

The Impact and Driving Mechanism of Digital Technology on the Interactive Development of Cultural Tourism and Cultural Creative Industries and Urban Renewal

Miaomiao Hu^a, Yang Wang^{b,*}

Faculty of Geography, Yunnan Normal University, Kunming, Yunnan, China

^ahmniazb@outlook.com, ^b210058@ynnu.edu.cn

*Corresponding author

Abstract: With the rapid advancement of information technology, digital technology has become a significant force in driving the transformation and upgrading of the cultural industry as well as the reconstruction of urban spaces. This paper seeks to investigate the impact and mechanisms by which digital technology fosters the synergistic development of cultural tourism, the cultural and creative industries, and urban renewal, with a specific focus on the Jinsha Site Museum in Chengdu, China, as a case study for in-depth analysis. The study reveals several pivotal insights: (1) Digital technology, serving as an external catalyst, has not only accelerated the digital transformation of the cultural tourism and creative sectors but also enhanced the city's cultural soft power and attractiveness through the provision of intelligent and personalized services, thereby promoting the diversification of urban functions and the revitalization of spatial dynamics. (2) The Jinsha Site Museum in Chengdu, China, utilizes digital technology to innovate and augment the display of cultural artifacts, effectively broadening the scope of cultural communication and engagement. (3) The museum's digital transformation has catalyzed commercial development in the surrounding area, expanded cultural tourism routes, and shaped urban cultural brands, positioning it as a model for cultural leadership and industrial progress within the framework of urban renewal.

Keywords: Digital technology, Cultural tourism and cultural creative industries, urban renewal, interactive development

1. Introduction

Amidst the tide of information and globalization, modern information technologies such as computers, the Internet, mobile communications, the Internet of Things, big data, artificial intelligence, and virtual reality have rapidly evolved, bringing profound transformations to various sectors [1]. Against this backdrop, the tourism industry has ushered in a new era of digital tourism [2]. In terms of the application of digital technology, firstly, digital technology has radically altered the presentation and experience of cultural heritage, transforming static displays into dynamic, interactive experiences [3]. Secondly, technologies like virtual reality (VR) and geographic information systems (GIS) have played a significant role in the documentation and preservation of cultural heritage [4]. Furthermore, the application of digital information platforms has fostered the development of cultural landscapes and heritage sites [5]. These technologies not only enable the digitization of cultural heritage but also extend its accessibility and engagement, enhancing the role of the Jinsha Museum in cultural tourism. Additionally, Zhou and Yuan have noted that the use of digital technology in folk crafts and cultural heritage not only aids in conservation but also promotes sustainable tourism practices [6]. This dual focus on preservation and promotion is crucial for the sustainable development of Chengdu's cultural tourism and creative industries.

Digital technology has emerged as a formidable catalyst for the convergence and advancement of the cultural tourism industry. Its swift progression is not only pivotal to urban renewal and sustainable development but also instrumental in fostering enhanced synergies within urban environments [7]. Moreover, it has been a key component in the smart city initiatives of major European cities, as articulated in strategic formulations [8]. Around the globe, there exists a close connection between the cultural and tourism creative industries and urban renewal. These industries are consistently regarded as a driving

force for economic growth and urban development in many cities worldwide.^[9] Urban renewal, a critical facet of urban development, finds its synergy with the cultural tourism and creative industry to be essential for achieving interactive growth. Many cities have embarked on urban renewal projects that focus on the theme of creative cultural products or have leveraged cultural activities to drive urban revitalization^[10]. These initiatives not only deepen the cultural fabric of the city but also stimulate economic development, highlighting the interplay between cultural enrichment and economic prosperity.

2. Research area and method

2.1. Study Area

Figure 1 depicts the Jinsha Site Museum in Chengdu, China, which was the capital of the ancient Shu Kingdom, a center of civilization in the upper reaches of the Yangtze River from the 12th century BC to the 7th century BC. It was selected as one of the "Top Ten Archaeological Discoveries of 2001 in China," designated as a Key National Cultural Relics Protection Unit, and included in the first batch of National Archaeological Site Parks. Together with the Sanxingdui Site, it has been listed on the "Tentative List for World Cultural Heritage in China." The emergence of the Jinsha Site has pushed back the history of Chengdu's establishment from approximately 2,300 years ago to around 3,000 years ago, which has an immeasurable impact on enhancing the city's reputation as a historical and cultural city. Since its discovery, the Jinsha Site has attracted widespread attention from both domestic and international communities.

The discovery of the Jinsha Site in Chengdu, China, has significantly expanded the connotations and extensions of the ancient Shu culture, holding substantial significance for the study of the origins, development, and decline of the Shu culture. Particularly, it has provided compelling evidence for unraveling the mystery of the sudden disappearance of the Sanxingdui civilization. The Jinsha Site has resurrected a lost history, recreating the splendor of the ancient Shu kingdom. The museum has harnessed digital technology to excavate its collections, developing distinctive cultural and creative products. These products are then promoted through online channels such as e-commerce platforms, enriching the creative market and expanding cultural influence. This demonstrates the pivotal role of digital technology in transforming cultural resources into economic value. It has been proven that the Chengdu Plain is the center of civilization origin in the upper reaches of the Yangtze River and an essential organic component of the Huaxia civilization. This provides crucial evidence for the establishment of the "multi-unity" theory on the origins of ancient Chinese civilization.



Figure 1: Aerial view of the Jinsha site in Chengdu, China

2.2. Research Methodology

2.2.1. Logical Reasoning Method

The types of logical reasoning can be categorized based on the direction of thought in the reasoning process. One category involves reasoning from the particular to the general, with the primary forms being induction and analogy. The other category involves reasoning from the general to the particular, with the primary form being deduction. This paper, drawing on existing theories of digital technology, cultural tourism and creative industries, and urban renewal, reviews relevant literature and employs deductive reasoning to explore the interactive relationships among these three domains from multiple perspectives. It discusses the interactions between digital technology and the cultural tourism and creative industries,

between digital technology and urban renewal, and between cultural tourism and creative industries and urban renewal. From these discussions, a model of their interactive development is synthesized.

2.2.2. Case Study Method

The case study method is a research approach that focuses on the analysis of actual cases. It primarily concentrates on the uniqueness of the case study object and uses the case to illustrate the "essence" within a particular discipline. This paper selects the Jinsha Site Museum in Chengdu, China, as a case study to analyze the current state of interaction between digital technology, urban renewal, and the development of the cultural tourism industry during its development process, thereby validating its operational mechanism model.

3. Results and Analysis

3.1. The Intrinsic Mechanism of Digital Technology Driving the Interaction between Cultural Tourism, Creative Industries, and Urban Renewal

Digital technology, as an external driving force, plays an auxiliary and accelerating role in the development of the cultural and tourism creative industry and urban renewal. The application and innovation of digital technology can not only improve efficiency but also promote the development of new industries and business forms, thereby driving comprehensive economic and social progress. As shown in Figure 2, digital technology, as an external driving force, reshapes the cultural and tourism creative industry and profoundly influences the path of urban renewal through multi-dimensional pathways such as cultural activation, spatial integration, smart services, community co-creation, and sustainable development strategies. Under the traction of this force, the two have formed a close interactive relationship.

When discussing internal driving factors, a "square outside and circle inside" model is adopted. Since urban renewal is a rather broad topic, urban renewal is represented by the outer square in Figure 2, while the inner circle represents the interactive effects between the cultural and tourism creative industry and urban renewal. The four aspects contained within the cultural and tourism creative industry interact and promote each other with urban renewal. This collaboration and integration are conducive to forming a synergistic force that drives the development of the entire system or region.

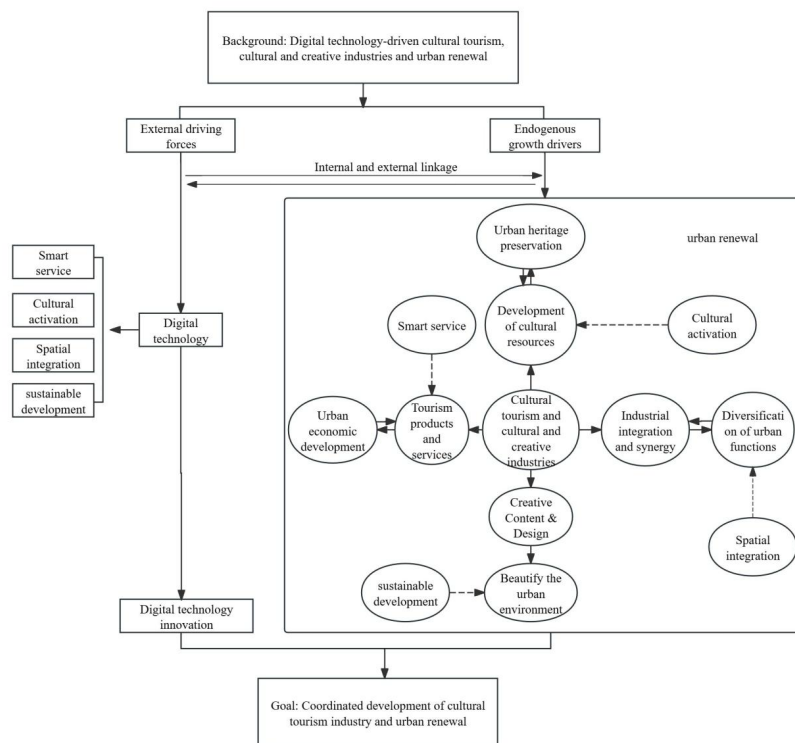


Figure 2: Illustration of the interactive mechanism of digital technology-driven cultural tourism, cultural creativity and urban renewal

3.2. The Manifestation of Digital Technology in Driving the Interaction between Cultural Tourism, Creative Industries, and Urban Renewal at the Jinsha Site Museum

3.2.1. External Driving Force: Application of Digital Technology

The Jinsha Site Museum employs digital technology to a high degree, utilizing a variety of forms such as phantom imaging, augmented reality, virtual reality, and 3D animation technologies. These technologies present cultural relics and archaeological sites in innovative ways, offering visitors a richer and more in-depth cultural experience. The museum has created multiple interactive experiences through digital technology, including the "Archaeological Time Portal" digital experience project, which leverages 3D modeling and virtual reality to immerse visitors in a navigable, interactive virtual archaeological journey. Through the use of interactive LED wall screens and floor screen devices, visitors can engage in a simulated archaeological excavation process, experiencing the thrill of archaeology and gaining a deeper understanding of the context of the relics and unearthed artifacts.

Furthermore, the Jinsha Site Museum uses digital technology for the popularization and education of archaeological findings. The exhibition hall features a 4D cinema that regularly screens the 4D film "Dreams of Jinsha," which employs state-of-the-art audiovisual technology to transport audiences back 3,000 years in time, allowing them to experience the grandeur of the ancient Shu Kingdom from the Du Yu Dynasty to the Kaiming Dynasty.

3.2.2. Endogenous driving forces: interactive development and interaction

(1) Integration of Digital Technology with the Cultural Tourism and Creative Industries

With the continuous advancement of digital technology, it has had a profound impact across various fields. The question of how to bring cultural relics to life has become a hot topic in China's museum community. Several large museums in the country have kept pace with the times by introducing a diverse range of creative products. By integrating e-commerce platforms to conduct convenient and efficient online marketing of these products, this approach is set to become a significant channel for the promotion and sale of museum creative products. Methods such as mini-programs, Taobao, Weibo, and others are being utilized. Nowadays, every museum has its own WeChat public account for disseminating various types of news, allowing consumers to stay informed about the latest updates. Additionally, official top-spot advertisements can be released on commonly used platforms to increase the popularity of creative products.

The Jinsha Site Museum in Chengdu has combined digital technology to develop a series of creative products with distinctive Jinsha cultural features, such as digital replicas and interactive educational toys. These products not only meet the shopping needs of visitors but also promote the inheritance and development of culture. In September 2016, an app named "Jinsha Site Museum" was launched, which serves the Touch Magic Card series designed with elements from the museum's collection. This app is an interactive software based on AR technology. Users can download the software and scan postcards with the app to view the three-dimensional effects of the cultural relics on their mobile phones or iPads. They can also learn about the history of the relics through AR photography, voice interaction, and other engaging methods. Breaking through traditional limitations, the app combines "culture + technology," allowing cultural relics to come alive on screens, making them more appealing to the general public who seek spiritually enriching cultural and creative products.

(2) Digital Technology and Urban Renewal

The Jinsha Site Museum employs advanced technologies such as 3D modeling, virtual reality, and augmented reality to recreate the splendid scenes of the ancient Shu culture, providing visitors with an immersive exhibition experience. This has enhanced public awareness and interest in historical culture, thereby stimulating the development of the city's cultural tourism industry. The museum conducts online activities through virtual exhibitions, digital tours, and live streaming, disseminating its rich cultural relics and connotations to a broader geographical area and audience, breaking the traditional spatial and temporal constraints of museums. This not only expands the museum's influence and reputation but also fosters the dissemination and exchange of urban culture, infusing new vitality into the city's cultural construction.

The Jinsha Site Museum also fosters the protection and inheritance of urban cultural heritage through digital technology. The museum uses digital methods for the restoration and preservation of cultural relics, ensuring their safety and integrity. Furthermore, through digital display and dissemination, the Jinsha Site's historical and cultural district thrives with the museum as its anchor. The museum enables more

people to understand and recognize the city's cultural heritage, providing cultural support for the city's sustainable development.

(3) Interaction between Cultural Tourism, Creative Industries, and Urban Renewal

The Jinsha Site Museum, leveraging its abundant cultural relics, has designed and developed a series of cultural and creative products with local characteristics and cultural connotations. This has stimulated the development of related industry chains and provided new impetus for urban economic growth. The museum's prized possessions—the Sun God Bird and the Bronze Standing Figure—are featured on the world's largest naked-eye 3D+4K spherical screen. In 2021, the Chengdu Culture, Radio, Television, and Tourism Bureau, in collaboration with the Jinsha Site Museum, showcased their renowned IP in Shanghai. By employing a 1:1 replica modeling technique, the Shanghai Meilong Metaverse has achieved the most faithful reproduction of the collection, drawing global attention to Chengdu's culture. The seamless integration of culture with advanced technological methods has provided an interactive experience for the public. This cross-industry collaboration has facilitated cultural exchange between Chengdu and Shanghai, significantly promoting the promotion of Chengdu's regional culture and offering a new technologically empowered approach to building urban cultural identity.

3.2.3. Interactive Development through Internal-External Linkages

The Jinsha Site Museum in Chengdu, serving as a modern museum that integrates education, research, leisure, and entertainment, stands as a quintessential example of how digital technology drives the interaction between the cultural tourism and creative industries and urban renewal. It exemplifies the internal and external interactions facilitated by digital technology in these domains:

(1) In-depth Exploration and Utilization of Cultural Resources

The Jinsha Site Museum in Chengdu employs methods such as 3D reconstruction and virtual reality to digitally recreate the ancient Jinsha cultural site. It collaborates with various dimensions of popular culture, including film, gaming, catering, media, publishing, and fashion, to extend the museum's cultural resources into every aspect of life. By animating the museum's cultural relics and deeply excavating the historical culture behind the exhibits, and integrating these with modern creative designs, the museum transforms a rich cultural backdrop into widely appealing products. This approach better integrates into people's lives and drives in-depth renewal within the cultural tourism and creative industries.

(2) Integration of Cultural Tourism Industry with Urban Space

As a component of the cultural tourism and creative industries, the Jinsha Site Museum in Chengdu has leveraged digital technology for precise market marketing and the development of cultural and creative products. Through online platform promotion, the museum has attracted a substantial number of visitors, stimulating the local tourism economy. Additionally, the museum's sale of cultural and creative products, such as replicas and souvenirs, which blend modern aesthetics with traditional Jinsha cultural elements, are highly favored by tourists. These industry activities not only enrich the urban cultural connotations but also enhance the economic value of urban spaces.

(3) Optimization of Urban Functions

The Jinsha Site Museum in Chengdu offers guided services, online ticketing, and virtual tours through smart tourism platforms, significantly enhancing the visitor experience. Moreover, the museum utilizes big data technology to analyze tourist traffic and visitation patterns, providing a scientific basis for traffic planning and the layout of public facilities. For instance, adjusting guided tour routes based on visitor flow data and optimizing parking lot layouts are concrete manifestations of how digital technology drives the optimization of urban functions.

3.3. Operational Mechanism

Figure 3 illustrates the operational mechanism of the Jinsha Site Museum in Chengdu, depicting the complete process from digital strategic planning to implementation, emphasizing the protection and utilization of cultural heritage, the construction and development of urban culture, and the significant role of digital technology within. The entire process is broadly divided into three stages: the digital strategic planning phase, the establishment of a two-way interactive mechanism phase, and the implementation, feedback, and optimization phase.

Digital technology, by leveraging user preferences and demands, offers personalized content customization services. Through the integrated development of digital technology and the cultural

creative industry, traditional cultural industries are undergoing digital transformation and upgrading. This process not only deepens the city's cultural heritage but also significantly enhances the added value and market competitiveness of the cultural industry. Furthermore, the process of industrial optimization and upgrading includes the construction, implementation, and feedback optimization of the two-way interactive mechanism as shown in Figure 3, highlighting it as a dynamic system that continuously evolves and upgrades, requiring constant strategic adjustments and optimizations based on market trends and user feedback.

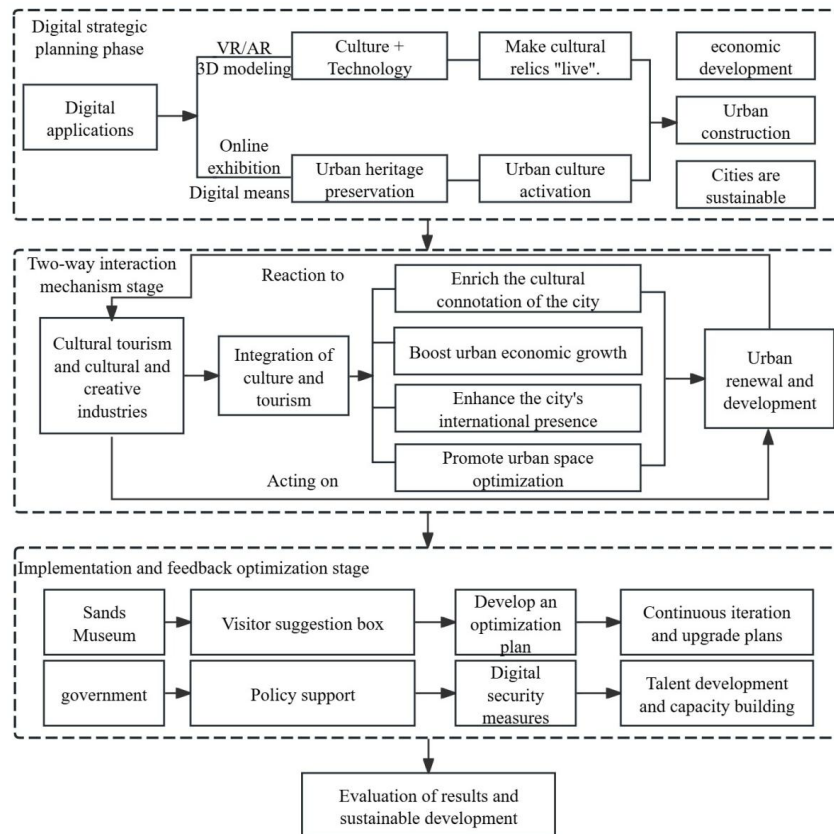


Figure 3: Diagram of the interactive development operation mechanism of Chengdu Jinsha Site Museum

4. Conclusion

This paper posits that digital technology is a pivotal force in driving the interactive development between the cultural tourism and creative industries and urban renewal. The innovative application of digital technology not only facilitates internal transformation and upgrading within the industry but also catalyzes the reconstruction of urban spaces and the shaping of cultural brands, thereby injecting new impetus and vitality into the sustainable development of cities. The results show that (1) Taking the Jinsha Site Museum in Chengdu, China, as an example, it is evident that digital technology, as a potent external driving force, has not only propelled in-depth digital transformation within the cultural tourism and creative industries but has also significantly enhanced the city's cultural soft power and attractiveness through intelligent and personalized service methods. This has provided robust support for the diversification of urban functions and the revitalization of spatial vitality. (2) The digital transformation of the museum is not confined to the innovation of its internal operations; it has also stimulated the prosperity of surrounding businesses, promoted the expansion and integration of cultural tourism routes, and provided significant support for the shaping and dissemination of the city's cultural brand. (3) The Jinsha Site Museum in Chengdu, China, under the joint influence and mutual promotion of these factors, has become a paragon of cultural leadership and industrial upgrading in urban renewal, fully demonstrating the immense potential and value of digital technology in driving the interactive development of the cultural tourism and creative industries and urban renewal.

Looking ahead, with the continuous advancement and deepening application of digital technology, we have reason to believe that the interactive development between the cultural tourism and creative industries and urban renewal will exhibit a more diverse, efficient, and collaborative new dynamic.

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