Application Analysis of New Media Digital Art in Museum Exhibition Design

Gao Shan, Wu Yufei

Northeast Normal University, Changchun, 130024, China

Abstract: The emergence and development of computers have had a profound impact on various industries in society, and the emergence and popularization of new media digital technology have provided new ideas for museum exhibition design. The study combines traditional museum growth methods with the application of new media digital art in museum growth design, and compares the impact of new media digital art application on museum exhibition design. Based on the needs of museum exhibition design, the principles and specific methods of applying new media digital art to museum exhibition design were analyzed.

1. Introduction

The rapid development of modern information technology has had a significant impact on museum exhibition design, and digital museum exhibition design has gradually become the norm in museum space. This change is conducive to promoting the inheritance and development of excellent traditional culture. At present, some museums have problems in exhibition design, such as chaotic exhibition space, inverted display content, and visual effects that do not pay attention to expressing the cultural heritage, which greatly affects the audience's perception and is not conducive to the dissemination of cultural connotations behind cultural relics. In the era of information technology, museum staff should fully leverage the advantages of new media digital art, apply it reasonably in museum exhibition design, further enrich exhibition content and space, and bring more diverse visual effects to the audience, so that advanced technology can truly serve the promotion and dissemination of culture and museum exhibition design[1].

2. The Impact of New Media Digital Art Application on Museum Exhibition Design

2.1. Transition from static to dynamic

The traditional museum exhibition design mainly uses static methods such as sand table models to display cultural relics or specimens, and the audience mainly understands the relevant information of the exhibits and the theme culture presented through text explanations or language descriptions by commentators. The integration of interdisciplinary technologies such as sound, light, and electricity in new media digital art has enabled museum exhibition design to shift from static to dynamic. For example, the multi touch system used in some museums allows viewers to understand the changes of

cultural relics or specimens in different historical periods through desktop projection and touch screens, and even when some viewers pass through the projection area, the images on the desktop or ground will undergo dynamic changes based on the audience's location, which can help them further understand the cultural connotations or social environment behind the exhibits[2].

2.2. The transition from passive to interactive

In traditional museum exhibition design, the audience mainly passively receives information related to cultural relics or specimens through narrators' explanations or other textual information. This passive reception of information can easily reduce the audience's interest in viewing, which in turn leads to some viewers abandoning the later viewing process or going through a horse watching style exhibition, greatly affecting the effectiveness of museum exhibitions. The application of new media digital technology in museum exhibition design allows viewers to utilize advanced information technologies, platforms, and tools such as virtual reality technology to engage in more diverse interactions with cultural relics or specimens, attracting their attention and enabling them to actively participate in interactions. Through these interactions, viewers can further understand the cultural connotations of cultural relics and their impact on contemporary and future generations, and can effectively leverage the public education role of museum exhibition design.

2.3. The transition from two-dimensional to multidimensional

The traditional museum display design is static and flat, which makes it easy for viewers to experience visual fatigue during the visit process and refuse to continue visiting due to boredom. The application of new media digital technology in museum exhibition design enables two-dimensional graphic and textual images to be transformed into vivid and vivid three-dimensional images. For example, some museums provide visitors with tomb cinemas and virtual reality technology and equipment, allowing them to enjoy a wonderful audio-visual feast and gain multi-dimensional experiences such as vision and touch during the visit process, which are specifically reflected in three aspects, As shown in Figure 1[3-4].

Figure 1: Design framework for multi-dimensional digital museum exhibitions

3. Principles of applying new media digital art to museum exhibition design

3.1. Principle of Centering Exhibits and Visitors

The purpose of applying new media digital art to museum exhibition design is to better showcase the characteristics and other information of cultural relics or specimens to the audience. Therefore, in the process of applying new media digital art, it is also necessary to adhere to the exhibition as the center, that is, decide whether to apply new media digital art and specific application methods based on the characteristics and types of exhibits. For museum exhibits that discover, invent, and apply technological means, a large number of virtual reality and other digital media technologies can be introduced to directly express the technological principles contained in these exhibits and technological means. For historical and cultural exhibits with strong humanistic significance, in the process of applying new media digital art, emphasis should be placed on shaping the historical environment and cultural atmosphere, and the cultural connotations and related historical development processes represented by cultural relics should be expressed as much as possible. The concept of audience centeredness, that is, staff should fully consider the audience's experience of watching exhibition works in the process of applying new media digital art, and make every effort to use new media digital art to create a highly interactive, visually effective, and safe viewing environment for the audience[5].

3.2. The principle of adapting to local conditions

Museums are cultural windows and landmarks of cities, with the function of public education. In order to fully utilize this function of museums, the application of new media digital art in museum exhibition design should also be selected based on local cultural characteristics and display themes. The application of technology should fully highlight the thematic characteristics and cultural connotations of museum cultural relics display. Therefore, in the process of utilizing new media digital art, we must also adhere to the principle of adapting to local conditions and starting from the actual situation.

4. The application of new media digital art in museum exhibition design

4.1. Application in Exhibition Space Design

Exhibition space design is an important part of museum exhibition design, and the space design in this section mainly refers to the design of space size. The successful design of the world-renowned Sydney Opera House is not only due to the historical and cultural heritage of the building itself, but also because its architectural space design is perfectly integrated with the surrounding environment, and its architectural space design will not change due to factors such as distance and perspective. Some museum exhibitions require very large architectural space, but the actual architectural space is limited. Therefore, new media digital technology can be used to fully release other spaces, such as expanding the audience's visual extension through curved spherical spaces, making the museum exhibition space larger and wider. For example, when designing an exhibition hall for ancient mammals and reptiles, it is necessary to fully consider the results of audience analysis. The specific analysis content is shown in Figure 2. On this basis, clarifying the theme of the exhibition hall and the design concept of the exhibition space can change the traditional display methods of display cabinets and text and images, and clarify the evolution of mammals and reptiles as the main theme. By applying new media digital art to existing display methods, for example, through touchable electronic screens and virtual reality technology and devices, highly restored restored paleontological

features and living scenes are displayed on the exhibition hall walls. Virtual reality technology also enables the interaction between the audience and the wall to display restored paleontological creatures, showcasing infinite space for the audience in the limited exhibition space[6-7].
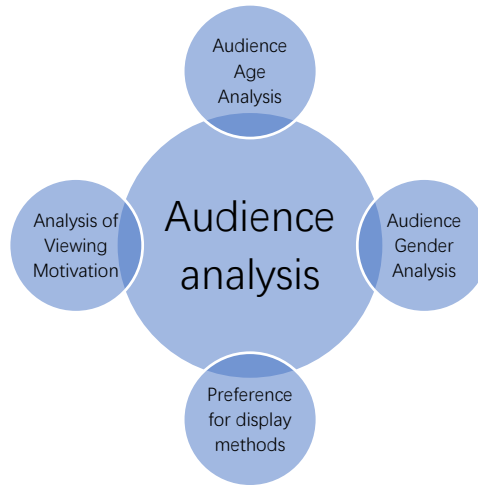

Figure 2: Main Content of Audience Analysis for Museum Exhibition Space Design

Museums with conditions can also optimize their existing exhibition space based on the need to improve visual and infectious effects. For example, in order to enhance the visual effect of some products transitioning from 2D to 3D, two-dimensional spray painting maps can be pasted on cardboard or facades and placed in front of the vertical space, creating an artistic effect that combines virtual and real elements. Alternatively, the existing display space can be renovated to create a curved spherical space, and new media such as digital projection can be used to project exhibits and other content onto the spherical space. This three-dimensional visual effect can enhance the audience's experience, and even recognize the projected sculptures and other cultural relics as three-dimensional objects[8].

4.2. Optimizing Color Language Design

The color language in museum exhibition design plays an important role in the dissemination of exhibition information instructions, and even brings different psychological implications to the audience. Therefore, the color language design in exhibition space design should revolve around the theme of the display, the characteristics of the display space, the audience's visual and auditory experience, and visual psychology. However, traditional two-dimensional museum exhibition design is clearly difficult to achieve this goal, so designers should actively utilize new media digital art to continuously optimize color language design, so that colors can achieve the fusion of function and emotion expression, and improve the expressive and infectious power of museum exhibition design. Therefore, it is necessary to choose different color languages under different theme languages. For example, in the color design of museum exhibition spaces with natural themes, green, blue, and brown color languages should be applied as much as possible to restore the true natural space. By applying new media digital art to exhibition space design and color language design, a better scene atmosphere can be created, and the intrinsic nature of exhibits can be restored as much as possible, extending the exhibition form and presentation effect of cultural relics or specimens[9-10].

4.3. Utilizing New Media Digital Art to Strengthen Interaction

The interaction in museum exhibitions can bring better viewing effects to the audience, and the interactive exhibition devices can stimulate the audience's curiosity about cultural relics or specimens,

enabling different groups to actively explore the cultural connotations behind the specimens or artifacts driven by interest. For example, the Mawangdui Han Tomb series exhibition showcases Han Dynasty astrology through animation projected from the arbor listening center. Viewers can click on the touch screen set up in the cinema center to learn about relevant content. This two-way interactive form of cultural dissemination and information extraction can stimulate their interest in Han Dynasty astrology. You can also use the screen to browse pictures of Han Dynasty jewelry and artifacts, as well as the question answering system to further perceive the shape and color of these items, and broaden your horizons.

5. Conclusion

New media digital art has a significant impact on museum exhibition design, causing the viewing effect of the audience to change from static to dynamic, from passive to interactive, and from two-dimensional to multidimensional. It is even more necessary for designers to make reasonable use of new media digital art based on local conditions, with the audience and exhibits as the center, to promote the application of this art in space design and color language design, and to enhance effective communication between people and exhibits, enhance visual effects and the role of public education in museums.

References

[1] Zhuang Wanyi. A Study on the Display Design of Museums in the New Media Environment: Taking the Nanjing Six Dynasties Museum as an Example [J]. Northern Literature (Mid Tencent), 2018 (4): 155

[2] Qiao Ran. On the Mutual Integration and Promotion of Art and Contemporary Emerging Technologies -- Taking the "New Media" Installation in the Jiangning Weaving Museum as an Example [J]. Jintian, 2015 (2): 107-108

[3] Chen Zientheng, Wang Chenqi, Liu Jiali, et al. Analysis of the Digital Transformation of Museums in the New Media Environment - Taking the App Produced by the Forbidden City as an Example [J]. New Media Research, 2019,5 (10): 78-80, 90

[4] Zong Hanxue, Liang Xueyong. Research on the Innovative Design Path of Museum Information Visualization under Digital Technology - Taking the "Cloud Tour Dunhuang" Platform as an Example [J]. Packaging and Design, 2023 (2): 138-139

[5] Liu Xinyang. Interpretation of Historical Exhibition through Digital Technology - Application of New Media Technology in Museum Exhibition [J]. Design Art Research, 2012,2 (2): 37-42

[6] Abbas Ali, Zhang Zhao (compiled). The Future of New Media Art - A Discussion on the Exhibition, Collection, and Protection of New Media Art in Museums and Art Museums [J]. Oriental Art, 2012 (3): 125-130

[7] Wang Hong, Liu Yilin. Museum Culture Digital Immersion Experience: Pocket "Mobile" APP Art [J]. Comparative Study on Cultural Innovation, 2019, 3 (1): 58-59

[8] Lv Liang, Li Yanxia, Wei Juan. The Application of Virtual Panoramic Design in the Digital Construction of Museums under the Background of New Media: Taking the Gaoqing Ronggu Rubbings Art Museum as an Example [J]. Digital users, 2021,27 (15): 78-80

[9] Zheng Yijie. Research on the Application of New Media Interactive Art in Online Digital Museums [J]. Journal of Suzhou Vocational and Technical College of Arts and Crafts, 2023 (2): 18-20

[10] Xu Xiaotian, Wang Chen. Analysis of the Distance between People and Art under New Media Technology - Taking the Application of Museum VR Technology as an Example [J]. Art Technology, 2017,30 (1): 117