# Preserving the Past: Digital Strategies for Cultural Heritage in Modern China

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## Abstract

Cultural heritage has become more significant in today's global scenario, when technological advancements and use of digital technology have enabled the development of new ways to gather, safeguard, modify, and distribute information related to cultural heritage. This research examined the significance of digital strategies for the cultural heritage and the current prominent challenges it is encountering. This research utilized digital technology to effectively showcase China's cultural history to a wide audience, both nationally and globally. It aimed to reinterpret and analyze the cultural heritage, fill it with fresh cultural and historical significance. The purpose of this study was to inspire individuals, to acquire the skills to utilize modern technology in order to advance the preservation and growth of cultural heritage, finally resulting in its comprehensive utilization and sustainable development. Before attempting to design a unique digital display and dissemination technology system, it is crucial to carefully evaluate and analyze various digital technologies to determine their suitability. The results of the study reveal that digital solutions contribute significantly for preserving cultural heritage in modern China and have important implications for policymakers and cultural heritage agencies in China and other countries.

**Keywords**

Cultural Heritage, China, Digital Technology, Strategy, Sustainable Development.

## 1. Introduction

Cultural heritage is highly esteemed and treasured by individuals in today's modern, interconnected world (**Salemink**, 2021). Modern digital technology is opening up new ways of acquiring, storing, converting, and sharing cultural heritage information as a result of technical innovation and advancement. "Digital survival" has recently been trendy, and the fire that destroyed Notre Dame Cathedral in Paris on April 15, 2019, has made people think deeply about the direction that UNESCO has long advocated for and how to use technology to preserve cultural heritage (**Guo; Boonyarutkalin**, 2023). This is important because it is a measure of a country's ability to protect its cultural heritage.

A country's cultural heritage conservation infrastructure and services may be evaluated by their usage of digital approaches, which UNESCO has long advocated for (**von Schorlemer**, 2020). As computer applications including Web2.0 platforms, and other emerging information technologies continue to advance and find more novel uses, digital technologies built on top of virtual reality, big data analysis, and other enabling technologies are making steady strides from technology integration to system application. An essential area of application for this transition period is the digital conservation of cultural resources. When compared to more traditional conservation theories and methods, digital conservation technology offers clear benefits, such as simplified distribution, maintenance, and storage (**Economou**, 2015). Figure 1 exhibits a model of shaping cultural heritage.

Nevertheless, in the present day, cultural heritage preservation encounters several intricate obstacles, such as evolving demands, insufficient resources, and territorial disputes. There has to be technological innovation-focused research into a new conservation model in addition to institutional and theoretical studies and solutions for preserving cultural

assets (**Ioannides *et al.***, 2016). Luckily, a new technological tipping point for the preservation of cultural assets has emerged with the development of computer and network technologies since the turn of the century: high-precision digital conservation technology (**Poulopoulos; Wallace**, 2022). As computing and networking capabilities expanded, digital technology basically symbolic formal logic reasoning started to seep into every facet of human activity and life. A paradigm change in our thought processes and daily lives has occurred alongside the advent of digital technology. As an example, a dynamic digital museum has emerged as a consequence of the convergence of digital technology and the cultural industry (**Giannini; Bowen**, 2019; **Zhang**, 2023). This museum has changed the way traditional cultural institutions preserve and display artifacts, introduced new automated and personalized products and services, and challenged the industry's long-held views on the nature of time and space. Due to its ability to meet the demands of more efficient management, personalized consumption, and varied presentations, digital technology has grown into a prominent symbol of contemporary society (**Hahm *et al.***, 2020).

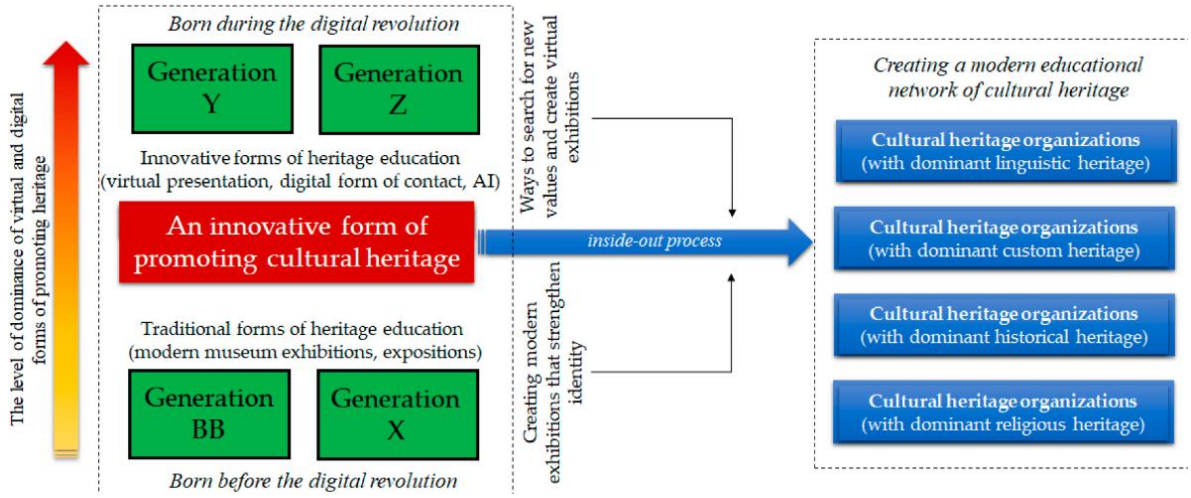


Figure 1: Model of Shaping Culture Heritage.
Source: Szromek and Bugdol (2024)

One of the many fields that has emphasized and promoted the use of digital technology in recent years is cultural asset conservation in China (**Ebbe *et al.***, 2011). The current technological methods of preserving China's cultural heritage are antiquated and fail to address the practical requirements of the Chinese people and society. On the other hand, if China wants to bolster its cultural soft power, it must swiftly and intuitively disseminate the core values of its traditional culture to the rest of the globe through digital and network technologies. Finally, technological advancements in conservation are important for several reasons: they are vital to the survival of our cultural heritage (**Ye**, 2024; **Bosone *et al.***, 2021), they allow our nation to proudly display its cultural identity, and they represent a positive trend in human history that will help us remember our past and spread positive vibes.

## 2. Method

The data for this study was collected through various online sources. To ensure a comprehensive understanding of the digital strategies being employed to preserve cultural heritage in modern China, primary sources of data included academic databases such as JSTOR, Google Scholar, and IEEE Xplore, where peer-reviewed journals and conference proceedings were accessed. Additionally, reports from Chinese government agencies, UNESCO, and other cultural heritage institutions were reviewed to gather institutional insights where relevant news articles from reputable media outlets provided recent developments and public opinions while websites and blogs for cultural heritage projects, museums, and digital archives provide the personal information about ongoing digital preservation activities.

To simplify the data collecting process a list of relevant keywords was discovered. The selection of the keywords indicates their relevance to the issue and frequency of occurrence in the literature (**Li *et al.***, 2022; **Wang *et al.***, 2020; **Liu *et al.***, 2024). It was utilized to conduct searches throughout the identified web sources. It results in a diverse set of data relevant to the research where the collected data was then used to perform content analysis to discover themes, trends, and solutions for the digital preservation of cultural heritage in China. To ensure validity, the data collecting and analysis techniques were documented. It attempts to provide a thorough examination of the digital strategies used to preserve cultural heritage in modern China. It emphasizes the success, problems, and future opportunities in this sector (**Lazzeretti**, 2023).

### 2.1. Cultural Heritage in China

China's 20th Century Architectural Heritage is listed at the state level. It includes structures that were important to China's culture, history, technology, and art in the 20th century. It serves as a record of the last century and a

demonstration of how human understanding, tradition, and creativity have progressed (**Liao *et al.***, 2023). When various communities, organizations, and individuals recognize certain practices, performances, forms of expression, knowledge systems, skills, tools, physical objects, handicrafts, and cultural spaces as part of their cultural heritage. This is referred to as cultural heritage (CH), as per the UNESCO Convention for the Safeguarding of Intangible Cultural Heritage (**Song *et al.***, 2019). The creation of the Convention for the Safeguarding of Intangible Cultural Heritage is an effort by UNESCO to preserve the world's diverse cultural expression. It is more transitory cultural manifestations (**Kuang *et al.***, 2023). In addition to standing for the universal culture that has always existed, it is a sign of national identity. The knowledge and skills that have been passed down over the years are a part of its rich past, which is where it's worth lies. A growing problem is threatening the cultural legacy that humanity has amassed throughout the ages due to the rise of modern economies, rapid urbanization, and changes in production and lifestyle (**Sun *et al.***, 2021; **Carniel; Timmins**, 2023).

Certain elements of cultural heritage have perished due to the waning interest of subsequent generations in passing them on. The transmission of cultural legacy is more susceptible to disruptions in the generational chain because it is inherently more delicate, contingent, and selective than the transmission of physical cultural material. Incorporating traditional intangible cultural heritage practices into present creative expressions is an important part of learning and sharing them in order to achieve sustainable cultural legacy. Ten aspects of traditional Chinese culture including folklore, music, dance, drama, opera, sports, amusement and acrobatics, traditional fine arts, traditional crafts, and traditional medicine are listed as intangible cultural heritage by the Chinese government (**Tang**, 2021; **Wei; Phanlukthao**, 2023). There are 1557 main things and 3610 sub-items in the list. National, provincial, municipal, and county CH are the four levels of organization in China. There were almost 100,000 representative items known as of May 2024.

## 2.2. Digital Strategies for Cultural Heritage in China

*Digital Archiving and Documentation Strategy:* Digital archiving and documentation involve the use of advanced technologies to create and preserve digital records of cultural heritage artifacts and sites where one key technology is 3D scanning and modeling (**Kantaros *et al.***, 2023). It allows for the creation of highly detailed digital replicas of artifacts and historical sites (**Shiri *et al.***, 2022). These digital models can capture minute details that might be missed by traditional photographic methods. It also provides a comprehensive and precise record of the object or site.

*Virtual Reality (VR) and Augmented Reality (AR) Strategy:* These strategies are also employed to create immersive experiences that allow users to explore heritage sites virtually. VR can recreate entire historical environments (**Trunfio *et al.***, 2022; **Garbin Praničević**, 2021), and enables users to experience them as if they were physically present; while AR may overlay digital information on actual environments and also improves the visitor experience with interactive and informative material.

*Comprehensive database management strategy:* It is necessary for storing and maintaining digital documents and also makes sure that digital materials are structured, searchable, and easily available to scholars, conservators, and the general public (**Lam *et al.***, 2021). To maintain the lifespan and integrity of digital records good database administration incorporates metadata standards and preservation practices for cultural heritage.

*Geographic Information Systems (GIS) strategy:* This technique is used to map and evaluate cultural heritage sites by combining spatial data with other forms of information. It demonstrates that how GIS may give significant insights into the geographical context of historic monuments. This connection improves the planning and administration of these installations where GIS technology helps in decision-making processes. It connected to heritage preservation by detecting places that may be at danger owing to environmental or human factors, as well as understanding the distribution and status of cultural assets. It directs conservation efforts to locations that require immediate care. GIS may be utilized to build precise maps and visualizations (**López Sánchez *et al.***, 2021), that can also improve public awareness and enjoyment of cultural assets.

*Digital Museum:* This feature transports the physically situated Museum to the online sphere where online museums are a relatively recent phenomenon (**Giannini; Bowen**, 2019). It may use this feature to find out more information about the museum's layout and displays without leaving your house (**Taormina; Baraldi**, 2023).

*Social media:* This function mediates conversations between service providers and their clients. In order for producers to have a deeper understanding of customer psychology and make products that are both creatively and culturally significant. At the same time, it facilitates communication amongst consumers. They might share short videos of their creations in an effort to spark creative brainstorming sessions that could lead to better ideas for the company's design system (**Hisrich; Soltanifar**, 2021). Concurrently, the app's well-liked creative design platform allows users to interact with designers when they post their preferred design concepts on social media. This not only helps consumers get what they desire, but it also raises their level of innovative consciousness and enthusiasm, which in turn fosters the expansion of collective imagination (**Wu; Din**, 2014).

*Mass Creative Design Platform:* The Mass Creative Design Platform is an environment tailored to solo artists and small groups working on creative projects. An essential part of the updated value system is this. By following this platform's lead, members of the public may help promote innovation and China culture (**Wang**, 2022a). By drawing culture as a foundation, this innovative platform can bring creators and producers into the process of building culture and creativity.

Additionally, with the help of the public, the development of culture and creativity can initially generate more value, both culturally and economically (**Gou**, 2021; **Li**, 2024). The value of the public may be realized in this method by means of artistic and cultural development. In addition to inspiring new ideas for the development of China culture and creativity (**Liang; Wang**, 2020), it draws in a large pool of talented individuals from the cultural and creative sectors, who then join the industry's extensive workforce.

*Cultural and creative goods sales platform:* Customers may more easily and quickly choose the cultural and creative products they want using this tool. In addition to informing about the related cultural treasures, the virtual assistant Diaoyu will provide a comprehensive explanation to culture and creativity when you select them (**Wang; Liu**, 2023).

## 2.3. Digital Strategies Implementation in China

Among all Internet-based applications, WeChat is currently the most widely used application in keeping with the current trend of social information that identifies the unique cultural and creative items through this WeChat platform (**Bao**, 2018). Once WeChat's peer-to-peer push function is fully operational, users who follow the official account will have unprecedented access to information regarding the marketing dynamics of creative and cultural products. Users can also buy the products they love and pay for them directly through the app. Improving information accessibility and lowering some operational costs for real shop are both achieved through the establishment of an official WeChat microstore (**Lu**, 2021). Comparable to microblogging, WeChat divides its users into two categories to encourage healthy competition and rapid progress.

The fundamental objective of "SoLoMo" which was first presented by John Doerr, is to predict how the Internet industry will evolve in the future. Social, local, and mobile are the three essential features that "SoLoMo" brings together. To put it simply, "SoLoMo" is an online strategy that optimizes the user experience by integrating social networking, local search, and mobile search. In the world of cultural goods, the phrase "O2O" describes the process of attracting an online audience to a real-life event space. With innovative marketing strategy, customers may peruse cultural artifacts at their leisure, make purchases via mobile terminals, and then pick them up at the store's location in the field (**Huang; Guo**, 2020). By allowing customers to select their own products, wait for delivery, and physically examine them before making a final decision, this method not only circumvents the limitations of a brick-and-mortar store, but it also encourages customers to spend more money when they go to the store to pick up their orders. Most importantly, the "SoLoMo" and "O2O" models enable socializing in operations, greater feedback, a better understanding of consumer psychology and preferences, and a change in localization. It assures that the company is aware of its strengths and features. So, not only can the company build and develop creative goods online, but it can also use the precise placement of creative products to create cultural services that are different from each other, which increases the economic advantages.

## 2.4. Benefits and Challenges for Digital Strategies Implementation in Chinese Culture

The results demonstrate that digital transformation is an all-encompassing issue for the regional innovative system, calling for a wide range of strategic actions structured around three main tenets (**Danesh; Rajabi**, 2022). Digital education, digital talents, and digital culture make up the first pillar, "culture and skills," which has three main areas of activity. "Infrastructures and technologies," the second pillar, highlights AI, information, and interaction as key strategic domains. "Ecosystems," the third pillar, stresses the need of putting money into relationships, life quality, and medium-to long-term goals. To summarize, this study shows that when looking at digital transformation from a systemic perspective, individual initiatives aren't enough (**Brunetti *et al.***, 2020).

## 2.5. Benefits for digital strategies implementation in Chinese Culture

**Enhanced Preservation and Conservation**: Digital strategies significantly enhance the preservation and conservation of cultural heritage where the technologies can create highly detailed digital replicas of artifacts and historical sites. It includes 3D scanning and modeling (**Skublewska-Paszkowska *et al.***, 2022). These replicas can capture minute details. It ensures that the smallest features are preserved digitally and reduces the need for physical handling of fragile objects and also minimizes the risk of damage and deterioration.

1. **Increased Accessibility and Public Engagement**: Without having to visit, online platforms, virtual tours, and mobile applications enable people all over the world to discover China's rich cultural heritage. VR and AR technology offer immersive experiences that engage the public (**Aswini *et al.***, 2023; **Lampropoulos *et al.***, 2022) and also improves their comprehension and respect for cultural locations and objects.
2. **Educational Opportunities**: High-resolution photographs, thorough explanations, and interactive experiences digital methods provide important instructional materials for use in teaching. It also gives students and scholars an in-depth understanding of cultural heritage (**Gireesh Kumar; Raman Nair**, 2022) where online platforms and databases make it simpler for instructors. To include cultural heritage into their teaching materials, it ultimately leading to a better understanding of history and culture among students.
3. **Improved Management and Planning**: On the geographical setting of cultural assets geographic Information

Systems (GIS) give useful information where GIS technology by combining geographical data with other information improves site planning and administration. It enables better informed decision-making about conservation initiatives. It also identifying at-risk regions, and effectively allocating resources (**Menéndez-Marsh *et al.***, 2023).

4. **Global Collaboration and Repatriation**: In order to enabling the digitalization and dissemination of objects that are part of China's cultural heritage digital repatriation improves collaboration with foreign organizations (**Zhou**, 2024). While also encouraging global collaboration and a feeling of common heritage are situated elsewhere. This guarantees that cultural material is available to a wider audience

### 2.6. Challenges for digital strategies implementation in Chinese Culture

1. **High Costs and Resource Requirements**: In this regard 3D scanning, VR, and AR are expensive to acquire and maintain that postulates the implementing advanced digital strategies involve significant financial investment (**Samarasinghe; Wood**, 2021). Additionally, it ensures that institutions have the necessary resources and expertise is a major challenge where these technologies require specialized skills and training, adding to the overall costs.
2. **Technical Challenges and Infrastructure**: High-quality digitization requires advanced equipment and software developing and maintaining digital infrastructure is technically challenging. It also ensures continuous updates to keep pace with technological advancements. It determines the need for robust data management systems to store, organize, and secure digital records. Technical challenges also include ensuring compatibility and interoperability flanked by different digital platforms and technologies to preserve the culture (**Andreoni; Anzolin**, 2020; **Shan *et al.***, 2022).
3. **Data Management and Security**: Ensuring the integrity and security of digital archives is critical and identifies that the robust data management practices and security protocols are necessary to protect against data loss, unauthorized access, and digital degradation. It postulates that culture must address issues related to digital rights and access (**Pūraitė *et al.***, 2020) and must ensures that digital content is available to the public while respecting copyright and intellectual property laws.
4. **Cultural Sensitivity and Ethical Concerns**: Balancing public access with the preservation of cultural values and sensitivities is essential. Digital representations of cultural heritage must respect the significance and context of the artifacts and sites because ethical considerations are particularly important when dealing with sensitive or sacred objects. It finds the way in which these issues carefully tackle to ensure that digital preservation efforts are respectful and culturally appropriate.
5. **Sustainability and Long-Term Maintenance**: Sustainability is a key challenge in digital preservation where developing sustainable models for the long-term maintenance and updating of digital records is essential that includes securing continuous funding and support for digital preservation projects. It ensures that digital infrastructure remains up-to-date and functional, and planning for the ongoing training and development. It must also consider the environmental impact of digital preservation efforts. It aims to minimize their carbon footprint

## 3. Conclusion

Digital technology is revolutionizing the preservation of cultural heritage in China and offering benefits such as simplified distribution, maintenance, and storage. However, challenges such as evolving demands, insufficient resources, and territorial disputes persist where high-precision digital conservation technology has emerged as a solution. It transforming traditional cultural institutions and introducing automated and personalized products and services. This paper analyzes digital preservation strategies in modern China. Focusing on the 20th-Century Heritage, digital strategies for preserving CH include digital archiving, documentation, virtual reality, augmented reality, comprehensive database management, Geographic Information Systems (GIS), digital museums, and social media.

These strategies aim to preserve and promote China's rich history and culture while ensuring the preservation of cultural heritage where the Mass Creative Design Platform attracts talented individuals from the cultural and creative sectors, generating more value both culturally and economically. WeChat is widely used for distributing unique cultural and creative items, with "SoLoMo" and "O2O" models. It is combining social, local, and mobile features and offers numerous benefits, including enhanced preservation and conservation, increased accessibility, educational opportunities, improved management and planning, and global collaboration. Balancing public access with cultural value preservation is critical. In this regard sustainability is required for long-term maintenance, emphasizing the significance of digital techniques for protecting cultural heritage in China. It also emphasizes the importance of technical innovation and investment in digital infrastructure where the international collaboration is often offered as a way to solve problems and promote best practices on a global scale.

### 3.1. Implications

The conclusions of this paper on digital solutions for protecting cultural heritage in modern China have important consequences that provide useful insights for policymakers and cultural heritage organizations in China and beyond. It provides a roadmap for other areas experiencing comparable issues in conserving their cultural heritage in the digital era by identifying essential topics by emphasizing effective digital preservation measures (**Di Giulio *et al.***, 2021). The

paper emphasizes the significance of technical innovation digital archives, virtual museums, and other technology tools in the field of cultural heritage preservation for the effective deployment that highlights the power of digital solutions in improving the accessibility and preservation of cultural items.

The study findings have serious implications in digital infrastructure and capacity building for cultural sector's technical development and budget allocation that encourages greater investment (**Hou *et al.***, 2022). Cultural heritage organizations may develop a sense of ownership and connection by engaging them through digital platforms to cultural heritage among various audiences. It has far-reaching implications for the viability of conservation initiatives where the interest and support might lead to increased financing for cultural heritage initiatives. The finding can inform future policy development where supportive policies are essential for the effective implementation of digital strategies that encourages governments and institutions to create and enforce regulations that facilitate digital preservation efforts (**Wang**, 2022b).

Funding constraints and technological obstacle can improve the efficacy of digital preservation initiatives that indicate areas that require focused interventions, and addressing these issues via strategic planning and collaboration. It adds to the increasing body of knowledge about digital cultural heritage preservation that proposes the international collaboration, via the exchange of information and resources may assist overcome common hurdles and promote best practices on a worldwide scale (**Mendoza *et al.***, 2023). Understanding and addressing the elements that determine the effectiveness of digital initiatives can help stakeholders negotiate the complexity of maintaining cultural heritage in the digital age with practical implications for improving the protection and accessibility of cultural material in China and throughout the world (**Pandey; Kumar**, 2020).

### 3.2. Limitations and Future Research

The study discovered that there are still significant conceptual errors due to a lack of expertise and training about digital cultural asset conservation, as well as issues with digital technology. Within this framework, in terms of interdisciplinary collaboration and cross-departmental cooperation it is critical to define cultural heritage digital conservation more precisely, to effect cognitive transformation (**Kaszynska *et al.***, 2022), and to prioritize the development of technical standards and a digital preservation system. As new media and platforms arise and improve digital preservation, the process of conserving cultural resources in digital form continues and expands (**Ocón**, 2021). This study implies that technology developments, educational possibilities, and tourism all have potential as practical inheritance mechanisms. International collaboration and promotion can improve the scientific rigor and efficacy of ICHA conservation in China, while empowering and encouraging inheritors is critical to conservation efforts. To effectively inherit ICHA, it is vital to develop a sustainable succession pathway that involves government, education, tourism, and communication (**Cai *et al.***, 2024).

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