Green Communication and Ecological Exploration of the Digital Museum of Intangible Cultural Heritage in Shaanxi

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Abstract: *The Intangible Cultural Heritage (ICH) Museums in Shaanxi embody the ancient genes and cultural wisdom of the Sanqin region. In the era of rapidly advancing information technology, the transmission of intangible cultural heritage is challenged by modern civilization and foreign cultural influences. A lack of awareness and appreciation among younger generations has led to the disappearance or endangerment of many ICH items. The construction of Shaanxi's Digital Museum of Intangible Cultural Heritage has played a crucial role in promoting the preservation of these traditions. However, its communication strategies and ecological framework remain in need of improvement. This study uses questionnaire surveys to examine public awareness, usage, promotion, and dissemination channels related to Shaanxi's digital ICH museum. Based on the current status and user experiences, the paper explores strategies for green communication and dissemination ecology, offering new perspectives for the construction and inheritance of digital ICH museums in China.*

Keywords: Intangible Cultural Heritage; Digital Museum; Users; Green Communication; Communication Ecology.

1. INTRODUCTION

Shaanxi is one of the major cradles of Chinese civilization. Its unique natural geography and rich cultural environment have given rise to an intangible cultural heritage (ICH) landscape characterized by the convergence of northern and southern traditions, the intersection of eastern and western cultures, and a diverse, symbiotic ecosystem. According to publicly available data from the State Council and the Ministry of Culture and Tourism of China (excluding data from Taiwan Province), as of June 30, 2021, Shaanxi had 91 nationally recognized representative ICH items.

The digitalization of Shaanxi's ICH museums aims to comprehensively display the province's abundant intangible cultural resources and preserve their achievements. Through multidimensional digital technologies, these museums present and disseminate the historical context, production techniques, and cultural connotations of various ICH items. Users can gain a clear understanding of the cultural background and current status of specific heritage projects via digital platforms.

The concept of the digital ICH museum falls under the broader framework of digital museums, utilizing computer-based technologies to present ICH content in a digital format that sustains and protects its vitality. However, tensions between traditional museum models and contemporary heritage preservation philosophies have long existed. Criticisms such as "detachment from authenticity" and "heritage ossification" remain prevalent — particularly for ICH, whose intangible, dynamic, and spatiotemporal characteristics necessitate the extensive use of visual media, interactive exhibits, and "virtual + physical" scenarios. Consequently, how to optimize the green communication strategies and ecological dissemination frameworks of digital ICH museums has become a central focus of current academic and practical interest.

2. PUBLIC AWARENESS, UTILIZATION, PROMOTION, AND COMMUNICATION OF THE SHAANXI DIGITAL MUSEUM OF INTANGIBLE CULTURAL HERITAGE

This study employed both online and offline survey methods, conducted from June 1 to June 15, 2022. The online questionnaire was distributed via the "Wenjuanxing" platform, collecting 73 valid responses. Offline surveys targeted undergraduate students from three universities in Xi'an — Xi'an Jiaotong University, Xi'an Academy of

Fine Arts, and Xi'an Eurasia University—with 100 questionnaires distributed at each institution. The number of valid responses collected were 81, 100, and 65 respectively, totaling 319 valid questionnaires. All respondents were undergraduate students aged between 19 and 24.

2.1 Visitation Status of the Digital ICH Museum

Among the respondents, 67% were students from within Shaanxi Province. In terms of locality distribution: 33% were from provincial capitals, 37% from tier-2 or tier-3 cities, 21% from small towns, and 9% from rural areas. The results show that only 61% of participants had previously visited the Shaanxi ICH Museum. Of these, 44% had browsed the digital museum online, and 57% had experienced its digital features.

These findings indicate that people from better-developed environments and more urbanized areas tend to have greater awareness and acceptance of ICH museums and show a stronger demand for their digital development.

2.2 Motivations for Visiting the Museum

The motivations for visiting the museum were distributed as follows: 12.6% for personal interest or hobbies; 13.7% for tourism or school-organized activities; 17% for academic research; 45% for personal knowledge enhancement or cultural enrichment; and 11.7% for social interaction. Regarding the use of online guided tours, 95% of respondents expressed willingness to participate, with 31% citing pandemic-related reasons, 54% citing time and cost efficiency, and 10% citing other factors. As for the mode of visitation, 57% preferred to visit with friends or family, 11.6% visited alone, and 31.4% participated in school or group-organized visits.

Most participants reported visiting for personal enrichment and intellectual development, with interest and academic research also playing significant roles. This suggests that the museum's educational and cultural functions are recognized, though not yet fully leveraged. Key reasons for low public engagement with digital ICH exhibitions include: (1) lack of time, (2) lack of interest, (3) unsatisfactory interactive or digital experiences, and (4) difficulty understanding the content. These insights point to the need for enhancements in both physical and digital presentation, while also highlighting a general lack of effective user pathways to navigate digital museum experiences.

2.3 Preferences for Digital Introduction Methods

According to the survey, 49% of students preferred in-person docent-led tours, while 39% favored audio guides or guided tours via public platforms such as WeChat. Although the public has begun accepting audio guides, several shortcomings were identified: (1) lack of interactivity, (2) monotonous and unengaging content, (3) absence of Q&A mechanisms, and (4) poor mobile signal reception affecting app performance. These issues offer concrete guidance for improving future audio guide systems.

2.4 Preferences for Digital Exhibition Formats

Survey results show that the most favored form of digital display was physical object presentation (36%), followed by VR and interactive multimedia (34.8%), video explanations (17.5%), and text-image formats (11.7%).

A total of 83.2% of participants rated the current state of digital development in the Shaanxi ICH Museum as "average," with only 3.4% expressing satisfaction. These responses suggest that the museum is still in the early stages of digital transformation, and that many advanced technologies have yet to be implemented. Public expectations are shifting toward more immersive and engaging experiences such as virtual reality (VR), interactive gaming, immersive storytelling, and AR/VR scene reconstruction—highlighting potential directions for the museum's digital display strategies.

2.5 Communication Channels and Dissemination Pathways

According to the questionnaire, 75.2% of respondents accessed information about the digital museum through social media platforms such as Douyin (TikTok), Kuaishou, WeChat Official Accounts, Xiaohongshu (RED), and WeChat Moments. An additional 20.2% learned about the museum via word of mouth, and 4.6% through creative cultural souvenirs and gift products.

Analysis of the results reveals several reasons for the weak public recognition, usage, and engagement with the digital ICH museum:

1) The "strong-get-stronger, weak-get-weaker" phenomenon in museum development, with digital infrastructure in most ICH museums remaining underdeveloped and lacking innovation;

2) Digitalization for its own sake—standardized use of projection and video formats falls short of user expectations for interactive digital experiences;

3) Limited financial resources, leading to inadequate infrastructure and lower-quality collections;

4) A general lack of public initiative and awareness regarding the importance of intangible cultural heritage and the shared responsibility of its preservation;

5) Insufficient governmental attention, with limited effective publicity and supporting commercial policies.

3. CURRENT STATUS AND GREEN COMMUNICATION PATHWAYS OF THE SHAANXI DIGITAL MUSEUM OF INTANGIBLE CULTURAL HERITAGE

In the contemporary information age, the Shaanxi Digital Museum of Intangible Cultural Heritage, though limited in scale and resources compared to large national digital museums, holds considerable potential in the areas of artifact exchange, cultural transmission, heritage protection, and commercial application of ICH. These demands underscore the equal importance of green communication strategies and dissemination pathways alongside heritage preservation.

Survey results indicate that a significant portion of the public chooses to access museum content online due to time and cost constraints. According to the first museum data report published on the Douyin (TikTok China) platform, as of May 2021, more than 33.89 million museum-related videos had been uploaded, with 72.3 billion views and nearly 2.1 billion likes. Such public enthusiasm is poised to become a powerful driver of national digital museum development.

In a collective study session of the 19th CPC Central Committee Political Bureau on May 27, 2022, President Xi Jinping emphasized the need to "bring more cultural relics and heritage to life" and to foster a strong societal atmosphere for preserving Chinese civilization. Cultural relics and heritage are irreplaceable resources carrying the genetic legacy and spirit of the Chinese nation. It is essential to protect and utilize these resources, explore their multifaceted value, and disseminate symbols and cultural products that reflect Chinese culture and spirit.

The protection and transmission of intangible cultural heritage through the Shaanxi Digital ICH Museum are primarily manifested in the following green communication and ecological dissemination strategies:

3.1 Science-Based Public Communication

A core feature of green communication in the Shaanxi Digital ICH Museum is its adherence to a science-based communication model guided by the "5W" approach (Who, What, When, Where, Why). This model enables the museum to analyze and disseminate digital content more effectively. For instance, in the digital display of Qin embroidery, a representative ICH item of Shaanxi, the museum could utilize "virtual artifacts" to visualize complex stitching techniques in 3D form from multiple perspectives. Through projectors, the processes of fabric stretching, draft sketching, and needlework can be virtually reconstructed and integrated with physical exhibits to create an immersive experience. Simultaneously, these processes can be archived via imaging, scanning, and modeling into the museum's database for further development using emerging digital media technologies—thus preserving the authenticity and vitality of heritage content within a green communication framework.

3.2 Experiential and "Living" Communication

As Li Qiusheng points out in The Value and Methods of Oral History in the Transmission of Local Intangible Cultural Heritage, digital media technology has reshaped how modern society receives information. Transforming oral histories of heritage inheritors into accessible formats such as documentaries or short films is crucial for engaging younger audiences in ICH preservation. The Shaanxi ICH Museum has already begun inviting cultural

inheritors to participate in live demonstrations and interactive events, bringing dynamic folk practices into the museum space. As an institution of cultural transmission, the museum should cater to the public's need for simplified and engaging presentations. Through accessible oral storytelling, on-site demonstrations, and interactive visitor experiences, ICH items can be transformed into "living heritage"—enabling more intimate, experiential, and meaningful public engagement.

3.3 From Mass Communication to Interpersonal Communication

Survey data suggest that young audiences increasingly regard ICH museums as spaces for social engagement and conversation. Many young visitors share their museum experiences on social media platforms or within their personal networks, sparking broader discussions and social interaction. Meanwhile, digital ICH museums have begun offering virtual meetings, online communities, and VR-based browsing functions to facilitate interaction. Heritage items like Qin embroidery, cloth collage art, felt-making, papercutting, and leathercraft have become trending topics on social media, blending tradition with contemporary lifestyles. During physical visits, interactions between visitors, docents, and staff also foster informal learning and socialization—signaling a shift from mass dissemination to interpersonal communication.

3.4 From Communication Subject to Communication Medium

The Shaanxi Digital ICH Museum breaks the temporal and spatial constraints of physical museums and provides new dissemination routes. Visitor experiences now extend from physical to virtual and hybrid spaces, with engagement spanning the entire pre- and post-visit lifecycle. The boundaries between storytelling spaces blur and overlap, embedding cultural encounters seamlessly into daily life. The digital museum not only fulfills academic and educational roles but increasingly functions as a communication medium in its own right. This medium-based role enables segmented dissemination, catering to both professional researchers and general enthusiasts alike. Tailored, engaging, and personalized digital displays—based on user preferences—can increase audience stickiness and enhance the communication ecosystem of the museum.

4. CONCLUSION

To effectively explore green communication and ecological strategies for the Shaanxi Digital Museum of Intangible Cultural Heritage, a clear understanding of its role and position is essential. "Meeting public demand" must remain the core objective of the museum's digital development. Its advancement requires joint support from government, enterprises, academia, and cultural inheritors. Beyond changing lifestyles, digitalization and internet technologies have opened new pathways and ecosystems for heritage transmission and innovation.

By integrating storytelling, immersion, gamification, and social interactivity, the Shaanxi Digital ICH Museum is beginning to merge its communicative content with its digital form. This fusion encourages active audience participation and the co-creation of personalized knowledge and dissemination systems. Consequently, the museum is steadily evolving toward a unique communication model tailored to the mobile information era.

FUNDING STATEMENT

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