Expansion of the Functions of Art Museum Spaces in the Digital Era

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Abstract

With the development of social technology, particularly related technology, the wide application of information technology and digital technology has marked the arrival of the digital age in the 21st century. The fusion development of digital media technology and museum space display design has improved the effectiveness of the art museum art space form and function, bringing new spatial aesthetics. Currently, mobile phones, tablets, computers, and other electronic products have become more convenient, economical, and intelligent, due to the continuous improvement of technology optimization and people's desire for diversified museum artwork displays. The wireless network coverage has been enhanced, allowing for web virtual spaces in art museums to expand their intervention in people's daily lives. This is no longer limited to a single form of exhibition information promotion and browsing. Physical entities are gradually being digitized and transformed into three-dimensional museums, achieving holographic projection presentations that can be shared in a more engaging manner. With the assistance of network virtual spaces, the collection of products in art museums can be brought into public life, further leveraging the art museum’s educational and art appreciation functions.

Keywords

Art museum, Digital era, Space functionality, Expansion

Introduction

As social functions and demands have improved, museums have undergone continuous changes in their functions and roles within the social environment. The public now demands higher requirements for museum functions, particularly for the functionality of art museum spaces. Incorporating digital technology is necessary to strengthen the functionality of art museum spaces.

1. The space function of an art museum

An art museum is a public space for collecting, displaying, and studying artworks. It also serves as a hub for cultural and artistic education. When the public refers to a specific art museum or art gallery, they often associate it with iconic art pieces. A prime example is the "Ma Ta Fei Yan" at the Gansu Provincial Museum, which is considered its most representative artwork. The collection of artworks not only gives the museum its identity but also tends to be more famous than the museum itself. Thus, an art museum can be described as a building that encompasses both internal and external spaces (Qu Shuai, 2022).

Secondly, an art museum is a space for displaying artworks. Art museums collect and exhibit artworks, conduct research on art and collections, and the main way for visitors to appreciate artworks is through visiting art museums. Art museums have essential differences from other museums, the most critical of which is that art museums investigate the spatiotemporal characteristics of art. Art has a dual relationship with time and space.
The spatial characteristics exhibited by art museums encompass all factors that exist within a specific time and space. Artworks serve as a form of artistic expression and their physical presentation, including the materials utilized and the level of craftsmanship, necessitates a certain amount of time and space. Meanwhile, during the exhibition of artworks, there are restrictions imposed by the spatiotemporal relationship, whether it be through subjective or objective perception. Moreover, art can be expressed through its own existence, similar to a virtual space. Within an art museum, the relationship between the exhibited artworks and the museum itself is one of mutual permeation, mutual connection, and mutual existence, forming the foundation for each other's existence. Art museums offer a venue for the public to appreciate and view artworks (Li Gangli, 2021).

2. Digital technology intervention in art museums

Digital technology refers to the storage, processing, transmission, and other software and hardware technologies used for information objects in computers and computer networks. The development of digital technology relies on the advancement of the information age and has given rise to a method of managing and processing information called digitization. This form of technology can also achieve networked, intelligent, and visualized information (Li Qianwen, 2022).

With the introduction of digital technology into art museums, physical exhibition spaces face limitations in presenting artworks through traditional media, which are unique and non-replicable (Xu R, Mi Hanlin, & Wang Chen, 2022). Digital technology plays a vital role in showcasing artworks in art museums, gradually replacing traditional mediums like slide tapes and film negatives with digital storage. It offers a novel way of disseminating information and presenting artworks.

Initially, targeted exploration of digital media technology established a connection with art museums to achieve mutual benefits. It started as a technical tool used during art exhibitions for independent art evaluation. It played a role in various functional areas of art museums, including collection, exhibition, research, and education. The most significant impact and effectiveness were achieved through digital technology's use in the art display process, including digital voice browsing, digital audiovisuals, and virtual reality, where it served a crucial and prominent role (Xu R, Mi Hanlin, & Wang Chen, 2022).

Moreover, the combination of digital media technology and new media networks takes advantage of the strengths of both. The optimization of exhibition spaces has been achieved by continuously expanding from physical spaces to virtual spaces with the emergence of online media as a form of art museum exhibition space. The process of presenting art museum artworks includes the establishment of museum websites, setting up interactive media platforms on social media such as Weibo and WeChat, and the emergence of digital museums. All of these are products of the combination of digital media technology and computer network technology. Initially, the purpose of combining digital media technology and museums was to better present the museum's collection and promote exhibition activities (Shi Feng, 2022). As technology optimization continues to improve and people's demands for the presentation of museum artworks become more diverse, electronic products such as mobile phones, tablets, and computers have become more convenient, economical, and intelligent. The coverage of wireless networks has increased, expanding the ways in which people can interact with the museum's virtual space. It is no longer limited to just browsing exhibition information. Nowadays, there is a gradual move towards creating simulated entities, digitizing exhibition spaces, and creating three-dimensional museums. This enables holographic projection presentations, allowing for a more lively form of sharing. With the help of the virtual space, art museum collections can enter the lives of the general public, better leveraging the educational and artistic appreciation functions of art museums.

3. Expansion of Functionality in the Digital Era Art Museum Space

3.1 Using light stereoscopic shaping and texture expression

In the presentation of spatial functionality, art museums shape the space through lighting, showcasing the stereoscopic shaping and texture of the design. This can more accurately represent the art museum space and directly influence the psychological state of the viewers, achieving the function of displaying the art museum space. When selecting lighting equipment for art museums, it is necessary to choose suitable light sources and colors, and to accurately adjust the dimming and focusing of the lighting source. This is conducive to shaping the ideal spatial impression, as space can generate a sense of liveliness and provide a beautiful display space, further enhancing the artworks (Li Xiaohong, 2021). Light and shadow symbolize three-dimensional space, providing a beautiful display environment and a more comprehensive way to shape the space. By using the effect of shadows, it is possible to create a harmonious space of truth and illusion, generating a beautiful illusion. Through the arrangement of lighting,
it is possible to achieve coordination between shadows and shapes. This effectively increases the degree of spatial changes and enriches the sense of hierarchy in the space, deepening the spatial impression. In the display of the “Ma Ta Fei Yan” collection at the Gansu Provincial Museum, the use of display lights surrounding the space from eight directions creates a solemn atmosphere, showcasing its mysterious and lively beauty. Visitors can fully immerse themselves in a fantasy world during the viewing process.

3.2 Realizing the Synergy of Dynamic and Static through Spatial Planes

Dynamic and static are relative concepts. The movement in dynamic displays and the stillness in static displays create an aesthetically pleasing psychological sensation. When visiting an art museum, observing relevant collections through different forms of presentation will evoke various aesthetic experiences for visitors. The static display relies more on spatial plane layout. The size, density, and structure of the art museum must be planned accordingly to effectively optimize the display of artworks. The placement, spatial planning, and layout design of artworks can efficiently control the pace of visitors' movement and viewing at the art museum, allowing them to appreciate artworks while in motion. As the displayed artworks change with their bodies' movement, the visitors' line of sight moves within different spaces, resulting in no difference between this type of observation and static observation.

Dynamic display makes better use of the current digital media era by utilizing technological means to present static paintings in dynamic forms. Visitors can stand or sit and observe the beauty of continuously changing static artworks, effectively appreciating the artworks. For example, the painting "Along the River During the Qingming Festival," which combines traditional Chinese painting and folk art, is a hundred-meter-long scroll based on Zhang Zeduan's traditional painting version. Through multimedia presentation, it is better presented to visitors. With the scroll playing, one can feel the artistic beauty brought by the changing scenes.

3.3 Utilizing Technology to Display Minutiae and the Overall Picture

Art museums use digital technology to better showcase the minutiae and overall picture. By employing digital media, they can achieve virtual deconstruction of large cultural relics, allowing for a high-definition display of the details of paintings, calligraphy, seals, and other artistic works. This enables visitors to clearly see the intricate depictions in scrolls, compensating for the limitations of observing minutiae caused by the inability to get too close during the authentication process. At the Palace Museum, high-definition scanned artworks are presented to visitors through online platforms in the exhibition of paintings and calligraphy. Not only can they restore the complete picture of paintings and calligraphy in a 1:1 scale, but they can also be magnified or reduced for detailed observations of specific parts.

4. Conclusion

The expansion of art museum spaces' functionality, achieved through the use of digital technology, offers a more comprehensive approach to optimizing the effectiveness and presentation of art pieces. It provides a greater realization of the purpose of the art museum by creating an optimized space for people to view and appreciate artworks and aesthetic beauty.

References

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