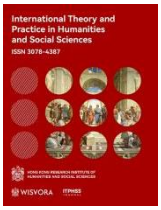
WISVORA

International Theory and Practice in Humanities and Social Sciences
2025 Volume2,Issue4 ISSN 3078-4387



A Study on Design Driven Innovation and Development of Non-Heritage Handicrafts

LuoYu Chen[1] , Chih Long Lin[1]

[1] *Taiwan University of Arts, New Taipei City, China*

Accepted

14 Apri1 2025

Keywords

Design-Driven Innovation; Traditional Handicrafts; Intangible Cultural Heritage, Rootedness Theory, Cultural and Creative Industries

Corresponding Author

LuoYu Chen

https://doi.org/10.70693/itphss.v2i4.749

Abstract

Addressing the inherent tension between cultural authenticity and commercial viability in the modernization of intangible cultural heritage handicrafts, this study seeks to explore the potential role of design as a transformative catalyst. Grounded in the theoretical framework of design-driven innovation and employing a grounded theory methodology, this research systematically examines the case of Natural Creation Co. in Hangzhou. Through semi-structured interviews, content analysis, and a structured three-stage coding process, a three-dimensional model—encompassing technological innovation, meaning-driven innovation, and network innovation—is proposed. The findings suggest that design may contribute to the modularization of traditional production processes, the reinterpretation of cultural meanings through narrative enhancement and cultural metaphor, and the fostering of collaborative ecosystems among artisans, designers, and markets. By mediating the balance between cultural preservation and market adaptation, design appears to offer pathways for sustaining cultural continuity while facilitating scalable transformation. It is hoped that this study provides a conceptual foundation that may support further theoretical development and practical exploration in the sustainable revitalization of intangible cultural heritage handicrafts within the cultural and creative industries.

1. Introduction

In recent years, the cultural and creative industries have been playing an increasingly important role in economic growth, job creation and the transmission of intangible cultural heritage. The core logic of cultural and creative design lies in the transformation of traditional cultural resources into innovative products with market competitiveness through the modern translation of cultural symbols and the in-depth fusion of commodity services, thus realising the synergistic enhancement of economic and cultural values. The non-heritage handicrafts show the characteristics of openness and spontaneous evolution in the change of time. By constantly breaking through the boundaries of design and art, maintaining dynamic inheritance and innovation, this process not only reflects the adaptability of traditional crafts, but also reveals their cultural resilience in the modern context (Chen & Ma, 2021). However, despite their potential for market transformation, Intangible Cultural Heritage crafts still face many challenges

in their modernisation. These challenges stem from the unique nature of NH crafts and the complex socio-cultural environment in which they are embedded.

The modernisation of non-heritage handicrafts faces structural contradictions: on the one hand, traditional handicrafts carry national aesthetics and cultural memories; on the other hand, there are significant differences between them and contemporary consumers in terms of functional needs, symbol recognition and value orientation. This tension makes it difficult to balance the cultural authenticity and commercial viability of Intangible Cultural Heritage products. Traditional crafts not only carry national aesthetics and cultural memory, but are also affected by market demand, production costs and consumer preferences. How to balance cultural authenticity and commercial viability has become a key issue in the development of Intangible Cultural Heritage crafts, and Beheshti. et al. (2021) suggest that the success of cultural and creative industries requires a combination of in-depth cultural excavation, innovative design thinking, technological application, and an efficient business operation model. Therefore, there is an urgent need for in-depth research on how to effectively excavate and recreate cultural resources to promote the innovative development of non-heritage handicrafts.

The core of the theory of design-driven innovation is based on social culture and the deep-rooted needs of users, proposing new functions and forms from the two dimensions of technology and product significance, with the designer acting as a bridge to effectively connect the value of the two. Therefore, how to effectively explore and recreate cultural resources and promote the innovative development of non-heritage handicrafts has become a key issue in the development of cultural and creative industries. Currently, research and practice mainly focus on functional expression. However, in the traditional social structure, craftsmen not only undertake the function of producing necessities, but also carry the responsibility of cultural inheritance. With the advancement of the industrial revolution, traditional handicrafts have gradually lost their original production function in modern societies, but their unique cultural characteristics and national aesthetic connotations have transformed them into indispensable cultural carriers in contemporary societies, undertaking the important mission of inheriting and manifesting traditional culture (Chen, 2012). Based on the theory of design-driven innovation, this study explores the socio-cultural innovation value of non-heritage handicrafts from the perspective of brand cases.

2. Literature Review

2.1 The Development of Design-Driven Innovation Theory

The design-driven innovation theory was firstly proposed by Verganti in 2003, which breaks through the traditional binary model of technology-driven and market-driven, and emphasises the central role of design in the construction of product meaning. Verganti pointed out that design is not only the optimisation of the appearance of the product, but also the reconstruction of the cultural and social values, which can create a new market space. This is illustrated in Figure 2.1. This innovation model emphasises the central role of design as a "meaning builder", achieving breakthrough innovation by changing the cultural connotation of a product rather than simply enhancing its functionality(Chen & Chen, 2010). The theory is different from the traditional user demand-oriented innovation, which focuses on how to re-interpret cultural and social values through design, so as to create new market space. Subsequently, Brown (2008) and Dorst (2011) further deepened the theory and proposed that design plays a key role in knowledge integration and innovation. Design-driven innovation focuses on how to satisfy the implicit needs of users through changes in the semantic system of a product, rather than just technological or

market-oriented improvements.

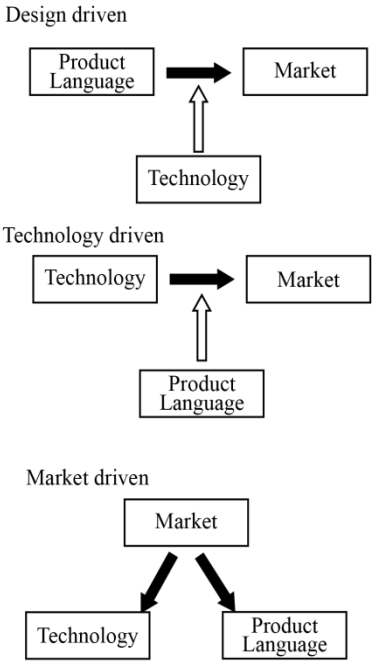


Figure 2.1a
Knowledge Types and Innovation Dynamics

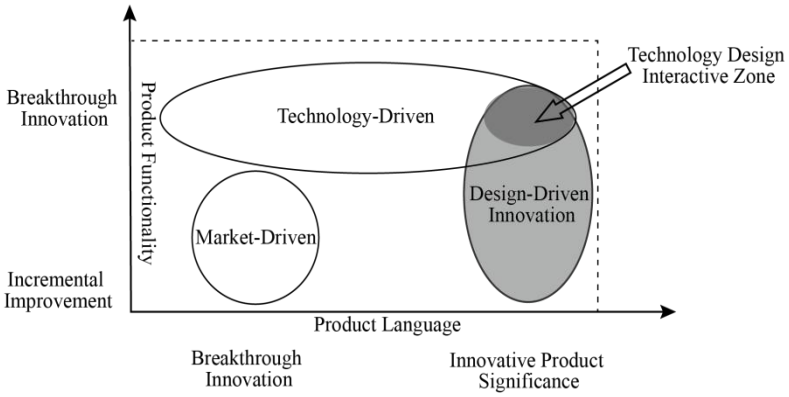


Figure 2.1b
Technological and Meaning Innovation Strategies

Figure 2.1 Schematic conceptual diagram of design-driven innovation
Source: Chen and Chen (2010)

As shown in Figure 2.1, Figure 2.1a it was found that the knowledge interaction between technology, market demand and product language constitutes the core element of the innovation process. The black arrows are used to indicate the decisive or dominant influence, while the white arrows are used to indicate the secondary or supporting role. When product language is the key driver of technological development and market demand changes, this type of innovation model can be defined as design-driven innovation. Further, Figure 2.1b shows Verganti's classification of innovation types into three categories based on the product innovation strategy and founded on the dimensions of technological change and product significance. Innovations that are breakthroughs in technology are categorised as technology-driven innovations; those that are revolutionary in product language are categorised as design-driven innovations; and those that show incremental improvements in both are categorised as market-driven innovations. It is worth noting that the intersection area at the top right of the coordinate system represents a breakthrough innovation model where technology and design work in tandem, and can be defined as the ‘Technology-Design Interaction Zone’. With the penetration of digital technology, Zhao (2019) proposes the theory of “meaning reconstruction in digital context”, which emphasises the role of user-participatory design in value co-creation. The current research frontiers focus on the intersection of service design and social innovation design, such as the “cultural sustainable design framework” proposed by Chen (2021). The theory of design-driven innovation consists of three core concepts: cultural innovation, design-driven change, and innovative communication networks. Of these, Cultural Meaningful Innovation emphasises the symbolic value of products rather than just functional optimisation, Design Driven Change highlights the systemic role of

design, and Innovation Communication Networks highlights how design can be realised through cross-disciplinary collaboration.

2.2 The Application of Design-Driven Innovation in the Field of Intangible Cultural Heritage Handicrafts

The core value construction of intangible cultural heritage handicrafts is not only embodied in the time dimension of the material carriers of skills transmission and historical accumulation, but also more deeply rooted in the interaction between the collective memory symbol system and cultural ecosystems that it carries (Lv, 2018). However, in the process of market transformation, Intangible Cultural Heritage products often face the structural conflict between cultural authenticity and commercial viability, and this tension presents a new complexity in the wave of digital transformation. The establishment of a three-dimensional framework of meaning construction - value transformation - network communication provides a systematic methodology for resolving this conflict (Verganti, 2009). Through design interventions, traditional crafts can not only adapt to modern market demands, but also maintain their cultural core. This study combines cultural studies and innovation management theories to explore how design thinking can act as an intermediary mechanism to reconstruct the value ecosystems of intangible arts and crafts in a contemporary context. The significance of design-driven innovation The application of innovation theories in Intangible Cultural Heritage innovation is mainly reflected in the following three aspects: Fig. 2-1 Schematic conceptual diagram of design-driven innovation.

(1) Innovation of Cultural Significance

In the context of Intangible Cultural Heritage innovation, innovation of cultural significance transcends the traditional paradigm of product function optimisation and shifts to the contemporary interpretation of symbolic values and collective memory. Emphasis is placed on the cultural symbolic value of the product rather than on functional optimisation alone. According to Norman's (2004) three-level theory of affective design, the innovation of Intangible Cultural Heritage products should be extended from the functional level (craft aesthetics), the behavioural level (experience of use) to the reflective level (cultural identity). For example, the application of the Suzhou silk thread craft in modern clothing design hassuccessfully realised the contemporary translation of traditional pattern symbols by extracting the visual elements of the Southern Song Dynasty's ‘Duck in Lotus Pond’ and combining them with modern tailoring techniques (Wang, 2013). This innovative approach confirms Verganti's (2017) theory of “innovation of meaning”, whereby design redefines the symbolic value of a product in a cultural context, rather than merely improving the existing product characteristics.

(2) Design-driven change

Design plays the role of a ‘system catalyst’ in the transformation of non-heritage industries, and its mechanism of action is embodied in three levels: firstly, reshaping the production process through the experimentation of materials and the integration of technology, for example, Jingdezhen ceramic artists combined 3D printed embryos with traditional blue and white flower techniques, which enhanced the efficiency of production while preserving the handmade quality (Wang et al., 2024); secondly, extending the value chain through service design thinking; secondly, extending the value chain through service design thinking; and secondly, extending the value chain through service design thinking, which is the most important factor in the development of the non-heritage industries. Secondly, service design thinking is used to extend the value chain, as exemplified by the ‘digital collection + physical products + experiential workshops’ model established by the Palace Cultural and

Creative Industries (Borsotti & Bollini, 2009); and finally, design thinking promote organisational innovation, as seen by the introduction of a design management system in the Fujian Lacquer Art Co-operative Society, which has resulted in the formation of a new type of collaborative network of ‘intangible heritage inheritors + design organisations + e-commerce platforms’ (Jing & Li, 2024). The introduction of a design management system to the Fujian Lacquer Art Co-operative has resulted in a new collaborative network of ‘intangible heritage inheritor + design organisation + e-commerce platform’ (Jing & Li, 2024). These practices corroborate Utterback's (1996) dynamic model of industrial innovation, highlighting the key role of design in promoting industrial restructuring. They show that design-driven innovation can be an effective breakthrough in promoting a step change in industrial structure.

(3) Innovative Communication Networks

The innovative communication of Intangible Cultural Heritage is essentially a knowledge-intensive social network construction process, which requires the integration of four types of key nodes: the traditional knowledge system of craftspeople, the modern translation capacity of designers, the cultural cognitive schema of consumers,and the digital tools of technical experts (Chen & Ma, 2021). The modern transformation of the Yunnan Bai tie-dye art demonstrates the feasibility of this model - through the establishment of a triadic structure of ‘Intangible Cultural Heritage Workstation + University Laboratory + E-commerce Live Base’, a synergistic innovationbetween the construction of a traditional pattern database, the development of modular design tools, and community marketing is realised (Yulianto, 2024). To investigate how design can facilitate the diffusion of innovationthrough interdisciplinary collaboration. This interdisciplinary collaboration echoes Chesbro's (2003) theory of open innovation and highlights the ‘double embeddedness’ of ICH innovation: embedded in the local cultural context and connected to global innovation networks.

This research adopts the three-stage approach of open coding, spindle coding and selective coding of the rooted theory to systematically analyse the case data of non-heritage design innovations, and to explore the transformation paths and innovation mechanisms of non-heritage handicrafts in the cultural and creative industries. In order to enhance the reliability of the study, triangulation cross-checking, in-depth interviews and literature research were used to ensure the robustness of the findings. Focusing on design as the core driver, the study analyses the key issues in the process of heritage and innovation of non-heritage handicrafts from the dual perspective of socio-cultural and market demand. It focuses on how traditional cultural values can be transformed into innovative products and services that meet modern market demands through design, and realises a deep integration between traditional culture and modern needs. The aim is to promote the transformation of the value of non-heritage handicrafts and continuous innovation. Ultimately, it aims to construct a systematic theoretical framework to provide scientific and rigorous academic support and practice-oriented innovation strategies for the dynamic transmission of non-heritage handicrafts and the high-quality development of cultural and creative industries.

3. Research Methodology

Based on the theoretical framework of design-driven innovation, this study adopts the

grounded theory methodology, selecting Natural Creation Co. in Hangzhou as a case study to systematically explore the modernization and transformation mechanisms of intangible cultural heritage (ICH) crafts. Through semi-structured in-depth interviews, open-ended observations, and content analysis, the study analyzes the adaptive strategies of ICH artisans within the context of contemporary design, and subsequently constructs a design-driven innovation model.

Grounded theory, as an inductive qualitative research method, identifies patterns and relationships within the data through constant comparative analysis, ultimately leading to theory generation (Chen, 1999). Following the three-stage coding process of grounded theory—open coding, axial coding, and selective coding—this study systematically codes and categorizes the data from ICH design innovation cases, establishing key concepts and categories, and ultimately developing a theoretical model.

3.1 Research Subjects

This research selects Hangzhou Made in Natural Cultural Creativity Co. Made in Natural is a cultural enterprise that focuses on the revitalisation of non-heritage crafts and design innovation, and is committed to empowering traditional crafts through design and adapting them to modern market demands (Natural Creation Co., 2022). The selection criteria are as follows:

(1) Intangible heritage revitalisation: covering 56 items of intangible cultural heritage, cooperating with more than 2,000 craftsmen, according to the enterprise's 2022 financial report, enhancing the social influence of traditional skills through documentaries, exhibitions and experiential activities, and the modular design strategy of Made in Natural, which reduces the production cost by 30% and increases the production capacity by 50%.

(2) Market transformation ability: the products cover 200+ offline channels nationwide, with online sales exceeding 10 million, demonstrating the potential of design-driven commercialisation of intangible cultural heritage, and possessing the first gene bank of folk art materials in China.

(3) Industry benchmarking: the company was recognised as one of the ‘Top 10 Innovative Institutions of Intangible Heritage in China’ and a ‘Cultural Demonstration Enterprise in Zhejiang Province’, and was invited to share its experience at a UNESCO forum.In the selection of interviewees, this research follows the principle of ‘key information, provider’ and selects participants with profound experience and influence, as shown in Table 3.1, the background of the interviewees:

Table 3.1 Background of the interviewees

Code	Gender	Age	Interviewee	Employment Age	Employment Background
A1	Male	42	Brand Founder	20 years	Corporate strategy and cultural positioning
A2	Male	36	Brand Founder	16 years	Sourcing intangible heritage crafts
B1	Female	31	Product Director	8 years	Modern reinterpretation of heritage crafts
B2	Female	28	Product Designers	5 years	Modern design adaptation of folk arts

3.2 Data Collection

All the interviews in this research were recorded, transcribed and coded, and qualitatively analysed by NVivo to ensure systematic data processing. The semi-structured interviews were used to collect first-hand data, and the interview questions focused on the following core themes:

(1) The relationship between design and non-heritage: how do traditional crafts adapt to the modern design context?
(2) Collaboration and cognitive differences: How do designers and craftspeople influence each other in the process of collaboration?
(3) Innovation Strategies and Challenges: What are the main difficulties and solutions in product design and marketing?
(4) The relationship between culture and design: How can non-heritage crafts be translated and reinvented in a modern design context?
(5) Market Challenges and Adaptation: What are the main challenges in the marketisation process of ICH?
(6) Mode of co-operation and interaction: How can designers and craftspeople share knowledge and create together in the process of co-operation?

3.3 Data Analysis

This research adopts the three-level coding method of rootedness theory to extract concepts from the original interview data for categorisation respectively for the scholars coded as A1, A2, A3 and A4, with a total of 386 initial labels collected and extracted, and 17 domains generalised and collapsed after focusing on the three core categories, as shown in Table 3.2 below.

Table 3.2 Background of the interviewees

Selective coding	Spindle coding
Technological innovation	Tension between instrumental rationality and humanistic care
	Innovation in communication strategies
	Generational gap in heritage education
	Design-driven craft innovation
	Contemporary transformation of heritage contexts
	Sustainable pathways for cultural products
Meaning-driven Innovation	Conflicts in cultural translation
	Long-term cultural preservation
	Transmission of emotional value
	Respect for artisans' agency
	Cognitive differences between artisans and designers
	Conflicts in cultural translation
Network innovation	Building collaborative networks
	Technological bottlenecks in supply chain and industrialization
	Challenges in market adaptation
	Cross-disciplinary knowledge integration
	Social impacts of cultural reproduction

3.3.1 Technological Innovation

(1) Tension between Instrumental Rationality and Humanistic Care

The application of technology must balance efficiency with cultural essence, emphasizing that technology should assist rather than dominate innovation. As noted in the interviews:

- Digital technologies help document craft processes, but designers must engage directly with artisans; computer-generated drawings cannot replace hands-on experience (A2).

(2) Innovation in Communication Strategies

In contemporary contexts, the communication of intangible cultural heritage crafts has shifted from one-way dissemination to collaborative co-creation. Communication strategy innovation is reflected in the use of visual documentation, festival events, and experiential marketing to break knowledge barriers and deepen public participation. As stated in the interviews:

-We integrate craft-related activities with festivals to draw greater public attention (B1).

-Visual media such as documentaries are also employed as communication tools, aiming not only at knowledge preservation but also at stimulating public participation and market response (B2).

(3) Generational Gap in Heritage Education

The lack of institutional support hinders the integration of intangible heritage into everyday education, resulting in a cognitive and practical divide.As stated in the interviews:

-Heritage crafts remain stuck in usage scenarios from 30 years ago, while the current education system leans toward Western models, lacking courses on folk arts and intangible heritage" (A1).

-Without establishing cultural memory from childhood, intangible heritage risks becoming mere museum exhibits in the future, symbolizing a crisis of static cultural representation (A2).

（4）Design-driven Craft Innovation

Through the reinterpretation of materials, technologies, and forms, design-driven innovation advances the evolution of crafts. Craft innovation must balance traditional technical constraints with modern aesthetic demands, emphasizing that design must respect the technical limitations and experiential knowledge of traditional crafts. As reflected in the interviews:

-Design must be matched to the craft; artisans adjust materials and technical issues. Without the participation of artisans, design remains merely a visual concept (A1).

-"Craft emphasizes tradition, while design focuses on modern aesthetics. For instance, traditional embroidery techniques are preserved in cloth tiger making, but the motifs are adapted to appeal to youth trends" (A2).

(5) Contemporary Transformation of Heritage Contexts

The transformation of heritage craft contexts involves not just formal updates but also the re-embedding of cultural meaning and lifestyle relevance. As described in the interviews:

-"The value of a gift lies not in its price, but in the experience of making it together with my father." This indicates that the contemporary expression of intangible heritage products is shifting toward emotional resonance and life-world engagement, thereby reconstructing "practice fields" in contemporary contexts (A1).

-"Heritage crafts are disconnected from modern living; it is necessary to conduct

life-centered research to understand contemporary cultural needs" (A2).
-Through the model of "DIY gift kits," intangible heritage crafts are introduced into family spaces, serving as mediums for parent-child bonding and social interaction (B1).

(6) Sustainable Pathways for Cultural Products

Intangible heritage cultural products cannot achieve sustainable development through single-market sales alone. Their sustainability relies on the integration of productionmechanisms, licensing systems, and community participation.As highlighted in the interviews:

-"Craft knowledge should be modularized and transformed into educational tools, allowing cultural products to generate value across educational, emotional, and social contexts, thereby promoting long-term circulation and cultural regeneration" (A1).
-"An artisan's production output alone cannot meet market demands; crafts should be deconstructed into teaching kits to encourage broader participation" (A2).
-"Heritage practitioners should be recognized as copyright beneficiaries; institutional development is critical for implementing sustainable strategies" (B2).

3.3.2 Meaning-driven Innovation

(1) Conflicts in Cultural Translation

Tension between Instrumental Rationality and Humanistic Care The contradiction between traditional symbols and contemporary contexts necessitates the redefinition of cultural meanings through design. While the functional essence of traditions must be preserved, their forms need to adapt to modern needs. Traditional culture must be translated into contemporary design language, balancing the tension between essence and form. As stated in the interviews:

-"Traditional culture is the soil and the root; modern design has only a century of history, while traditional culture represents millennia of accumulation. Western logic emphasizes minimal expression, but we must combine contemporary design concepts with the embodiment of the cultural soul through external forms" (A1).
-"The functionality of crafts persists forever, but their forms may evolve. For example, the shape of a bowl has remained unchanged for thousands of years, though the material may shift to metal" (B1).

(2) Long-term Cultural Preservation

Sustainable cultural preservation must be driven by intrinsic passion rather than excessive commercialization. Cultural inheritance requires authentic internal motivation. As stated in the interviews:

-"Persistence stems from passion, not passivity; only genuine love can sustain continuous engagement, otherwise it will be merely superficial" (B1).
-"Crafts should grow naturally; overprotection accelerates their demise. A relaxed and organic approach aligns better with natural laws" (B2).

(3) Transmission of Emotional Value

Crafts serve as spiritual media, facilitating emotional connections and cultural identity.

Cultural products must embody deep emotional meanings, transmitting cultural emotions and social attributes.

-*"Crafts act as mediums, linking the emotions of consumers and artisans through products. Even 'useless' objects can bring spiritual value, such as the memory of parents making a kite with their children" (A2).*

-*"The embroidery patterns in traditional garments represent an 'expression of love,' such as a mother embroidering a dowry for her daughter. Design must incorporate emotional narratives rather than merely aesthetic forms" (B1).*

(3) Respect for Artisans' Agency

Artisans are not merely executors of skills but also holders of cultural knowledge and co-creators of meaning. Design-driven innovation must respect artisans' rights to cultural interpretation and creative authorship. Establishing mechanisms for equal participation is essential for achieving genuine cultural respect and co-creation. As highlighted in the interviews:

-*"We approach it with passion, but for them, it is a tool for living" (A2).*

-*"Artisans should be regarded as creative directors and entitled to copyright benefits" (B1).*

(5) Cognitive Differences between Artisans and Designers

There exist linguistic and logical differences between traditional craftsmanship and modern design. Without mutual understanding and experience integration, collaboration can easily fail. Designers must possess craft literacy and act as cultural translators to facilitate two-way communication. As mentioned in the interviews:

-*"Craftspeople cannot understand the drawings made by designers because the gap is too wide" (B1).*

-*"Materials behave differently under specific conditions, requiring artisans to adjust and correct issues" (B2).*

3.3.3 Network Innovation

(1) Building Collaborative Networks

The collaboration among heritage practitioners, designers, designers, and market players iessential for co-innovation, emphasizing the necessity of multi-party cooperation and the operational models of collaborative networks. As highlighted in the interviews:

-*"After dissemination, technological reconstruction is required; it is necessary to assess whether artisans accept innovation and whether they can integrate with the market, while also integrating supply chains and production systems" (A2).*

-*"Establishing long-term partnerships with artisans, inviting them to join folk art stores, and organizing annual gatherings help form an ecological network" (B2).*

(2) Technological Bottlenecks in Supply Chain and Industrialization

There is an inherent contradiction between the standardization and scalability of handicrafts, reflecting production limitations and the challenges of industrialization, while highlighting the conflict between standardization and individuality. As noted in the interviews:

-*"Artisans can only produce a few unique pieces a day, making it impossible to achieve a commercial closed loop; thus, crafts must be deconstructed into teaching kits to enable wider participation" (B1).*

-*"Folk art products are difficult to adapt to e-commerce because handmade items lack*

uniform standards; thus, online and offline operations must be separated" (B2).

(3) Challenges in Market Adaptation

Traditional crafts often struggle to meet modern market demands and consumer logic due to characteristics such as individuality, long production cycles, and lack of standardization, leading to obstacles in market transformation. As reflected in the interviews:

-"An artisan can only produce a few unique items a day, making it impossible to achieve a commercial closed loop" (B1).

-"Folk art should serve daily life; if it cannot achieve sufficient production volume, it merely becomes an art object" (B2).

(4) Cross-disciplinary Knowledge Integration

Innovation in intangible heritage requires the integration of knowledge across design, craftsmanship, technology, and marketing, breaking down disciplinary barriers and shaping a co-creation context to address complex cultural and market needs. As pointed out in the interviews:

-"It is necessary to connect heritage practitioners, designers, and brand operators to form a transformative mechanism" (A2).

-"After dissemination, technological reconstruction is still required, and alignment with supply chains and production capacities must be considered" (B1).

(5) Social Impact of Cultural Reproduction

Intangible cultural heritage products not only preserve cultural memory but also continuously construct identity and emotional connections in contemporary expressions, influencing societal re-recognition of traditional values. As illustrated in the interviews:

-"Accompanying someone is the most precious gift; making a kite together creates an unforgettable memory" (A1).

-"Craftsmanship serves as a medium linking emotions and memories; intangible heritage crafts extend cultural continuity through products and narratives, shaping social-level identity and resonance" (A2).

This study adopts a coding framework based on three primary dimensions: "Technological Innovation," "Meaning-driven Innovation," and "Network Innovation." Drawing from in-depth interview data, it systematically examines the reconstruction of modern production mechanisms for intangible cultural heritage crafts, the empowerment of cultural meaning and design value, and the strategic negotiation between cultural preservation and commercial viability.

The findings reveal that design-driven innovation is not confined to technological iteration alone but emerges from the synergistic interplay between the reinterpretation of cultural meanings and the development of adaptive mechanisms for market integration. Within this dynamic process, design functions as a critical mediator, facilitating cultural translation, strengthening industrial networks, and integrating digital technologies. These mechanisms collectively enhance the interaction between artisans and contemporary market demands, thereby fostering the sustainable development and dynamic revitalization of intangible cultural heritage products.

4. Results and Discussion

Based on the theoretical framework of design-driven innovation and the empirical research of

Made in Natural Company in Hangzhou, this research proposes a three-dimensional innovation mechanism for the modernisation and transformation of non-heritage handicrafts. The following three dimensions of technical innovation, meaning innovation and network innovation are discussed, as shown in Figure 4.1 below, and a systematic theoretical model is constructed.

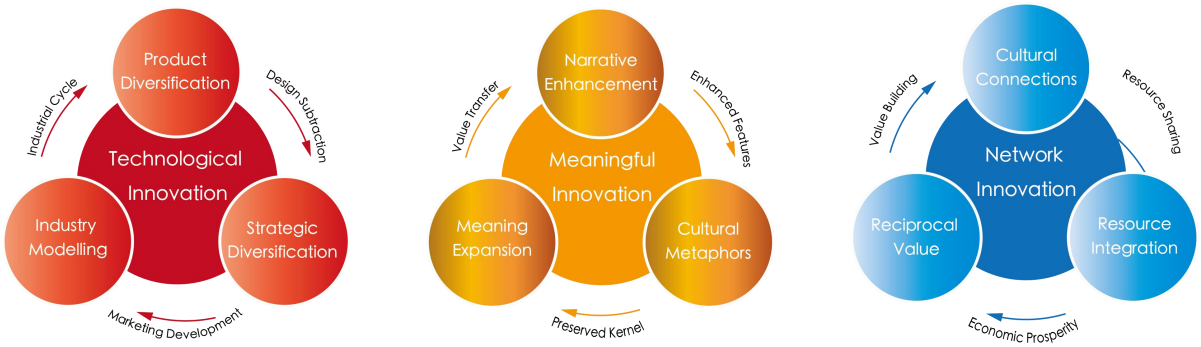


Figure 4.1 Schematic diagram of the design-driven ICH mechanism

4.1 Technological Innovation:Reconstructing the Modern Production Mechanisms of Intangible Cultural Heritage Crafts

The marketization of intangible cultural heritage products continues to face significant challenges, including high production costs, limited scalability, and insufficient alignment with contemporary aesthetic preferences. Design-driven innovation proposes a systematic solution to address these issues, which can be categorized into three key dimensions:

(1) Diversification of products

Through modular design strategies, traditional crafts are deconstructed into standardised production units. For example, Made in Natural breaks down the bamboo weaving process into basic weaving units and combines it with 3D printing technology to create moulds, thus realising a hybrid production model of ‘handmade core + mechanical assistance’, which can increase productivity by 50% while retaining the handmade texture (Interview A3). This strategy not only reduces production costs, but also introduces a variety of products such as tea sets and lighting through combination innovation to meet differentiated market demands.

(2) Diversification of strategy

Adopts a ‘tiered market positioning’ strategy: the high-end line uses limited edition to enhance cultural scarcity, while the mass line expands the consumer base through joint cooperation (e.g. with the Forbidden City Cultural and Creative Industries). In addition, the company has introduced the principle of ‘design subtraction’, eliminating excessive decorative elements and focusing on the nature of craftsmanship. For example, the company has simplified traditional lacquer ware into a series of minimalist tableware, which has successfully penetrated the young market (Interview A1).

(3) Modularisation of the industry

A digital platform called ‘Craft Gene Bank’ was set up to break down Intangible Cultural Heritage skills into visual teaching modules and open them up for sharing by designers and

craftspeople. For example, with the digitisation of embroidery stitches, designers can quickly match the needs of modern clothing, while craftspeople can enhance their productivity through modular training (Interview A4). This model solves the 'isolated product dilemma' and facilitates the transformation of handicrafts from individual workshops to collaboration in the industrial chain.

4.2 Meaning Innovation:Cultural Empowerment and Design Value

Design-driven innovation is not only a technical enhancement, but also a reconstruction of cultural meanings. As shown in the following figure, Made in Natural uses the strategies of 'narrative enhancement' and 'cultural metaphor' and 'meaning expansion' to give traditional symbols a new contemporary context:

(1) Narrative Enhancement

Constructing Cultural Identity through Product Narrative. Made in Natural objects are embedded with 2D codes in their packaging, linked to craft documentaries and interviews with craftsmen, transforming 'objects' into 'cultural carriers'.

(2) Cultural Metaphors

uses metaphors to reconstruct traditional symbols. This kind of translation is not a form of imitation, but a way of extracting cultural genes through 'symbol layering' and integrating them into the contemporary context, so as to solve the problem of the break between tradition and modern aesthetics (Interview A1).

(3) Expansion of meaning

From functional value to social value. Made in Natural launched the 'Intangible Heritage + Public Welfare' series, donating a portion of the revenue from each product sold to the training of rural craftsmen. This transforms consumer behaviour into cultural participation and meets the contemporary demand for 'meaningful consumption'. It also enhances the effect of market adhesion.

4.3 Network Innovation: Balancing Culture and Commerce

(1) Extending the linkage between old and new cultures

Constructing a triangular network of 'inheritors-designers-educational institutions'. For example, non-heritage masters are invited to work in university workshops to jointly develop the 'Traditional Tie-Dyeing + Digital Printing' programme, and students' works are directly imported into the supply chain of enterprises. This model not only activates the cultural awareness of young people, but also injects experimental innovation into the craft (Interview A4).

(2) Integration of online and offline resources

Adopts a 'closed-loop experience' strategy: offline flash shops and workshop activities enhance the immersive experience, while online live streaming demonstrates the production process and links to e-commerce. In addition, the company has established a digital platform called 'Virtual Art Museum', which provides AR trial and customisation services to break through the bottleneck of handmade product standardisation.

(3) Mutual Benefit from Institutional Value

Design a 'revenue-sharing' contract to ensure that craftspeople receive a sustainable share of product sales. At the same time, the enterprise provides brand endorsement and technical support to the heirs, forming a virtuous cycle of 'cultural empowerment and economic feedback' (Interview A3). This mechanism has significantly increased the willingness of craftspeople to cooperate with each other, and the renewal rate of cooperative projects has

reached 92%.

4.4 Model Construction

Integrating the preceding analyses, this research proposes the "Three-Dimensional Model of Design-Driven Intangible Cultural Heritage Innovation" (as shown in Figure 4.2). This model systematically organizes technological innovation, meaning-driven innovation, and networked ecosystem innovation into an interactive framework, supporting the sustainable revitalization and value transformation of Intangible Cultural Heritage Innovation crafts in contemporary contexts.

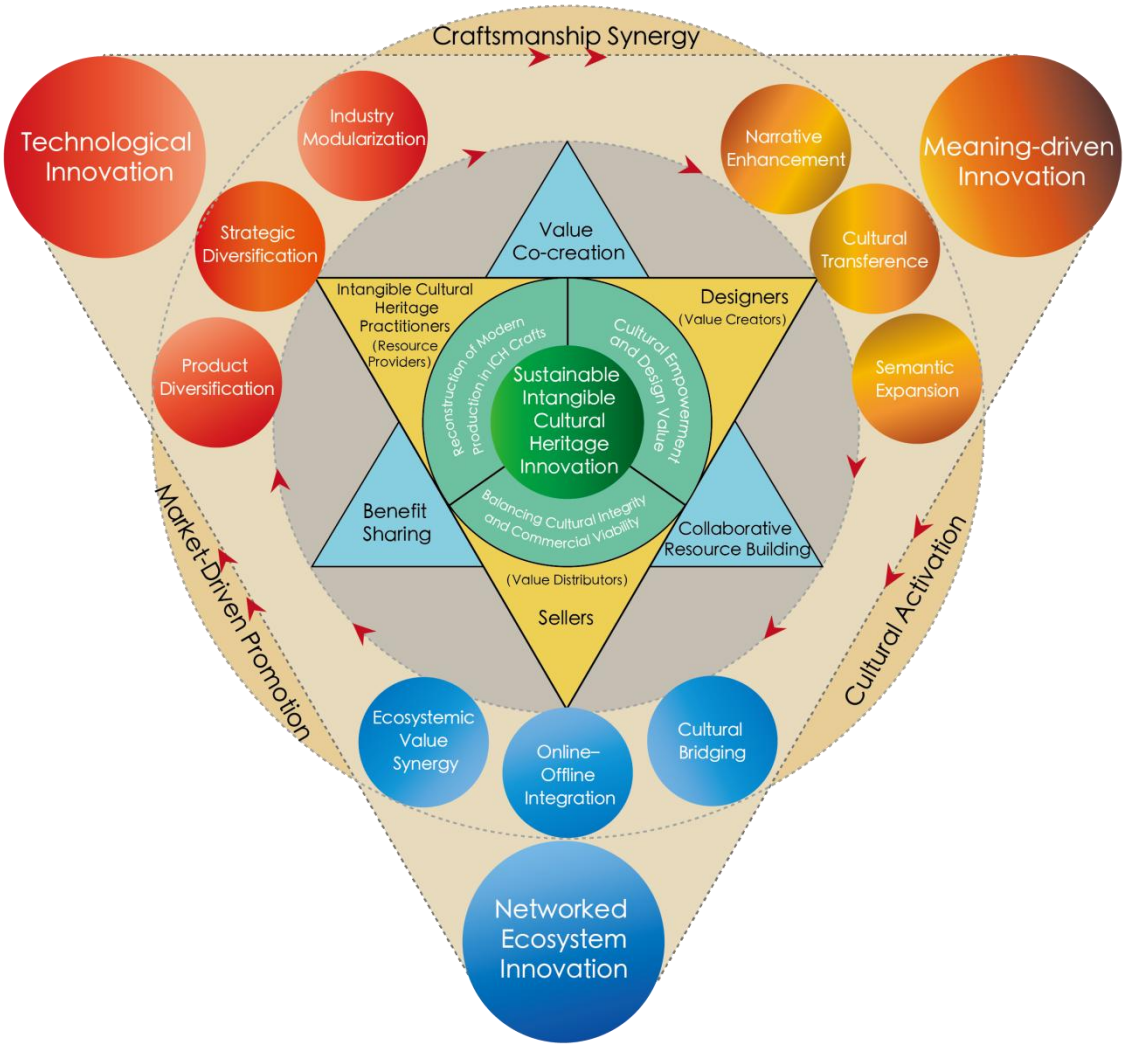


Figure 4.2 Three-dimensional model of design-driven ICH innovation

As shown in Figure 4.2 above ，vividly illustrates the core structure and dynamic logic of design-driven Intangible Cultural Heritage Innovation innovation. At its center lies Sustainable Intangible Cultural Heritage Innovation, emphasizing the dual imperative of preserving cultural integrity while enhancing commercial viability. Surrounding the core are three key stakeholders—Intangible Cultural Heritage Practitioners (Resource Providers), Designers (Value Creators), and Sellers (Value Distributors)—each anchored to functional domains of Value Co-creation, Benefit Sharing, and Collaborative Resource Building. This configuration

simultaneously reconstructs traditional craftsmanship into modern production systems and reinterprets cultural meanings into market-recognizable forms.Surrounding these central interactions are three dynamic innovation axes:

(1) On the left, Technological Innovation drives production efficiency and market adaptability through industry modularization, strategic diversification, and product diversification;
(2) On the right, Meaning-Driven Innovation reshapes traditional symbolism and enhances cultural narratives via narrative enhancement, cultural transference, and semantic expansion;
(3) At the bottom, Networked Ecosystem Innovation builds systemic value co-creation and strengthens industry collaboration through ecosystemic synergy, online-offline integration, and cultural bridging.

These innovation pathways are dynamically reinforced by three overarching forces — Craftsmanship Synergy, Cultural Activation, and Market-Driven Promotion—which interweave to drive the continuous evolution of the system. Through this structural model, the study highlights how design functions not merely as a tool for product enhancement but emerges as a critical mediator for cultural regeneration, industrial transformation, and value co-creation.In sum, Figure 4.2 encapsulates the inner mechanism and structural dynamics of design-driven Intangible Cultural Heritage Innovation innovation, providing a theoretically rigorous and operationally actionable framework for the modernization and internationalization of intangible cultural heritage industries.

5. Conclusion and Suggestion

This research reveals three core mechanisms of design-driven innovation in the transformation of non-heritage arts and crafts based on the coding and case analysis of rooted theory:

(1) Innovation of cultural meaning based on the theory of symbol hierarchy: through symbol redefinition, traditional cultural symbols are adapted to the modern market demand, and consumers' aesthetic demand is satisfied while the cultural essence is inherited.
(2) Multi-party synergy relying on innovative communication networks: strengthening the interaction between designers, craft inheritors and market players to form a multi-party synergistic innovation model, and optimising the commercialisation path of Intangible Cultural Heritage products through design strategies, so as to achieve a balance between culture and the market.
(3) Integration of modular design and digital technology to enhance market adaptability: Reduce production costs through modular design and expand sales channels through digital technology to enhance market competitiveness.

This research combines the theory of design-driven innovation with the study of non-heritage, and puts forward the concepts of ‘meaningful innovation’ and ‘cultural metaphor’ and ‘market adaptation mechanism’, which provide theoretical references for the marketing strategy of non-heritage brands. Design intervenes in the Intangible Cultural Heritage industry and promotes the digitalisation and sustainable development of Intangible Cultural Heritage. The long-term impact of design-driven innovation on the Intangible Cultural Heritage industry needs to be further observed. In the future, we can introduce consumer behaviour theories to explore how design affects the market acceptance of Intangible Cultural Heritage products, with a view to

providing valuable references to the academia and the industry, and promoting the sustainable development of Intangible Cultural Heritage culture.

References

Borsotti, M., & Bollini, L. (2009). Reshaping exhibition and museum design through digital technologies: A multimodal approach. *International Journal of Virtual Reality,* 8(3), 25—31.

Beheshti, A., Benatallah, B., Sheng, Q. Z., & Schiliro, F. (2020). Intelligent knowledge lakes: The age of artificial intelligence and big data. In *Web Information Systems Engineering: WISE 2019 Workshop, Demo, and Tutorial, Hong Kong and Macau, China, January 19—22, 2020, Revised Selected Papers 20* (24-34). Springer Singapore.

Brown, T. (2008). Design thinking. *Harvard Business Review, 86*(6), 84—92.

Chen, J. (2012). The cultural inheritance of traditional handicrafts and contemporary "redesign." *Literary and Art Studies, 5,* 137—139.

Chen, J., & Chen, X. (2010). Design-driven innovation: An innovation model within open societies. *Technology Economics*, 29(8), 1—5.

Chen, P., & Ma, X. K. (2021). The modern transformation and regenerative design of traditional handicrafts from the perspective of the revival of Chinese culture. *Jinan Journal (Philosophy & Social Sciences Edition)*.

Chen, X. M. (1999). The ideas and methods of grounded theory. *Educational Research and Experiment, 4,* 58—63.

Chesbrough, H. W. (2003). Open innovation: The new imperative for creating and profiting from technology. Harvard Business School Press.

Dorst, K. (2011). The core of ‘design thinking’ and its application. *Design Studies, 32*(6), 521—532.

Hannah, M. A., & Simeone, M. (2018). Exploring an ethnography-based knowledge network model for professional communication analysis of knowledge integration. *IEEE Transactions on Professional Communication, 61*(4), 372—388.

Jing, W., & Li, M. (2024). The role of design thinking in driving innovation. *Design Insights, 1*(3).

Lv, P. T. (2018). The sentiment of beautifying life: Aesthetic emotional attitudes influenced by Chinese folk cultural concepts. *Folk Art, 3,* 6—10.

Natural Creation Cultural Research Institute. (2022). *White paper on folk art ecology.*

Norman, D. A. (2004). Emotional design: Why we love (or hate) everyday things. Basic Books.

Utterback, J. M. (1996). Mastering the dynamics of innovation. Harvard Business School Press.

Verganti, R. (2003). Design as brokering of languages: Innovation strategies in Italian firms. *Design Management Journal (Former Series), 14*(3), 34—42.

Verganti, R. (2009). Design-driven innovation: Changing the rules of competition by radically innovating what things mean. Harvard Business Press.

Verganti, R. (2017). Design thinkers think like managers. *She Ji, 3*(2), 100—102.

Wang, R., Zhang, L., Wang, M., Wang, H., & Xin, Q. (2024). Design and implementation of ceramic virtual display system. *Design Insights, 2*(2), 86—92.

Yulianto, E. (2024). Educational marketing management in increasing the competitiveness of institutions. *International Journal of Educational Research and Social Sciences, 5*(4), 634—642.