Digital Design and Heritage Strategy Research of Intangible Cultural Heritage in the View of Cultural Creative Industry

Ma Ruixin and Nurul Azlen binti Hanifah*

City University Malaysia, Petaling Jaya, Selangor 46100, Malaysia

*nurul.azlen@city.edu.my

Abstract. Cultural creative products play an important role in preserving and innovatively developing intangible cultural heritage (ICH), serving as a key path for the sustainable inheritance and development of heritage in modern China. Research that focuses on intersections within the collaborative approach between digital design and preservation strategy under the cultural creative industry. Through systematic analysis of the development of recent Chinese ICH cultural product design, this paper is divided into three important pillars: digital technology empowerment, cultural translation design method, and user experience-oriented strategy. The research has put forward a combination of cultural gene extraction, symbolic transformation, and carrier adaptation integrated framework that can be used for ICH product development efficiently. Empirical studies on traditional handicraft categories show that artificial intelligence-generated content and virtual reality technology can enhance the sense of reality in protection and the vitality of the market. The findings contribute to the theoretical exploration of the transformation of cultural resources and, at the same time, provide reference for designers and inheritors involved in the revitalization of intangible cultural heritage by creative industry approaches.

Keywords: Intangible Cultural Heritage, Cultural Creative Products, Digital Design, Heritage Transmission, Cultural Translation

1 Introduction

There has never been a transformation of intangible cultural heritage engaged with modern cultural industries in chinese society at such extent. The State Council's attention to the creative transformation and innovative development of intangible cultural heritage has stimulated scholars' research interest in sustainable inheritance of intangible cultural heritage through market-oriented approaches[1]. Among the old crafts, like embroidery, ceramics, paper-cutting, and bamboo making, all have gotten stuck in a corner trying to solve the dilemma of maintaining tradition while being relevant when faced with an expelling consumer market.

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The cultural creative industry is both an opportunity and a difficulty for ICH protection [2]. While commercial engagement brings about economic sustainability and more social recognition, it also means the cultural essence of something is lost to too much adaptation [3]. Recent scholarship shows that systematic design methodology can resolve the above contradictions, give birth to new life for heritage elements, and at the same time not lose the basic cultural heritage culture. Digital technologies especially are able to bring about transforming power in documentation, creative reinterpretation, and experience transmission for heritage [4].

This study focuses on the three interrelated issues. First, how to systemize the transformation of the translation of traditional cultural elements into contemporary product design languages and maintain the symbol appearance at the same time? Secondly, in what ways can new emerging digital technology enhance both the level of preservation and competitiveness of ICH cultural products on the market? Third, what kind of response strategies should user-centered design take to meet the changing needs of consumers, especially younger consumers who will be the next generation of heritage inheritors?

2 Theoretical Framework and Literature Review

The theoretical basis for ICH cultural product development is the convergence of cultural industry theory, a heritage preservation framework, and contemporary design knowledge. The non-material cultural heritage Blue Book released by Sun Yat-sen University has established a protection-transmission-innovation framework, highlighting systematic approaches to the sustainability of heritage with a multi-party cooperation model involving enterprises in the cultivation of heritage bearers and the construction of cultural ecology protection zones [1]. Such a policy framework means the move away from a passive type of protection to one that actively engages in market mechanisms. Tang Y's bibliometric analysis of 2,744 academic papers shows that the three most prominent research perspectives in Chinese ICH studies are protection-oriented approaches emphasizing legal norms, transmission-focused investigations analyzing educational mechanisms, and development-oriented research on industrialization paths [5]. This tripartite arrangement expresses the idea that scholars' recognition of how to properly protect heritage is transitioning towards the need for a combined policy, practice, and economic strategy to be employed at once.

Cultural translation theory becomes the methodology of designing ICH products at present. Liu Yuanxia and Yin Jun’s highly cited works on Taohuawu woodblock prints built a three-stage transformation model of cultural gene recognition, symbolic transformation, and carrier adaptation [6]. This framework shows that successful heritage product development needs to carry out systematic extraction of the cultural elements on the level of morphology, semantics, and spirit, and then realize such elements through contemporary design languages for corresponding material carriers. Zhang Aiping's basic research builds a hierarchical translation system, dividing it into form layer, meaning layer, and spirit layer transformations [7]. This theoretical architecture is to help designers preserve the cultural characteristics in the modern aesthetic

integration. Recent extensions by Wenrui Ji and his team have proposed multiple translation paradigms with multi-dimensional dimensions, which can achieve multi-dimensional translations including visual morphology, cultural connotation, and usage context at the same time, emphasizing the simultaneous design of all these aspects [8]. Such refinement of methods enables a more precise approach to cultural elements and reinterpreting.

Digital technology integration is the most advanced research front. Wen Wang made an all-round study on the applications of Artificial Intelligence Generated Content (AIGC) in ICH product design and got a data deconstruction-algorithm generation-human-machine collaboration innovation model [9]. Yumeng Hou's systematic analysis traces the process of ICH digitalization through informatization, online, and intelligentization stages, pointing out that technological innovation, institutional design, and multi-stakeholder participants are the three key research dimensions [10].

Table 1. Theoretical Framework Summary for ICH cultural product Design.

Theoretical Domain	Core Concepts	Representative Scholars	Application Value
Cultural Translation Theory	Cultural gene-symbolic translation-carrier adaptation	Liu Yuanxia[6], Zhang Aiping[7]	Design methodology construction
Digital Heritage Theory	Informatization-online-intelligentization progression	Yumeng Hou[10], Wen Wang[9]	Technology roadmap guidance
User Experience Theory	Function-emotion-cultural identity hierarchy	Yongli Dai[11]	Market positioning strategy

The theoretical synthesis presented in Table 1 shows the multi-dimensional knowledge that supports current research on ICH product design. Each theoretical domain deals with different but interrelated aspects of the design challenge, together building a whole structure of practice and exploration.

3 Digital Design Methods for ICH Cultural Product Development

Artificial intelligence technologies completely reshape the traditional ICH product design workflow by means of intelligent automation and improving creativity. The AIGC-based design process is divided into three stages: the first stage is data disassembly, that is, to utilize systematic digitization and machine learning for the analysis of heritage elements; The second stage is algorithm production, which creates variation based on the pattern learned from culture; and the third stage is the collaboration of human and machine, in which the designers will refine and verify the AI proposal based on their professional judgment. This workflow will be able to move forward the idea stage quickly and come up with more answers than the usual human could come up with.

Virtual reality technologies make almost unparalleled immersive experiences surpassing the physical limitations of heritage shows. Three-dimensional scanning and modeling technology to capture detailed information of traditional crafts such as embroidery stitches, ceramic glaze, and bamboo weaving patterns with a very fine eye. These digital twins have two effects: all-round records and knowledge inheritance for

when old masters of craftsmanship retire, and interactive learning platforms where people from all over the world can visit virtual workshops and exhibitions to learn about the inheritance of heritage processes.

4 User-oriented Design Strategy and Market Adaptation

Yongli Dai's basic research has set up a three-tier need hierarchy for cultural creative products, including functional needs, emotional wishes, and cultural identity aspirations [11]. The current market demand is presented as the needs of the Gen Z group, which will be the main heritage stakeholders in the future, and they have different preference characteristics, including strong cultural consciousness, high expectations of emotion, and digital experience.

Table 2. Consumer Preference Analysis for ICH Cultural Products (Survey N = 856).

Design Dimension	Importance Weight	Satisfaction Score	Priority Category
Cultural Authenticity Representation	0.342	3.85/5.0	Performance
Contemporary Aesthetic Design	0.287	4.12/5.0	Performance
Digital Interactive Experience	0.196	3.56/5.0	Excitement

According to Table 2, consumers are the research content of the studies, and it has been revealed that cultural authenticity presentation has the highest importance weight but maintains a medium satisfaction level, which suggests that further enhancement in consumer satisfaction can be done. Vegheș C's research identifies that brand construction is a fundamental element of the market success of ICH products [12]. Branding strategy consists of these three parts that are interrelated with one another: First part is taking culture related symbol and giving a visual image to grab market recognition; second part is to tell stories that deliver both heritage values and up to date message; And third part is experiential touch points forming consumers' memory.

5 Case Analysis and Implementation Framework Only English Version

In an in-depth analysis by Yanan Fu of the way craft arts go about becoming industrialized, three basic ways of doing so can be observed: there is a cultural link up, meaning making use of traditional heritages that connects to what modern day consumers desire, creative empowerment via design innovation as well as introducing some sort of technology, and finally, mutual benefits that arises as several different groups, those such as carrying out the craft art, persons who have designs and make things, and those who buy things, each get something from it. [13]. Those mechanisms work together to translate those cultural resources into sustainable livelihoods and preserve heritage as a whole. The implementation framework shown in Figure 1 that is proposed integrates the theory into practice guidance for practitioners. The framework develops through the following five interrelated processes: a complete heritage investigation and documentation is done, then systematic extraction and design transformation of cultural elements

takes place, digital technology is combined with the construction of prototypes, it moves on to user testing and refinement, and finally market launch and continuous performance monitoring take place.

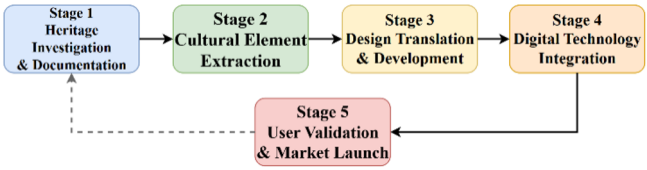

Fig. 1. Five-Stage ICH Cultural Product Development Framework.

Long-term sustainability requires economic viability, cultural integrity, and social benefit all at the same time. Economic sustainability is realized by profitably achieving the desired business model of producing enough income for the cultural bearers and paying for the continued preservation efforts. Cultural sustainability means carefully observing to make sure commercial use raises rather than waters down heritage values, keeping things that make something unique.

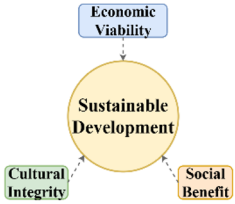

Fig. 2. Sustainability Triangle Model.

Fig. 2 is a three-dimensional sustainability model for ICH cultural product development with the balanced integration of economic viability, cultural integrity, and social benefit. Triangular: Dependencies are needed and improved simultaneously in all dimensions for long-term success.

6 Conclusion

This research has provided a complete theoretical and methodological basis for the inheritance of intangible cultural heritage through the development of cultural and creative products. The synthesis of cultural translation design methods, the integration of digital technology, and a focus on user-centered design provide practical guidance for heritage practitioners, designers, and policymakers involved in heritage revitalization. Chinese traditional handicraft categories have demonstrated via empirical study that the former practices, which managed the balance of cultural integrity together with present-day market necessities, perform more effectively than prior ones.

We should highlight a number of noteworthy findings here. First of all, through cultural translation frameworks, heritage elements can be systematically transformed into

contemporary design languages and still retain their core cultural meanings. Second, emerging digital technologies, especially AIGC and virtual reality, significantly improve the preservation quality and market competitiveness. Third, from user research, it can be concluded that cultural authenticity is most important to the consumers of digital interactive experiences. Fourth, sustainable industrialization requires achieving economic viability, cultural integrity, and social benefit at the same time, without prioritizing any one. Future work should fill out several of the gaps I have noted. Longitudinal studies follow up on the long-term influence of commercial involvement on heritage authenticity to enhance the theory of sustainability dynamics. Comparative international research on different cultural contexts could find out the general principles and culture-related factors in heritage product development. These research directions will also contribute to advancing academic studies and implementing heritage protection methods in a changing cultural environment.

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