Proceedings of the Design Society, Volume 5: ICED25
https://doi.org/10.1017/pds.2025.10178

Exploring differences in design context construction within social innovation collaborative initiatives

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ABSTRACT: Design has shifted from product manufacturing to tackling systems' complexities in social innovation, focusing on participatory and human-centered design. Despite tools developed to enhance participation, differing perspectives complicate co-creation, necessitating better ways for interdependent thinking and communication. Designers must be embedded within the same social and cultural contexts as others, engaging in long-term participation. Establishing a design context that transcends temporary action but with a joint vision and tasks achievement is crucial. This study identifies varying levels of designers' involvement and the differences of design context construction. Three modes are illustrated: (1) patching-based, (2) intertwining-based, and (3) expanding-based design context construction. This study advances design theory, encouraging designers to engage in multi-level collaboration.

KEYWORDS: Social innovation, Collaborative design, Complexity, Design context, Design practice

1. Introduction

Design is considered as a highly cognitive process (Lawson, 1979; Schön, 1979; Valkenburg and Dorst, 1998). Design collaboration involves diverse tools and methods that support designers in developing an integrative framework, refection, critical movement, actions, and reasoning when seeking common design objectives (Goldschmidt and Weil, 1998; Dorst, 2011). Some researchers argue that design collaboration has not yet undergone rigorous examination and integration, particularly in complex social innovation contexts (Idi and Khaidzir, 2018). Issues such as shared team objectives, group cognitive actions, reasoning, and tacit knowledge sharing have not been adequately investigated (Kasali and Nersessian, 2015; Sanders and Stappers, 2008). Most studies fail to extend communication, technology, and environmental approaches to design team collaboration. Beyond communication, cognitive actions, thinking, and the environment, research on design team collaboration should also recognize the transformations brought by stakeholder interactions (Idi and Khaidzir, 2018). This study aims to go beyond exploring collaborative tools and methods by providing a more holistic and dynamic analysis of collaborative models from the perspective of design context construction.

This study is part of ongoing research aimed at theoretically explaining design collaboration models within social innovation projects. In the creative design practice of addressing complex real-world problems, our goal is to answer the following research question: How do designers collaborate with other actors in complex and dynamic social innovation projects to solve problems through the construction of design contexts? Our findings are significant for elucidating the richness and ambiguity of design collaboration models and the construction of design contexts.

The structure of this paper is as follows: In Section 2, we describe the burgeoning development of social innovation in design practice and explore the concept of design contexts and their importance in addressing social issues. Section 3 introduces the research methodology, including the selection of research samples, data collection process, and qualitative data coding process. Section 4 develops three modes of describing the construction of design contexts: (1) patching-based design context

construction, (2) intertwining-based design context construction, and (3) expanding-based design context construction. Section 5 provides a preliminary discussion of the three modes, and together with Section 6, elucidates the study's contributions to design theory development and its implications for design practice.

2. Theoretical background

2.1. Social innovation as an emerging design practice

For decades, the design landscape has undergone significant evolution, with researchers and practitioners continuously probing the boundaries and concepts of design. As design increasingly engages with dynamic, multi-layered, and unpredictable complex social systems, it has shifted from a focus on tangible entities to a broader consideration of entire systems and organizations (Buchanan, 2015). Designers are now frequently tasked with large-scale transformation projects, moving from product-level issues to more extensive systemic challenges. This transition necessitates a comprehensive understanding of the contextual complexities and the wicked problems inherent in these social systems. Such complex issues are often not merely ill-defined; they are open, dynamic, and frequently situated at the intersection of social, economic, and environmental factors (Valkenburg and Dorst, 1998). These problems typically exhibit characteristics of ambiguity, multifacetedness, and non-linearity, thereby requiring designers to adopt an integrated approach that synthesizes systems thinking with design thinking in order to develop effective solutions. Richard Buchanan's articulation of four orders of design enriches our understanding of the discipline and underscores the capacity of designers to address complex challenges within human social contexts (Buchanan, 1992). This capability positions design as an indispensable asset in tackling social innovation challenges.

The concept of social innovation is both rich and multifaceted, primarily encompassing the development of new solutions that are more efficient, effective, and sustainable in addressing societal issues (Phills et al, 2008). Social innovation necessitates the creation of novel ideas—products, services, and models—that simultaneously fulfill social needs while fostering new social relationships or collaborations. It not only contributes to societal welfare but also enhances society's capacity for action (Chick, 2012). Unlike high-tech solutions, social innovation prioritizes the resolution of social problems (Van der Have and Rubalcaba, 2016), characterized by its core principles of openness and participation. The inherent ambiguity surrounding social innovation has led to a fragmented state of knowledge within this field (Cajaiba-Santana, 2014; Dawson and Daniel, 2010; Pol and Ville, 2009).

The complexity of stakeholders and ecosystems involved in social innovation presents numerous practical challenges. Divergent perspectives and backgrounds among multiple stakeholders necessitate more effective strategies to enhance collaboration, communication, and critical thinking. Furthermore, social innovation demands long-term engagement from actors and a commitment to continuous improvement; thus, establishing mechanisms that support key stakeholders in sustainable transformation is crucial (Yang and Sung, 2016). Additionally, the high complexity and unpredictability of social systems hinder actors from adequately describing or controlling outcomes through predetermined design solutions. Design is inherently systemic, enabling the development of interventions across multiple levels within a system. This systemic perspective is evident in the integrative approaches adopted by designers (Schön, 1979). Designers possess the ability to establish and maintain relationships between design initiatives and the broader systems into which they are embedded, providing them with a systematic framework for addressing social innovation challenges. Furthermore, tools such as visualization techniques, multi-stakeholder participatory design processes, user-centered methodologies, and rapid prototyping for quick testing represent significant advantages for design within the context of social innovation (Van der Bijl-Brouwer and Malcolm, 2020). However, concerns have emerged regarding designers' partial involvement in projects and their lack of essential competencies during project development and implementation. This highlights the necessity for closer collaboration between design and other disciplines to clearly define designers' roles within increasingly dynamic networks and their collaborative practices with others (Mulgan, 2009; Manzini, 2014).

2.2. Context construction as an important means of design

Context theory, which originates from psychology, elucidates individuals' cognitive and emotional responses to specific objective environments. A fundamental characteristic of this theory is its emphasis

on the dynamic interaction and transformation between individuals and their overall operating environment (Wang, 1996). In the domain of product design, context encompasses the array of interactive relationships between a product and its associated elements within a specific temporal and spatial framework. In an era marked by material abundance and significant product homogeneity, adopting a user-centered approach is imperative. This approach necessitates that design solutions are informed by the actual or anticipated contexts in which products are situated, as exemplified by research and practical applications in context-based design for tea room furniture.

The insights gained from context theory and its adaptations by design researchers have profoundly influenced the author's perspective. Context can be defined as the interrelated conditions in which phenomena exist or occur (Chokwitthaya et al, 2019). This focus on the organic interaction between active subjects and their environments implies that stakeholders must not only be embedded within their environmental systems but also possess an understanding of complex contexts that involve multiple stakeholders and socio-cultural backgrounds. This notion resonates with John Dewey's conceptualization of experience, which encourages a deeper examination of context construction within the design process. Dewey asserts that the interaction between living beings and their surrounding conditions is central to his theory of experience. He expands the definition of "environment" to include not only physical surroundings but also social and cultural contexts. According to Dewey, experience is intrinsically tied to an individual's location and circumstances at any given moment (Dewey, 2008).

In this study, the author reinterprets and defines design context construction as follows:

Context construction is a vital step in comprehending the needs of diverse stakeholders and their environments throughout the design process. It transcends a mere focus on individual elements such as design objects, users, or organizations; instead, it highlights the relationships among these elements and their integration within a cohesive system. Through effective context construction, designers can identify users' challenges and requirements in specific situations, thereby enhancing user satisfaction. Moreover, context construction emphasizes the necessity for a holistic understanding of the design system, requiring consideration of physical environments, social contexts, cultural backgrounds, economic influences, and more. The construction of design contexts facilitates resource integration and systems thinking, thereby fostering deeper collaboration between designers and other stakeholders.

Design contexts necessitate that designers engage in continuous system iteration while collaborating with various actors at different stages to achieve more enduring and impactful design strategies. The construction of design contexts empowers designers to fully utilize a diverse array of professional skills when addressing social innovation challenges in real-world scenarios while simultaneously developing emergent design capabilities that extend beyond traditional expertise through interactions with systems and other stakeholders. Ultimately, context construction serves to address concerns regarding designers' competencies within the realm of social innovation.

3. Research setting and methods

Based on the review of theoretical knowledge and practical participation, the author proposes the following research hypotheses: In complex social innovation environments, the construction of design contexts is a core aspect of design collaboration. The interaction between designers and other stakeholders significantly influences the dynamic process of constructing design contexts.

Our empirical study was conducted at Nice Commune, a social innovation organization located in Shanghai, China. The author has engaged in participatory action research (PAR) within this organization for over three years. PAR facilitates collective refection among participants and fosters a continuous understanding of social relationships and cultural contexts. Nice Commune operates as a social innovation organization that leverages resources from design colleges and is managed by designers. By providing collaborative spaces and creative support, Nice Commune has effectively connected a wealth of social innovation resources, gradually developing a vibrant creative community network.

The selection of Nice Commune as the study site was based on three primary characteristics:

1. Composition of Stakeholders: Nice Commune is comprised of designers and design researchers, allowing for the observation of professional design skills and capabilities utilized throughout the practice process. This environment also cultivates critical thinking and discourse surrounding design theory.
2. Diverse Engagement: Over its five-year operational history, the project has engaged multiple stakeholders, resulting in a diverse array of social innovation sub-projects. The active

involvement of designers has facilitated various design interventions that enrich the project's impact.

3. Long-term Involvement: The author has been embedded in Nice Commune since its initial construction phase, maintaining long-term engagement in practice and observation. This involvement has enabled the collection of first-hand data and insights into the collaborative processes among designers and other stakeholders.

Firstly, based on the author's observation log and the work meetings and review records of the working group, 38 representative projects of Nice Commune were selected and clustered. The relevance, feasibility, and representativeness of the projects regarding the research question were primary selection criteria. These projects effectively reflected the research theme and had high feasibility during implementation. Specifically, the selection criteria are as follows. Project Relevance: All projects were social innovation projects with frequent interactions between designers and other activity participants. Feasibility of Data Collection: These projects were relatively stable during operation, with detailed records ensuring the authenticity and reliability of the research data. Project Scope: The projects covered a wide range of themes, including parent-child education, art activities, healthy living, mental healing, learning and communication, aesthetic life, and daily experiences. Time Span: These projects included significant social innovation activities conducted by Nice Commune in both online and offline spaces from May 2020 to October 2024, during which the research data was collected. The duration of each project varied, with some lasting only a few weeks and others lasting several years, including both short-term pilot plans and long-term implementations. These projects provided valuable opportunities to explore collaborative relationships within the context of social innovation.

The stakeholders collaborating with designers include community members, such as members of Nice Commune operations team and event participants, who contribute local knowledge and insights; partner organizations, including event organizers and co-creators, who provide expertise, resources, or logistical support for project implementation; subject matter experts, who offer technical knowledge related to specific aspects of the projects; sponsors, who are entities providing financial support; and government representatives, who ensure alignment with policies and regulations while facilitating access to public resources. These stakeholders engage in the projects in varying ways and to different extents, providing support in terms of content, technical expertise, and funding. Typically, content and technical supporters are more deeply involved in the specific details of the project, while financial supporters often engage more during the initial stages and less during the later stages of project execution.

Through deductive analysis, three types of activities were formed based on the differences in designer participation in the projects. The author invited an experienced member of the working group to evaluate the classification to ensure its effectiveness. Subsequently, the author selected 14 actors who were deeply involved in these projects as interviewees. The interviewees included the three most important categories of stakeholders in the co-creation process: designers, event participants, and co-creators. These three roles are the primary actors in the collaborative process, with deep involvement and comprehensive participation throughout the projects. Among the 14 interviewees, there were 6 designers, 3 event participants, and 8 co-creators (3 of whom were both participants and co-creators). Designers were indeed included in the interviews, as their perspectives were critical for understanding the collaborative dynamics and decision-making processes within the projects. Their insights into their roles, challenges, and interactions with other stakeholders enriched the findings of this study. Including designers also allowed for a multi-perspective understanding of the interview questions, making the data more comprehensive and objective. The author conducted semi-structured in-depth interviews with them, with each interviewee having an interview time of 30-90 minutes, ensuring focused questioning and giving the interviewee a certain degree of freedom. The interview mainly focuses on understanding the interviewee's identity and specific actions in the project, how they understand the actions of designers contributing to collaboration, and in what ways they collaborate with designers. It is particularly hoped that the interviewee can provide a detailed explanation of the collaboration process with designers. After obtaining the informed consent form signed by the interviewee, the author authorized the recording and transcription of the interview, which together with field notes constitute the research data. The author conducted inductive coding analysis on the data and formed differentiated contextual construction on collaboration methods through open coding and topic coding. As the author was directly involved in Nice Commune, the author's perspectives and experiences may have influenced data collection and interpretation. To mitigate this subjectivity, we employed diverse data sources, including interviews, observational records, reflective

journals, and meeting minutes from working groups, to ensure the reliability and validity of the findings. Additionally, the interviewees included designers and other stakeholders, which enhanced the objectivity of the data. These measures ensured the credibility of the research results.

The author flexibly applied Andrea J. Bingham's coding strategy of deduction and induction in qualitative research, forming a systematic, organized, and iterative qualitative analysis (Ravitch and Carl, 2019), ensuring the rigor and trustworthiness of the analysis. This coding strategy allows for a balanced analysis strategy between data organization, research objectives, theoretical and conceptual issues, as well as the inductive nature of qualitative work, ensuring a certain degree of flexibility and the ability to generate theoretical data (Bingham, 2023). Deductive analysis can be used to organize data or classify data into predetermined categories, including organizing the data and sorting data into relevant topical categories. In the deductive analysis, the author mainly collected and organized the social innovation projects of Nice Commune, summarized the main characteristics of each project, including project vision and mission, initiator identity background, roles of designers and other actors in the project, and specific tasks to be executed. Based on the differences in designer involvement, three types of projects were classified according to their themes. Inductive analysis involves reading data and identifying codes, categories, patterns, and themes when they appear (Saldaña and Omasta, 2016). At this stage, the author did not pre-set categories or codes. In the process of analyzing data, the author conducted open coding and topic coding for each type of activity. Through continuous comparative analysis, it was found that designers constructed design contexts that included both vision and task contexts in each type of project. The author conceptualized three modes and analyzed the participation process and main design abilities of designers in each mode.

4. Results

In the deductive analysis, the author observed variations in the degree of collaboration among designers in social innovation projects. Accordingly, 38 representative social innovation projects from Nice Commune were clustered into three categories: (1) five projects with high originality initiated and driven by designers; (2) twelve projects developed through joint reflection, negotiation, and decision-making between designers and other actors, with both parties collaboratively advancing project execution; (3) twenty-one projects where external actors had relatively mature projects, and designers' collaboration began with executing specific tasks and gradually evolved into project planning. In each category, designers addressed challenges by constructing design contexts, which included the construction of vision contexts and task contexts. The author selected a representative Nice Commune project in the statements of each model to illustrate the general process of constructing different design contexts.

4.1. Patching-based design context construction

The core working group members of Nice Commune initiated an original "community garden" project. The project began with a community resident's beautiful vision for an idle plot of land. Inspired by this, the design team conceptualized a vision of "enhancing community relationships through a community co-governed mini-garden." To achieve this, they completed a series of systematic tasks: first, the designers organized workshops to envision the community garden, followed by the completion of a detailed design plan and its implementation. The design team not only built the community garden but also organized residents and volunteers to create a schedule for planting and garden maintenance. During this process, the designers encountered challenges due to professional limitations, such as professional plant care and species identification. To address these gaps, they actively sought help from individuals or teams with relevant expertise. The designers ultimately invited a university botany club to conduct educational activities. In this project, the collaboration between the designers and others was characterized by the designers' strong leadership, with others patching specific functional gaps, and decision-making primarily driven by the designers. Through analysis and induction of similar projects, this collaborative model was defined as "patching-based design context construction" and explored in greater depth. In original projects led or initiated by designers, they first encountered an insight, an idea that arose from their own inspiration or from capturing an interesting and promising idea from others. Designers started with an unknown concept and transformed this uncertain, unstable state into a stable one. They first constructed a vision for the entire project and then developed a comprehensive view. Subsequently, they created an operational task context and transformed the idea into concrete steps. As designers refined the task context, they often discovered functional gaps that required technical support from other actors, who effectively patched these

gaps. This process involved situating the idea in a broader context for gradual refinement and implementation. However, these actors were typically not included in the vision construction phase of the design context and had limited, localized participation in task context development.
During the vision context construction, designers considered the purpose, meaning, and value of the projects. This phase required a comprehensive understanding and systematic thinking of the project. The designers embedded a broader and deeper analysis into the social, cultural, and economic context of the projects. This phase involved strategic thinking and creative brainstorming, which proved to be essential design capabilities for open-mindedness and innovation. Designers constructed global thinking during this stage, which prepared them for the complexity and ambiguity of the social system.
During the task context construction phase, designers translated an inspiring vision into a concrete implementation framework. Despite their systematic thinking and integration of available resources, gaps often arose between execution and vision due to a lack of expertise, insufficient resources, or unpredictable obstacles. When designers identified functional gaps during execution, they sought other actors with the necessary skills, knowledge, or resources to fill these gaps. In this process, designers leveraged their networking, rhetorical, and communication capabilities to identify and engage qualified collaborators. While constructing the task context, designers allocated functional roles as flexible positions, where any qualified actors capable of addressing the gap could contribute.
In such projects, the construction of the design context was primarily undertaken by the designers, which resulted in adequate innovation. However, sustainability was limited because designers had to balance various trivial issues between conception and execution, which consumed significant efforts. Furthermore, design skills and capabilities typically circulated within the design teams and were rarely cultivated among external participants. Designers initiated, led, and executed various stages of the project, with external actors acting only as supporters or participants, leading to ineffective design collaboration between them.

4.2. Intertwining-based design context construction

A municipal government department engaged a designer from Nice Commune to lead an art project aimed at enhancing community cohesion and cultural ambiance. The designer collaboratively developed a shared vision with community stakeholders through workshops. Participatory design methods were used to gather needs and preferences, while brainstorming sessions defined project objectives such as fostering cohesion and promoting cultural exchange. Visual tools, including diagrams and mind maps, helped refine these ideas into a shared vision outlining project goals and values. Next, the designer collaborated with stakeholders to create a task context using user personas and service blueprints for the art experience. During the implementation phase, the designer continued to work closely with stakeholders, providing design expertise and facilitating problem-solving. Throughout the integrated process of vision development and task refinement, continuous improvements were made. Following an analysis and induction of similar projects, the collaborative model was formally defined as “intertwining-based design context construction” and subjected to further in-depth exploration.
In the second type, other actors engaged in the design projects from an earlier stage, with both designers and collaborators participating in project planning and execution. They constructed a nuanced design context jointly, which fostered closer cooperation. Initially, designers worked with other participants to build a vision context, which involved collectively considering the project’s background, prospects, and value, while continuously optimizing it. In this stage, designers were observed to demonstrate empathy and were adept at exploring the potential needs of others, connecting multiple perspectives, and achieving a balance between multiple perspectives and insights.
Following the collaborative construction of the task context, designers engaged in practical actions related to their design expertise, such as designing participatory workshops, optimizing activity processes, and creating promotional posters. Additionally, designers collaborated with others to provide a clear roadmap for project vision and allocate resources. The findings indicated that systematic work in these projects often involved systems thinking and utilized tools like user personas, action maps, and service blueprints. Through frequent communication and interaction with other actors, design skills and knowledge extended beyond the design team, enabling non-professional designers to solve problems through design thinking and methods. Design became a process of collaboratively transforming the current state into an improved one with various stakeholders.
Due to the collaborative construction with other actors, the design context became more specialized, with designers adjusting the context based on the specific situations and needs of others. Collaborators were

no longer interchangeable components, but integral parts of system change and iteration. In such collaborative processes, the thoughts and actions of designers and collaborators were closely intertwined; they were interdependent and inseparable, weaving together the systematic network of the project. In these collaborations, the collective investment and consensus of all stakeholders ensured their support for the system. This process not only enhanced the effectiveness and impact of social innovation initiatives but also built stronger relationships and trust among participants, laying the foundation for sustainable change.

4.3. Expanding-based design context construction

In a plant-based dietary initiative, the event organizer already possessed a relatively mature and well-established project. As Nice Commune actively advocates for emerging dietary practices, the organizer began collaborating with Nice Commune, gradually forming a stable partnership. During this process, designers utilized their professional expertise to assist in creating event posters and promotional social media posts, thereby accelerating the progress of the initiative. As trust deepened, relationships grew closer, and mutual understanding increased, members of Nice Commune began contributing more targeted suggestions to the organizer regarding the event. In subsequent series of activities centered on sustainability, the organizer collaborated with Nice Commune members to develop new activities that were more aligned with the theme. Designers employed systems thinking to establish a network of available resources for the new activities and worked with the organizer to refine the content and processes of the events. Consequently, the organizer's initial vision, which focused solely on plant-based diets, expanded to encompass broader sustainability issues. By analyzing and drawing insights from similar projects, the collaborative model was identified as "expanding-based design context construction" and further examined.

In the third category of activities, non-professional design roles frequently engaged with relatively mature products or projects, which impeded designers' immediate involvement in the development of the project vision. This limitation arose from the established direction and objectives of the project. Designers invested time in understanding and assimilating existing contextual information. Within this framework, designers adopted a supportive role, primarily participating through specific actions in task-oriented contexts where their autonomy was somewhat restricted. Such circumstances led designers to become ensnared in concrete and fragmented realities, compelling them to deliver rapid and effective solutions based on prevailing conditions. Initially, designers conducted a comprehensive assessment of the project's landscape to clarify their position within the system and grasp the overall vision and dynamics at play. Following this assessment, they began to cultivate connections and trust within the team by executing specific design tasks, including visual design and user experience optimization.

As collaboration advanced, designers demonstrated their professional competencies and deepened their understanding of the project through these targeted tasks. This engagement fostered closer collaborative relationships with other stakeholders and enhanced the influence of design within the project. Consequently, designers gained opportunities to be integrated into the broader planning processes of the project, which enabled them to propose innovative possibilities that extended the design context.

However, it was important to note that this process was not linear; co-creation was inherently iterative, allowing for ongoing feedback and refinement of ideas. Through sustained participation and contributions in such projects, designers actively expanded the design context and explored new avenues for innovation, thereby positioning themselves to re-engage in the construction of the project's vision. This evolution illustrated how designers' roles transformed at various stages within organizations, reflecting a proactive design process that transitioned from task supporters to vision builders.

The three models of design context construction—patching-based, intertwining-based, and expanding-based—each demonstrate distinct effectiveness and applicability. The patching-based model is highly effective for quickly building new projects from scratch, as designers lead the process and ensure innovation. Nevertheless, its collaborative depth and broader impact may be limited in complex social innovation contexts. It is best suited for small-scale projects with limited resources, tight timelines, or a need for rapid prototype validation. The intertwining-based model excels in complex and dynamic social innovation projects by emphasizing early collaboration and multiple perspectives. It fosters system resilience and long-term sustainability through shared visions and design skills. It is ideal for projects requiring deep collaboration among multiple stakeholders, complex goals, and long-term impact. Lastly, the expanding-based model performs well in projects with established frameworks or mature directions. It allows designers to gradually build trust and expand their roles through specific tasks. However,

limited autonomy in the initial stages may restrict its innovation potential. It is particularly suitable for large-scale or long-term projects with clear objectives that seek further optimization and innovation through design.

5. Discussion

Social innovation projects exhibit significant differences from the execution of design projects within traditional design studios or corporate environments. Firstly, designers no longer occupy a purely subordinate role; they are not solely responsible for the design outcomes. Given that designers cannot separate themselves from the socio-cultural contexts in which they operate, they are required to engage in more systematic thinking and assume responsibility for both the design artifacts and the broader contexts associated with these artifacts. Furthermore, social innovation projects are intricately linked to the realities of everyday life, introducing additional complexity and uncertainty into the design process. A linear work model or a singularly functional designer role is inadequate to address these demands; instead, designers must adopt more flexible and multifunctional roles. It is evident that many of the expectations placed on designers cannot be met by traditional professional design skills alone. Immersed in complex social systems, designers acquire new competencies that are essential for effective collaboration with diverse stakeholders. However, these competencies are often not explicitly taught in design schools or firms; rather, they represent tacit knowledge that designers develop through extensive practice over time.

In addressing the challenges inherent in social innovation, collaboration between designers and other stakeholders can be characterized by three distinct modes of constructing design contexts: patching, intertwining, and expanding-based design context construction. Our findings indicate that these modes encompass both vision context construction and task context construction. However, the timing of engagement in context construction varies among designers and other actors, leading to differences in their identities and roles throughout the process. This variation ultimately delineates the essential distinctions within social innovation projects.

The timing of a designer's involvement in a social innovation project significantly influences its innovativeness and social value. Early engagement allows designers to contribute to the formation of a holistic systemic strategy and facilitates an early assessment of the project's potential. By systematically integrating available resources, designers can effectively align supply and demand relationships, thereby maximizing resource utilization. Design thinking offers a comprehensive framework and creative solutions for addressing systemic challenges; even when design objectives are complex or ambiguous, designers can leverage their expertise and adaptability to navigate difficulties (Kruger and Cross, 2006). Through continuous reflection and synthesis of their work, designers can adjust their pace appropriately to ensure alignment between practice and vision. While early involvement by designers presents numerous advantages for projects, it is equally crucial to consider the timing of other actors' engagement. Excluding stakeholders from the vision construction phase may impede not only the long-term development and sustainability of the project but also impose an excessive burden on the designer. Effective design collaboration necessitates that designers actively participate with others throughout the entire process of constructing the design context—forming a unified initiative during vision construction and dynamically collaborating during task execution to exchange resources and knowledge. This collaborative model fosters organic growth within the system by integrating elements such as knowledge, skills, resources, capabilities, and social capital.

Both designers and other actors may initially find themselves limited to engaging solely in task context construction; however, designers possess proactive design thinking capabilities. Design transcends mere problem-solving; it serves as a process of meaning-making—this distinction is one of the most significant differentiators between designers and engineers (Lou, 2015). By exploring new meanings, design can transcend system boundaries, drive innovation, and promote changes in social lifestyles. Designers are positioned to engage proactively and assume greater social responsibilities during transformative processes. Historically, design has often functioned in a service-oriented capacity; once a project concludes or a design is finalized, designer involvement typically ceases. This cultural norm significantly constrains the potential for design to respond effectively to real-world challenges and contribute meaningfully (Lou, 2018). This study underscores the importance of proactive design within social innovation projects and illustrates how designers can initiate proactive contributions through collaboration with others.

This study has several limitations. Firstly, due to the use of qualitative analysis and the author's action research, the research results are inevitably subjective. Although we have taken some measures to avoid this subjectivity as much as possible, it is still impossible to completely eliminate it, which limits the universality of the research results. Secondly, as the research is mainly conducted within a single organization (Nice Commune), this may result in incomplete observations. We believe it is necessary to explore cases that differ from the selected social innovation organizations in future research. The focus of this study is to construct a collaborative theory in the context of social innovation. Although the scope and focus of this paper limited a comprehensive elaboration of practical guidance for these models, the author presented illustrative examples in the construction of the three models and compared them to inform designers' practical actions. Furthermore, a more in-depth examination of how designers apply these models in real-world settings over the long term is warranted in future research.

6. Conclusion

In this study, we introduce the concept of "design context construction" and elucidate three distinct collaborative modes employed by designers in social innovation projects: patching, intertwining, and expanding-based design context construction. This framework significantly enhances our understanding of design concepts and the role of designers within complex social systems. We identify that design context construction encompasses both vision context construction and task context construction. Through a detailed analysis of this process, this research contributes to the theoretical development of collaborative design. Furthermore, we encourage designers to engage more proactively with the complex challenges present in social systems, fostering a more comprehensive understanding of design expertise and capabilities.

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