

The Role of Multimodal Digital Exhibition in Promoting Awareness of the Cultural Heritage of the Wei, Jin, Southern and Northern Dynasties

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Abstract: The cultural heritage of the Wei, Jin, Southern, and Northern Dynasties embodies profound historical and cultural values. However, traditional methods of exhibition often fail to fully present its multidimensional cultural connotations. With the advancement of technology, multimodal digital exhibitions have emerged, utilizing virtual reality, augmented reality, 3D modeling, and other technological means to showcase historical scenes, artistic works, and cultural relics of the Wei, Jin, Southern, and Northern Dynasties in a more vivid and interactive manner. This innovative exhibition method not only enhances the visualization and interactivity of cultural heritage but also deepens the audience's understanding and recognition of its cultural context. Moreover, digital exhibitions play a vital role in education and cultural transmission, garnering broader attention and fostering the protection of Wei, Jin, Southern, and Northern Dynasties culture in modern society. These technologies enable the continuous deepening of the inheritance and protection of cultural heritage, providing contemporary audiences with a platform for in-depth interaction with historical culture.

1. Characteristics and Value of the Cultural Heritage of the Wei, Jin, Southern, and Northern Dynasties

1.1. Overview of the History and Culture of the Wei, Jin, Southern, and Northern Dynasties

1) Political Transformations and Cultural Integration

The Wei, Jin, Southern, and Northern Dynasties marked an era in Chinese history characterized by both division and unification. Following the Yellow Turban Rebellion at the end of the Eastern Han Dynasty, the central authority weakened, leading to the rise of regional powers. In 220 CE, the Wei state was established, and the Three Kingdoms period became the defining political feature of the time. Despite the temporary balance of power among Wei, Shu, and Wu, the disintegration of the

Three Kingdoms and the subsequent confrontation between the North and South led to an increasingly complex political landscape that presented unprecedented challenges in Chinese history.

The political turbulence, however, did not hinder cultural prosperity; rather, it provided opportunities for cultural exchange. In particular, during the Southern and Northern Dynasties, the rise of northern ethnic minorities and their interaction with southern Han culture accelerated the exchange of Eastern and Western cultures and ideas. For example, the Northern Wei dynasty, led by the Tuoba Xianbei people, integrated nomadic and agrarian cultures by adopting Han cultural practices, which facilitated the introduction and popularization of Buddhism. Meanwhile, in the southern regions of Wu and Yue, literature and art flourished. Despite political division, cultural inheritance and innovation created a vibrant cultural landscape.

2) Philosophical Schools and Achievements in Literature and Arts

The Wei, Jin, Southern, and Northern Dynasties were not only an era of cultural division but also a golden age of ideological and cultural innovation. Prominent philosophical schools of the time included Daoism, Confucianism, Buddhism, and Xuanxue (Neo-Daoism). The fusion of Daoist and Confucian thought during this period gave rise to the influential "Wei and Jin Xuanxue," which emphasized "non-action" (wuwei) and profoundly influenced later intellectual thought and literary creation.

In literature, this period saw remarkable achievements, with cultural figures like Cao Cao, Cao Pi, Wang Xizhi, and Tao Yuanming creating works of enduring significance. Wang Xizhi's Preface to the Orchid Pavilion is considered a masterpiece of Chinese calligraphy and literature, while Tao Yuanming's pastoral poetry reflects humanistic concerns and the pursuit of transcendence, freedom, and tranquility, emblematic of the intellectual spirit of the time.

1.2. Core Elements of the Cultural Heritage of the Wei, Jin, Southern, and Northern Dynasties

1) Literary and Documentary Heritage

The literary creations and records of the Wei, Jin, Southern, and Northern Dynasties serve as vital carriers of historical and cultural transmission. Numerous historical texts, poems, and philosophical records provide invaluable resources for understanding the culture of this era. Works such as the Zizhi Tongjian (Comprehensive Mirror to Aid in Government), Book of Jin, and Book of the Later Han are essential historical documents. Additionally, literary works like Wang Xizhi's calligraphy and Tao Yuanming's poetry are timeless cultural treasures, reflecting the intellectual ethos of this period.

2) Artworks and Archaeological Sites

The artistic achievements of the Wei, Jin, Southern, and Northern Dynasties encompass a wide range of forms, including sculpture, painting, ceramics, and crafts. Buddhist art flourished during this period, with stone carvings, sculptures, and murals in sites like the Mogao Caves in Dunhuang, the Yungang Grottoes, and the Longmen Grottoes. These works not only showcase the artistic heights of the era but also provide valuable insights into its culture, religion, and social dynamics.

Archaeological sites also play a crucial role in the cultural heritage of this period. Excavated artifacts such as gold and silver items, bronze ware, and pottery highlight the craftsmanship and social practices of the time^[1]. Advances in archaeology have uncovered more sites and relics, offering tangible evidence for studying the culture of the Wei, Jin, Southern, and Northern Dynasties.

3) Folk Customs and Religious Beliefs

Folk customs and religious beliefs held significant cultural importance during this period. The spread of Buddhism profoundly influenced both society and individual lives, shaping artistic expression and social transformation. Daoism and Confucianism also gained widespread influence, particularly among scholars, fostering deep philosophical reflections on humanism and cosmology. The diversity of religious practices and their integration into daily life represent both the material and

spiritual legacy of this period.

1.3. Current Status and Protection of the Cultural Heritage of the Wei, Jin, Southern, and Northern Dynasties

1) Challenges and Difficulties in Preservation

Despite its immense historical value, the cultural heritage of the Wei, Jin, Southern, and Northern Dynasties faces numerous challenges. Prolonged warfare and natural disasters have led to the destruction or disappearance of many relics. Additionally, the historical complexity of the era means that many sites and artifacts remain unexplored or inadequately studied, resulting in the underutilization of cultural heritage resources. In modern times, challenges such as limited funding, insufficient technology, and inadequate management further hinder the preservation and transmission of this heritage. Addressing these issues is a pressing concern for safeguarding this cultural legacy.

2) Application of Modern Technology in Cultural Heritage Protection

Advances in modern technology have opened up new possibilities for the preservation of cultural heritage. For example, digitization techniques have been widely applied to the restoration and exhibition of cultural relics. Through 3D scanning technology, artifacts and sites from the Wei, Jin, Southern, and Northern Dynasties can be precisely modeled to create permanent digital archives. Moreover, technologies like virtual reality (VR) and augmented reality (AR) have enriched the presentation of cultural heritage. These technologies transform cultural relics from static exhibits into interactive and immersive experiences, allowing audiences to engage more directly with the cultural essence of the Wei, Jin, Southern, and Northern Dynasties.

2. Overview of Multimodal Digital Exhibition Technology

2.1. Definition and Development of Multimodal Technology

1) Basic Concept and Development of Multimodal Technology

The term "multimodal" originally comes from multimodal sensing technology in information science, which refers to a method of integrating information obtained through multiple sensory channels. In the context of cultural heritage exhibitions, multimodal technology means combining various display methods (such as images, sound, video, and touch) to convey information through multiple sensory channels simultaneously, thereby enriching and diversifying the audience's experience.

Over the past few decades, the development of multimodal technology has undergone a transformation from single-medium displays to diversified interactive experiences. Early cultural heritage exhibitions relied heavily on static texts and images, such as traditional museum exhibitions and site displays, which offered a relatively one-dimensional experience with limited interactivity. However, with advancements in computer graphics, artificial intelligence, and internet technologies, multimodal exhibition technology has gradually emerged. Using new technologies such as virtual reality (VR), augmented reality (AR), 3D modeling, and holographic projection, it has created more dynamic and diverse ways to present culture^[2]. Modern multimodal technology now allows cultural heritage to be presented in immersive and interactive ways, enabling audiences to perceive culture through visual and auditory senses, and even interact with cultural heritage through touch and motion, thereby enhancing the depth and breadth of cultural awareness.

2) Main Display Methods of Multimodal Technology: Virtual Reality, Augmented Reality, 3D Modeling, etc.

In multimodal digital exhibitions, virtual reality (VR), augmented reality (AR), and 3D modeling are the most common and effective display techniques.

Virtual Reality (VR): VR technology creates a computer-generated 3D virtual environment, offering an immersive experience for the audience. By wearing VR headsets, viewers can experience historical scenes or cultural sites from the Wei, Jin, Southern, and Northern Dynasties, such as entering an ancient calligraphy room, a ceramics workshop, or exploring the palaces and streets of the Wei Jin period. VR technology helps audiences gain a deeper understanding of the history, culture, and social structure of the Wei, Jin, Southern, and Northern Dynasties through realistic environmental reconstructions.

Augmented Reality (AR): Unlike VR, AR overlays virtual images, text, and other information onto the real world through smart devices (such as smartphones or AR glasses), allowing viewers to see virtual information in real environments. For instance, in cultural heritage sites, viewers can use AR devices to see the restoration of cultural relics from the Wei, Jin, Southern, and Northern Dynasties within the real-world environment, or access the historical context and cultural significance of these artifacts. By merging virtual and real elements, AR enables viewers to not only experience a realistic environment but also gain abundant information.

3D Modeling: 3D modeling technology allows for the digital modeling of artifacts, buildings, and ruins from the Wei, Jin, Southern, and Northern Dynasties, transforming them into visual 3D images using computer graphics. Viewers can observe artifacts or sites from all angles and perspectives using 3D models, even enabling actions like rotating or zooming in to explore every detail, offering a more in-depth sensory experience compared to traditional two-dimensional displays.

The combination of these technologies makes cultural heritage exhibitions more than just static text and images, but a comprehensive and interactive way of transmitting culture through multisensory stimulation.

2.2. Technical Framework and Application Areas of Digital and Intelligent Exhibitions

1) Integration of Digital Technology and Intelligent Exhibition

With the rapid development of digital technologies and artificial intelligence (AI), digital and intelligent exhibitions have become an innovative direction in the cultural heritage field. Digital exhibitions are no longer just about digital archiving and display; they now involve intelligent methods for in-depth interpretation and multidimensional recreation of cultural heritage. For example, AI technologies can be used for intelligent recognition and restoration of artifacts, or for reconstructing social life scenes from the Wei, Jin, Southern, and Northern Dynasties through data analysis and modeling, making cultural heritage exhibitions more precise, intelligent, and personalized.

The core of intelligent exhibitions lies in improving the system's intelligence through methods such as deep learning and data mining. For instance, based on big data analysis, exhibition systems can dynamically adjust content and display methods based on the interests and needs of viewers, providing a tailored cultural experience. Intelligent exhibition systems can also enable automated narration and interactive functions. Through speech recognition and natural language processing technologies, systems can answer viewers' questions in real time, further enhancing interactivity and educational value.

2) Specific Application Cases of Wei, Jin, Southern, and Northern Dynasties Cultural Heritage Exhibitions

In the exhibition of cultural heritage from the Wei, Jin, Southern, and Northern Dynasties, the application of multimodal digital technologies has already yielded some initial results. For example, VR and AR technologies have been applied to the restoration and re-presentation of cultural heritage from the Wei, Jin, Southern, and Northern Dynasties in various museums and cultural heritage sites. At significant sites such as the Yungang Grottoes and Longmen Grottoes, visitors can wear VR

headsets to enter a virtual cultural space from the Wei, Jin, Southern, and Northern Dynasties and witness carvings and murals that have disappeared or been damaged. This immersive experience feels like stepping back into ancient times, providing a profound sense of realism.

Additionally, some digital museums use multimodal digital technologies to digitally present the artifacts and historical contexts of the Wei, Jin, Southern, and Northern Dynasties. For instance, the Nanjing Museum has used 3D modeling technology to recreate burial environments from this period. Visitors can explore the artifacts within these tombs through interactive digital exhibitions and learn about the historical and cultural significance behind them.

3. The Role of Multimodal Digital Exhibition in Promoting Awareness of the Cultural Heritage of the Wei, Jin, Southern, and Northern Dynasties

3.1. Enhancing the Visualization and Interactivity of Cultural Heritage

1) Presenting Cultural Heritage to Audiences with Virtual Reality Technology

The cultural heritage of the Wei, Jin, Southern, and Northern Dynasties, including numerous ancient artifacts, sites, and calligraphic works, holds immense historical and cultural value. However, due to site damage and artifact aging, many cultural relics can no longer be presented to the public in their original form. Virtual reality (VR) technology enables the vivid restoration and presentation of such cultural heritage through 3D modeling and immersive environments. For instance, VR technology can virtually reconstruct historical scenes from the Wei, Jin, Southern, and Northern Dynasties. Audiences can not only view the entirety of historical architecture but also freely navigate through virtual spaces, explore artifact details, and even interact with them.

By leveraging VR, audiences can experience the daily life, art, and cultural scenes of the Wei, Jin, Southern, and Northern Dynasties in an immersive way. For example, viewers can use VR equipment to step into an ancient calligraphy studio, experiencing the creative process of masters like Wang Xizhi, or enter ancient religious temples to witness the flourishing of Buddhist art^[3]. This immersive visual experience makes learning about history and culture more intuitive and engaging.

2) Interactive Exhibitions Enhance Audience Engagement and Experience

Multimodal digital exhibitions emphasize interactivity rather than static displays. By using technologies like augmented reality (AR), touchscreen interaction, and sensors, audiences can directly engage with the displayed content. For instance, audiences can use AR glasses or mobile devices to scan artifacts or sites from the Wei, Jin, Southern, and Northern Dynasties to receive real-time digital information, gaining insights into the historical background, artistic styles, and social significance of these relics.

Additionally, interactive exhibitions allow audiences to participate in the restoration process of cultural relics. For example, through 3D modeling and virtual displays, audiences can "rebuild" the original appearance of an artifact or structure. This participatory approach not only enhances learning interest but also deepens their understanding of the cultural and historical significance behind the relics and sites.

3.2. Enhancing Historical Interpretation and Educational Functions of Cultural Heritage

1) Using Intelligent Exhibitions to Promote the Dissemination of Historical Knowledge

The Wei, Jin, Southern, and Northern Dynasties represent a complex and transformative period in Chinese history. Its political upheavals, social changes, and intense cultural and ideological interactions may seem unfamiliar or challenging for many audiences to comprehend. Intelligent exhibitions, powered by artificial intelligence (AI) and machine learning, can effectively interpret and disseminate the complex historical background of this era.

Digital narration systems can tailor historical background information, biographies, and cultural events to the preferences and interests of the audience. For example, in exhibitions of cultural heritage from the Wei, Jin, Southern, and Northern Dynasties, intelligent narration systems can dynamically follow the viewer's movements and points of interest, automatically presenting related historical stories, cultural events, or artistic movements in a user-friendly manner. Such systems enable audiences to not only view artifacts and artwork but also gain a deeper understanding of the history and cultural context behind them. This significantly increases public awareness of the cultural significance of the Wei, Jin, Southern, and Northern Dynasties.

2) Application of Digital Narration and Adaptive Learning Systems

Digital narration systems have become essential tools for modern cultural heritage exhibitions. These systems provide comprehensive interpretations of cultural heritage using text, audio, and video formats. In the context of Wei, Jin, Southern, and Northern Dynasties cultural heritage exhibitions, digital narration can deliver personalized information based on the audience's language, preferences, and interests, enhancing the specificity and depth of learning.

More advanced adaptive learning systems can adjust the depth and complexity of displayed content based on the audience's learning progress and understanding level. For instance, a beginner might be introduced to basic historical and cultural knowledge in a simple and engaging way, while experts or scholars could access more detailed historical context, cultural analyses, and academic research. These systems meet the needs of diverse audiences and improve the educational functionality of cultural heritage exhibitions, making them more inclusive and widely accessible.

3.3. Promoting Cultural Identity and Heritage Transmission

1) Inspiring Audience Recognition of the Culture of the Wei, Jin, Southern, and Northern Dynasties

Multimodal digital exhibitions present cultural heritage in a more intuitive and sensory manner, fostering a stronger sense of cultural identity among audiences. Through immersive experiences, viewers not only engage with the artifacts and sites of the Wei, Jin, Southern, and Northern Dynasties but also gain a deeper understanding of the era's philosophy, art, and social life. These experiences often evoke a sense of cultural resonance.

For younger generations in particular, the integration of modern technology with ancient culture enhances their connection to traditional heritage. For example, in digital museums and virtual exhibitions, audiences can use AR to explore calligraphy works, artifacts, and sites from the Wei, Jin, Southern, and Northern Dynasties. Interactive displays allow them to engage with these cultural treasures, fostering an emotional connection to the heritage. Such experiences bring traditional culture closer to modern life, inspiring audiences to appreciate and respect it.

2) Raising Modern Awareness of Traditional Culture and Promoting Its Protection

In the context of globalization and modernization, traditional culture faces significant challenges, including the risk of loss and decay. Multimodal digital exhibitions combine traditional culture with modern technology, enabling better preservation of cultural heritage while raising public awareness of its importance. Digital exhibitions not only safeguard cultural heritage but also emphasize the need for its protection.

Through multimodal digital exhibitions, the cultural heritage of the Wei, Jin, Southern, and Northern Dynasties can reach a wider audience. Modern technology allows people to "access" these relics while preserving their original state. At the same time, these exhibitions enhance public awareness of cultural preservation, encouraging modern society to pay more attention to and protect traditional cultural heritage.

4. Conclusion

Multimodal digital exhibition technology has greatly advanced the awareness and transmission of the cultural heritage of the Wei, Jin, Southern, and Northern Dynasties. Through innovative technologies such as virtual reality and augmented reality, cultural heritage is presented in a more intuitive and interactive way, allowing audiences to deeply understand the cultural essence of this historical period. This approach enhances audience engagement and learning interest, while also effectively fulfilling historical interpretation and educational objectives. Furthermore, digital exhibition technology strengthens cultural identity and public awareness of cultural preservation, contributing to the transmission and protection of the cultural heritage of the Wei, Jin, Southern, and Northern Dynasties in modern society.

References

- [1] Feng Bin. *Research on the Historical Environment Protection and Regeneration Model of Cultural Heritage in the Western Section of the Hexi Corridor* [D]. Xi'an University of Architecture and Technology, 2022.
- [2] Duan Ying. What Is Heritage? What Is Heritage For? — Cognitive and Practical Comparisons of Cultural Heritage [J]. *Cultural Heritage*, 2024(04): 104-112.
- [3] Cai Libin, Cheng Xiaoying. Formation Mechanisms of Heritage Responsibility Behavior of Cultural Heritage City Tourists from the Perspective of Emotional Cognition Evaluation [J]. *Journal of Natural Resources*, 2024, 39(06): 1278-1298.