Brief History of Internet Governance. Shanghai Jiao Tong University Press.
[8] Bratton, B. H. (2015). The Stack: On Software and Sovereignty. The MIT Press.
[9] Yu, Jingyuan (2015). Qian Xuesen's Information Revolution Thought and Its Practical Significance. Journal of Xi'an Jiaotong University (Social Sciences), 35(06), 69-72.
[10] Price, C. (1982). The City As An Egg.
[11] Castells, M. (1997). The Power of Identity: The Information Age: Economy, Society, and Culture (Vol. 2). Wiley-Blackwell.

Research on the dematerialization of fashion curation and its strategy

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Abstract

Influenced by the pandemic, traditional offline fashion curatorial methods have proven inadequate in addressing the current dematerialization trend, driven by both advancements in Internet technology and people's increasing demand for spiritual and cultural enrichment. This study focuses on dematerialized fashion curating, its research subject encompassing not only clothing-related fashion content but also digital curatorial practices. It summarize the characteristics of domestic media and immaterial fashion curation while proposing more suitable strategies for contemporary fashion curation. Firstly, this paper presents a comprehensive overview of the historical development of dematerialized fashion curatorial exhibitions and discuss its evolution through a social history lens. Secondly, this paper investigates the current state of dematerialized fashion curatorial development, analyses both its content and curatorial form, thereby exploring potential insights for present and future developments in fashion curation. Finally, building upon the aforementioned research, this paper discusses strategies for fashion curation from three perspectives: timely responses to fashion trends, mediatization and communication within the realm of fashion, as well as narrative construction in cyberspace. The aim is to construct an approach to dematerialized-oriented fashion curation while uncovering new possibilities for future endeavors.

Author keywords

Fashion; Fashion curator; Dematerialization.

Introduction

Fashion curation is a significant discipline that demands a distinct level of professionalism. By examining recent fashion exhibitions, it becomes apparent that there has been a noteworthy transformation in the field of fashion curation - shifting away from the conventional presentation of tangible fashion artifacts towards fostering a dialogue between intangible cultural elements and ephemeral objects. This transition can be described as the dematerialization of fashion curation, which unfolds across two dimensions: the dematerialization of fashion content and the evolution of curatorial practices within the realm of fashion. Fashion curating is essentially a critical practice, a means of providing a critique of an increasingly complex, interesting, and pervasive part(Byrd, 2019), based on the advancement of the information society and social media, it has become extensively integrated into people's lives. Consequently, contemporary fashion expression places greater emphasis on fashion itself, thereby transforming critical fashion curation into a means of knowledge production. By continuously generating fashion discourse, it employs its unique allure to engage the audience in active participation rather than relying solely on rigid educational dialogues. The information technology developed in 21st-century has facilitated diverse curatorial approaches which give rise to a new phase as the global outbreak of coronavirus at the end of 2019 compelled institutions to explore possibilities for online exhibitions and other display forms. This paper will concentrate on dematerialization as a novel strategy within the developmental

process of fashion curation while exploring additional prospects for future endeavors.

The three developmental stages of dematerialized fashion curation.

In the first stage before 1970, when the fashion industry serves as an important part of material production and capital development, as well as the characteristics of the bourgeoisie to manifest identity, there was no obvious non-material change and fashion exhibitions predominantly revolved around conventional displays of historical clothing. In the second stage spanning from the 1970s to the 1990s, take the V&A's 1971 exhibition Fashion: An anthology by Cecil Beaton for example, this phase repositioned the discourse and practice of fashion curation beyond mere clothing, embraced a more immersive theatrical experience(Clark J., 2014). However, compared with the overall social environment, the dematerialization of fashion curation has just started. In the third stage after the 21st century, the rapid development of digital technology has promoted the shift to dematerialization and spawned a series of concepts related to immaterial. By calibrating the concept of "Clothes" in 1944, MoMa's 2017 exhibition "ITEMS: Is Fashion Modern?" no longer simply equates fashion with fashion, but greatly expands the scope and possibility of fashion discourse, and regards fashion as a perspective and approach to broader social issues(Paola Antonelli, 2017). Fashion curation gradually began to turn to the stage of dematerialization. Due to the impact of the pandemic, 2019 has become an important node for people to turn their attention to virtual curation.

The current state and challenges of curating dematerialized fashion

The discussion on the dematerialization of fashion can be divided into two categories: the content of fashion and the form of fashion curation. Fashion curation focuses more on the fashion text in a broad sense and presents a more diversified orientation on the meaning behind the dematerialization of fashion itself.

The dematerialization of fashion content

In terms of content, finding innovative ways to revolutionize virtual experiences will bring more diverse possibilities for the subversive development of digital virtual fashion no matter it is the ensuing of digital fashion shows or the crypto art of Non-Fungible Token (NFT). In terms of cultural ideology, the connotation of fashion today has transcended beyond clothing and expanded its influence to encompass multicultural aspects such as values, lifestyle, taste, and aesthetic concepts. In May 2021, designer Edouard Vermeulen's fashion collection inspired by the Madonna statue in Antwerp's Notre Dame Cathedral embodies a profound reverence for history and culture while offering a fresh perspective on individuals' spiritual beliefs. Its primary focus lies in addressing the psychological and spiritual needs of individuals through dematerialization. Roland Barthes once emphasized that fashion emerges as a result of the amalgamation between clothing and its societal context(Barthes, 2014). He further elucidated this phenomenon by highlighting the distinctive structure of symbols and meanings inherent in fashion.

The dematerialization of fashion curatorial form

With the continuous development of technology, virtual game world is starting to emerge as a new market for the fashion industry. For instance, the online shopping platform NET-A-PORTER recently organized a Fashion Show on "Gather up! Animal Friends." This innovative virtual design approach effectively harnesses the potential of collective creative initiatives. In terms of curatorial platforms, several digital curatorial platforms such as the digital project "MoMuMedia," which digitally presents fashion collections have emerged. Furthermore, Central Academy of Fine Arts (CAFA) has also developed a virtual curatorial platform, but this type of curatorial platform still offers significant potential for enhancement in terms of its tools. In terms of the comprehensive exhibition experience, fashion curating has gradually evolved into a means for engaging the public in cultural analysis, thereby generating fashion knowledge throughout the curation process. Moreover, driven by the continuous development of the experience economy, brands now strive to create more participatory and

immersive experiences within exhibitions to offer audiences all-encompassing sensory encounters that facilitate brand culture dissemination. This also introduces innovative curatorial concepts for fashion exhibitions where viewers are no longer mere spectators but active participants. In conclusion, fashion exhibitions begun to try to explain the side of fashion beyond materialization. Therefore, it is necessary to discuss the curatorial strategy of immaterial fashion.

Research on dematerialized fashion curating strategy

According to current research, three strategies which are well-suited for dematerialized fashion curation were proposed in this paper.

A proactive strategy to promptly address fashion trends.

From collections' perspective, taking the "Rapid Response Collecting" mechanism initiated by V&A in 2014 as an illustrative example, collections prioritize addressing the immediate issues arising from objects and their newsworthiness. This approach enables them to respond to pivotal moments in contemporary society, thereby uncovering and engaging in discussions about life's truths. For instance, Christian Louboutin Fifi serves as a reflection of the challenges faced by people of color, while Pussyhat, a pink knitted hat symbolizing global women's unity and collective action, possesses collection value that transcends its materiality. From a thematic perspective, curators can use the relationship between fashion and society as an entry point for their theme. For example, MoMu's "Fashion Ball" project planned for 2021 places differently sized colored balls in various locations throughout the city. When models wearing different styles of fashion stand on these balls, they become part of an exhibition that blends seamlessly with the surrounding environment. Fashion is at the heart of Antwerp's story, and "Fashion Ball" encourages a positive and enjoyable way of life to activate the city during these challenging times. A fashion curator should possess a profound understanding of fashion and demonstrate a strong commitment to humanistic care. They should diligently stay updated with current trends, discern the essence of fashion through ordinary objects in daily life, and exhibit prompt reactions and articulate expressions within the realm of fashion.

A communication strategy using fashion as a medium

Walter Benjamin, a German philosopher and cultural critic, the view of fashion is that "wherever it has stirred in the bushes of long ago, there is an air of topic"(Benjamin, 2009). The characteristic of fashion is what lends the exhibition a distinctive experiential quality, and with the advent of Internet media, particularly social media platforms, fashion has become highly mediated. The Gucci brand centennial exhibition "Gucci Original" was held in Shanghai in 2021, exemplifying a strategic approach to garner attention and sustain popularity. It captivated audiences through high-quality WeChat posts and visually appealing exhibition materials, then the exhibition's visibility soared as extensive visuals were shared across various social media platforms along with engaging promotional content. Notably, a post featuring a girl donning Hanfu attire while attending the Gucci exhibition sparked a trend of incorporating Hanfu fashion into this prestigious event, stimulating fervent discussions on their seamless integration. We used to talk about how to produce consumers, but now we may focus on how to help creators. With the democratization of creativity and communication, it is possible to establish a consensus with creators through shared labels, images, and needs. By utilizing fashion's inherent communicative function and leveraging social media platforms, curators can not only facilitate more convenient implementation and efficient dissemination of fashion exhibitions but also actively engage in the process of fashion curation.

Constructing fashion narrative strategy in cyberspace

The two crucial elements in developing a fashion narrative strategy in cyberspace are the articulation of fashion perspectives and the creation of virtual environments. In 2020, an online exhibition called "IN/OUT" was conducted in the perspective of curator. However, due to the inconvenience of web browsing, tweets showcasing

exhibition items on WeChat public accounts replaced website viewing. Therefore, it became essential to effectively articulate the core views of the exhibition. Considering today's communication advantages offered by various social media platforms, when planning for the "TU TU TU " online exhibition in 2022, H5 is used for production exhibition. This reduced user difficulty in accessing and efficiently presenting exhibitions; however, modular editors limited visual design experience. In the context of digitizing offline exhibitions, the VR exhibition of the "David Bowie is" app offers a superior presentation of both the exhibition experience and design. This utilization of technology represents a significant breakthrough; however, it is currently limited to documenting iconic exhibitions. Due to the substantial human and material resources required for producing such AR exhibitions, curators can explore new curatorial ideas by considering spatial narrative methods and audience experiences.

Conclusion

Dematerialized fashion curation has emerged as a pivotal component of the fashion industry, gradually replacing offline exhibitions. However, its future trajectory does not solely revolve around virtualizing fashion items through online exhibitions; instead, it aims to offer a more diverse and immersive fashion cultural experience. Fashion curation has evolved into an intellectually stimulating, visually captivating, creatively engaging, and participatory strategy. As curators, we should embark on broader explorations beyond the confines of materialistic aspects such as museum practices, historical clothing, and renowned designers. A proficient fashion curator must possess a keen sensitivity towards fashion trends along with a fundamental sense of social responsibility. By effectively harnessing the inherent allure and communicative potential of fashion itself, we can delve into the intricacies of conveying narratives and fostering engagement on new media platforms while maximizing our unique advantages as curators. This amalgamation will undoubtedly infuse fresh inspiration into the realms of both the fashion industry and art while enriching the lives of our audience members. Employing these three strategies in unison enables curators to swiftly grasp contemporary issues within fashion culture and society at large while formulating innovative curatorial programs.

References

Barthes, R. (2014). Systeme de la mode. Points.

Benjamin, W. (2009). On the concept of history.

Byrd, S. C. (2019). Fashion Curating: Critical Practice in the Museum and Beyond. Journal of DesignHistory, 32(4), 401-402. https://doi.org/10.1093/jdh/epz048

Clark J., D. L. H. A. (2014). Exhibiting fashion: Before and after 1971. Yale University Press.

Paola Antonelli, M. F. (2017). Items: Is Fashion Modern. The Museum of Modern Art.

Working Flows Between Digital and Material

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Abstract

This paper explores the design flows of inspiration from parametric design principles in textile pattern designs, focusing on the potential of computational tools to enhance creativity and innovation. Designed using Grasshopper in Rhino3D as a computational tool to develop parametric knitting patterns, through manipulating design parameters such as stitch placement, density, and scale, the study investigates the possibilities of creating visually appealing and customizable textile patterns. Results: The study demonstrates the flow from digital design to fabrication by hand and craft. Expressing the interplay between digital design tools and the tactile craft and tradition of textiles, highlighting the fusion of technology and tradition. The use of computational tools offers designers greater control and flexibility, enabling exploration of a wide range of design possibilities. Conclusions: The parametric design offers unique ways to iteration and innovate textile design patterns for enhancing creativity and innovation in various fields such as including interior design, fashion, and textile art. The study emphasizes the transformative capacity of computational tools to advance the design process and yet result in hand craft, which may be more accessible and approachable for artists. This approach opens up opportunities for personalized and responsive designs, revolutionizing the way textiles are conceptualized and integrated into design.

Author keywords

Craft, Fabrication, Parametric Design, Digital Design, Textiles

Introduction

Textiles and technology have a rich history of influence and symbiosis. Notably the between early computers and Jacquard looms, which inspired the early punch cards used on computers. Ada Lovelace, recognized this potential of Charles Babbage's Analytical Engine, a precursor to modern computers, and wrote extensively about its capabilities (Lovelace, 1843).

This project further explores this relationship by utilizing computational design tools to develop patterns for knitting. These patterns are ultimately knit by hand integrating a flow of design from digital to physical connecting the computer to crafting.

The project results in a folding wall design which is tactical and expressive. Allowing the making process to expand beyond just the computational design process. Merging multiple fields into interdisciplinary expression.

Parametric Design

The integration of parametric design principles in textile creation brings a new dimension to the field. In the book "The Digital Turn in Architecture", Mario Carpo, highlights the significance of parametric design theory in

architecture and design practices. Parametric design enables designers to create highly complex and adaptive patterns that respond to various parameters, such as environmental conditions or user preferences (Carpo, 2012). This approach allows for the possible creation of dynamic, responsive textiles that can transform their appearance and behavior based on specific inputs.

"The Craftsman", by Richard Sennett, emphasizes the importance of hands-on engagement and tangible skills in the creative process (Sennett, 2008). Parametric design tools provide a new type of craftsman-ship where the tool are now computers and the trained hand is trained to control the computational tools (McCullough, 1998). These computational design often leave much of the designs to digital fabrication for speed and precision. Although this is an easy flow of work. What happens to the handmade creativity from the Craftsman? Can it be merged with digital design? In this case study the attempt is to work from digital to physical and embrace the handmade as part of the workflow and process.

Knitting

Knitting is a versatile and widely practiced textile craft that has been used for centuries to create fabrics, garments, and decorative items. Knitting involves interlocking loops of yarn to form a fabric structure. One notable aspect of knitting is the use of knitting patterns, which serve as guides for creating specific designs and textures are often in a sort of binary code and many domestic knitting machines use punch cards. These machines consist of a needle bed with a series of latch-hook needles. The machine operates by feeding the yarn across the needle bed using a carriage, which creates new stitches as it moves along.

"Hand-Manipulated Stitches for Machine Knitters" by Susan Guagliumi explores the techniques and possibilities of using these machines to create intricate stitch patterns while still using many manual techniques to manipulate these patterns (Guagliumi, 1996)One of these designs used in this project is based on simple float and stich pattern. A float is when a needle is inactive and not stitch is made.

Computational Design

To begin the digital pattern design, a grid spreading definition was employed in Grasshopper, manipulating a series of lines around attractor points. In Grasshopper a set of parallel lines are determined as the base. This could resemble the wales or vertical columns of stitches stacked in alignment. Attractor points were randomly scattered across this set of lines. The attractor points were used to create spreading in the lines. This is done by reversing the relationship of closest point and line. The lines were divided in to a set of points along the line, which would then measure a distance between those points and the closest point. The inverted relationship would be that where the points on the line was closest to the point it would then actually move father away, and those points on the line which are farther would move very little. This creates a spreading effect. See Figure 1.

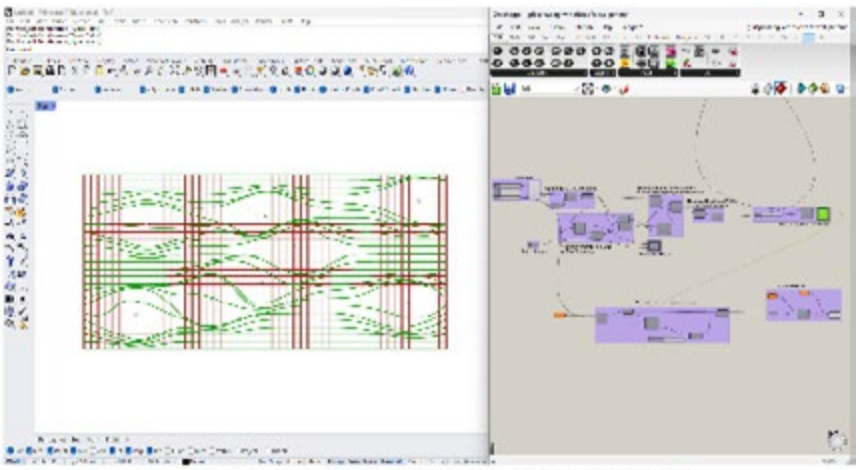

Figure 1. Grasshopper definition for grid spreading.

These lines then would not translate exactly to stitches, but to proportion of density versus transparency. The next step with the Grasshopper code was to overlay a grid in the opposite direction to represent the courses of the knit rows. Which could overlay the stitch types of either float or stitch.

To achieve the triangular shape panels, a technique known as narrowing was employed. This involved transferring stitches at the edge of the material every few rows, reducing the number of needles and narrowing the width. Starting with a full width of 108 stitches, the stitches at the edges were transferred to the neighboring needle every eight rows, resulting in a gradual reduction of width. By the end of the 336 rows of knitting, only eight stitches remained on the knitting bed to form the top point of the triangle panel. This provided easy bind off at the end of production.

In order to facilitate production speed, the parametric pattern design was further adjusted. Rather than adhering to the computer-generated design, which dictated changes in stitches and floats with each row, the design was modified to repeat the pattern every eight rows to create elongated shifts. This adaptation aimed to simplify the fabrication process, considering the movement of the knitting machine carriage and the manual manipulation of active stitches using a transfer tool. See Figure 2.

Figure 2. Sample of the final pattern design.

The final knitting process was performed manually, requiring several hours for each panel. Since this involved a human craftsperson following a printed pattern, mistakes and errors were inevitable, including counting errors, dropped stitches, or mistaken transfers. However, these imperfections were embraced as part of the craft, contributing to the uniqueness of each panel. As long as the craftsperson took the time to manually adjust the design to repair any errors and begin to make it match as much as possible to the original design patterns. This flow between the pattern to the knowledge and skill of the maker and freedom for adjustments was embraced as part of the process.

Final Design

In a total of twenty knitted panels were made for the folding wall, separated by the depth of the frame to allow for interaction and shifting of the pattern layers based on perspective and parallax. To highlight the different layers, two yarn colors, a blue and a pink wool mix of medium weight with 2 ply, were used for the front and back respectively.

The final dimensions of the knitted screen wall, measuring 2m (6.4ft) long by 1.8m (6ft) tall and 0.33m (13in) deep, proved to be successful in providing a visually engaging and lightweight architectural element. When collapsed,

it was easily transportable and deployable. The lightweight nature of the knitted screen, allowed a single person to effortlessly carry and unfold it into an upright standing position, enhancing its practicality and versatility. See figure 3.

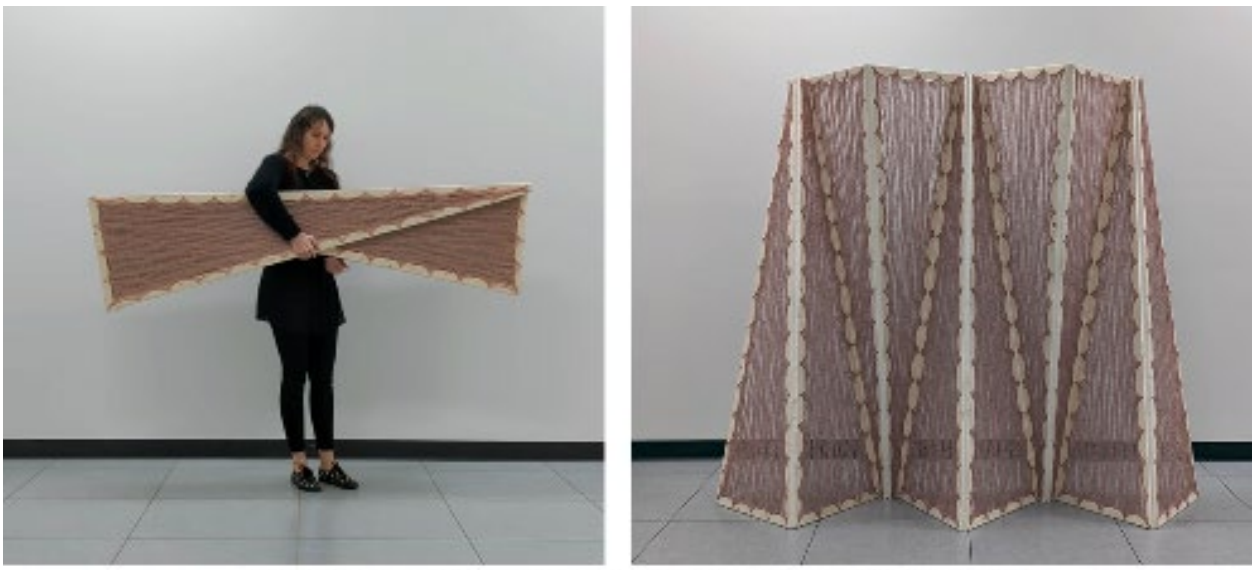

Figure 3. Final wall being transported and deployed.

he knit pattern particularly played the significant role in achieving the project's goals of screens and transparency. By leveraging the pattern design with Grasshopper in Rhino3D and applying parametric design principles, the pattern seamlessly transitioned solid and transparent areas, providing a play of light and shadow. The dynamic shifts in aperture and transparency created captivating patterns of light that added an artistic touch to the space. The design of the knitted screen wall incorporated two layers of textile separated by the depth of the wood frame, which resulted in captivating visual effects of patterning and shadow play. As individuals move around the screen and light interacts with the layers, dynamic patterns emerge, resembling a moiré effect. The intentional difference in the density of the knit pattern between the two layers contributes to this captivating interplay of light and shadow. See Figure 4.

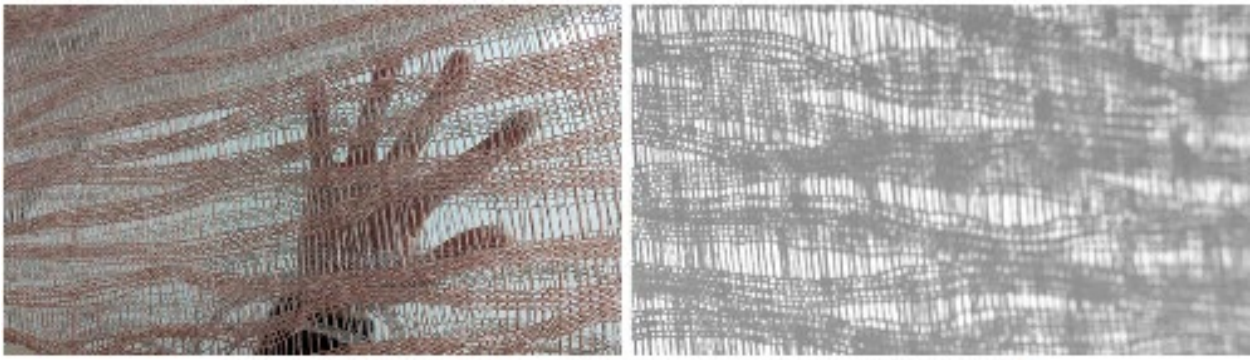

Figure 4. Final pattern details of shadows and texture.

The ability of the fluid design allowing more flexibility for the maker to manipulate the pattern or make adjustments on the fly during fabrication to achieve the desired result. This takes reflection on how you can design with digital tools but use those as a conceptual influence rather than as a fully resulted pattern to be followed to precise decisions.

Conclusion

By embracing both traditional craft and digital design methods, the project achieved a delicate flow between processes. The project uses the systematic approach of designing knitting patterns in a grid format, which lends itself well to computational design methodologies. This allows designers to create intricate and dynamic patterns with ease, bridging the gap between traditional craft and digital design.

The integration of digital design tools with handcrafted making highlights the value of human touch and craft in the creation of architectural elements. Richard Sennett's exploration of craft and making in "The Craftsman" emphasizes the importance of embracing errors and the maker's hand imprint on the final work (Sennett, 2009). This dynamic quality resonates with the concept of "architecture of error" as discussed by Francesca Hughes, embracing imperfections and unique outcomes in the fabrication process (Hughes, 2014).

The success of this project demonstrates how parametric design can offer architects and designers a powerful tool to push the boundaries of textile-based architectural elements. The seamless integration of computational design methodologies with traditional craft techniques expands the possibilities of architectural expression and spatial experience. As the project highlights the dynamic effects of screens and transparency, it sets the stage for further exploration and innovation in the intersection of textiles, architecture, and digital design. By embracing the unique capabilities of knitting patterns and their inherent connection to early computing history, architects can continue to push the boundaries of design and fabrication in the pursuit of novel and engaging spatial solutions.

References

Carpo, M. (2012). The Digital Turn in Architecture. Wiley.

Guagliumi, S. (1996). Hand-Manipulated Stitches for Machine Knitters. Taunton Press

Lovelace, A. (1843). Sketch of the Analytical Engine Invented by Charles Babbage, Esq. L. F. Menabrea, Trans. Taylor and Francis.

McCullough, M. (1998). Abstracting Craft: The Practiced Digital Hand. United Kingdom: MIT Press.

Sennett, R. (2008). The Craftsman. Yale University Press.

Hughes, F. (2014). Architecture of Error: Matter, Measure, and the Misadventures of Precision. MIT Press.

Design-driven multi-subject participation in community place- making: a case study of Yulin East Road Community in Chengdu

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Abstract

Many cities have changed the original governance framework to a more multi-subject participatory one. Therefore, the roles of designers and other subjects in community place- making changed. This case study of the Yulin East Road community in Chengdu, explores the multi-subjects participation framework in a design-driven community place-making, discussing the roles and approaches of each subject, and highlighting that of designers.

Author keywords

Design Driven, multi-subject participation, community place-making.

Introduction

The national concept of "The cities are built by the people and are for the people" in 2019 re- emphasizes the role of all entities in building well-being. In such a context, many cities have changed the original governance framework to a more multi-subject participatory one (Li & XInag, 2022) as we are living in an era of "less stuff and more people" (Thackara, 2006, 4). Urban cultural practices are gradually expanding to grassroots, small-scale, multi-subject community spaces because of social context changes (Song, 2023). Meanwhile, communities are vital sources of urban innovation (Lou, 2018). Therefore, this research focuses on multi-subject participation in community place-making.

Originating in the 1960s, participatory theory has developed into one with ever-greater participation and ever-larger participants (Fuad-Luke, 200, 143). Nowadays, design has become a collaborative effort involving diverse stakeholders (Bjögvinsson et al., 2012, 103). Individual designers or communities can not solve the systematic problem on the sole strength of design. We therefore questioned how the roles of designers and other subjects in community place- making changed, and have the participation framework changed too.

Research methods

This case study research uses 3 methods in the data collecting and analyzing phases.

1. Semi-Structured Interview in data collecting: to better understand the participating approaches and intentions, 4 interviews were conducted separately on July 6th and 7th,

2023, with 1 staff from the designer team, 1 artist and community volunteer, 1 staff from the social organization, and 1 community planner with an average length of 2 hours by 2 researchers.
2. Participant Observation in data collecting: To better understand the behavior and interaction of the multi-subject participation in place-making, 2 researchers participated as tourists and residents conducting 2 observations on July 6th and 7th, 2023 separately with an average length of 4 hours by 2 researchers.
3. Flow-map analysis in data analysis: The participation framework includes elements of different roles, forces, and interdisciplinary interactions. Flow maps are used to describe this participation network system due to the features of graph-based, force-directed, and visualized readability.

Case Study: Participation subjects and frameworks in Yudong

Introduction to the site

The Yulin East Road Community (Yudong) in the Yulin sub-district, Wuhou District, Chengdu City in China is representative as it is one of the community governance pilots of Chengdu. Yudong is located in the old town area with convenient transportation and a relaxing local culture. This 0.45 km2 community has over 18,000 residents. Thriving in the 1980s as the first modern neighborhood of the city, Yudong avoided urban expansion, maintaining a historical but less popular area. Officially established in 2001, Yudong finally started a community place-making in 2018. The local history brings a majority of aged built-up spaces and a society of aging and acquaintance in Yudong which are the contextual factors of multi-subject participation and community place-making.

Subjects in participatory place-making

Yudong values the variety of participants in place-making as it sets the action strategies in four dimensions: community management, professional planning, resident democracy, and market management while design plays a supporting and synergistic role in between.

Accordingly, we divided the participants into 5 sectors, namely governmental, community- based, social, market-based, and designer subject (Figure 1).

Roles and participating approaches of subjects

Governmental subject

The participating approach of the governmental subject in Yudong has been influenced by innovations in the organizational framework of the Municipal Government in 2017 when the Urban and Rural Community Development and Governance Committee of the Chengdu Municipal Party Committee (CDGC) was established (Figure 2).

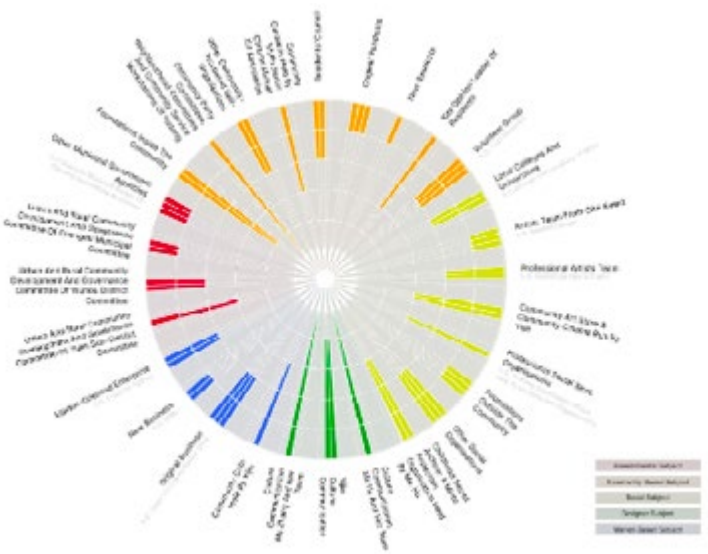

Figure 1. Roles, components and level of participation of subjects.

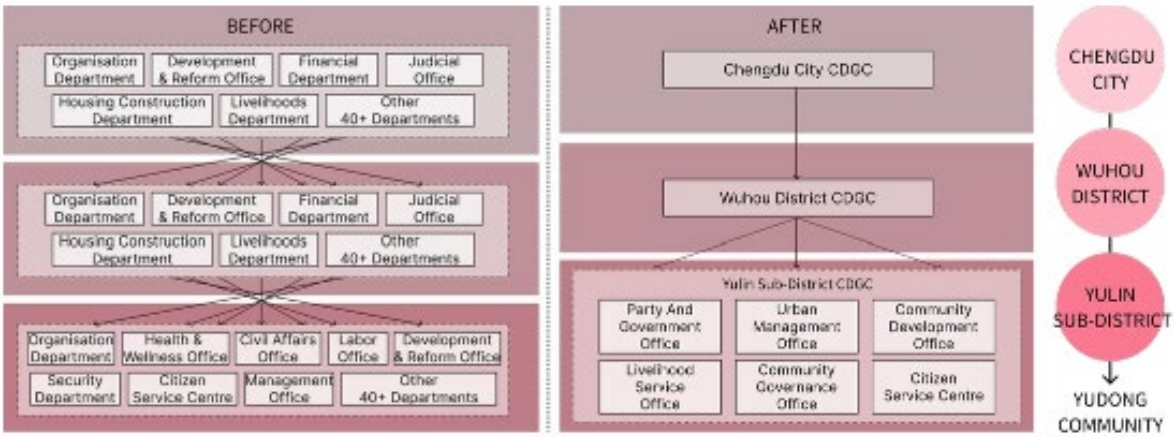

Figure 2. The change of orgianizational framework.

The more linear and targeted governmental framework improves the efficiency, professionality, and participation level of the subject which can be proved by the positiveness and the high mention frequency during all interviews with non-governmental subjects.

C**ommunity-based subject**

The community-based subjects in Yudong include community managers, self-organization, social foundations, and residents which take up the largest portion of participants with 50 volunteer teams, and over 160 members of residents' councils. Three of them are analyzed in detail below.

The community managers

The framework of community manager, namely "two committees and one station", includes a communist party committee, a neighborhood committee, and a community workstation with 7 staff overall. This subject values professional capacity cultivation as they traveled to Germany and Japan to learn about related theories with experts before the start of place-making which provides an active and trustful foundation for the later participant.

The community funds and self-organizations

Yudong set up an internal community fund, the Community Microfund, which enables Yudong to incubate self-organizations and empower more participants. Subjects can apply as a start-up project for grants, and a review committee comprising all 5 subjects, including 50 residents, social organizations, enterprises, expert teams, community managers, etc. reviews the approval of various projects and the allocation of the funds (Figure 3).

This slice is representative of the overall Yudong framework, as all 5 subjects form a community of interest with a clear monitoring system. The outcome of this framework is significant as 36 active self-organizations have been formed. According to an on-site publication, Yudong plans to use a fund of ¥235,000 this year to support the participation of market-based or social subjects, e.g. in the construction of the community open source governance web 3.0 digital platform by one market-based enterprise.

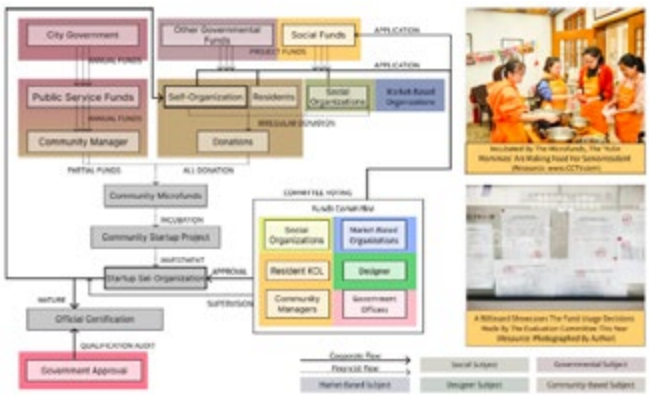

Figure 3. Framework of Yudong Microfunds incubating self-organisations.

The residents

Retired workers and teenagers account for an important proportion of residents in Yudong. Due to the historical context of this district, most of these residents are former colleagues, forming a typical society of acquaintance. Therefore, resident opinion leaders have a great influence on the participation of community members. During the interview, a staff of the designer team stated that the core of place-making in Yudong is the value of people. As she introduced, community workers spend a lot of time on one person (an opinion leader) to understand the needs and make those opinion leaders understand, recognize, and even be involved in the place-making process. In this way, the participation of resident entities is expected to grow in the long term.

While residents participate in the design process, design is also empowering them. A vivid example is what design has done in protecting rights and enhancing the participation of vulnerable residents, such as the disabled, children, women, etc.

Figure 4. Barrier-free design in Yudong.

Taking the participation of the disabled as an example, in 2018, the community managers and Wuhou District Disabled Persons' Federation commissioned the designers to renovate an abandoned car shed in the community and create an accessible community cafe in Yudong. All the public open spaces in the community were improved and equipped with barrier-free facilities afterward (Figure 4). In this way, design empowers these vulnerable community members and enables them to have more possibilities to participate in place-making.

Social subject and market-based subject

The social subjects in the Yudong are diverse, including non-profit social organizations, social foundations, social enterprises, etc., aimed at promoting public welfare. Noteworthy is that there are 7 professional artists or researcher teams who actively participate in place-making. Designers also have a close interaction with them. For example, these events, e.g. Yulin Opera Festival, were designated by the community planner in a community calendar, with different events happening every quarter.

The market-based subjects in Yudong are relatively small in business, less profitable, and more dependent on other subjects, especially with designers, e.g. the architects renovated Ms Lee's local hairdresser's shop to provide a better consumer experience.

Designer subject: take Yiiie as example

The designer subjects in Yudong include community planners and multidisciplinary design teams. Compared to that of community-based subjects, the population of designer subjects is relatively small, but the level of participation is the deepest.

Among them the Chengdu Yiiie Co.,Ltd (Yiiie), a local multi-disciplinary creative institution mainly focusing on

architectural design, is one of the earliest designer participants of Yudong's place-making.

As a design team, Yiiie serves as a core participant and an empowering agent in place-making. These 5 years witnessed Yiiie consistently participating as a design force in the entire process of place-making, reshaping the core public space of Yudong through architectural design, community planning, etc. What is more, it serves as a coordinator for a multi-subject participation platform with its series project, named Community Art Project (CAP, later changed into CACP) in 2019 (Figure 5). This project, initiated and operated by Yiiie and sponsored by governmental foundations, used leftover community public space as a medium, creating a tangible platform for subjects to quickly reach consensus and cooperate. Different themes of each year allow the ever-increasing participants such as designers, artists, scholars, and residents to conduct a rapid and active collaboration in a short period.

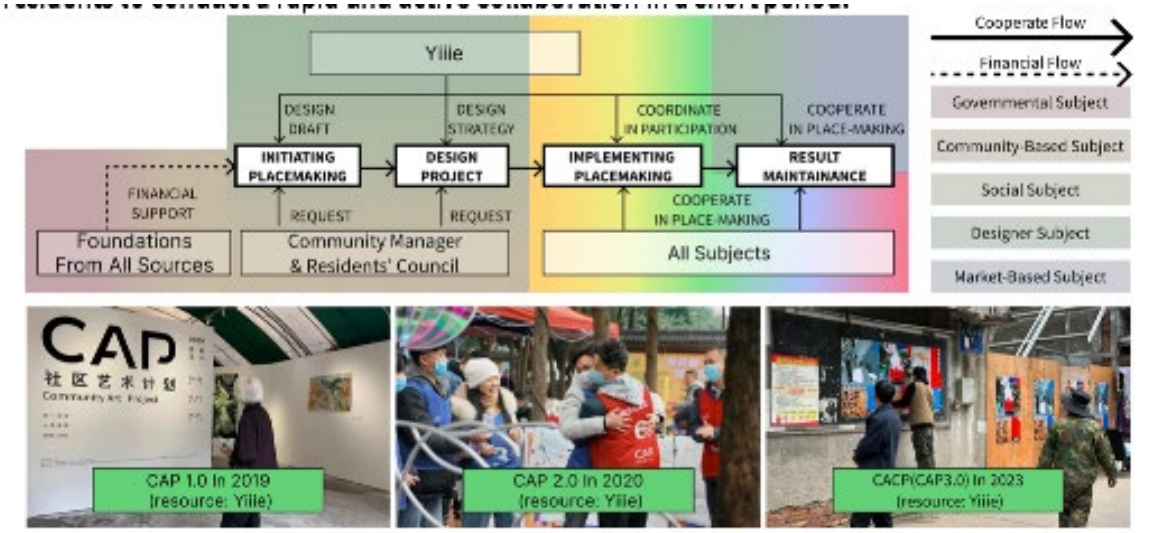

Figure 5. A design driven multi-subject participatory community platform framework of Yiiie.

Conclusion

The above paragraphs discuss the roles and framework features of all 5 subjects who participated in the community place-making of Yudong.

A flow map is used to summarize the overall framework of the multi-subject participation in Yudong place-making, which demonstrates relatively equal and multidisciplinary participation in the place-making process among all subjects(Figure 6). The Microfunds incubating system in this framework is highlighted.

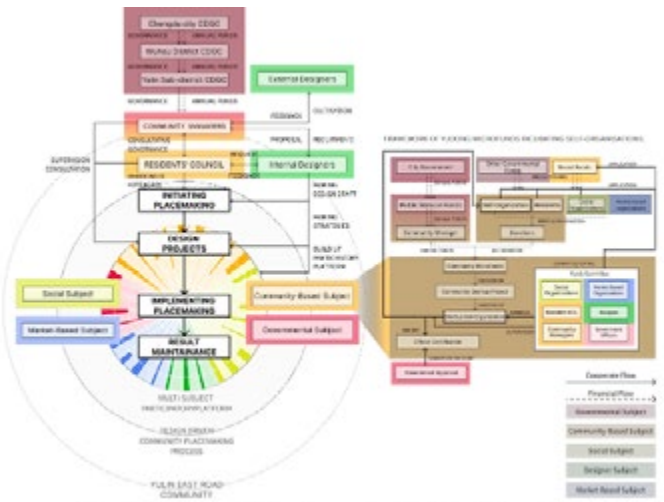

Figure 6. The overall participatory framework model in Yudong's place-making.

In this framework, governmental subjects, i.e. CDGC, play an active and targeted role in top- down decision-making and urban resource allocation, while community-based and social subjects have the largest population of participants, making it possible for bottom-up democratic decision-making and the diversity of participants in place-making to happen. Market-based subjects provide economic and professional support to the community, while Yudong nourishes them in return. Among them, we consider design as a driving force of this framework as designers play the roles of core participants, empower agencies, and platform coordinators.

In conclusion, this is the era of "less stuff and more people" when multi-subject innovative participatory frameworks in community place-making are needed. The research of Yudong provides a framework reference to help "participants to shape up the overall concept" in the place-making process. (Thackara, 2006, 4; Wu et al., 2019)

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References

Björgvinsson, E., Ehn, P ., & Hillgren, P . (2012). Design Things and Design Thinking: Contemporary Participatory Design Challenges. Design Issues, 28(3), pp. 101-116. DOI: 10.1162/DESI_a_00165

Fuad-Luke, A. (2009). Design Activism: Beautiful Strangeness for a Sustainable World.Redström, J. (2017) Making design theory, The MIT Press.

Lou, Y. (2018) ' NICE 2035: An Experiment of Design Driven Community-supported Social Innovation', Social Innovation and Design for City Making, pp. 34–39.

Li, X. & Xiang, L. (2022) ' Research on Multi-Stakeholder Collaborative Mechanism in Old Community Redevelopment:Based on the Experience of Shenzhen's Market-Led Policy Reform', CONSTRUCTION ECONOMY, 43(8), pp. 15–21.

Song, D. (2021) 'From Urban Production to Urban Culture Governance:The History，Reality and Mechanism of the Urban Cultural Construction Practice in China', Journal of Shandong University. doi:DOI:10.19836/j.cnki.37-1100/c.2021.06.004.

Thackara, J. (2006) In the bubble : designing in a complex world. 1. MIT Press paperback ed. Cambridge, Mass. [u.a: MIT Press.Norris, J (2016) A-Z of craft: A is for artisan, Crafts, September/October 2016, p.45

Wu, D., Ma, Y., Wang, J., & Xu, J. (2019). A design innovation framework research in the context of social regeneration. DS 95: Proceedings of the 21st International Conference on Engineering and Product Design Education (E&PDE 2019), University of Strathclyde, Glasgow. 12th -13th September 2019. https://doi.org/10.35199/epde2019.5

The Integration of Artificial Intelligence and Design

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Abstract
This study delves into the correlation between Artificial Intelligence (AI) and design, examining the influence of AI on creative thinking, innovative design, and design education. By analyzing existing research and applications, this paper emphasizes the revolutionary impact of AI on the traditional design field, guiding the transformation from manual to intelligent design.

Keywords: Artificial Intelligence, Design, Creative Thinking, Innovative Design, Design Education

Introduction

The concept of utilizing artificial intelligence (AI) to produce creative and valuable outputs is not new [1-2]. However, due to the reliance of modern AI and big data technologies on online data resources, it's only recently that AI tools have begun to surge on a large scale. AI tools are renowned for their capability to efficiently and directly generate high-quality multimedia content [3], challenging longstanding paradigms in various creative disciplines, including art and design. As a result, an increasing number of scholars are re- evaluating and rethinking established design concepts and educational philosophies. They are delving deep into the impacts and challenges that big data and AI bring to the design education system [4-7]. How to guide students in facing the challenges posed by the advancement of AI technologies, seize opportunities, and leverage AI to enhance efficiency and creativity has become a pressing issue in contemporary design education.

1 Literature Review

1.1 Design and Analogical Thinking

Design emphasizes the use of imagery and visual tools to solve problems. In 2005, the British Design Association introduced the double diamond model of design, which includes four stages: Discover, Define, Develop, and Deliver[8]. The Discover phase mainly focuses on exploring the value of the topic and identifying problems in the current field. The Define phase organizes and integrates the content from the Discover phase. The Develop phase diverges to consider various potential solutions to the problem, and the Deliver phase integrates and implements these solutions[9]. Analogical thinking is one of the three main reasoning methods in human logical thinking. By comparing the similarities between things, it generalizes knowledge to another subject. This method is widely used in scientific research[10-11]. Through analogical thinking, humans can create innovative solutions in new fields, leading to new business opportunities. Additionally, analogical thinking can help people better understand complex problems and provide viable solutions[12]. It also fosters interdisciplinary collaboration and knowledge sharing, promoting the advancement of knowledge[13]. Past research indicates that an individual's analogical processing mainly involves three core processes: abstracting the problem into a single schema,seeking the analogical domain, and applying the discovered analogy to generate solutions[14]. In the field of design

innovation, analogical thinking is considered a fundamental cognitive tool[15], with the identification and application of analogies serving as innovative methods. This aids designers in drawing inspiration when creating new products and services[16]. As a valuable cognitive tool, it helps students solve problems, invent new solutions, and promote knowledge sharing and interdisciplinary collaboration[17-18]. With the rapid development of the internet in modern society, a vast number of invention patents, scientific papers, legal cases, web pages, and videos are emerging online. The explosive growth of online data provides new opportunities and possibilities for identifying analogies. How to mine analogies in a rapidly growing information space, especially deep similarities between multiple fields, remains a challenge in modern design innovation. Moreover, humans' sensitivity to superficial similarities often means they focus on surface details, making it hard to retrieve or apply distant similarities[19]. Due to these human limitations, effectively leveraging online data in the information age is a significant concern in contemporary design education.

1.2 Innovation and Artificial Intelligence

The concept of innovative capability best expresses human potential. Renowned American creativity and innovation psychologist, Sawyer, views innovative capability as "part of being human"[20]. In most existing studies, emotional intelligence, artistry, aesthetic level, and innovative ability are defined as primary human cognitive characteristics, with innovative capability widely recognized as a unique human trait[21-23]. With the rapid advancement of AI, after analyzing existing art pieces, AI has produced outputs indistinguishable from human-made outputs[24-26], blurring the lines between AI and artists[27]. This presents a formidable challenge for today's innovative designers. Regarding AI, Patrick Winston of MIT defined it in his 1992 textbook "Artificial Intelligence"[28] as "the study of computation that makes perception, reasoning, and action possible." This suggests AI employs algorithms, models, and other computational methods to mimic some human intelligence behaviors, including receiving external information, reasoning, and deriving certain outputs. It's a tool inspired by the human brain and empowered by mathematics and computational methods to achieve various intelligent behaviors[29]. However, computers can't autonomously generate programs for any arbitrary need; they must be designed and coded by humans since they lack creativity. Computers' increasing prowess stems from humans creating more and more programs for them to run, but they can't expand their functionalities on their own. Sawyer argues, "Despite AI computer programs holding world champion titles in chess, processing vast amounts of data, and recognizing patterns invisible to the human eye, they still cannot master everyday creativity." They lack the kind of creativity inherently associated with humans[30] and require physical development to produce outputs[28]. Thus, computer creativity and intelligence are mechanical and rigid; they follow human-issued instructions to complete specific tasks. While they are fast and accurate, they lack the abilities of creation and abstraction[31]. The outputs of data-centric computers fundamentally differ from the intentions and expectations humans have during creative tasks[32]. Nevertheless, the value of AI is undeniable. With continual scientific and technological progress, AI will achieve unparalleled accuracy, usability, and accessibility, inevitably being globally embraced and utilized. Most people will enhance their creativity with AI support. Therefore, how to effectively leverage AI to augment human creativity is a pressing issue in modern design education.

2 Research Hypothesis

Due to the significant limitations of analogical innovation in the traditional human brain, in our teaching practice, we deconstruct the traditional analogy process and allocate it to different information processing units. This approach aims to overcome the limitations of current analogical thinking and maximize the potential of artificial intelligence. This leads to our research hypothesis: By breaking down the analogical processing capability into multiple steps and distributing them amongst different individuals and AI, design innovation outcomes can be

enhanced more effectively.

During the course planning phase, the curriculum is based on the four design stages of the double diamond model. We designed an approach combining analogical thinking with distributed focus groups, utilizing both artificial intelligence and machine learning to identify and address real-world design issues. In the Discover phase, machine learning is employed for big data analysis to detect user needs. During the Define phase, focus groups abstract user requirements to identify deeper issues. In the Develop phase, artificial intelligence language models are trained to search and retrieve analogy suggestions, offering students innovative paths to potential solutions from other fields. In the Deliver phase, focus groups are once again employed to collate and summarize the obtained analogy data to formulate the final solution to the problem.

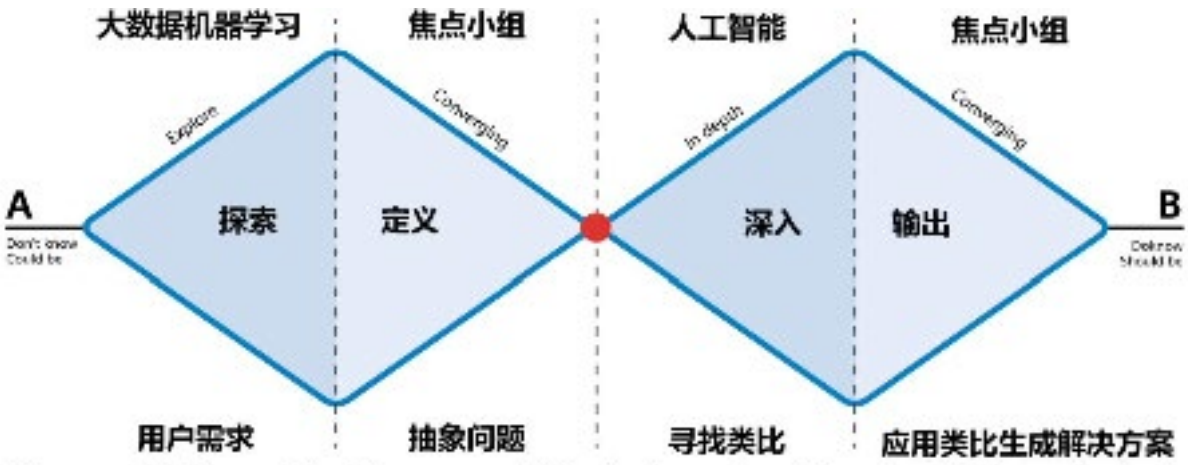

Figure 1 A theoretical framework for design education in which analogical thinking is integrated into artificial intelligence

3 Teaching Practice

The subjects of this study were 40 students of the 2021 Industrial Design Design Thinking and Methodology course at the School of Art and Design, Yanshan University. Overall, the students had a high level of design literacy. The experiment was conducted in a discussion classroom in the Department of Industrial Design to ensure flexible use of the classroom space for group discussion activities and manipulation of teaching aids. Students are divided into two groups, one for issue groups and the other for non-issue groups, with the issue groups designing products based on their chosen targets and the non-issue groups acting as a support group for the issue groups to expand their analogous thinking and not directly involved in product design. In practice, the different issue groups actually exist as non-issue groups for the

other groups. The researcher also made it clear in advance of the course that it would be used as a teaching practice research course and informed the post-interviews to ensure that students were informed and volunteered.

3.1 Big data machine learning to discover user needs stage

The objectives of this stage are: to enable students to effectively use the python language to data crawl the user evaluation information of the products involved in the web platform, and to use the LDA (Latent Dirichlet Allocation) algorithm to construct a topic model and to form preliminary information on the structural representation of product requirements, the difficulty at this stage is the students' mastery of the python language. Thanks to the rapid development of artificial intelligence, students have effectively solved the problem of data crawling and processing integration through the form of semantic question and answer with the help of

artificial intelligence chat bots, and improved the efficiency of design exploration.

In the actual teaching process, after the issue group students teamed up according to their selected target products, they used the proposed design theme works as keywords and used the python program to obtain the top ten user reviews of the target products in the Jingdong shopping platform for similar products. Duplicate reviews with the same id and reviews with a total word count no greater than 2 were removed and valid review statements were obtained. After cleaning the review vocabulary, a bag-of-words model was constructed and LDA topic analysis was performed. By adjusting the parameters, five topics as well as core vocabulary were obtained as shown in the figure. This uses machine learning methods to efficiently extract the possible demand points of users and ensure the diversity of demand extraction, which provides a scientific basis for the extraction of abstract questions on the nature of demand by users at a later stage.

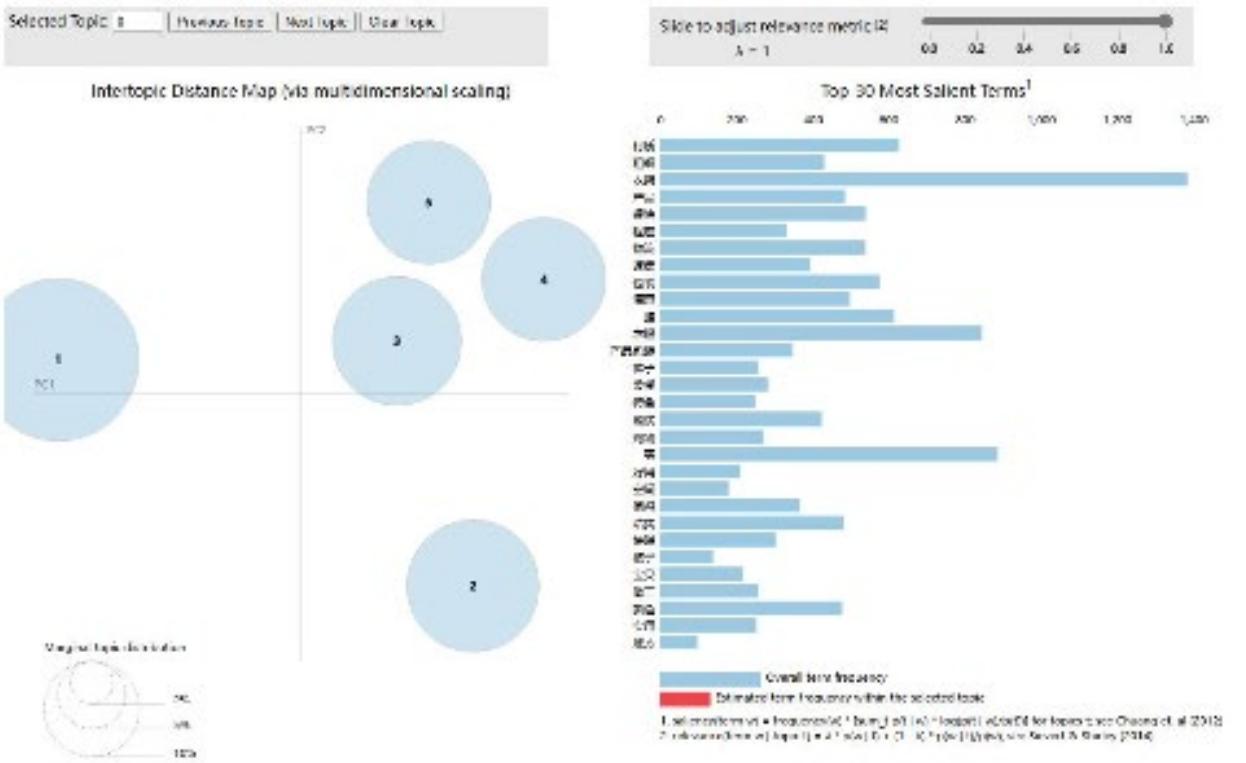

Figure 2 Results of LDA model runs

3.2 Focus group classification abstraction definition design problem stage

The aim of this stage is to guide the students in defining abstractions based on the information obtained from the machine. The abstracted problem should

reflect the essence and be far removed from the product domain, but reflect enough relevant expertise to motivate students to come up with useful and non-obvious solutions. The challenge at this stage is to construct and reconstruct the problem, which requires students to abstract the problem while leaving as much room as possible for the solution to be implemented.

In practice, issue group students are required to develop ideas for the proposed design theme. The main task is to analyse high-frequency words from user reviews crawled on the web and to understand the meaning behind the words, which are then abstracted and abstracted into a series of concrete problems. In the guided teaching phase,

the course therefore reproduces a number of specific products so that students understand the specific problem schema and mechanism of their design, for example such as the Dyson bladeless fan, whose main problem is the uncomfortable noise and safety hazards that can arise from traditional fans, and whose mechanism is to separate the blades and the blower and then synthesise them, resulting in the design of a bladeless fan. In the students' concrete practice, they are mainly guided through the inductive method of grouping the key problems into different categories, and then allowed to brainstorm as many possible problems as possible, combining the card method with this to form the final abstract problem, which through training, students can gradually abstract to a high quality. For example, when considering the design of a coat rack, students first understand the user's needs through high frequency words and abstract the surface part of the problem, then focus on the user's core needs and break them down into multiple constraint patterns.

3.3 Artificial intelligence to construct analogous data stages

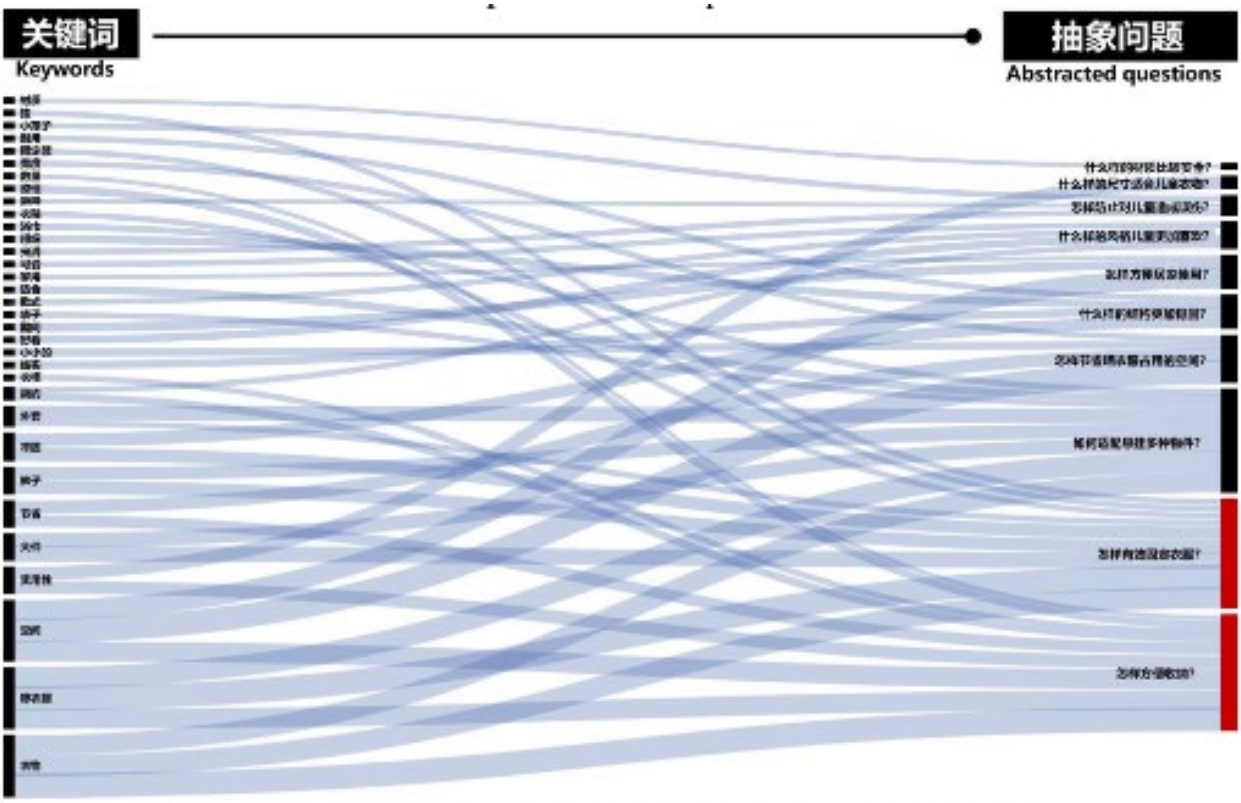

Figure 3 Classified abstraction defining the design problem

The goal of teaching at this stage is to guide the non-topic group students to use artificial intelligence to search through these areas for inspiration that might be applicable to solving the original problem. The benefit of this approach is that the non-issue person does not have the professional constraints of the intended product and searches for answers through the wealth of ideas, solutions and skills recorded on the web only in relation to the abstract problem provided by the issue group, such an approach makes it easier for the non-issue group to use AI to search for analogies that closely match in one dimension but are far apart in another, for items that are distant clustering to provide different similarity solutions.

During the teaching process, the main task of the non-topical group was to use artificial intelligence to find as many solutions to the problem as possible and to put together a workable solution mechanism. For example,

when considering the design of an infusion device for children, the non-topics group students gave more than 10 different solutions to different problems through artificial intelligence, based on the abstract problems abstracted by the topics group: reducing child rejection, automatic infusion control, etc. At this stage the artificial intelligence processed is millions or even billions of data at a speed unmatched by humans, there is a lot of noisy data, which therefore needs to be checked, selected and adjusted manually to exclude the impurities produced by AI. For this reason, the non-topical group has adapted the solutions given by the AI search and has given example diagrams of each of the five possible solutions to the problem, with illustrations.

Figure 4 Artificial intelligence to construct analogous data

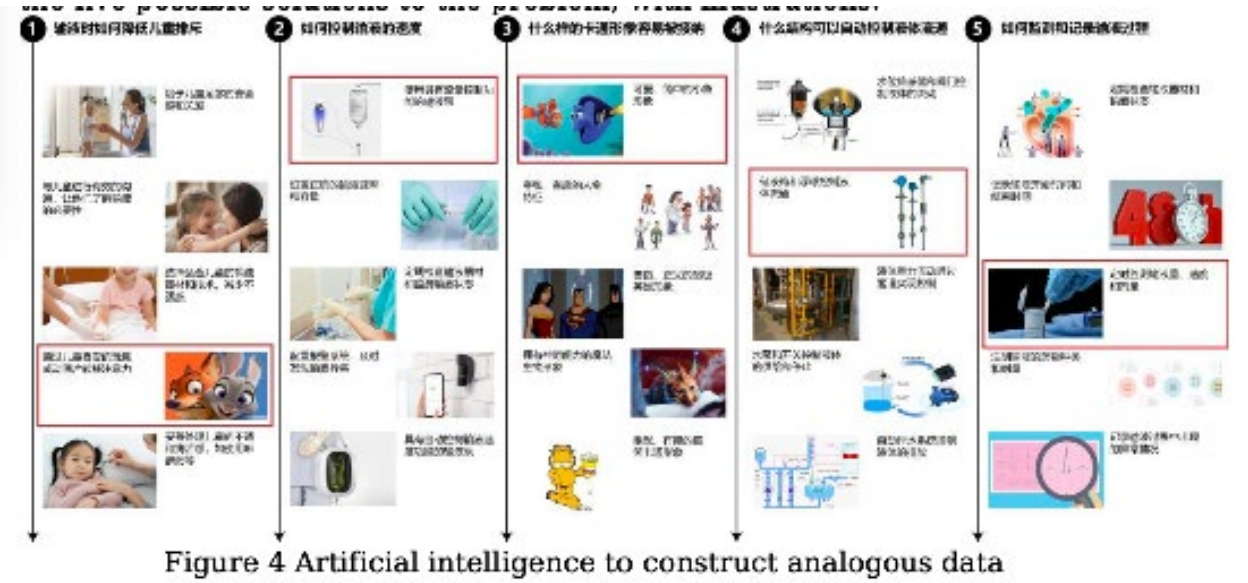

Figure 4 Artificial intelligence to construct analogous data

The main objective at this stage of the teaching is for the topic group to sort through the information and develop a final innovative analogical solution based on the information provided by the students in the non-topic group. During the teaching process, students addressed two main aspects of the problem, firstly by reviewing candidate inspirations retrieved by the AI and secondly by applying them to the problem at hand and integrating multiple potentially conflicting inspirations. For example, in the design of a forklift truck, in response to the problem of how to move the object in a small space, the issue team took the rotating dining table solution given by the non-issue team and modified the product by using a 360 degree rotation. By taking the open-ended problem-solving solutions put together by the non-topical group through artificial intelligence and turning them into a better solution, students are often able to find inspiration for innovation from other disciplines or fields, an approach that can effectively transcend the boundaries of students' current information and lead to innovation. Some of the design coursework is shown in Figure 5.

Figure 5 Part of the design coursework

4 Exploring Teaching Outcomes

The aim of this course is to develop the skills and tools for students to acquire innovative knowledge and to enhance their effectiveness to engage in innovative activities[33]. Efficacy is defined by Bandura as an individual's ability to assess his or her performance in a given task. Efficacy is defined by Bandura as the individual's ability to assess his or her ability to perform a given task, and perceived efficacy is positively correlated with innovation[34][35]. The perception of efficacy is positively correlated with innovation. Therefore, this study explores the outcomes of the programme by understanding students' assessment of efficacy in the learning process. Questionnaires and focus group interviews were used to find out the efficacy of students participating in the programme and to understand the outcomes of the programme.

To assess students' agreement with learning efficacy, a five-point Likert scale was used and the learning efficacy research literature was consulted[36][37]. A four-component learning effectiveness scale was designed to include four dimensions: competence enhancement, goal attainment, self-directed learning and confidence in application. The competency enhancement scale includes questions on knowledge gained, methods and tools, teamwork and ability to implement the topic; the goal attainment scale includes questions on topic attainment and knowledge learning; the self-directed learning scale includes questions on knowledge acquisition and implementation of the topic; and the application confidence scale includes questions on application of learning and entrepreneurial application. The Learning Effectiveness Scale was administered to students at all four stages of the course, and an online questionnaire was administered through Yanshan University's Teaching Quality Assessment System. We asked students how much they agreed with the questions in order to understand their feelings about various aspects of learning effectiveness. In the end, we received 40 valid questionnaires.

The focus group interviews were conducted in groups of students in the discussion rooms of the school and were recorded to ensure the accuracy of the data collected. The interviews consisted of a questionnaire on learning effectiveness and were conducted through discussions among group members to understand the effectiveness of students' learning at each stage of the process. During the focus group interviews, the content of the course and the results of each group topic were provided to help the participating students review their learning journey in order to obtain reliable interview data.

The results of the questionnaire on learning effectiveness were presented using a quantitative approach, presenting students' self-assessment results across the four stages of the learning and implementation themes. The verbatim transcripts of the interviews are analysed and summarised for content. The results of the quantitative and qualitative analysis are used to interpret the assessment and feedback of the participating students on the effectiveness of their learning in this course.

The results of the Student Learning Effectiveness Questionnaire are shown in Table 1. The Cronbach's alpha scale was used to check the reliability of the four constructs, with Cronbach's alpha values of 0.891, 0.933, 0.934 and 0.951 respectively, all of which are greater than 0.7, indicating that the results of this study have good reliability. The mean value of students' learning effectiveness in this course was 4.36, and overall, the majority of students considered the learning effectiveness of this course to be high. In terms of the four dimensions of competence enhancement, goal attainment, self-directed learning and confidence in application, students agreed with the highest level of competence enhancement (4.43) and the lowest self-rating for confidence in application (4.293). Across the three learning stages of the course, students' self-ratings of learning effectiveness were highest at output (4.41) and lowest at depth (4.35). The qualitative data collected through the focus group interviews were used to analyse and interpret the students' learning effectiveness.

Table 1 Descriptive statistical analysis of learning effectiveness

Learning Phase / Learning self-efficacy		Depth: User requirements		Definition: Abstract questions		In-depth: Finding analogies		Output: Applying strategies to generate solutions		Total
		Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)
Depth: Upgrading	Knowledge	4.45 (0.597)	4.413 (0.455)	4.50 (0.506)	4.488 (0.475)	4.615 (0.479)	4.375 (0.525)	4.50 (0.591)	4.463 (0.495)	4.434 (0.470)
	Methodologies	4.45 (0.677)		4.60 (0.598)		4.564 (0.716)		4.35 (0.597)		
	Teamwork	4.50 (0.599)		4.40 (0.591)		4.667 (0.672)		4.35 (0.597)		
	Implementation capacity	4.35 (0.702)		4.45 (0.597)		4.564 (0.716)		4.35 (0.594)		
Objective Reach	Theme achieved	4.30 (0.648)	4.375 (0.575)	4.40 (0.632)	4.375 (0.696)	4.615 (0.495)	4.375 (0.805)	4.30 (0.648)	4.310 (0.648)	4.344 (0.606)
	Knowledge learning	4.45 (0.677)		4.35(0021)		4.590 (0.610)		4.35 (0.723)		
Autonomy Study	Knowledge	4.45 (0.677)	4.375 (0.597)	4.45 (0.597)	4.375 (0.677)	4.667 (0.662)	4.375 (0.666)	4.35 (0.744)	4.425 (0.616)	4.375 (0.574)
	Discussion Topics	4.30 (0.648)		4.30 (0.791)		4.538 (0.733)		4.30 (0.597)		
Application & Confidence	Apply what you have learned	4.35 (0.802)	4.293 (0.668)	4.05 (0.876)	4.125 (0.805)	4.615 (0.776)	4.125 (0.772)	4.25 (0.583)	4.375 (0.714)	4.295 (0.633)
	Start-up applications	4.25 (0.707)		4.30 (0.791)		4.436 (0.810)		4.40 (0.677)		
Total		4.375 (0.480)		4.360 (0.546)		4.545 (0.596)		4.41 (0.546)		4.362 (0.524)

5 Exploration of research findings

This pedagogical practice is based on the Double Diamond model of design thinking, which expands the prospects for unexpected discovery in a distributed manner through a series of manual focus group discussion processes and artificial intelligence systems. These processes overcame the previous challenges of analogical innovation. Through post-questionnaire and interview content analysis, the study concluded that there are a number of important benefits to incorporating distributed analogies through artificial intelligence, summarised in three advantages:

5.1 Effective ways to break out of the mindset

In traditional analogical innovation, one can often only find analogies with high surface similarity, but not those with deep structural similarity. To address this problem, many researchers have proposed various approaches to help designers build more abstract representations of problems, such as generating multiple abstract representations or using functional ontologies to represent the relational structure of a problem[38]. However, using web- based big data and artificial intelligence techniques, it is possible to bring together thousands of people worldwide to work on complex cognitive tasks. Through student questionnaires and interviews, it can be seen that this teaching practice method can help people to find inspiration in distant areas while avoiding stereotypical thinking. However, in the early stages of teaching practice, there was some risk that the method might fail, for example, because students might not be able to ask abstract questions explicitly or, even after giving some key cues through the non-topic groups, they still did not recognise the deep structural relationships contained in this information and therefore missed some important information. To address such problems, the group added to the teaching content at a later stage of teaching practice, focusing on exploring the abstraction model of questions and the way distributed focus groups fit together, as well as the value of distributed processes and abstraction models among group members, and training students to become proficient in tools such as induction and card methods as a way of taking data summarised by machines, transforming it into different categories, and then carrying out focus abstraction in order to generate high quality abstract questions that can be used to find inspiration from different fields.

Analogies are an effective way to find new ideas, but finding useful analogies in large-scale data sets can be a challenge. To address this challenge, this teaching practice uses two complementary approaches to solve it: a population-based approach and an artificial intelligence-based approach. The AI-based approach uses artificial intelligence to examine large datasets and suggest possible analogies. Machines can process large amounts of text, images, video, patents, research papers and other data sources to discover potential analogies and help students find useful inspiration faster. By assigning steps to different people and machines, different innovation paths are explored. The benefit of this approach is that machines can process large amounts of data quickly and accurately and find useful analogies quickly, but machines cannot understand the deep knowledge and context of the domain in the same way that humans can, and thus a human and machine collaborative approach is used throughout the teaching process in order for students to find analogies in different domains to gain an abstraction capability that machines do not have, and the strategy is able to provide machine learning system with useful analogical problems and a useful complement to student innovation that can help students search for more distant and fruitful areas of expertise.

5.2 Forming effective ways to expand thinking

Through interviews, students generally found these AI-provided analogies to be a valuable, unexplored source of new ideas, and the approach offered more possibilities with increased creative efficacy than standard self-directed learning. This suggests that this collaborative human-AI strategy may hold promise for helping students more quickly to extract useful information from a range of different real-world datasets.

5.3 Effective means of responding to complex issues

By breaking down tasks and opening the door to more possibilities for more types of innovative work, the involvement of artificial intelligence will bring complementary benefits to this process. While people's ability to derive and apply deep relational patterns from unstructured real-world data is unparalleled, they are limited in their ability to search widely for vast repositories of potential analogues.

The interviews revealed that the teaching strategy can effectively address multiple constraints in product innovation and find solutions to design problems through effective abstraction. In the students' design process, there are often multiple conflicting factors to consider, such as safety and flexibility. To address these challenges, through the group process of human-machine interaction, students first decompose the problem into multiple constraint patterns and find corresponding solution models for each constraint pattern. These models are then integrated into a solution that addresses each constraint. Through this approach, students can solve open-ended design problems of unknown form and translate them into problem statements with clearly defined constraints. Students can then integrate these constraints by finding inspiration from different fields and create solutions that are more practically useful and original in their thinking. This approach offers a viable approach to complex design problems and can help students to explore problem-solving possibilities in a more focused way, avoiding over-reliance on traditional sources of inspiration, such as copying or modifying existing designs. It can also help students to better understand and manipulate design constraints, further improving the practical feasibility and innovation of their designs.

6 Conclusion

Although the application of existing AI systems in the design field is still relatively limited, as technology continues to develop and data resources increase, we believe that design methods based on AI and human collaboration will become increasingly common and practical in the future. To better accommodate the future of design teaching, in this teaching practice the course breaks down a person's analogous processing power into decentralised steps and assigns them to different individuals or artificial intelligences. This approach allows for the use of the respective strengths of the person and the AI to form a complementary set while improving their weaknesses in order to increase the number of potential analogies found. It also allows the brain work done by each individual in the focus group to be captured effectively so that the rest of the group can make use of it. So analogies are not just a person's expertise in the traditional sense, by collaborating to exploit the complementary strengths of people and machines, important social problems can be better solved. However, this approach also brings new challenges, such as how to coordinate the efforts of different people and how to determine the best configuration of human and machine processing, which are issues that need to be explored in depth in future teaching.

References

[1] Boden M A . Creativity and artificial intelligence[J]. Artificial Intelligence, 1998, 103(1- 2):347-356.

[2] Heller, M: Artificial intelligence (AI) in applications [J]. Microcomputers Abroad, 1991(2):17- 23.

[3] Anantrasirichai N, Bull D. Artificial intelligence in the creative industries: a review[J]. Artificial intelligence review, 2022: 1-68.

[4] Holmes W, Bialik M, Fadel C. Artificial intelligence in education [M]. Globethics Publications, 2023.

[5] Braun V, Clarke V. Conceptual and design thinking for thematic analysis[J]. Qualitative Psychology, 2022, 9(1): 3.

[6] Xu Y. The Evolving eSports Landscape: Technology Empowerment, Intelligent Embodiment, and Digital Ethics[J]. Sport, Ethics and Philosophy, 2023: 1-13.

[7] Feng X, Yu L, Kong W, et al. Frontier hotspots and trend evolution of cultural and creative design in China-an empirical research on CNKI- based bibliometrics[J]. Library Hi Tech, 2022. ahead-of-print
[8] Kochanowska M, Gagliardi W R. The double diamond model: in pursuit of simplicity and flexibility[J]. Perspectives on Design II: Research, Education
and Practice, 2022: 19-32.
[9] Yu Lei, Chen Guoqiang and Wang Jingya: "A practical study on the integration of entrepreneurial thinking into university design education" [J]. Art and Design Research, 2023, 106(Vol. 2, pp. 123-128 .
[10] Lu Mingsen:Exploring the Mysteries of Thinking: An Introduction to Civics [M]. Beijing: Beijing Agricultural University Press, 1994 , pp. 348-368.

[11]Schoenfeld A H. Mathematical practices, in theory and practice[J]. ZDM, 2020, 52(6): 1163-1175.
[12]Ghazal T M, Hasan M K, Alshurideh M T, et al. IoT for smart cities: Machine learning approaches in smart healthcare-A review[J]. Future Internet, 2021, 13(8): 218.
[13] Eigi-Watkin J, Koskinen I. Reasoning by analogy and the transdisciplinarian's circle: on the problem of knowledge transfer across cases in transdisciplinary research[J]. Sustainability Science, 2023, 18(3): 1343-1353. [14] Haefner N , Wincent J , Parida V , et al. Artificial intelligence and innovation management: a review, framework, and research agenda[J]. Technological Forecasting and Social Change, 2021, 162:120392-.
[15] Dahl D W, Moreau P. The influence and value of analogical thinking during new product ideation[J]. Journal of marketing research, 2002, 39(1): 47-60.
[16] Mi P. Stimuli-responsive nanocarriers for drug delivery, tumor imaging, therapy and theranostics[J]. Theranostics, 2020, 10(10): 4557.
[17] Iringan E M . Instructional Exposure of Senior High School Students to Approaches that Promote Critical Thinking and Problem-Solving Skills[J]. Journal of Asian Research, 2021(1).
[18]Jarrahi M H, Askay D, Eshraghi A, et al. Artificial intelligence and knowledge management: a partnership between human and AI[J]. Business Horizons, 2023, 66(1): 87-99.
[19]Don H J, Goldwater M B, Livesey E J. Cognition of relational discovery: why it matters for effective far transfer and effective education?[J]. Frontiers in Psychology, 2023, 14.
[20]Chen X, Zou D, Xie H, et al. Two decades of artificial intelligence in education[J]. Educational Technology & Society, 2022, 25(1): 28-47. [21]Holyoak K J, Ichien N, Lu H. From semantic vectors to analogical mapping[J]. Current Directions in Psychological Science, 2022, 31(4): 355-361. [22] Akter S, Hossain M A, Sajib S, et al. A framework for AI-powered service innovation capability: Review and agenda for future research[J]. Technovation, 2023, 125: 102768.
[23]Badra F, Lesot M J. Case-based prediction-A survey[J]. International Journal of Approximate Reasoning, 2023, 158: 108920.
[24]Hadjeres G , Nielsen F , Pachet F . GLSR-VAE: Geodesic latent space regularization for variational autoencoder architectures[J]. IEEE, 2017.
[25]Yu L, Feng X, Wang J, et al. Research on the mechanism of emotional design in Chinese cultural and creative products[J]. Heritage Science, 2022, 10(1): 1-18.
[26]Köbis N, Mossink L D. Artificial intelligence versus Maya Angelou: Experimental evidence that people cannot differentiate AI-generated from human- written poetry[J]. Computers in human behavior, 2021, 114: 106553. [27] Cetinic E. Towards generating and evaluating iconographic image captions of artworks[J]. Journal of Imaging, 2021, 7(8): 123.
[28]Li Xiuquan: Intelligent change: artificial intelligence technology evolution and value creation [M]. Tsinghua

University Press, 2021.

[29]Tabrizchi H, Kuchaki Rafsanjani M. A survey on security challenges in cloud computing: issues, threats, and solutions[J]. The journal of
supercomputing, 2020, 76(12): 9493-9532.
[30]Csikszentmihalyi M , Sawyer K . Creative Insight: The Social Dimension of a Solitary Moment[J]. Nature of Insight, 2014, 4:47-50.
[31]Janiesch C, Zschech P, Heinrich K. Machine learning and deep learning[J].
Electronic Markets, 2021, 31(3): 685-695.
[32]Steinau S, Marrella A, Andrews K, et al. DALEC: a framework for the systematic evaluation of data-centric approaches to process management software[J]. Software & Systems Modeling, 2019, 18: 2679-2716.
[33]Beynon M J, Jones P, Pickernell D. SME development strategy and product/service innovation intention: A NCaRBS analysis of the role of uncertainty[J]. The International Journal of Entrepreneurship and Innovation, 2020, 21(1): 3-16.
[34] Neneh B N. Entrepreneurial passion and entrepreneurial intention: the role of social support and entrepreneurial self-efficacy[J]. Studies in Higher Education, 2022, 47(3): 587-603.
[35] Liu X, Lin C, Zhao G, et al. Research on the effects of entrepreneurial education and entrepreneurial self-efficacy on college students' entrepreneurial
intention[J]. Frontiers in psychology, 2019, 10: 869.
[36]Anyadubalu C.C. Self-Efficacy, Anxiety, and Performance in the English Language among Middle-School Students in English Language Program in Satri Si Suriyothai School, Bangkok[J]. International Journal of Social Sciences, 2010, 5(3):193-198.
[37] Arjanggi R, Hart H, Adnjani M D, et al. Validating the behavioral academic
confidence scale for Indonesian college students[J]. International Journal of Innovation, Creativity and Change, 2020, 11(12): 688-700.
[38] Ming Z, Sharma G, Allen J K, et al. An ontology for representing knowledge of decision interactions in decision-based design[J]. Computers in Industry, 2020, 114: 103145.

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