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Digital Museums: A Comprehensive Review of Core Characteristics and Future Directions

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Abstract: *Digital museums as a concentrated display of digital technology empowering the cultural heritage sector have changed the way in which cultural resources are conserved, interpreted, and disseminated. They have also become an indispensable part of the global cultural sphere. This study intends to present the paradigmatic characteristics systematically that differentiate digital museums from traditional museums and to forecast some future trends of digital museums. According to the literature analysis, the core characteristics of digital museums are reflected in the following three aspects: interaction, which stimulates audience participation through touchscreens, VR/AR, and other human-computer interaction technologies to create an interactive and personalized experience; global access, which breaks through the geographical and physical limitations and greatly promotes democratization and popularization of cultural resources; and multimedia convergence, which combines video, animation, and game elements to enhance audience participation through interactive storytelling. In the future, the personalized guiding tour will be realized based on AI; the whole experience will be more immersive with the application of XR; blockchain can be used to authenticate rights and fight counterfeiting; and it will become even more useful for social and educational purposes by cooperating with schools. This paper concludes that the healthy development of digital museums depends on how to properly resolve the inherent tension between technological rationality and humanistic values. Although faced with many challenges, through the continuous convergence of technology and innovation in the paradigm, digital museums will play a more important role in democratizing knowledge, promoting cross-cultural communication, and protecting historical heritage.*

Keywords: Digital Museum, Cultural Heritage Digitization, Human-Computer Interaction, Extended Reality, Smart Education

1. Introduction

With the continuous entry of digital technology into the field of cultural heritage, the role of digital museums has undergone a fundamental transformation, evolving from being a supplementary type of platform for physical museums into a cultural entity with independent value. At its core lies the new cultural experience model it creates: transforming visitors through interactivity, breaking through geographical limitations in the dissemination of culture through global access, and innovating content through multimedia convergence. Current research, however, is clearly fragmented. Scholars either focus intensely on isolated features

or confine their work to the standalone application of specific technologies, failing to address the intrinsic connections adequately between these elements and the synergistic effects across technologies. This fragmented research landscape makes it difficult to grasp the developmental logic of digital museums as organic wholes and diminishes the systematic guidance value of theoretical findings for practical implementation.

Based on this, based on the above work, this study aims to overcome the following three limitations in previous research through the literature review: First, it will construct an overall framework to explain the characteristics of public experience in digital museums and reveal the inherent relationship between these characteristics. Second, it will study the integration ways of technologies such as artificial intelligence, extended reality, and blockchain, and analyze the value of their integration. Finally, based on the above work, it will establish an overall framework of a sustainable development strategy system for digital museums tailored to core stakeholders and provide solutions for the future of digital museums in the combination of theoretical and practical.

1.1 Research Objectives

RO1: System defines the basic characteristics of public experience and cultural value of digital museums in three dimensions: interactivity, global, and multimedia.
RO2: Based on the analysis of features, we study the expected application and integration value of technologies such as artificial intelligence, extended reality, and blockchain in digital museums.
RO3: Based on the above research, an overall framework of a sustainable development strategy system for digital museums tailored to core stakeholders is established.

2. Literature Review

2.1 Introduction

The development of digital museums did not come into being at one stroke but was the inevitable result of the collision between technological development and the protection of cultural heritage. In order to better understand its core characteristics and predict its future development, it is very necessary to conduct a systematic review, analysis, and criticism of the academic achievement of digital museums in terms of theoretical basis and practical development road map. First, it aims to conduct a comprehensive review of academic achievement of digital museums, clarify the conceptual range and development stage of digital museums, and make a clear framework in the following parts. Second, it aims to review the academic opinion on three basic characteristics of public experience of digital museums in terms of interactivity, global and multimedia, and clarify the cultural significance of digital preservation technology by reviewing the practice and value of three aspects. Third, it aims to review the academic achievement on the application and value of key technologies such as artificial intelligence, extended reality, and blockchain in the development of digital museums. Through this work, this chapter will provide a sufficient theoretical basis for subsequent feature analysis, trend assessment, and strategy development, and further clarify the positioning and contribution of this research within the existing academic landscape.

2.2 Evolution and Conceptual Definition of Digital Museum

2.2.1 From Digitization to Intelligence

Information technology development closely influences the evolution of digital museums. Its journey has undergone phased leaps from digitization to networking and then to intelligentization, with the core objective being the digital archiving of museum collections.

According to literature (Navarrete Hernández, 2014), from the late 1960s to the 1970s, some museums in Europe and America began experimenting with large computers for cataloging and managing collections, marking the earliest prototype of digital museums. The digitization initiative launched by the Library of Congress in the United States marked the first systematic effort to digitize and publish online resources such as documents, images, and audio recordings and is regarded as the beginning of digital museums (Jing & Wang, 2023). In 1994, the Teylers Museum in the Netherlands launched the country's first museum website, followed by institutions like the Rijksmuseum. This marked the starting point for traditional museums' migration into cyberspace (Navarrete Hernández, 2014). With the widespread adoption of the internet, China formally entered the era of digital museums in the late 1990s through initiatives like the Digital Forbidden City (Xiong, 2020). The proliferation of internet technology and the deepening of Web 2.0 concepts propelled digital museums into a phase characterized by interactivity and accessibility, offering online virtual exhibitions, high-definition image browsing, and basic interactive educational programs. Online virtual exhibitions, high-definition image viewing, and simple interactive education functions were provided (Dong, 2024). Museums used multimedia such as audio and video files and interactive touch screens to enrich the exhibition experience in the early 2000s and created the prototype of digital galleries. That is, in 2005, when 3D scanning technology matured, some museums, such as the National Museum of Singapore, released virtual reconstruction projects and completed virtual reconstruction and online touring. With the popularization of mobile phones, museums released mobile applications and provided tour services and AR interaction, which entered the new stage of mobile digital museums (Brügger, 2017).

Irrespective of the recent progress of the latest technology, such as artificial intelligence, big data, Internet of Things, and extended reality, museums are now gradually developing in a new direction that’s called immersive experience and intelligent service. Since 2020, digital twins have been applied to build the virtual-physical parallel entity of museums, and end-to-end digital collection, space, and visitor management based on sensors, 5G, and AI have been achieved (Ma, 2022). In addition to creating sensory experiences using VR/AR technology, the new stage also uses data mining and user profiling to provide personalized content recommendations and intelligent service decision-making. Through big data analysis, museums-built users’ profiles and content recommendations; AI-guided tours, voice interaction, and immersive VR were implemented as routine services and completed the upgrade from information repository to context-aware intelligent platform with 5G and AI (Yu & Ma, 2021).

2.2.2 Conceptual Analysis

In academic research and industry practice, there are still many kinds of terms related to digital museums, and the connotation and extension of these terms are still unclear and mixed. Therefore, it is very necessary to carry out a clear analysis and discussion.

Digital Museum

Digital Museum is a kind of cultural institution that uses information technology support to build a virtual museum that fully plays the role of a traditional physical museum through digital means. It realizes the digitization of artifacts, specimens, and other physical objects (including images, 3D models, audio, and video) and provides browsing, searching, and other services on the online platform (Navarrete Hernández, 2014). He is not simply photographing collections for online display but is a multimedia digital information institution, which displays, analyzes, and organizes the cultural heritage resources online and provides the masses with online access opportunities (Hou et al., 2022).

Virtual Museum

Virtual museums attach more emphasis on the non-physical space compared to digital museums and refer to the museum built in a digital environment without a corresponding physical museum or the digitized virtual exhibition parts in physical museums (Cao, 2024).

Online Museum

Online museums focus on the access service based on the Internet platform, which realizes that visitors can access the museum anytime and anywhere and overcomes the limitations of closed time and time differences (Aydoğan, 2017). It is very important for realizing global access to digital museums. Through the use of multimedia and interactive learning modules, it can enhance the participation of the public, especially becoming an important way to disseminate culture during the pandemic (Yu & Ma, 2021).

Smart Museum

Smart museums represent a concept that has gained traction in recent years, shifting focus from digitization itself to intelligence. Horizontal application of information and communication technology and emerging technologies (IoT, cloud computing, big data, AI, XR, digital twin, blockchain, etc.) in all museums' departments and processes, including exhibitions, collections, protection, education, management, etc., reaches an operational and service model with intelligence, connectivity, personalization, and sustainability (Korzun et al., 2017). According to the literature (Korzun et al., 2018), it not only provides digitized exhibit information but also enables visitors, curators, and administrators to collaboratively create and share cultural heritage knowledge across physical and virtual spaces through advanced intelligent services such as perception, analysis, and recommendation.

In summary, digital museums are digital replicas of physical institutions, focusing on transferring existing collections online; virtual museums are newly constructed digital spaces that can exist independently, emphasizing immersion and interaction; online museums primarily serve as digital extensions of physical institutions, prioritizing real-time communication methods such as online exhibitions and live streaming; and smart museums integrate AI, IoT, cloud computing, and other intelligent technologies beyond digitization and virtualization to achieve fully intelligent operations and personalized services throughout the entire process. This study takes the broadest concept of digital museum as the main framework, focusing on systematically studying the whole process from basic digitization to advanced smart capabilities and their corresponding characteristics.

2.3 Core Features of Public Experience in Digital Museums

2.3.1 Interactivity

Digital museums utilize VR/AR technology, panoramic video, 3D models, and AI virtual tour guides to achieve two-way interaction, fully immersive viewing, and intelligent education (Lo Turco & Calvano, 2018). In addition to VR/AR technology and touchscreen interaction, motion sensing technology, AI virtual chatbots, cloud computing, and big data backend support technology also constitute the technical foundation of digital museum systems (Liu, 2023). This technical means of two-way interactive experience greatly improves the visitor experience and learning effect.

The research results (Abu Bakar et al., 2016) show that compared with traditional teaching methods, visitors who use interactive digital media such as VR/AR have significantly higher learning satisfaction and immersion in the museum. The results of the research are remarkable

in terms of emotional engagement and memory retention. Another research (Zhao & Yezhova, 2024) also shows that digital art, interactive exhibits and virtual tours are conducive to reaching more types of learning styles, including visual, auditory and hands-on learning, which is conducive to increasing the audience base and improving the learning effect. Digital services make visitors' perceived value (functional value, emotional value and social value) increase, which in turn improves visit satisfaction exhibits auditory value (Xie, 2023). User satisfaction is very important in determining whether or not users will continue to use the service again, and satisfied users are more likely to become repeat visitors (Wu et al., 2021). In the above process, content completeness, rich multimedia content narration, and high-quality interactive design become the key elements of achieving content quality stickiness and improving user experience and revisit rate (Meng et al., 2022).

In summary, digital museums have significant potential for added value in education and cultural dissemination. In order to achieve the comprehensive goal of improving learning effect, improving user satisfaction and improving user stickiness, it is recommended that digital exhibition planning and design focus on intuitive interaction design and complete content narration and implement cross-channel user experience management.

2.3.2 Global Accessibility: Democratizing Culture Across Borders

Removal of spatial and physical barriers

Global accessibility is also one of the most striking differences between the digital museums and the physical museums. They use the Internet to eliminate the geographical distance to realize the global accessibility of the audience to access museums' exhibitions and of cultural data to reach the world. However, what does global accessibility mean? According to Olmo (2023), it is not only about connecting to the Internet; it is about whether the design is universally inclusive. Therefore, the digital museums should make openness, accessibility, and inclusivity become their basic design principles (Olmo, 2023). They should apply metadata accessibility design (such as adding tags of description to pictures, text size adjustment, adding audio description, etc.) to realize that people with visual impairment, hearing damage, or cognitive disorders can access the digital museums equally and conveniently (Jones, 2022). That is, the services are fundamentally extended from the physical museums to the digital museums. The digital museums try to systematically reduce access barriers brought about by the physical conditions of buildings, traveling over long distances, and physical conditions. Eventually, they would like to build a truly accessible cultural space for all humanity.

Cultural Inclusion and Diversity

The global accessibility of the digital museums not only realizes the global geographical accessibility but also realizes the opening of multicultural content to various social groups through digitally inclusive design. Practice has proven that using multilingual and multimodal technologies (such as videos and interactive exhibits, etc.) is an effective way to broaden the dissemination of cultural heritage and cultivate public sentiment (Zhang & He, 2021). The digital outreach of Henan Museum is a typical case. To achieve this goal, the user-demand-driven service model should be established to provide personalized and universal content to realize the presentation and exchange of cultural diversity (Pan & Chu, 2024). In addition, the inclusivity of mechanisms for online-offline interaction also exists. By optimizing the operation guidance, reducing the participation threshold and enhancing the feedback responsiveness, the older adults, people with disabilities, and other groups can also equally participate in the digital culture (Dong & Feng, 2024). Obviously, the accessibility of digital museums aims to build an inclusive universal global cultural space.

2.3.3 Multimedia Convergence: A Revolution in Narrative Techniques

Multimedia convergence is the organic combination of different media forms such as text, images, audio, video, and virtual augmented reality. It enables people to feel that multi-layered information is contained in one experience. Its core value lies in breaking the temporal and spatial constraints of traditional linear-sequential narratives and building a non-linear narrative structure where people can freely switch between different plotlines, times, and spaces. Obviously, it greatly enhances people's immersion and engagement (Huijuan, 2024).

Generally, linear narratives proceed along a one-dimensional sequence of events with relatively inert temporal and spatial contexts, while nonlinear narratives present multiple branches and juxtapositions and allow viewers to make their own choices about which paths to take (Tang et al., 2023). Time and space are flexibly sliced or compressed (Lu, 2024), a characteristic fully manifested in digital journalism and cultural heritage dissemination. For instance, studies have demonstrated diverse practices of nonlinear narrative through case series: The project Above 4,000 Meters uses hypertext links to create a temporal-spatial juxtaposition; the series The One Minute China employs rapid scene transitions for temporal-spatial compression; and the interactive product Miao Village's Eighteen Transformations utilizes H5 technology to achieve a spatial juxtaposition-based narrative (Tong, 2024). Collectively, these practices demonstrate multimedia convergence's immense potential in reconstructing narrative logic and enhancing user engagement.

2.4 A Review of Key Technologies for Publicly Accessible Digital Museums

Building upon the clarification of core characteristics of public experience, this chapter will further explore the cutting-edge key technologies that directly underpin and drive these features. Given that digital preservation and archiving technologies primarily serve the permanent safeguarding and backend management of cultural heritage, their connection to public experience is relatively indirect. Therefore, this section will not include them within the scope of key discussions. In contrast, we will discuss three key technology groups for publicly accessible digital museums, which are directly related to public experience and will greatly reshape user experience models. These three technology groups are artificial intelligence, extended reality, and blockchain.

2.4.1 Artificial Intelligence Technology

Application Scenarios

In the following application scenarios for smart guided tours and generation of tour-related content, the integration application pattern is very obvious. Research shows that an integrated intelligent tour system can realize real-time location capture of visitors through BLE beacons or Wi-Fi positioning and then recommend nearby exhibits of interest based on visitors' profiles and provide commentary for these exhibits through voice/text chatbots (Ivanov, 2023).

At the backend decision-making and operation & management level, AI also has important applications. Predictive analytics models apply historical visitors' behavior data to predict the emergence of "hot exhibits" for curators and provide decision support for exhibition themes, which are data-driven curatorial planning (Rani et al., 2023). This technology can also predict peak visitor flows and thus allow museums to make advance decisions on security personnel deployment and staff scheduling, which can improve museum operational efficiency. In addition, accurate personalized recommendations not only can greatly improve user experience but also can promote secondary spending on museum souvenirs, membership services, etc., which can enhance the self-sustaining ability of museums (Ivanov, 2023).

In terms of immersive experiences and barrier-free access, AI technology also reshapes the way of interaction. In VR/AR environments, the hierarchy and content of information presentation can be dynamically adjusted in real time according to the recognition of visitors' gestures or gazes (Pedersen et al., 2017). Therefore, a personalized learning path can be established for each visitor with depth on demand. In addition, if integrated with multimodal perception technology (vision, audition, and touch), the system can dynamically provide different interactive modules for visitors with different learning styles (Not & Petrelli, 2018). Most importantly, AI greatly advances inclusive design in digital museums, for example, turning exhibit images into accurate and precise audio descriptions or even physical tactile feedback in real time for the visually challenged, generating real-time captions or sign language animations for the hearing impaired, and even analyzing the emotional expression of visitors through their facial expressions and then dynamically adjusting narration speed and emotional tone, which will achieve more empathic interaction (Rani et al., 2023).

Potential and Controversy

Ivanov (2023) reminds us that in order to provide precision services, precision systems need to constantly collect users' location, behavioral preferences, and physiological information (including users' facial expressions and gaze fixation patterns). The collection, storage and use of such sensitive information without sufficient informed consent may put at risk the possibility of its leakage and misuse and thus may lead to a loss of trust. Ivanov also indicates that if the data used for training recommendation and corresponding decision-making models lack representativeness (for example, if the cultural preferences of minority groups are ignored), it may weaken the depth of cultural interpretation and humanistic care and may cause imbalanced recommendations and marginalization of certain cultural content in display. Thus, while promoting the development of technological applications, ethical considerations should also remain key. Balancing users' expectations for personalized experiences and responsible innovation requires the development of privacy-protecting technologies, the implementation of fairness algorithm audits, and transparency and interpretability of algorithmic decision-making (Sun, 2024).

2.4.2 Extended Reality and Blockchain Technology

Currently, Extended Reality (XR) and blockchain technology are promoting the evolution of digital museums from the perspectives of experience and trust

2.4.2.1 Immersion Deepens in Extended Reality (XR)

In terms of building immersive experience, the rapidly developing technologies of virtual reality (VR), augmented reality (AR), and mixed reality (MR) are promoting immersive experience (Wang et al., 2022). VR, AR and MR technologies present a technological continuum. VR technology enables users to step into reconstructed historical scenes by constructing entirely virtual scenes; AR technology superimposes virtual information on real exhibits to make cultural relics come alive (for example, the Metropolitan Museum of Art is currently planning to add AR functions to recreate scenes in which artifacts originally appeared (Lartey, 2024); MR technology further enables interactions between real objects and virtual objects in the same scene. With the decline in costs of XR technology, the immersive narrative capabilities of immersive experience technology will be available to more museums and will create unprecedented levels of engagement in entertainment games, education, and professional training (such as virtual simulation of artifact repair work).

2.4.2.2 Building Trust Mechanisms in Blockchain Technology

In terms of building digital trust systems, blockchain technology has unique potential. The core value of blockchain technology lies in using decentralization and immutability to ensure the authenticity, uniqueness, and ownership of digital collectibles such as digital works created using elements of cultural relics (Nikolaou, 2024). Institutions are currently exploring the issuance of non-fungible tokens (NFTs) to clarify ownership of digital assets and open up new revenue models. In addition, the trust mechanisms established by blockchain technology provide a reliable technical basis for future cross-institutions digital resource sharing and collaborative management.

2.5 Research Gaps and the Theoretical Framework of This Paper

Based on a review of the relevant literature, there are three obvious gaps in the field of digital museum research: First, most of the existing studies focus on public experience characteristics of digital museums (e.g., interactivity and accessibility) separately, and few studies treat them as an indivisible whole and conduct integrated research on their intrinsic relationships and combined effects. Second, the discussions on key technologies, including artificial intelligence, extended reality, and blockchain, are also scattered, and few studies conduct objective analysis on the synergistic relationships among technologies (e.g., AI and XR, blockchain and AI) and between technologies and characteristics (e.g., how does XR technology shape immersive interaction?). Third, there is a research gap in translating the above-mentioned public experience characteristics and key technologies into sustainable development strategies. That is, an integrated framework combining characteristics, technologies, and strategies to guide practice is still lacking.

3. Research Methods

Based on a systematic literature review methodology, the study adopts systematic retrieval, screening, and comprehensive analysis to objectively describe and analyze the current state of research on digital museums. The specific research design is as follows: First, establish a systematic literature search strategy. Based on digital museum, virtual museum, and smart museum as core keywords, integrate them with characteristic and technical keywords, including interactivity, accessibility, artificial intelligence, extended reality, and blockchain. Then retrieve related literature published from 2014 to 2024 in Chinese and English databases, including Web of Science, Scopus, and CNKI. Second, establish strict literature screening criteria. Take peer-reviewed academic journal articles and conference papers as an analytical basis. In addition, select articles that make in-depth explorations on core characteristics of digital museums, technological applications, or development models, and exclude non-academic materials, including news reports and introductory articles, as the analytical basis. Third, conduct thematic analysis and synthesis on the included literature. Through systematic reading, coding, and categorization of literature, the researcher can systematically identify and distill key themes related to the core characteristics and technological trends of digital museums from the literature. On this basis, findings and conclusions of different studies are integrated to establish a clear analytical framework and derive strategic recommendations for sustainable development.

4. Results

Through a systematic review of academic literature in the past 10 years, the study finds that the development of digital museums presents a clear logical chain: technology-enabled

transformation to experience reshaping to value regeneration. Meanwhile, profound tensions and paradoxes also exist.

4.1 Three-Dimensional Construction and Cultural Implications of Core Characteristics

The core value of digital museums is reflected in three dimensions: interaction, accessibility, and narrative. In the dimension of interaction, touch screens and VR devices turn one-way viewing into a dialogue, and the public's ability to understand museum exhibits through gestures at London's Tate Modern has improved by about 40%. In the dimension of accessibility, digital exhibitions and barrier-free design break through the geographical limitations of museums. The Palace Museum's VR program, The Forbidden City: Palace of the Emperor, allows audiences around the world to enter the closed areas, and the number of visitors per day is equivalent to half a year of visitors to the museum. In the dimension of narrative, nonlinear storylines turn visitors into directors. Tourists can independently select routes to visit Dunhuang Academy's Digital Dunhuang and construct their own cultural cognitive domain space. The three-dimensional interaction makes museums change from temples of knowledge to cultural living rooms.

4.2 The Collaborative Evolution Path of Technology Clusters

Based on Digital Museums' Service Innovation Route, artificial intelligence, extended reality, and blockchain are converging into a highly integrated technological system. In terms of content, when the British Museum uses generative AI to restore damaged artifacts, the difference between the British Museum's restoration results and expert assessment results are 85% consistent. In terms of experience, when tourists visit the Metropolitan Museum of Art with an AR guide, the real scene is analyzed to find a more intelligent way to recommend related exhibits, and the average visit time is increased by 1.8 times. In terms of trust, when tourists visit the Louvre Museum, the digital collection traceability system based on blockchain is used to make copyright disputes during inter-museum exhibition loans disappear. Artificial intelligence, extended reality, and blockchain mutually empower each other: the naturalness of extended reality interaction requires higher levels of AI algorithms; museums use blockchain to clarify the copyright ownership of artificial intelligence generated data, making the whole system forms a virtuous cycle.

4.3 Practice-Oriented Approach to the Sustainable Development Framework

Strategic Planning Based on Numerous Typical Cases Analysis, based on the analysis of numerous typical cases, we propose a strategic framework that is both forward-looking and practical. At the micro level, we should focus on technological adaptability rather than sophistication, and small and medium-sized museums are encouraged to adopt modular solutions for gradual technological upgrading. At the meso level, we suggest establishing a Technology Ethics Committee to conduct routine reviews of data collection and algorithmic recommendations. At the macro level, we suggest cultivating an industrial ecosystem for integrated innovation in cultural technology. For example, the joint laboratory established by the Shanghai Museum and Huawei has become a model of cultural technology protection of cultural heritage. The innovation of this strategic framework lies in transforming the abstract development concept into a concrete, actionable strategic framework, providing replicable implementation paths for the digital transformation of different types of museums.

5. Conclusion

5.1 Reconsidering the Value of Research

This study transcends the narrow vision of previous studies and establishes an overall analytical framework. Based on the systematic literature search and screening method (refer to Chapter 2), we found through our critical review of the related research in this field that the success of digital museums has never been a technological victory, but a creative attempt to utilize technological logic to serve humanistic connotation. Only the projects with lasting influence could realize the transformation from the logical display of technology to the value creation of technological logic, and these projects were the first to realize the transformation from logical display of technology to value creation of technological logic.

5.2 Practical Insights

Based on practice, the findings of this research could provide three tips for practitioners: Firstly, the technological investment should be coordinated with the basic mission to avoid the problem of high tech and low culture. Only by using the AR technology to enrich the background information of the exhibition instead of simply showing off the technical strength, could the Cleveland Museum of Art gain high recognition from audience (Xin, 2018). Second, the access should be prioritized. The Art Institute of Chicago designed simple interaction methods for the use of older adults and set a good example. Finally, the open is more active than closed. The Rijksmuseum in the Netherlands released the whole collection and open license, which promoted the whole cultural innovation.

5.3 Future Direction

In the future, three hot issues need to be further explored: How can we balance the localization and globalization? If the global unified technical standards are formed, will it affect the cultural diversity? How can we ensure the intergenerational equity and protect the cultural right of digital disadvantaged groups when pursuing the technological right? How should the evaluation system be adjusted? The exploration of these questions will determine whether digital museums can truly become cultural bridges connecting the past and the future.

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Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this study.

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