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# Bridging the Macro, Meso and Micro Levels of Designer–Artisan Co-Design: Case Studies of Value Co-Creation Within Chinese Textile Crafts

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## ABSTRACT

Designer–artisan co-design in the traditional crafts industry is recognised as promoting social innovation. However, existing co-design approaches in textile craft sectors are often fragmented, which presents challenges for systematically supporting co-design. This study examines the factors that shape designer–artisan co-design by analysing the experiences of 20 designers and artisans from the Chinese traditional textile craft sector. We identified a four-stage process involving interdependent factors across macro, meso and micro levels of stakeholders. This study addresses the views of multiple stakeholders on the co-design process and aims to strengthen the competitiveness of the craft industry by leveraging social resources and facilitating effective collaboration. In addition, the findings support capacity building for stakeholders at all levels, influencing their practices in the textile craft industry and helping to identify optimal pathways to support long-term sustainable development goals. This research contributes new knowledge to the field by proposing a holistic, multicausal co-creation strategy that enhances stakeholder involvement, enables resource transfer and promotes mutual adaptation in the co-design process.

## 1 | Introduction

Traditional craft value, also referred to as craft authenticity, contributes to maintaining regional uniqueness while adapting to continuously changing social needs (Prasiasa et al. 2023). Therefore, traditional crafts are considered crucial in supporting regional sustainability through economic growth, job creation, cultural diversity and environmental protection (Väänänen and Pöllänen 2020). Traditional textile sectors are also recognised as promoting global economic balance by contributing to domestic markets in developing regions as well as international trade (Zhou and Liu 2023). However, rapid industrialisation, globalisation and unbalanced regional development intensify the challenges posed by fast fashion, mass production, poor working conditions and limited career prospects, diminishing the potential of traditional textile crafts to foster societal sustainability (Hu, Hur, et al. 2024; Hu, Zimmermann, et al. 2024). Moreover, limited craft transformation capabilities make it challenging for artisans to adapt to a rapidly changing world (Malasan et al. 2023).

Social innovation is widely considered within research on traditional craft revitalisation, as a collective co-creative process that involves stakeholders from different fields recombining extant resources to develop new solutions for complex individual, organisational and social needs and economic and social benefits (Clarke et al. 2021; Manzini and Tassinari 2023). Supporting industrial sustainability and empowering local people are recognised as important tactics for achieving social innovation (Tung 2021). In addition, resource matching and

the integration of tangible (e.g., infrastructure, technology, materials, money, services and labour) and intangible (e.g., information, knowledge, networks, reputations, opportunities, time and self-spaces) elements through stakeholder co-design are crucial in social innovation (Clarke et al. 2021; Nguyen and Mougenot 2022). 'Stakeholder' refers to any individual, organisation or authority who 'has a stake or interest in a specific issue or is affected by a particular problem' and whose activities involve social and natural environment changes (Freeman 2023).

In traditional craft industries, co-design involves designers and artisans combining their expertise and skills to conduct craft innovation activities (Tung 2021). Traditional crafts are valued for their authenticity or continuity over time in terms of their materials, form and usage, and their value contributes to the sustainability of stakeholders' activities, to business and regional development and to elevating designer–artisan co-design from a mere manufacturing process to a form of social innovation (Chen et al. 2021; Hu, Hur, et al. 2024; Hu, Zimmermann, et al. 2024).

China, holding an 8.2% share of global handicraft trade and a market worth over USD 58,385.6 million by 2023, is a key global producer, with textile and fashion crafts playing a central role (Grand View Research 2024; Pang and Xu 2024; Wang and Zhang 2024). Traditional Chinese textile crafts (hereinafter referred to as traditional textiles) encompass various co-design practices and provide rich examples of developing areas within textile crafts (Chen et al. 2021).

Despite stakeholders promoting designer–artisan co-design in recent years, challenges are evident due to complex social issues (Malasan et al. 2023). Numerous studies have explored the role that designer–artisan co-design strategies play in artisan empowerment and knowledge transfer (Wang et al. 2023). However, most studies have focused on the dynamics of individual partnership transversal negotiations during craft product co-design projects rather than on broader stakeholder trajectories and longitudinal interactions within hierarchical social structures (Guo and Ahn 2021). This leads to disconnections between micro designer–artisan co-design practices (such as individual interaction and product design), meso factors (such as organisation and industrial and community management) and macro factors (such as policymaking and public cultural management), as outlined in previous studies, such as Chen et al. (2021). Such disconnections result in fragmented co-design strategies, which hinder designers and artisans from consistently integrating resources and limit their potential to move beyond low-end souvenirs or small-scale luxury fashion, thereby preventing broader value co-creation (Malasan et al. 2023). Although various factors have been identified, it remains unclear how they influence and are influenced by multilevel stakeholders' interactions to shape co-design. Therefore, it is challenging to identify the designer–artisan co-design processes that promote social innovation.

Accordingly, this study aimed to develop a greater understanding of how designer–artisan co-design shapes the development of sustainability among stakeholders. Therefore, the research question is: What factors influence and shape designer–artisan co-creation in the traditional Chinese textile craft sector, and how are these factors interlinked?

We developed a conceptual model of the co-design process that demonstrates the relationships in designer–artisan co-design through the exploration of the multilevel factors that influence stakeholders in the traditional Chinese textile industry. Thus, this study closes the research gaps in the literature and offers holistic perspectives on the long-term management of co-creation within the traditional craft industry and sustainable cultural sectors.

Our model contributes to practice by offering transferable insights for practitioners in craft industries focusing on cultural and community sustainability, especially practitioners in developing regions with hierarchical social power structures and limited social support. The results of our study can systematically guide these stakeholders to align long-term co-creation goals, conduct autonomous actions to mobilise and integrate resources, and devise more consistent, connected and transitional solutions to leverage cultural heritage for broader societal development.

The paper is structured as follows: Section 1 outlines the background, research gaps, research question, aims, rationale and expected contributions. Section 2 synthesises previous studies on co-design for social innovation and designer–artisan co-design in traditional crafts. Section 3 details the analytical framework of the study as well as the data collection and analysis methods. Section 4 presents a four-stage co-design process, highlighting barriers and enablers across the macro, meso and micro levels. Section 5 compares these findings with previous research to suggest improvements in co-design systems. Finally, Section 6 explores the theoretical and practical impacts, summarises key findings and presents the limitations of the study and future research directions.

## 2 | Literature Review

### 2.1 | Co-Design for Social Innovation

To integrate social innovation theory into the development of a conceptual model of co-creation, a value-creating-centred co-creation approach is frequently adopted, with co-design used as a key method of involving stakeholders in working together to design reciprocal and innovative solutions (Shen and Sanders 2023).

Sadek et al. (2023) addressed the factors that influence co-design practices in marginalised communities, highlighting the trends of broader involvement of stakeholders and the need for appropriate stakeholder involvement in co-design strategies. Barakat et al. (2022) emphasised the significance of exploring the interface between factors among stakeholders through logic levels to gain a systematic understanding and develop embedded co-design. Researchers have stated that co-creation or co-design expands traditional product design spaces, enabling design partners to co-explore large-scale value (Manzini and Tassinari 2023; Shen and Sanders 2023). Eikebrokk et al. (2021) proposed a co-creation process model that identifies the importance of resource

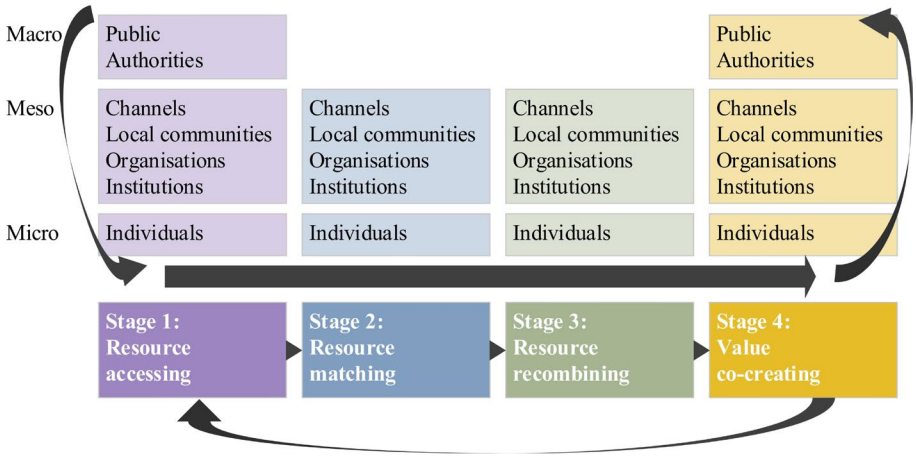


**FIGURE 1** | The research framework used in this study, which was adapted from Eikebrokk et al. (2021) and Johnson and Schaltegger (2020). This research framework is adapted from the co-design, co-creation process models and multilevel causal mechanism framework from the research outcomes in Eikebrokk et al. (2021) and Johnson and Schaltegger (2020). It consists of four stages and three levels of stakeholders. For supporting designer–artisan co-design and value co-creation, this research framework demonstrates which different stakeholders are involved in and contribute to different stages.

matching in consensus building, which was ignored by Shen and Sanders (2023). However, typological systems for mapping the interconnected factors in co-design processes in particular contexts are still missing (Malasan et al. 2023).

### 2.2 | Designer–Artisan Co-Design in the Traditional Craft Industry

Developing the traditional craft industry in underdeveloped areas, including China, Pakistan, India and Africa, is crucial for fostering social innovation through designer–artisan co-design in fields such as textiles, ceramics and woodcarving (Deshmukh et al. 2024; Li et al. 2022; Shafi et al. 2020). Previous research has explored designer–artisan co-design at the individual, organisational, community and governmental levels. At the individual level, scholars have emphasised resource management (including knowledge transfer), designer–artisan engagement and the influence of relationship strategies, profession gaps, capabilities and purposes (Wang et al. 2023). While this emphasis has promoted the development of craft value to attract consumers, scholars have struggled to build consensus (Kalkreuter 2020; Prados-Peña et al. 2023). Furthermore, it has been suggested that iterative processes increase craft innovation and artisan empowerment (Wang et al. 2023). However, such processes rely on established relationships, and it remains unclear how partners establish co-design practices.

At the organisational and community levels, networking is crucial for resource mobilisation, alongside operational and manufacturing strategies, relational capabilities, network availability and information transfer (Pathak and Mukherjee 2021). Moreover, governments provide and monitor resources through diverse incentive programmes designed to support craft co-design (Li et al. 2022).

Going beyond the provision of simplified tools, it is crucial to understand the interconnections between stakeholder activities and co-design practices to support designer–artisan collaboration in specific social environments (Malasan et al. 2023). Accordingly, this study aimed to provide a comprehensive overview of the interconnected factors that support the designer–artisan co-design process from a multilevel stakeholder perspective.

## 3 | Methods

A combination of interpretivism and constructivism was used in this qualitative research study to analyse collaborations and identify typological factors associated with local issues (Geels 2020). To explore adaptable common elements, multiple case studies of traditional Chinese textile designers and artisans were conducted. Traditional Chinese crafts are valued due to their contributions to cultural continuity, ethnic representation, rural development, tourism and poverty alleviation (Chen et al. 2021). While government-influenced mechanisms increase the co-creation of value among sectors, the component complex relationships are unknown (Zhou and Liu 2023). Multidisciplinary co-design focuses on transforming and digitising traditional processes used to create and manufacture craft products, partly by integrating resources through the development of business, research and charity projects (Guo and Ahn 2021). However, the quality and sustainability of the traditional Chinese craft industry remain unstable due to limited transformation strategies (Bryan-Kinns et al. 2022).

### 3.1 | Foundational Theories and Analysis Framework

Based on social innovation and to enhance comprehension of the interconnected factors that influence designer–artisan value co-creation, we combined co-creation process models with the multilevel causal mechanism framework (Eikebrokk et al. 2021; Johnson and Schaltegger 2020) (see Figure 1).

The widely used multilevel causal mechanism framework demonstrates how co-creation practices are influenced by

stakeholder hierarchy levels and thus highlights the interconnections across various field domains (Hu, Hur, et al. 2024; Hu, Zimmermann, et al. 2024). Drawing upon the work of Johnson and Schaltegger (2020), we focused on stakeholder activities performed at three levels: macro-level interactions between the public and the authorities that influence social cultures, economic conditions and infrastructure change; meso-level interactions within networks of organisations (i.e., design, craft, manufacturing, supply, for-profit big companies, media, non-governmental and professional organisations), research and educational institutions, local communities and channels (i.e., industry, supply and value chains); and micro-level interactions between individuals (i.e., designers, artisans, organisers, departmental managers, consumers and government officers).

Three causal mechanisms exist at different levels. First, situational mechanisms involve macro-level stakeholders that shape micro-level circumstances. Second, action-formation mechanisms involve micro-level individuals adapting to macro-level occurrences. Finally, transformational mechanisms involve micro-level individuals changing macro-level conditions (Hu, Hur, et al. 2024; Hu, Zimmermann, et al. 2024). Johnson and Schaltegger (2020) stated that situational and transformational mechanisms occur at all levels, while action-formation mechanisms occur at the meso and micro levels. Meso-level stakeholders mediate macro-level environments and micro-level individuals (Johnson and Schaltegger 2020).

To understand the causal processes that occur during designer–artisan co-design, we developed a co-creation model based on the work of Eikebrokk et al. (2021) and Johnson and Schaltegger (2020). This model demonstrates how resources are integrated during four stages: resource accessing, resource matching, resource recombining and value co-creating.

Resource accessing focuses on preparing for co-design, with macro- and meso-level stakeholder activities shaping individuals' opportunities and beliefs. Individuals evaluate their environment and their competence to position themselves and then utilise the available resources to increase their competence (e.g., their awareness, capabilities and capital) for co-design (Eikebrokk et al. 2021). Resource matching emphasises the building of trust, consensus and collaborations based on understanding each other's situation (Emmanuel et al. 2023). Resource recombining involves task division and product co-design; partners adapt to each other and make new use of existing resources (Eikebrokk et al. 2021). Finally, value co-creating involves sharing the co-created results that affect the stakeholders (Wang et al. 2023). Designers and artisans interact in an iterative manner, adjusting their individual actions and co-actions based on the results (Tung 2021). Resource accessing and value co-creating occur at all levels, and resource matching and resource recombining occur at the meso and micro levels.

### 3.2 | Data Collection

Data were collected from multiple sources to ensure the reliability of the findings (Donkoh and Mensah 2023). Given the specialised nature of the target population, a mixed purposive sampling approach was employed, combining snowball and criterion sampling to enhance data richness and quality (Nyimbili and Nyimbili 2024). Snowball sampling enabled access to hard-to-reach, specialised populations and helped build mutual trust through the researcher's personal networks and the networks of local artisans, along with networking at craft fairs and word-of-mouth referrals.

Subsequently, criteria sampling was adopted to select participants who met specific inclusion criteria, ensuring sample diversity, relevance and quality while reducing bias (Nyimbili and Nyimbili 2024). To be eligible, participants were required to be officially certified by a government body, have a minimum of 3 years of co-design experience, and possess expertise in a specific craft or design. Participants were selected so that as a group, (a) they were involved in different traditional textile segments, (b) they represented various geographical regions, (c) they were affiliated with a variety of organisation types, (d) they were engaged in different co-design practices and (e) they had at least 5 years of full-time working experience in their fields of textile crafts. Participants who did not meet these requirements were excluded. Recruitment channels included industry conferences, government-university training projects and official referral lists. Although artisans were not sourced from a single professional association, all participants were vetted according to institutional criteria to ensure professional credibility.

To ensure comprehensive results, data and theory saturation were used as the guiding principle to determine case numbers (Sebele-Mpofu 2020). That is, data collection continued until no new concepts or themes emerged. In total, 20 cases were examined, including 11 craft experts and nine design experts. Participants with dual identities were classified based on self-identification (see Table 1).

The primary data were collected through semi-structured interviews, observations and participatory observations. The interview questions were divided into thematic sections that covered the participants' background and their experience in co-design (Table 2).

During participatory observation, the researcher acted as a designer to co-design crafts with participants and, in this way, gained embodied insights into group dynamics and decision-making during co-design (Nabhan-Warren 2022). Informal discussions and working meetings facilitated co-design with artisans and designers on sketches, design proposals and prototypes, with the researcher recording detailed descriptive data (who, what, where and when), interaction patterns and reflections. To reduce researcher bias, traditional observation was also employed, allowing for an objective view of daily work processes through face-to-face interviews and informal interactions, such as tea breaks and guided tours.

Primary data included notes, photos, audio and video recordings, co-design sketches and chat logs from interviews and observations. Secondary data—including online images, blogs, databases, social media posts, press releases, public documents and documentaries relevant to the participants' interview

**TABLE 1** | Profile of the study participants.

| Organisation type | Region | Profession | Craft field | Value proposition |
|---|---|---|---|---|
| Fashion brand | Tibet | Designer = D1 | Ethical costume, weaving | Offers local traditional fashion products |
| | Inner Mongolia | Designer = D2 | Ethical costume, embroidery | |
| Academic design institution | Beijing | Designer-researchers = D3, D4, D5, D6 | D3: Design of craft pattern printing<br>D4: Weaving, embroidery<br>D5: Embroidery<br>D6: Blueprint design, weaving | Offers local traditional fashion products and application of traditional textile research to design |
| Craft brand | Guizhou | Designer–artisan = D7 | Batik, tie-dye, embroidery | Offers local traditional fashion and handcrafted products |
| | | Designer–artisan = D8 | Batik, blueprint, tie-dye, embroidery | |
| | Shandong | Designer–artisan = D9 | Tie-dye | |
| | Guizhou | Artisan = A1 | Batik, tie-dye, embroidery | |
| | Yunnan | Artisan = A2 | Embroidery | |
| | Tibet | Artisan = A3 | Weaving, dyeing | |
| Craft factory | | Artisan student = A4<br>Artisan master = A5<br>Artisan manager = A6 | | |
| Craft cooperative | | Artisan = A7 | Weaving | |
| | Guizhou | Artisan = A8 | Batik | |
| Craft brand | | Artisan = A9 | | |
| Academic design institution, Personal craft brand | Shanxi | Artisan-researcher = A10 | Tie-dye, grey printing | |
| Craft brand, personal museum, Academic design institution | Jiangsu | Artisan-researcher = A11 | Blueprint design | Offers local traditional fashion products, research and popularisation of traditional textile |

responses—were also collected to triangulate findings and provide contextual background.

### 3.3 | Data Analysis

Following the research framework provided in Figure 1, NVivo12 was used for thematic coding to capture emerging themes in the data (Allsop et al. 2022). The six Cs (causes, contexts, contingencies, consequences, covariances and conditions) of grounded theory were adopted to identify meaningful patterns and relationships relevant to the research questions (Ndame 2023). The three-phase coding process consisted of (a) identifying potential themes and linking them to the research questions, (b) categorising these themes into main themes and (c) iterating the entire coding process to ensure consistency and reliability by comparing the results with the original transcripts. Figure 2 illustrates the coding process used in this study.

To ensure the trustworthiness of the qualitative data, multiple validation strategies were employed throughout the research process. First, data triangulation was achieved by integrating information from relevant documents, interviews and field and participatory observations. Second, member checking was conducted by sharing preliminary interpretations with selected participants to confirm accuracy and authenticity. Third, three coders were involved, and an audit trail was maintained to document analytical decisions related to coding development, theme refinement and theoretical integration. Peer debriefing with academic colleagues further enhanced interpretive consistency. These procedures collectively strengthened the reliability

**TABLE 2** | The interview questions used in this study.

| Category | Questions |
|---|---|
| Sociodemographic | • Region<br>• Age<br>• Education<br>• Employment status |
| Methods and strategies of co-design | • How do you reach co-design? How do you choose partners?<br>• What do you think of the differing ways of thinking and the working methods between designers and artisans?<br>• What do you think are the principles of collaboration between designers and craftspeople?<br>• How do you balance the differences and combine the two sides? |
| Factors that influence co-design | • What difficulties did you encounter with co-design? How did you overcome them? What obstacles remain?<br>• Which of your collaborative working methods or paths do you think are effective? Why? |
| Value co-creation through co-design | • How do you describe your co-design effects and results? |

and ethical integrity of the study. To develop external validity, this study provided rich contextual descriptions based on diverse samples, facilitating the transferability of the findings to be tested against real-world scenarios and transferable to similar contexts.

This research was approved by the University of Leeds's Research Ethics Committee (approval number FAHC 21-055), and ethical procedures were used to ensure voluntary participation, anonymous information protection, data security and so on.

## 4 | Results

Figure 3 shows the three levels of stakeholders relating to designer–artisan co-design processes in the traditional Chinese craft industry.

At the macro-level, governments shape the development of the craft industry through policies and legislation aligned with international and national needs. Public perception and use of traditional crafts both influence and reflect the state of the industry. At the meso-level, stakeholders coordinate resources to drive industry development. At the micro-level, individuals within meso organisations and networks contribute expertise and resources to specific craft co-design projects and collective initiatives.

Table 3 summarises the challenges and enabling factors shaping designer–artisan co-design through three levels of stakeholder interactions at each stage of the process. It provides insights into the designer–artisan co-design practices employed in the production of traditional textiles and highlights the need for a multilevel perspective on value co-creation. Contributing factors at the macro, meso and micro levels across the four stages were identified and evaluated, with findings detailed in the following subsections.

### 4.1 | Stage 1: Accessing Resources to Improve Co-Design Competitiveness

When asked how they reach potential partners, respondents identified macro- and meso-level resource availability and meso- and micro-level competitiveness as key factors.

#### 4.1.1 | Macro-Level Challenges and Enablers

**4.1.1.1** | **Challenges.** Limited social resources and inadequate resource management impact co-design environments.

Constrained Economic Conditions and Insufficient Local Infrastructure: These impact the co-design efforts, as in the following comment: 'Here is quite backward ... good designers in big cities [who] come here only stay [for] between 10 and 20 days ...' (D8).

Insufficient Governmental Resources: The resources needed to attract collaborators are restricted, with governments providing 'no actual funding or support'. Rapid changes in industrial management also impact the availability of governmental resources. For example, according to A6, resource exploitation is prohibited, and alternatives are available. At the same time, restrictive industrial resource regulations reduce practitioners' trust in the co-design process. For example, A8 stated, 'If (co-designed products) are sold out ..., numerous similar products will emerge in the market soon, causing copyright issues'.

Inappropriate Governmental Guidance: The lack of joint management of craft and broader industries within tourism restricts the development of products for the budget-conscious tourism market, reducing market value and designers' willingness to co-design: 'They [artisans] sell in tourist attractions and the prices are generally low ... I don't agree (to collaborate if [our products are to be sold at] such price[s])' (D3). Also, access to governmental incentives is restricted to those who produce handmade products, which hinders artisans from developing their capabilities: 'Among the 200 to 300 selected artisans, very few are really capable of research and development' (D4).

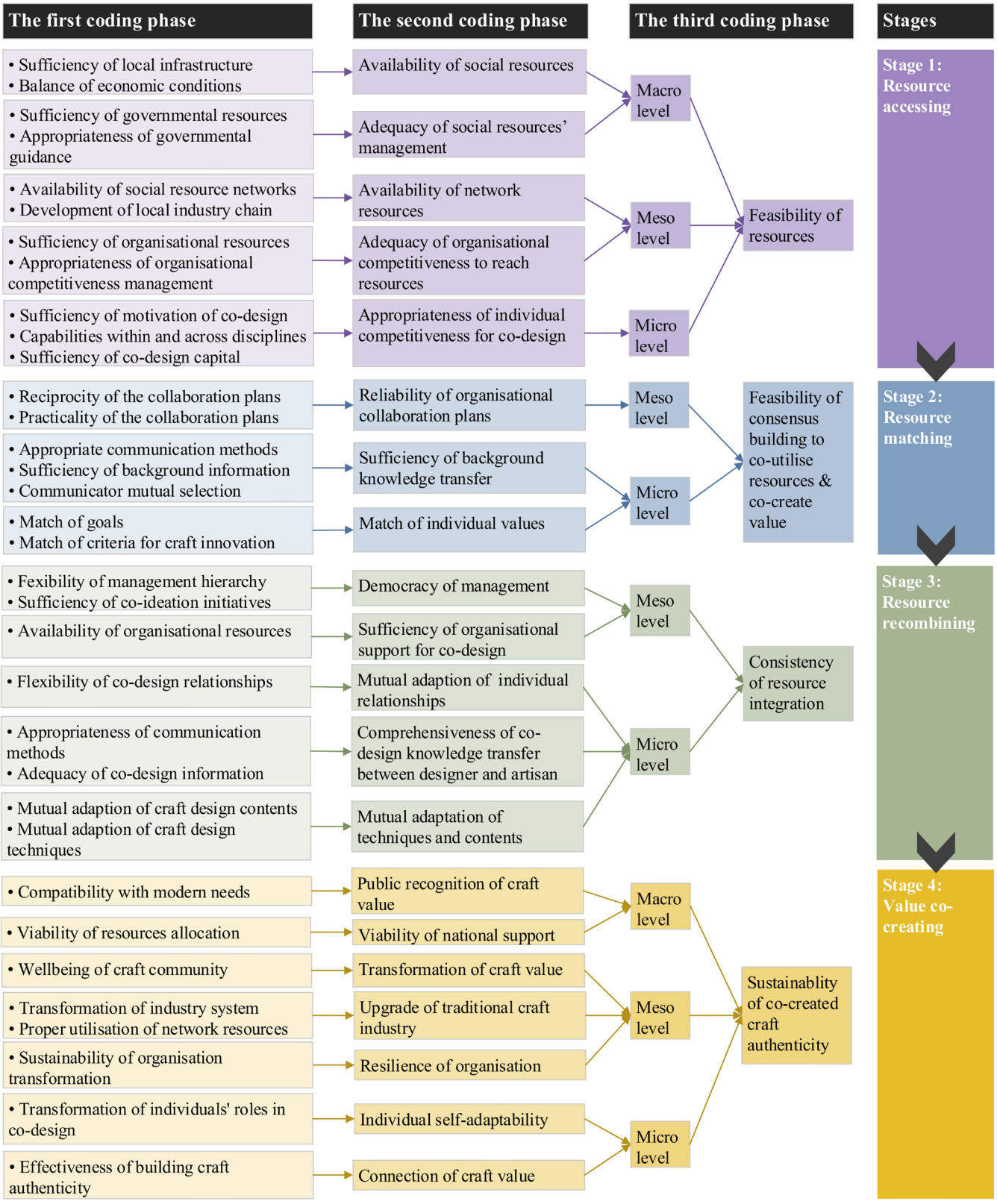


**FIGURE 2** | The coding process used and the themes identified in this study. Following the research framework in Figure 1, this figure demonstrates three levels of the coding process. Therefore, this figure identifies what factors influence stakeholders' activities at each level within each stage that influence designer–artisan co-design for value co-creation. Different consequences of value co-creation are also identified in this figure.

**4.1.1.2** | **Enablers.** The designers and artisans suggested that developing social resources and social resource management could improve co-design conditions.

Enhanced Local Infrastructure: Enhancing local infrastructure reduces literacy barriers and space isolation in rural areas, promoting co-design feasibility: 'We mainly use mobile phones

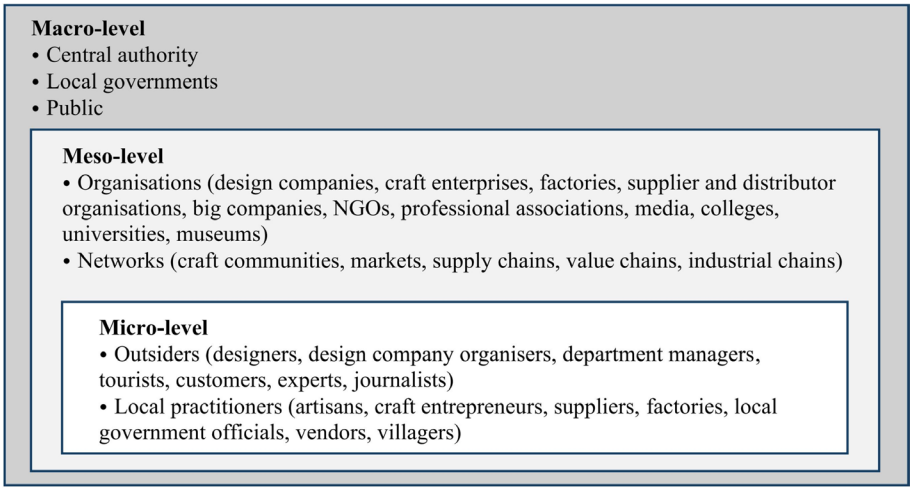


**FIGURE 3** | Three levels of stakeholders relating to designer–artisan co-design in the traditional Chinese textile craft industry. At the beginning of Section 4, this figure illustrates the specific stakeholders at three levels involved in designer–artisan co-design within the traditional Chinese textile industry.

and pictures, which are convenient (when collaborating) ... They can't type words but can send voice messages' (D8).

Improved Governmental Resources: Improving social resource management, including governmental resources and guidance, may be beneficial. Findings from craft industry incentive programmes suggest that increasing 'necessary alternatives', 'education' and 'mutual benefits' of co-design, alongside integrated industrial resource management in distribution channels and local talent cultivation, strengthens interdisciplinary resources, boosting competence and opportunities for local co-design: 'I studied design ... we can obtain better conditions for craft development if I collaborate with my sister [artisan] to target the local tourist industry' (D8).

Effective Governmental Guidance: The Chinese Traditional Craft Revitalisation Program mentioned by Li et al. (2022), encompassing 'poverty alleviation', 'culture revival' and resource regulations, such as 'regular inspection' and 'production certification', guides and monitors the regularisation and localisation of co-design. Support for resource transformation is thus essential for developing organisational capacity. Participant A3 stated, 'Experts provided suggestions for (technology) modification, and we implemented them. We have passed the acceptance check and are now in normal operation'.

### 4.1.2 | Meso-Level Challenges and Enablers

**4.1.2.1** | **Challenges.** Insufficient network resources and organisational competitiveness hinder co-design feasibility.

Fragmented Social Resource: A restricted industrial chain can cause supply shortages and poor-quality products. Limited supply chains and varying standards hinder practitioners from connecting resources, leading to a lack of adaptable and affordable co-design alternatives. Participant A3 shared: 'We couldn't find such dye domestically ... it is imported, very expensive ... The raw materials merchants don't know what RGB ... is either [common digital colour standards] ... the dyed colour is non-precise ...'.

Restricted Industry Chain: Poor-quality network resources (e.g., long value chains), social pressure and organisational unprofessionalism impact co-design. Designers and artisans 'work with dealers most of the time', limiting direct contact and increases costs. Market and community pressures prevent artisans from adopting innovative technology, compelling them to maintain traditional, labour-intensive processes. A9 stated, 'We are using the hand-make. Because everyone knows Dan-zhai's wax dyeing is pure handmade ... If I use mechanical products, ... [it] may arouse some dissatisfaction (from neighbours)'.

Stakeholder unprofessionalism further exacerbates designer–artisan mindset differences, hindering craft knowledge transformation and capability development. D4 stated, 'The level of this kind of programme and many local institutions, in general, is not high'. Participants commented that poor-quality programmes lacking practical and skill-focused content mean 'most artisans don't have design thinking, they have learned the technique from a young age, they have fixed it' (D4), resulting in products that 'can be seen everywhere and are not worth collecting' (D7). Consequently, only designers conduct research to determine the unique local factors and integrate them into their co-design processes.

Insufficient Organisational Resources: The limited business size and monetary resources hindering the hiring of professional teams and intellectualisation to meet innovative requirements in co-design: '... we are small business ... we don't' have (money to buy) the equipment '... to produce (diverse and large quantity of products) ...' (D2) and '... we don't have professional people (in our organisation know how to use the equipment) ...' (A3).

Rigid Organisational Competitiveness Management: Organisational tensions arise when there is rigid management of technology and human resources. Craft brands prioritise handmaking to differentiate themselves from industrial production, resisting modern technology and limiting their co-design participation capabilities: '... because it's meaningless to do so after others have engaged in chemical dyeing for so many years ... I was allowed to use machines [for

**TABLE 3** | Designer–artisan co-design: Challenges and enabling factors.

| Stage | Level | Factors | Challenges | Enablers |
|---|---|---|---|---|
| Resource accessing | Macro-level | • Availability of social resources | • Constrained economic conditions<br>• Insufficient local infrastructure | • Enhanced local infrastructure |
| | | • Adequacy of social resources' management | • Insufficient governmental resources<br>• Inappropriate governmental guidance | • Improved governmental resources<br>• Effective governmental guidance |
| | Meso-level | • Availability of network resources | • Fragmented social resources<br>• Restricted industrial chain | • Accessible networks |
| | | • Adequacy of organisational competitiveness to reach resources | • Insufficient organisational resources<br>• Rigid organisational competitiveness management | • Flexible organisational competitiveness management |
| | Micro-level | • Appropriateness of individual competitiveness for co-design | • Limited co-design motivations<br>• Insufficient design capabilities<br>• Restricted co-design capital | • Enhanced co-design motivations<br>• Adequate co-design capabilities<br>• Increased co-design capital |
| Resource matching | Meso-level | • Reliability of organisational collaboration plans | • Non-reciprocal collaboration co-design plans<br>• Impractical organisational co-design plans | • Reciprocal organisational co-design plans<br>• Practical organisational co-design plans |
| | Micro-level | • Sufficiency of background knowledge transfer | • Inappropriate communication methods<br>• Incomplete background information | • Appropriate communication methods<br>• Sufficient background information<br>• Communicator mutual selection |
| | | • Matching of individual values | • Mismatched goals<br>• Mismatched criteria for craft innovation | • Matched goals<br>• Matched criteria for craft innovation |
| Resource recombining | Meso-level | • Democracy of management | • Rigid top-down hierarchy<br>• Poor co-ideation initiatives | • Democratic management |
| | | • Sufficiency of organisational support for co-design | • Insufficient organisational resources | • Increased organisational resources |
| | Micro-level | • Mutual adaptation of individual relationships | • Dysfunctional relationships | • Adaptive relationships |
| | | • Comprehensiveness of co-design knowledge transfer between designer and artisan | • Ineffective idea, stimulating and implementing methods<br>• Limited co-design information | • Appropriate idea, stimulating and implementing methods.<br>• Adequate co-design information |
| | | • Mutual adaptation of techniques and contents | • Limited craft content adaptation<br>• Limited craft technique adaptation | • Craft content adaptation<br>• Craft technique adaptation |

collaboration], however, as I'm devoted to traditional crafts, I refused' (A8). Training imbalances and labour division hinder knowledge sharing: '... when we need to go out to study and exchange, it's me attending by myself, because old artisans are not educated, and they can't read or write' (D9). This rigidifies actors' roles within organisations and limits their capabilities to increase brand visibility and attract co-design partners. D8 said, '... we have an issue of manpower allocation ... there are many issues such as product development, offline employees, etc. ... I haven't recorded any short video for ... TikTok or e-commerce. I don't have time to study it', and A9 commented, 'Our studio's limited recognition makes it challenging to find a designer'.

**4.1.2.2 | Enablers.** Accessing social networks and implementing transformative organisational competitiveness management enables organisations to gain and exchange resources for co-design.

Accessible Networks: This requires engagement with public-facing channels, such as industrial platforms, activities and brokers, which provide incentives and educational co-design opportunities to bridge capability gaps. D8 stated, 'They [programmes] ... [provide] some funds, help us conduct training and make products ... Our mission is to train more female embroiderers'. Private channels within organisations, acquaintances and families are crucial for introducing young artisans to co-design and reducing hiring costs; for example, A6 said, 'We will send our staff to study design in Shanghai' and A11 said, 'I sent my daughter to study design. When she returned to perform crafts, she integrated better'.

Flexible Organisational Competitiveness Management: Transformative competitiveness management emphasises repositioning organisations for greater adaptability: '... [we] brand [ourselves as an] innovating enterprise ... Because people are developing now ... we try to meet the designers' requirements' (A2). Implementing systematic innovation strategies across labour, techniques and infrastructure management enables organisations to combine resources and increase flexibility, professionalism and collaborations. For example:

> Craft innovation is a chain of exploration, protection and innovation ... The teaching and learning studio inherits skills; the company handles mechanical orders ... We have 600 collaborated female embroiderers and 180 contracted ones; we select the best from the best ... so allowing for large orders [including co-design] ... (A2).

### 4.1.3 | Micro-Level Challenges and Enablers

**4.1.3.1 | Challenges.** Inappropriate individual competitiveness, including insufficient co-design motivation, professionalism and capital, are key barriers.

Limited Co-Design Motivations: Limited awareness and willingness hinder individual engagement in co-design. Individuals who lack appreciation for the value of crafts, resist innovation, prioritise profit, or focus narrowly on technical skill, framing 'inheritance' and 'authenticity' in superficial terms, can also impede effective co-design, for example:

> They [artisans] don't understand (craft value) (D7).

> ... they [artisans] think '... my craftsmanship is the best' ... but they don't even have this kind of innovative inheritance awareness (D4).

> ... they [organisers] don't want to cooperate ... If they can ... [do it] themselves, they may make more money (A3).

Moreover, different views on artisans' potential create conflicting attitudes towards educating them on innovation, impacting their adaptability. D6 said, 'I don't think the artisans should come to our school to learn; it would only exacerbate their confusion', and A11 said, 'The national-level inheritors have all furthered their study in art and design institutes ... How could one-month training change them completely?'

Insufficient Co-Design Capabilities: Knowledge gaps and poor knowledge transformation capabilities hinder partners from participating in craft transformation, collaboration and commercialisation for high-quality co-design, as exemplified by the following quotes:

> When given the design, artisans questioned whether it was possible to do it, and I had to tell them, 'You can try it out [using this one] ... of your craft techniques and see if it will be possible to weave it.' ... It is me having to seek technical solutions ... They can't even make that connection themselves ... they don't dare to change (original crafts) because they don't really understand (D4).

> I think it is risky for designers to use traditional crafts without understanding [the] craft's intangible continuity and cultural attributes (D6).

> ... artisans are not good at commercialisation. Maybe we are not good at it either ... Commercialisation requires cooperation and developing markets. I think it is quite hard (D3).

Educators encounter similar challenges in developing practitioners' capabilities: '... (in co-design programmes) mentors teaching design [skills] ... and [how to] ... understand [design] have great problems' (D4).

Restricted Co-Design Capital: Limited commercial and social capital impedes value exchange and collaborator recruitment, even those with design skills: 'If neither [the] designer nor artisan possesses resources except for the [ability to] design ..., how can they cooperate?' (D3).

**4.1.3.2 | Enablers.** Enhanced co-design motivations, capabilities and capital develop an individual's co-design competitiveness.

Enhanced Co-Design Motivations: Artisans adopting a more open mindset enhance their appeal as co-design partners: 'They [artisans] are very open-minded. It is normal for them to change, experiment and try out samples over and over again' (D6).

Adequate Co-Design Capabilities: Developing the capabilities to transform knowledge enables practitioners to learn and research independently: 'We are well educated, we can learn, research and develop, then we can go to artisans' workplaces to learn about their work' (D9). It also helps them redefine and comprehend the essence of craft inheritance and authenticity, as stated by D6:

> I think the inheritance and promotion of tradition point to the future, and people's essential needs are relatively stable. So, even if we use ... [a] machine [in the future] to print clothing directly, it also needs to know what we want ... these criteria for traditional crafts need to be referenced, as these traditional craft techniques reflect our core thoughts.

Possessing a greater capability for knowledge transformation could also enhance the mutual understanding required for successful co-design, 'Some designers are traditional with profound thoughts, and our cooperation [with them] is smooth [as we are] on the same [level] ...' (A11).

Increased Co-Design Capital: Social recognition improves artisans' legitimacy as cultural spokesmen, enabling them to attract esteemed partners and elevate their collaborative status; A2 stated, 'As China's Textile Intangible Cultural Heritage ambassador, I could collaborate with top designers who earned Jin-Ding Award, while our requirements (for collaboration) [rose] ... with [the] higher platform ...'.

## 4.2 | Stage 2: Resource Matching for Consensus Building

When asked about their criteria for selecting co-design partners and directions, respondents highlighted three factors for consensus building: the reliability of organisational collaboration plans, sufficient background knowledge transfer and values alignment.

### 4.2.1 | Meso-Level Challenges and Enablers

**4.2.1.1 | Challenges.** Unreliable organisational collaboration lacking reciprocity and impractical hindrances to co-design establishment.

Non-Reciprocal Collaboration Co-Design Plans: Unfair profit and risk sharing, such as delayed delivery and sample destruction, emphasised by D6 and D9, undermine collaboration motivation.

Impractical Organisational Co-Design Plans: Differences in strategy between design organisations focusing on 'routine' and 'fast-moving consumer goods' (e.g., mass production and low prices) and craft organisations prioritising 'slow-classic' and 'high-end' goods (e.g., limited production and high labour costs) create conflicts. Ambiguity in the organisation's self-positioning creates confusion among potential partners, hindering consensus building: 'The products should be high-end ... because these [high-end] products are exquisite, we don't like fabricating them' (A1).

**4.2.1.2 | Enablers.** Reciprocity and practicality develop reliable organisational co-design plans and foster co-design partnerships.

Reciprocal Organisational Co-Design Plans: Reciprocity fosters fair trade and sustainable long-term collaborations: '40 to 50 people keep a constant cooperation with me ... We refuse to force down the price for these rural people' (D8).

Practical Organisational Co-Design Plans: Practicality facilitates the alignment of segments, marketing channels, product management (e.g., price and technique classification) and seasonal production plans.

### 4.2.2 | Micro-Level Factors

**4.2.2.1 | Tensions.** Insufficient background knowledge transfer and mismatched values impede the co-design partnership's establishment.

Inappropriate Communication Methods: It can lead to potential partners receiving incomplete information, 'unclear instructions' and 'jargon gaps' caused by 'poor visualisations' and a 'lack of face-to-face communication' (A10).

Incomplete Background Information: Limited co-design awareness, communication methods and mutual distrust exacerbate incomplete information sharing, further obstructing mutual understanding: 'There are too many details to remember ...' (D2), and 'Artisans are afraid that designers will have their lunch ... [that they] will hide (key information) from you ...' (D9).

Mismatched Goals: Tensions arise when goals and criteria are not shared. Inconsistent decision-making within and across organisations impacts consensus building: 'their in-house thoughts are not consistent' (A11). Participants A11, D9 and A8 emphasise 'consumer needs', 'product effects' and 'lower costs', whereas artisans prioritise 'craft inheritance' and 'jobs'. Organisers consider 'business operation', while governmental officers focus on 'completing the working task' and are 'GDP-oriented'.

Mismatched Criteria for Craft Innovation: As shown by the following quotes, inconsistency in the 'inheritance' and 'authenticity' of craft practices create conflicts and the absence of criteria for co-design techniques and contexts, impacting the establishment and direction of co-design processes:

> The batik is inherited from the ancestors, although there is chemical dyestuff, I don't think we should use it (A9).

> Some artisans don't accept change ... it's very difficult for them to move on, so, difficult to collaborate (D6).

> I don't have any standard for considering the patterns (D8).

Conflict also arises over craft quality control. Designers define 'uniqueness' as 'improvisational self-expression'. However, artisans may intentionally label 'unstable quality' as 'uniqueness' to justify technical limitations, for example, 'There was no need to consider the colour fading ... the lighter ... colour ... represents the stories these clothes had experienced ... Actually, we recognise ... this challenge [colour fading] needs to be overcome' (A9).

When a designer's pre-determined designs cannot be realised by an artisan, this can also lead to conflict: '... all the [finished] products ... had defects ... [the] designers said that the products had been reworked three times, but the craft workshop didn't think it was their fault ...' (A8).

**4.2.2.2 | Enablers.** Comprehensive background knowledge transfer and aligned values facilitate co-design partnership.

Communicator Mutual Selection: Selecting motivated, well-educated, young locals can enhance background knowledge transfer: 'They [young designers] are from Yunnan ... they studied design in Italy ... they know a lot about us. Moreover, they are also willing to do it' (A2).

Sufficient Background Information: Effective mutual communication is essential for aligning partners' ideas and ensuring 'a same direction'. Sharing key information on initial ideas, requirements, interests, expertise and limitations helps bridge knowledge gaps and establish common criteria. As D9 said, 'The preliminary communication made designers not insist that "I must choose this, [or] I must choose that ..." They only chose a pattern.'

Appropriate Communication Methods: Using the appropriate communication methods in each situation fosters trust-building. One-to-one and respectful communication suits close-minded partners, as D9 stated: 'Avoid mentioning design ideas to the artisan, just say "I come to learn your crafts, you take me as a disciple." Like this, he/she will not reject you'. To address challenges in communicating with geographically distant partners, combining various tools with field trips enhances communication efficiency and information exchange, fostering mutual trust and understanding: 'I will take a photo [so they can] ... to take a look ... If they are unable to see clearly, I may send a sample ... if the quantity is large ... they intentionally come over ... here [to take a look] ...' (A1).

Matched Goals: Partners who share values set sustainable goals more easily. A11 stated, '... many designers prioritise performance over culture integration. If [we] collaborate, we pull them this way [to integrate culture into design] ... [we can then] not only ... disseminate culture but also bring certain economic profits.'

Matched Criteria for Craft Innovation: When consistent criteria are established, product quality and authenticity improve. Designers respect the artisans' ownership of their craft and believe artisans should clarify the criteria required to maintain cultural continuity while adapting to the modern craft industry: 'Inheritors themselves determine [the] craft features ... They raise their own suggestions; our suggestions are mainly [at the] visual level' (D5) and 'You should show your own standard, for example, you bring a colour card, I'll choose colour No. 3, you produce ... the same one ...' (D6).

## 4.3 | Stage 3: Recombining Resources for Consistent Integration

When asked about balance in the co-design process, participants identified two meso-level factors (management structure and organisational support democracy) and three micro-level factors (mutual adaptive relationships, knowledge transfer and technical and content adaptation).

### 4.3.1 | Meso-Level Challenges and Enablers

**4.3.1.1 | Challenges.** Undemocratic management practices and insufficient organisational support impede co-design flexibility.

Rigid Top-Down Hierarchy and Insufficient Organisational Resources: A top-down hierarchy often makes a higher-level partner omit the needs of a lower-level partner, resulting in insufficient organisational support. According to D9, tight schedules and limited latitude lead to superficial craft research, affecting co-design quality.

Poor Co-Ideation Initiatives: They can result from limited resilience, as outlined by A8: 'We run small businesses ... Designers own brands and manage design and marketing, while we handle crafting. Limited income but fewer risks, which is reasonable'.

**4.3.1.2 | Enablers.** Democratic management ensures adequate organisational resources for partners to deeply explore craft continuity.

Democratic Management: Open discussion among different-level partners helps uncover overlooked challenges, refine co-design plans, uphold quality and increase the lower-level partners' knowledge over time. D7 said, '... my experimented techniques and [the] artisans' implementation may be completely different ... so, they will communicate with me ...', and D2 stated, '... our artisans didn't know how to fabricate Mongolian costume[s] at the beginning ... I trained them step by step ... they are [now] proficient in tailoring for styles they have never previously crafted'.

Increased Organisational Resources: Open discussion helps the management team grasp broader employee and partner concerns, may increase organisational resources for partners to further explore craft continuity, for example, 'I provide what the designers need, no matter craft archives or [networking] platforms ...' (A2).

#### 4.3.2 | Micro-Level Factors

**4.3.2.1 | Tensions.** Three tensions hinder designer–artisan interaction during craft development, including non-mutual adaptation in relationships, incomplete co-design knowledge transfer and misalignment in technique and content.

Dysfunctional Co-Design Relationships: Dysfunctional partnerships hinder partners from engaging in co-creation or fully leveraging their respective strengths. In top-down relationships where artisans reproduce designers' ideas without negotiation, knowledge segregation occurs. Different understandings of each party's potential and limitations can reinforce conflicting attitudes towards engagement, for example: 'Designers design and apply traditional crafts. Artisans just keep open mindsets and cooperate with designers ... specialised people do specialised work' (D6) and 'Outsiders couldn't comprehend the (craft) inner-stuff ... artisans just may be illiterate or less educated, but they can still excel in both crafts and design sometimes ...' (A11).

Dysfunctional relationships also occur when artisans cannot effectively engage in co-ideation, which is often due to their lack of transformation capability: 'I encourage artisans to generate new ideas independently ... They cease to contemplate the matter and are unable to' (D4). Similarly, co-design team's professionalism and craft development suffer when senior artisan directors struggle with knowledge transformation capabilities, as articulated by A2: 'they [hired designers] are professional ... [entrepreneur] I'm unsatisfied with our products ... we are not a professional team ...'.

Limited Co-Design Information: Incomplete information and unclear explanations of abstract craft knowledge and complex design ideas hinder the transformation of designer briefs into artisanal creations: '... it's [crafts' hand-making warmth] hard to explain ...' (A2), and '... what you said is A, but what they [artisans] understood is B ...' (D7).

Ineffective Idea Stimulating and Implementing Methods: Fragmented inspiring methods fail to help artisans generate independent ideas independently: '... even though I explained how the others' designs were good; artisans couldn't connect to raise their own [ideas]' (D7). Furthermore, delated or absent feedback hinders long-term collaborations, as D3 noted: '... he [artisan] invited me to design the others. I rejected ... I must see your sales performance'.

Limited Craft Content Adaptation: This happens when the craft forms clash with users' and creators' lifestyles, as both partners blindly follow unfamiliar fashion trends. D4 commented, 'It's like I can't design a daily product for London residents as I don't know their lifestyle ... it is impossible to satisfy them.'

Limited Craft Technique Adaptation: It can lead to oversimplified, ineffective craftsmanship and the loss and waste of skills, for example: 'The excessive commercialisation leads partners to filter out many craft essences that require more complexity, time or [experience] ... to reach a high level ... over time, the intangible cultural heritage may be lost' (D4) and 'I could have made a dress with three metres of cloth, but I couldn't make the dress using even ten metres of the artisan's dyed cloth. Because the dyed colour was not even ...' (D6).

**4.3.2.2 | Enablers.** Three enablers involve mutual relationship adaptation, comprehensive co-design knowledge transfer and mutual technique and content adaptation.

Adaptive Relationships: Such relationships balance different capabilities and motivations through a capability-based approach and interdisciplinary mediators, as A2 exemplified: 'I am in the middle of female embroiderers and designers. Because I understand them well, I can try to avoid awkward circumstances'.

Adequate Co-Design Information: Customising communication information to match the partner's capabilities and co-design directions promotes democratic involvement and maximises artisans' vital role in co-creating craft authenticity:

> I ask them [young artisans] to embroider whatever they want with the basic embroidering method and their thoughts following my sample, and they can do well ... If this pattern isn't designed by me, some old women are familiar with these patterns, I just tell them the embroidering area and position ... If I design a pattern for artisans who have never made it before, I must detail the concept during their first embroidering session (D8).

Appropriate Idea Stimulating and Implementing Methods: Holding conflict-focused discussions (e.g., '... we will confront it directly and see whether we can conquer difficulties' [A2]) while balancing 'working together' and 'independent working', alongside 'double-checking' and 'in-time evaluation', ensures a steady flow of necessary information, resolves specific issues and supports shared goals, self-exploration and market recognition.

Resource integration is also enabled by technique and content adaptation. This involves integrating elements while considering the embedded culture and local resources.

Craft Content Adaptation: This entails integrating daily life experiences into one's work, fostering knowledge transformation and co-creation sustainability. D4 noted: '... if [my partners can] link ... [the] development [of their craft] to their own culture and familiar environment, [it] may enable them to associate it with the current design ...'.

Craft Technique Adaptation: Technique adaptation requires designers to minimise craft waste and maintain artisans' self-expression by adjusting their designs based on artisans' results (e.g., 'I follow their [artisans'] experiments' [D6]) and turning craft limitations into design advantages:

> The Chiu Chow embroidery is fragile ... it resembles a hard shell, could be supportive and [does not] ... twist when I put on the chest position ... [based on such design methods] it can be ... [cleaned in a washing] machine, so, dry cleaning is unnecessary ... thus, it is functional for contemporary everyday use (D4).

Technique adaption can also be practiced by considering the methods used by artisans when creating designs to diversify the effects produced and increase the convenience for the artisans, as demonstrated by D4: '... when artisans weaved the new patterns I designed, [the] artisans found they were highly convenient, efficient and suitable for their specific techniques, and the effect was quite good'.

Simultaneously, artisans can adapt to maintain and extend their craft implication domains by conserving 'the most exquisite and top-notch craft', understanding 'the relationship between the traditional patterns, the skills or the making techniques' and 'textualising craft-process standards for maintaining product consistency' (D6).

## 4.4 | Stage 4: Co-Creating Craft Authenticity

The participants identified two macro-level consequences—public recognition of craft value and national support viability—three meso-level consequences—craft value transformation, traditional craft industry upgrade and organisational resilience—and two micro-level consequences—individual self-adaptability and craft value connection—when evaluating their collaboration outcomes and impacts (Table 4).

### 4.4.1 | Macro-Level Consequences

**4.4.1.1 | Challenges and Negative Consequences.** Weakened public recognition of craft value created through co-design and lack of national support pose major challenges.

Non-Adaptability to Modern Demands: When co-design is limited, products and crafts are deemed 'old-fashioned', 'poor quality' and 'useless', reducing their value.

Inviable Resource Allocation: It highlights that existing national programmes, plans, or methods are neither operational nor effectively implemented in real-world conditions, preventing government resources from reaching those in need. Participants opined that the governmental support available can also be problematic. Unfair resource allocation ('... despite the national regulations' justification, there are numerous deviations in their implementation' [D6]) and the low utilisation of government technological support ('... she has never accepted governmental support to change to machine-based production' [A7]) were highlighted.

**4.4.1.2 | Opportunities and Positive Consequences.** Greater public recognition of craft value and strong national support present key opportunities.

Compatibility With Modern Needs: This refers to the widely recognised flexible craft authenticity, rather than rigid stereotypes of symbols and craft techniques. When there is 'collective awareness of a craft's authenticity' (D4), this can revive the craft and enhance its value.

Viable Resource Allocation: It underscores authorities fairly and efficiently allocating resources to marginalised organisations.

**TABLE 4** | Design–artisan co-design: Negative and positive consequences.

| Stage | Level | Consequences | Negative consequences | Positive consequences |
|---|---|---|---|---|
| Value co-creating | Macro-level | • Public recognition of craft value | • Non-adaptability to modern demands | • Compatibility with modern needs |
| | | • Viability of national support | • Inviable resource allocation | • Viable resource allocation |
| | Meso-level | • Transformation of craft value | • Limited craft community wellbeing | • Developed craft community wellbeing |
| | | • Upgrade of traditional craft industry | • Outdated industrial system<br>• Improper utilisation of network resources | • Adaptive industry transformation |
| | | • Resilience of organisation | • Unsustainable organisational transformation | • Sustainable organisation transformation |
| | Micro-level | • Individual self-adaptability | • Restricted roles of individuals in co-design | • Interdisciplinary roles of individuals in co-design |
| | | • Connection of craft value | • Ineffective building of craft authenticity | • Effective building of craft authenticity |

For example, allocating resources to marginalised organisations can foster industrial environments and establish broader collaborations, as D7 commented: '... [the] government invited our very small branch to participate in (networking activities), they are quite supportive now'.

#### 4.4.2 | Meso-Level Consequences

**4.4.2.1 | Challenges and Negative Consequences.** At the meso level, three challenges include insufficient industry upgrading, organisational resilience and craft value transformation.

Outdated Industrial System: This occurs from the absence of industrial system transformation and a 'disconnect between [the] craft industry and modern technology' (D6), leading to products failing to meet market demands: 'consumers will not accept them [co-designed crafts]' (D7).

Improper Utilisation of Network Resources: When a co-design network becomes 'a big interest group', it may result in partner exploitation, resource disparity, hidden real issues and industry chaos: 'Many groups steal money from our country in the name of intangible cultural heritage, leading to eventual money cheating' (D3).

Unsustainable Organisational Transformation: According to A9 and A8, a 'processing factory' strategy and 'unfair trade' during co-design undermine the organisational resilience and exacerbate 'brand invisibility'. It further worsens a poor organisation's operational performance, hindering brand value and market trust. A3 stated: 'The cashmere wool or plush scarves priced between 550 and 700 USD are good quality. But no one bought them ... The customers distrust us ...'.

Limited Craft Community Well-Being: This can occur when an organisation or industry fails to realise its full potential in fostering local sustainability. This leads to a loss of local labour and reduced local well-being, as mentioned by A8: 'Few are willing to do craft jobs due to [the] low [pay] ..., [workers can earn] only 130 to 400 USD per month in workshops, but [they can] earn over 850 to 1100 USD in cities'.

**4.4.2.2 | Opportunities and Positive Consequences.** Three co-created values identified: industry upgrade, organisational resilience and craft value transformation.

Sustainable Organisation Transformation: Adopting industrial processes has been shown to help craft organisations transform into resilient organisations. D6 shared, 'Many Nantong craft companies are industrialised and successfully use chemical dyes and serve fashion brands, offering stable products without emphasising pure handmade or natural items.' Resilient organisations have greater brand visibility and more sustainable channels: 'We don't have to go out because someone comes to buy' (A4).

Adaptive Industry Transformation: The presence of viable organisations also boosts the viability of the industry via local industrial agglomeration and ecology construction. D7 shared, '... they [craft community] have a lot of people who are going to do these things ... they have set up autonomous regions ...'.

Developed Craft Community Well-Being: As the value of a craft increases, so too does the well-being of the community. Poverty declines, talent returns, jobs increase, gender equity improves, and local cultures are conserved. Such a situation was highlighted by D8: '... the women [artisans] generate income through this cooperation mode, [and] young people are willing to return and strengthen the group'.

#### 4.4.3 | Micro-Level Consequences

**4.4.3.1 | Challenges and Negative Consequences.** The primary challenges identified were limited adaptability and disconnected craft value.

Restricted Roles of Individuals in Co-Design: Rigid co-design practices alienate workers and limit their adaptability in different co-design scenarios, as described by D4 in the following quote: 'They are just workers ... they lack the ability to create excitement by just relying on designers (to design)'.

Ineffective Building of Craft Authenticity: When modern needs diverge from a craft, the craft value diminishes. This is reinforced by designers' superficial modifications: '... they are just doing superficial things by redesigning the forms ...' (D4) and 'It's hard to integrate the totem into contemporary design and [have it] accepted by young people' (D7).

**4.4.3.2 | Opportunities and Positive Consequences.** Improved self-adaptability and connected craft value emerged as the primary values of co-creation.

Interdisciplinary Roles of Individuals in Co-Design: This theme highlights practitioners' interdisciplinary capacity for quality co-design and self-regulation: '90% [of the] products were designed and fabricated by ourselves; thus, we had some differences from others ... so we had a profitable business' (D8).

Effective Building of Craft Authenticity: High-quality co-design encourages the participation of individuals in co-design to establish valid collaboration and build a path toward craft authenticity. For example, D4 commented as follows:

> ... such a path means ... (collaborating) with all the artisans and understanding all the techniques ... I think this [supports] ... the [in]heritance of traditional handicraft through contemporary design. [We] should not only see the superficial phenomenon, but we must design based on mastering its essential characteristics, which I think is the truly valid [way to] design ... A small group of interdisciplinary artisans can lead the innovative way in transmitting traditional crafts ... inspiring others and creating a virtuous new trend for everyone to imitate.

### 4.5 | The Interplay Between the Value Co-Creation Factors

The results revealed that the co-creation of craft value in designer–artisan co-design involves multiple stakeholders, dynamic interactions and resource integration, with factors interacting across stages and levels (see Figure 4).

'Process interplay' refers to the interactions of factors across different stages, where earlier outputs shape later inputs. For example, designers' and artisans' knowledge transformation capabilities influence consensus building, which further affects craft design and co-design continuity.

'Level interplay' occurs when actions at one level generate new inputs at another. For example, micro- and macro-level factors may connect directly during the resource-accessing stage without involving meso-level organisations. For example, D9 commented, 'If the government thought you were qualified, they would help you ... some people have taken the initiative'. During the value co-creation stage, meso- and micro-level actions influence the quality and density of value created at the upper level of stakeholders. It is difficult for micro-level factors to directly influence macro-level factors, as 'this [is] a social problem that requires designers, artisans, government, then the collective awakening of the entire environment ...' (D4). Micro- and meso-level factors can interact at the same stage, for example, at the resource recombining stage, A2 stated: 'We brainstorm for a product fabrication project [at the micro level] ... we coach female embroiderers on-site [at the meso level] ... so, ensure the product quality [at the micro level]'. Inter-level influence extends across stages. For example, an organiser's open mindset (micro-level factor in resource accessing) improves organisational resources (meso-level factor in resource matching).

'Self-interplay' refers to the interactions that occur on the same level at the same stage, either among different factors (e.g., during resource accessing, market pressure influences community and craft organisational competitiveness management) or within a single factor (e.g., within organisational competitiveness management, organisational commercial foundations influence co-design talent hiring).

Although the model was developed in the context of traditional Chinese textiles, its multilevel and systematic analytical framework, along with the identified critical success factors, such as strategic resource integration and long-term co-innovation processes, demonstrate the potential for broader applications. Similar collaborative mechanisms have been observed in other sectors, such as sustainable cultural design, social entrepreneurship, community well-being and government management. The empirical trends in our data suggest that critical success factors can enhance the validity and quality of collaborative innovations beyond the traditional craft industry. Detailed implications for these cross-industry applications are discussed in the following sections.

## 5 | Discussion

In this study, we investigated designer–artisan co-design within China's traditional craft industry by developing a conceptual model that links three levels of stakeholders and demonstrates how factors within these three interconnected levels influence partners' craft design practices throughout a four-stage process. This model provides comprehensive insights into developing co-design opportunities, directions and quality for long-term co-creation by (a) identifying the crucial roles of common technical standards and personal values criteria in integrating multilevel stakeholders' resources for supporting designer–artisan co-design practices, (b) developing a co-design process model and emphasising the role of competitiveness between individual designers and artisans in accessing and conducting high-quality co-design by utilising social resources prior to craft object co-design projects and (c) highlighting the necessity of capability-based co-design relationships between individual designers and artisans to respond to and develop broader complex social conditions that support long-term and sustainable empowerment.

Many of the identified challenges and enablers overlap; hence, it is possible to pinpoint the key factors that influence designer–artisan co-design and where imbalance and disorganisation exist in the studied context. The tensions explain why co-design has failed in some cases, while the enablers provide insight into the shifts needed to improve the success rate of co-design. Our results show that there is a need for systematic, adaptive and standardised management strategies (see Figure 5). Within such a strategy, designers and artisans must manage and balance multilevel stakeholders, resources and competitiveness. Based on this, they are required to negotiate consensus and engage in co-design according to their respective expertise throughout the co-creation process. In doing so, they can co-create multilevel value that contributes to societal sustainability.

Previous co-creation and co-design models have focused on procedural actions among a few stakeholders, lacking integrated activities and limiting social innovation to small, short-lived projects (Eikebrokk et al. 2021). Our conceptual model reveals how multilevel stakeholder actions interact both within and across levels and stages, thereby extending the application of social innovation theory from brief pilot projects to long-term practice (Manzini and Tassinari 2023). The conventional multilevel causal mechanism framework found in Hu, Hur, and Thomas (2024); Hu, Zimmermann, and Marlow (2024) and Johnson and Schaltegger (2020) highlights the primacy of top-down processes and treats bottom-up feedback as lagging or reactive. They also ignore the need to balance short- and mid-term goals during long-term co-creation. In contrast, we consider that long-term co-creation involves numerous co-design activities with different timeframes, and thus we show that top-down and bottom-up influencing processes can coexist at the same stage—especially at the meso and micro levels—to enable timely adjustments and enrich subsequent stages. This cross-level, cross-temporal integration refines existing frameworks and highlights the dynamic stakeholder negotiations essential for sustainable outcomes.

Using our model, which addresses global concerns, including cultural conservation, economic growth and ethical social adaptation challenged by rapid digitalisation and globalisation (Dhar et al. 2025), we connect the key factors of (a) network resources, (b) criteria and goals and (c) co-design capabilities.

Our insights into network resources focus on capital accumulation and capability development. At the meso level,

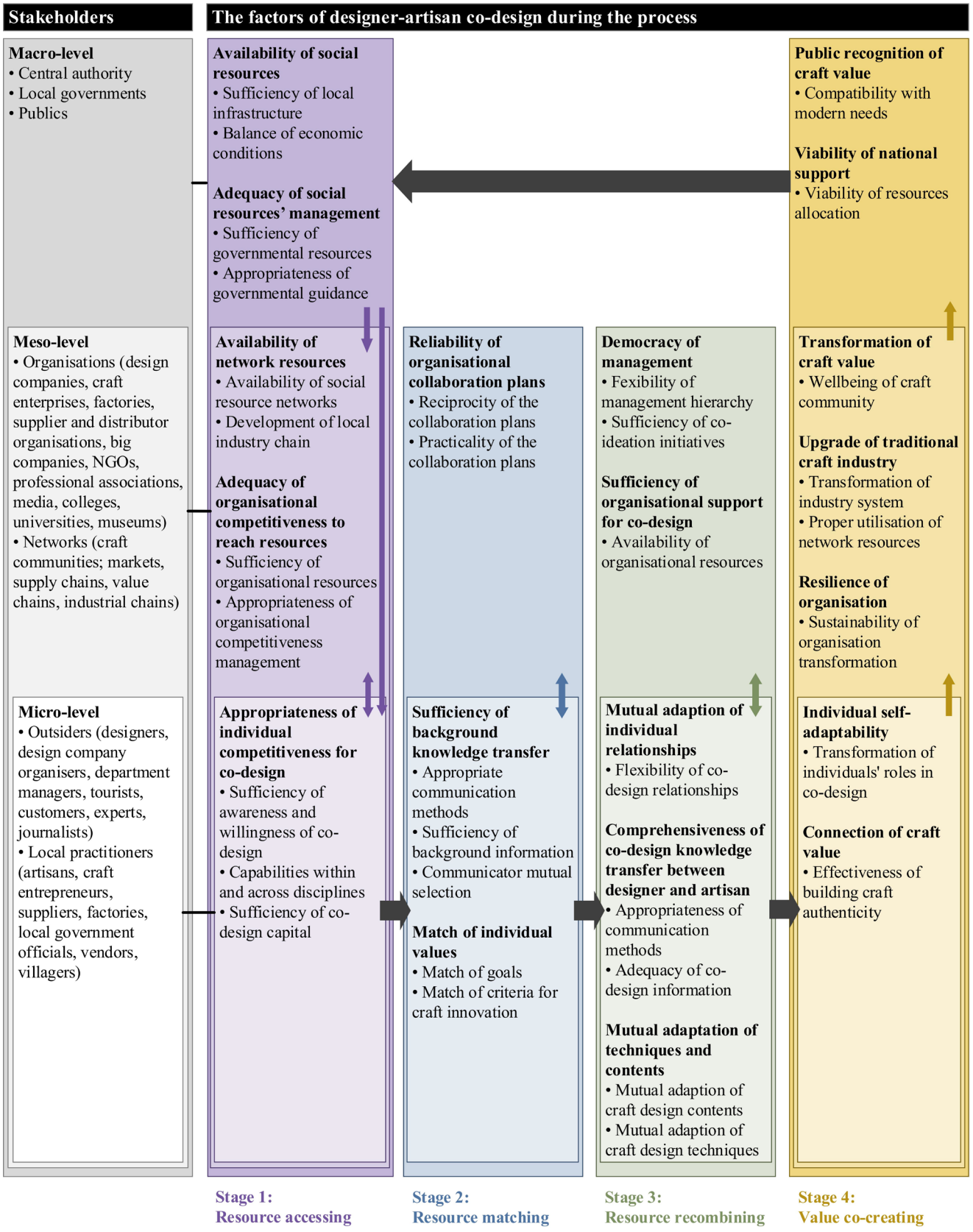


**FIGURE 4** | Conceptual model of designer–artisan co-design in the traditional Chinese craft industry environment. After identifying the factors, this figure explains the interdependent relationships between these multilevel and multistage factors with single and double arrows, demonstrating the process of how these factors influence each other and lead to the consequences, and then, the consequences will be the foundations for further iterations.

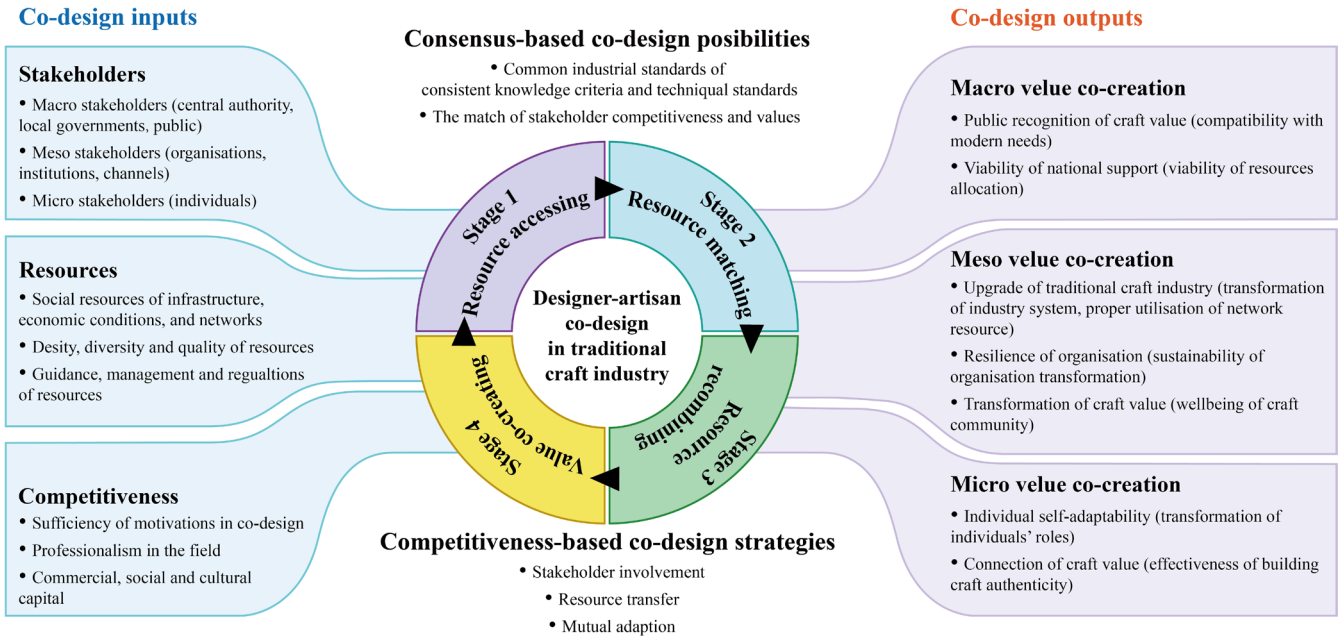


**FIGURE 5** | Value co-creation through designer–artisan co-design. Based on Figure 4, this figure further illustrates the systematic co-design strategies throughout the co-creation process, involving interconnected factors that shape the co-design inputs, possibilities and strategic directions, further determining the co-creation outputs.

organisational resource management mainly impacts the co-design opportunities available to individuals and the quality of their output, and not just organisational knowledge management, as emphasised by Kalkreuter (2020). At the meso-level, organisational resource management mainly impacts the co-design opportunities available to individuals and the quality of their output, and not just organisational knowledge management, as emphasised by Kalkreuter (2020). Our findings also suggest that at the micro level, emerging factors, such as self-promotion and political struggles as represented in social media, highlight the potential associated with developing grassroots opportunities and adapting to globalisation and digitalisation rather than relying on top-down support, in line with Crisman (2022). For example, to increase co-design credibility and opportunities, it may be beneficial to help prospective partners better prepare for the process and develop their autonomy, particularly marginalised artisans in competitive and resource-limited environments, as reported by Tung (2021). Given the differing goals of research- and market-oriented projects (Kalkreuter 2020; Wang et al. 2023), it may not be appropriate to implement strategies devised for research-oriented projects in real-world situations.

Developing consistent criteria and goals, which entails a comprehensive consideration of values, knowledge, resources and capabilities, is also crucial as it influences consensus-building and guides co-design actions and co-creation directions. During the resource-matching stage, we went beyond the in situ interactions and tacit craft knowledge transfer studied by Bryan-Kinns et al. (2022) and Wang et al. (2023). At the macro level, Bryan-Kinns et al. (2022) argued that practitioners' limited co-design competitiveness hinders them from adapting to rapid globalisation and digitalisation. We found that a flexible governmental narrative on craft value, along with transitional material support and consistent market operation standards, helps to address cultural and ethical concerns, such as rising unemployment, which can exacerbate misalignments in co-creation criteria among different stakeholders, further diminishing practitioners' potential in underdeveloped regions, limiting designers' and artisans' openness to co-design, and increasing stakeholder conflicts.

At the meso-level, common industry standards, particularly consistent knowledge criteria and common technique standards, are required to develop customised, localised and interdisciplinary co-design and industrial chains. In addition to consensus-building among organisations, we found that consensus-building within organisations is also crucial in shaping organisational positioning, which influences cross-organisational co-design opportunities and achievements.

At the micro-level, partners' evaluation of self-competitiveness influences their co-design requirements, thus affecting consensus-building. We found that content and technique negotiation are vital in reflecting actors' competitiveness and building co-design criteria. Thus, we have built on Kalkreuter's (2020) findings regarding the design criteria for mutable artefacts in technological and social contexts. Negotiating to update such criteria is necessary to help stakeholders understand each other's broader concerns, to facilitate effective trade-offs between contemporary and traditional cultures and techniques, and to foster a dialectical perspective on globalisation and digitalisation. This approach aligns with the need in various cultural contexts to revitalise cultural heritage, foster civic cultural management, and conserve unique cultural identities for global diversity (Luo 2021).

Accordingly, the recognition by all stakeholders of consistent knowledge boundaries regarding craft value and common

technique standards is needed to clarify and align different co-design criteria, goals and actions, improve interdisciplinary co-design, and transform industrial chains. To achieve these goals, customised education with consistent knowledge principles is necessary for different stakeholder fields.

Mutual adaptation by partners with different co-design capabilities is essential to improve quality and grow capabilities. Previous studies have shown that capable artisans transform their techniques to assist designers in problem-solving; however, such studies were mainly conducted in developed regions and neglected the methods used by artisans who live in rural areas and have limited capabilities to make intellectual contributions (Brown and Vacca 2022). In the current study, we have identified methods used by designers to overcome limitations in crafts (content, technique and development) and artisans' capabilities to integrate intellectual contributions, maximise advantages, reduce the impact of shortages and enhance craft design quality. Rather than forcing rapid bottom-up tactics from an external, top-down researcher's viewpoint, as in Wang et al. (2023), for actual daily work, we advocate transitional, flexible, capability-based collaborations that use inclusive, respectful communication with local communities. This approach respects local values and capabilities while balancing global ethical aims (such as grassroots engagement) with urgent local needs (e.g., market recognition). Beyond the craft sector, this approach can empower communities by demonstrating sensitivity to their specific contexts. Furthermore, we found that standardised recording practices can potentially preserve craft heritage, capture intangible material properties and transform tacit knowledge into structured, actionable intelligence. These practices support adaptive and progressive technology, enabling multilevel stakeholders—from designers and artisans to manufacturers—to preserve craft characteristics, balance capabilities and adapt to digitalisation and international fashion trends.

## 6 | Conclusions and Outlook

Through an analysis of qualitative data, we have determined how designers and artisans establish, participate in, and develop co-design partnerships for craft value co-creation by examining social, organisational and individual activities and their interconnections in the traditional textile industry. The co-design process model developed in this study can be utilised in both research and practice. The findings, implications and future directions of this research are outlined in Table 5.

### 6.1 | Implications

Aiming to develop design–artisan co-design by promoting craft industry sustainability, the model developed in the current study can be applied in both theoretical and practical contexts, from traditional designer–artisan collaborations to broader co-design and co-creation fields, including community-based co-creation, cultural tourism innovation, digital craft platforms, sustainable and circular economy ventures, cross-cultural design collaborations, non-profit partnerships and cultural education.

**TABLE 5** | Summary of the findings, implications and future directions of this research.

| Findings of previous studies | Findings of this study | Implications for practices | Implications for theory | Future research directions |
|---|---|---|---|---|
| • Short-term Individual-focused co-design interactions (Wang et al. 2023)<br>• Influential factors and results (Deshmukh et al. 2024) | • Long-term multilevel stakeholder interactions with different criteria and goals.<br>• Interdependent relationships between positive and negative factors. | • Guides stakeholders to align different collaboration criteria and goals.<br>• Guide stakeholders to identify and fill co-creation gaps. | • Inspires researchers to expand the boundaries of co-design, co-creation and social innovation.<br>• Enriches the complexity of multilevel causal mechanism framework for fitting long-term co-creation under social complexity.<br>• Guide researchers to reunderstand and examine co-design solutions for craft and cultural industry, and societal sustainability. | • Strategies and tools for reaching, connecting and aligning different stakeholders with varying competencies.<br>• Strategies and tools for co-design practices used in different craft fields, cultural sectors and cultural contexts. |

### 6.1.1 | Implications for Practices

Our model contributes to practice by guiding multilevel stakeholders to (a) fill the gaps in the value chain for continuous co-creation and (b) build sustainable consensus.

First, by identifying the specific influence of upper-level stakeholders, the model provides clear guidance for policymakers, organisers and education providers to offer transitional and targeted support by enabling them to understand the ripple effects of their decisions on various levels and at various stages within the complex system. With this new understanding of the interdependent relationships between positive and negative factors and consequences, these upper-level decision-makers, organisers and education providers should consider the effects of their decisions and actions on lower-level practitioners when developing their management tactics. By adopting this approach, they will be better positioned to prepare adaptive and transitional plans to address each factor and reduce the risk of deviating from their intended goals. Given that stakeholders are limited to specific positions and perspectives, they face the challenge of observing every aspect of a complex system (Chen et al. 2021). Policymakers can enhance regulation to monitor resource transfer during key stages of co-design to ensure fair resource allocation to targeted practitioners, and organisers can identify niche markets and collaboration opportunities by understanding gaps in the co-creation process and contributing to industrial diversity and continuity. Access to holistic information also allows lower-level practitioners, such as independent designers and artisans and those employed by companies, as well as workshops, academic institutions and social organisations, to address potential threats. For example, bottom artisans can seek co-design resources, such as tools for co-design, by following the model to examine government support and the supply chain. Then, they can adapt their behaviours to understand and evolve criteria for craft authenticity to align with changing social trends.

Second, the model serves as a practical tool that guides multilevel stakeholders to establish common co-creation criteria across the stages of co-design. The model can be used to harmonise top-down support with bottom-up autonomy. In addition, stakeholders, including designers, artisans, craft and fashion organisation managers, suppliers, manufacturers, educators, tool and platform developers, and policymakers can use the model to develop consistent knowledge principles on craft innovation to understand what they need to know and who they need to consider and negotiate with when updating value criteria and technical standards. Such principles can harmonise national craft registers, market operation standards, technology localisation, educational directions and collaborator selection to serve a common long-term goal.

### 6.1.2 | Implications for Theory

Our study contributes to theory by (a) increasing scholars' contextual sensitivity to explore effective co-design strategies for various situations and (b) connecting and aligning different co-design and co-creation research projects to support long-term shared goals.

First, we have identified the interdependent factors that partners consider when evaluating, interacting with and benefiting diverse stakeholders in co-design practice. We also provide insight into why partners use different relationships and design and communication methods to maximise value co-creation rather than criticising limitations without discussing embedded environments and relationships. The results indicate that design partners must be flexible and adaptable to successfully address different factors, providing a starting point for scholars focusing on the diverse designer–artisan co-design practices utilised in the traditional Chinese textile industry. Our insights guide researchers to increase contextual sensitivity and re-examine the legitimacy of various co-design strategies in different contexts, thereby fostering a more nuanced understanding of sustainability challenges in co-design.

Second, we anticipate that scholars will utilise the information we have provided on interdependent factors and problem-solving to analyse craft continuity and improve existing designer–artisan co-design methods and support materials (e.g., co-design toolkits), since current projects and toolkits tend to isolate designer–artisan co-design processes from social complexity without discussing which criteria should be adhered to. The comprehensive perspective of our model enables scholars to expand their insights beyond isolated co-design project procedures, guiding them to examine interconnected co-design approaches across diverse contexts. By bridging interdisciplinary fields, the model enhances researchers' capability to explore interconnected co-design and co-creation initiatives that, while differing in emphasis, are strategically aligned to pursue a shared long-term objective. For example, when working with the same community, researchers from different disciplines can use the model to identify common goals, stakeholder priorities and context-specific resources from diverse perspectives. This enables the design of reciprocal project agendas that acknowledge inter-field impacts while serving a unified contextual aim. As a result, even short-term projects can produce coherent and enduring outcomes that flexibly promote local sustainability, addressing the challenge of sustaining long-term initiatives in rapidly changing and complex environments. Accordingly, our model can support researchers in enriching and aligning diverse co-design, multilevel causal interaction models, methods and supporting materials (e.g., co-design toolkits) to enhance designer–artisan collaboration in broader co-design and co-creation contexts, thereby expanding the boundaries of social innovation for long-term sustainability.

Although this study focuses on the traditional Chinese textile industry, the analytical approach applied and the resultant findings can be used to understand complex local environments, co-design practices and designer–artisan collaborations in different craft industries, especially in underdeveloped regions.

## 6.2 | Limitations and Further Research

This study focuses on the Chinese textile craft sector, a unique cultural context that is influenced by macro, meso and micro factors, which may not always be directly relevant to other

geographical and cultural contexts. However, the diverse case selection and in-depth descriptions in the data analysis and presentation provide rich contextual evidence, offering comprehensive insights into the real-world complexity of traditional textile practices. Thus, our insights minimise the limitations of the research and maximise its transferability, providing valuable co-design guidance for stakeholders and scholars in other craft sectors and wider sustainable cultural industries in different cultural contexts. Accordingly, new avenues for future research include the development of the following:

- Co-design strategies that different stakeholders can use to explore consistent standards and increase the availability, feasibility, sustainability and monitoring of designer–artisan co-design resources.
- Co-design strategies and tools for co-design practices used in different craft fields and broader relevant cultural sectors, including community-based co-design, cultural tourism, craft education, civic cultural management, maker communities and sustainable and circular economy ventures in the artisanal sector.
- Examination of different developing regions, such as Southeast Asia and Sub-Saharan Africa, with limited resources and fragmented craft ecosystems, as well as cross-cultural research to compare designer–artisan co-design in developed and underdeveloped contexts.
- Localised sustainable development strategies to support local artisans in a diverse range of craft sectors based on larger sample sizes for long-term empirical studies.

In conclusion, our findings indicate that there is a pressing need for further knowledge renewal, technological advancement and enhanced stakeholder engagement.

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## Appendix A

### The Interview Questions Used in This Study

| Category | Questions |
|---|---|
| Sociodemographic | 1. Region<br>2. Age<br>3. Education<br>4. Employment status |
| Methods and strategies of co-design | 1. How do you reach co-design?<br>2. What do you think of the differing ways of thinking and the working methods between designers and artisans?<br>3. What do you think are the principles of collaboration between designers and craftspeople?<br>4. How do you balance the differences and combine the two sides? |
| Factors that influence co-design | 1. What difficulties did you encounter with co-design? How did you overcome them? What obstacles remain?<br>2. Which of your collaborative working methods or paths do you think are effective? Why? |
| Value co-creation through co-design | 1. How do you describe your co-design effects and results? |

**Appendix B**

**Artisans and Designers' Collaborations: Challenges and Enabling Factors**

| Stage | Level | Factors | Challenges | Enablers |
|---|---|---|---|---|
| Accessing resources | Macro | Availability of social resources | Constrained economic conditions | Enhanced infrastructure |
| | | Adequacy of social resources' management | Insufficient governmental resources<br>Inadequate or poor guidance | Adequate governmental resources<br>Effective governmental guidance |
| | Meso-level | Availability of network resources | Restricted industrial chain | Accessible networks |
| | | Appropriateness of organisational competitiveness to reach resources | Insufficient organisational resources<br>Rigid organisational competitiveness management | Adequate or organisational resources<br>Flexible organisational competitiveness management |
| | Micro-level | Appropriateness of individual competitiveness for co-design | Limited co-design motivation<br>Insufficient professionalism<br>Restricted commercial and social capital | Enhanced co-design motivation<br>Adequate professionalism<br>Increased commercial and social capital |
| Resource matching | Meso-level | Reliability of organisational collaboration plans | Lack of reciprocity<br>Lack of practicality | Reciprocity<br>Practicality |
| | Micro-level | Sufficiency of background knowledge transfer | Inappropriate communication methods<br>Incomplete background information | Appropriate communication methods<br>Background information<br>Communicator mutual selection |
| | | Matching of individual values | Lack of shared goals<br>Unclear craft innovation criteria | Shared goals<br>Shared criteria for craft innovation |
| Recombining resources | Meso-level | Democracy of management | Top-down hierarchy<br>Poor co-ideation initiatives | Open discussion |
| | | Sufficiency of organisational support for co-design | Insufficient supportive organisational resources | Adequate organisational resources |
| | Micro level | Mutual adaptation of relationships | Dysfunctional relationships | Adaptive relationships |
| | | Comprehensiveness of co-design knowledge transfer between designer and artisan | Ineffective communication methods<br>Inadequate co-design information | Mutual and respectful communication methods<br>Sufficient co-design information |
| | | Mutual adaptation of techniques and contents | Limited craft content adaptation<br>Limited craft technique adaptation | Craft content adaptation<br>Craft technique adaptation |