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Research on the Forms of Expression and Application of Interactive Narrative Exhibition Design of Museums in Guangdong

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Abstract

The continuous development and innovation of globalized 5G science and technology has greatly contributed to the improvement of artificial intelligence and high technology and is applied widely in national education service places. Interactive narrative technology, as the mainstream of new technologies, gained widespread application in the exhibition design of museums. Interactive narrative exhibition design is of great significance for museums in Guangdong, as the diversified interactive technologies provide various sustainable plans for museum exhibitions and create a more excellent environment for people to visit and communicate. The forms of expression and application of interactive narrative exhibition design of museums in Guangdong were deeply analyzed in this study.

Keywords

Interactive Narrative; Exhibition Design; Museum Cultural Dissemination.

1. Introduction

With the rapid development of globalized 5G science and technology and the improvement of people's living standards year by year, most people pursue spiritual satisfaction rather than being limited to material consumption. Museums, as service places for national education to protect and inherit human cultural heritage, become increasingly popular among the public year by year. According to the statistics released by the China General Administration of Cultural Heritage, China's museum industry showed good momentum. By the end of 2019, there were 5,535 museums registered in China, which implies that "museum fever" has been a new social and cultural fashion in China, and one of the main ways for the public to learn and improve themselves.

The "Memory of the World", a plan launched by UNESCO, is intended to preserve and inherit the best of tangible and intangible human cultural heritage through modern information technologies. Evidently, new technologies play a great role to protect human civilization, and aroused widespread attention. According to the statistics in the Museum Development Report of Guangdong in 2020 released by the Department of Culture and Tourism of Guangdong Province, there are 352 museums in Guangdong, with the number of museums increasing remarkably and ranking second in China, and the overall development quality coming top. In addition, the Department of Culture and Tourism of Guangdong Province is actively improving the system of museum policies and regulations, pushing forward the construction of the "City of Museums" and promoting deep integration between museums and high-tech technology. Therefore, interactive narrative exhibition design is of great significance for the long-term planning of museums in Guangdong as interactive narrative technologies provide a basic guarantee for diversified, distinctive, high-quality and sustainable development of museum exhibition design.

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2. Current Situation and Trend of Interactive Narrative Exhibition Design of Museums

2.1 Interactive Narrative Exhibition Design

The focus of interactive narrative exhibition design lies in "interaction narrative" and "exhibition". Interaction literally means communication, contact and conversation. Interactive design, originated from ergonomics with the integration of a multidisciplinary theoretical approach, simply refers to a "dialogue mechanism" with the virtual interface as an interactive carrier between men and machines. Narrative, in simple terms, is the description of the story. Interactive narrative means that in the narrative process, the basic script based on the story changes according to the audience's input to the narrative system. Exhibitions refer to demonstration and display. The exhibition design of museums intends to convey the content and concept of the exhibits to the audience. The interaction narrative exhibition design of museums provides a virtual space for users to engage, interact, communicate, view and preview through the application of multiple elements such as lighting, sound and touch. In the interaction narrative exhibition design featuring high technology, fun, and interactivity, exhibits and intangible cultural heritage are displayed vividly through the advanced new media interactive technologies. Its greatest significance lies in the immersive engagement and emphasis on the interaction between users and exhibits, thus providing maximum empathy for visitors. Meanwhile, as a new interpretation for space planning of the and way of display for exhibits, interactive exhibition design would create more possibilities for museums.

2.2 Current Situation and Trend

In the era of "big data" and 5G, people's social life was greatly infiltrated by new media. During the booming period of new media in China, the way and concept of museums as social and cultural service places has been changed greatly [1]. New media digital museums are not a simple combination of internet technology and museums, but a cross border integration of new media interactive technologies and exhibition design of museums, thus exploring new ways of exhibitions in the integration [2]. In recent years, the interactive narrative exhibition pattern in Guangdong still lies in the initial stage of exploration, where audience's feelings have been stressed when pursuing new media technologies. In order to enhance the interactivity, virtual reality technologies such as virtual reality (VR), augmented reality (AR) and others have been gradually used in Guangdong museums, creating an immersive virtual environment for visitors to learn the historical knowledge and cultural connotations of the exhibits.

As the new media interactive narrative technologies are gaining more understanding and acceptance of the public [3], the interactive narrative exhibition design receives positive response from museum visitors though it is at the initial stage of exploration. In this regard, interactive narrative exhibition design has promoted the progress of China's museum industry, showing a good momentum.

3. Forms of Expression of Interactive Narrative Exhibition Design of Museums in Guangdong

The visiting process and the exhibitions of cultural relics in traditional museums in Guangdong only allow visitors to feel the cultural relics with eyes and ears, resulting in the poor effect of exhibitions. Some simple new media technologies have been developed to solve these problems by playing animations and communicating messages with simple electronic screens. However, the main problem remains unsolved. For instance, when some cultural space projects are simply transmitted by new media or electronic media, the public can only gain a simple understanding of project names and basic forms, but neither experience their folk cultural activities and ritual steps nor perceive the emotions and meanings brought by such activities in a specific cultural space. Further, lots of folk culture items are not suitable for the exhibitions in folk museums as reported by the public. Hence, in the interactive narrative exhibition design, museum exhibits are combined with new media interactive technologies, and exhibition forms, limitations of the exhibition hall, and the needs of the public are taken into

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account. Furthermore, the interactive narrative exhibition design provides varying manifestations for museums in Guangdong, including virtual reality (VR) technology, augmented reality (AR) technology, and interface virtual technology.

3.1 VR Technology

VR technology is the product of the revolution in modern information technologies, as well as a major multidisciplinary and technological achievement since the 20th century. Proposed by Lanier in the U.S., VR means transforming graphics, sounds, texts, and others into digital forms and then presenting them on computer networks. In a nutshell, VR is to create a three-dimensional virtual space by simulating social natural things or motions of natural laws via such technologies as new media interactive technologies, artificial intelligence technologies, and simulation technologies. Its most distinctive feature is allowing participants to break through the limitations of time and space for communication and interaction [4]. Recently, most of the domestic and foreign museums have introduced VR technology by head-mounted displays or stereoscopic glasses, so that audiences can enter a virtual space through digital devices and hence interact with exhibits in an immersive way. For instance, the British Museum uses VR technology to lead visitors to the Bronze Age and allow them to participate in many kinds of rituals in ancient times, such as the ritual of sacrificing to the sun.

In China, relevant government departments and museums are gradually aware of the necessity to introduce VR technology, which however requires a great investment of human resources and funds. In addition, the creation of VR scenes should be based on a story script or historical background, so as to ensure that audiences complete the action or experience the storyline as required after entering the virtual space. Thus, the application of VR technology is still at the initial stage of exploration in the exhibition design schemes of museums in Guangdong. Located in Yangjiang City, Guangdong Province, the Maritime Silk Road Museum of Guangdong is China's first underwater archaeological museum with the theme of the excavation, protection, exhibition and research of "Nanhai No. 1", an ancient shipwreck in the Song Dynasty. It reproduces the nautical scene with VR technology and 3D modeling, allowing visitors to transform into the helms of an ancient ship in the Song Dynasty and enjoy sailing on the sea by using VR digital glasses and data handles. The simulated sailing experience hall as the highlight of the museum's exhibition scheme has become one of the most popular exhibition halls in the museum. By enabling visitors to better interact and communicate with history in the virtual space, it enhances the experience and visual enjoyment of visitors.

3.2 AR Technology

VR technology and AR technology have some technological similarities. The former creates the public with a three-dimensional virtual space with strong stereoscopic vision and realizes the combination of virtual technologies, simulation technologies and multimedia technologies by new digital means. The latter, based on modern information technologies and virtual technologies, displays the information of things in the real material world with augmentation, thus effectively improving audiences' perception and experience of real-world scenes. Thus, in the application of AR technology, how to combine with the characteristics of the architectural space or the operating environment should also be considered in addition to the application of modern information technologies. Most digital devices that AR technology relies on are smartphones or smart devices with cameras, and virtual technologies and the real physical environment can be integrated by scanning the interface port. Moreover, the augmented virtual design will supplement the parts of exhibits that are not displayed, including the background environment, accessories, and usage scenarios. VR technology has simpler operating equipment and script planning, higher product usability and it is easier to use. In contrast, AR technology has fewer restrictions on the operating environment, higher user participation in the operation, but also more technical difficulties.

In recent years, AR technology has been widely used in museums overseas. In general, visitors can generate AR by downloading the APP or scanning exhibits or exhibition areas with cameras. For instance, at Mauritshuis located in Hague, the Netherlands, audiences can activate the girl in the oil

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painting by scanning the world-famous painting Girl with a Pearl Earring. Using AR technology, the Royal Ontario Museum shifts paleontology exhibitions from lifeless to alive and interesting, allowing audiences to see dinosaurs with flesh and blood, rather than inanimate dinosaur fossil skeletons, via mobile phones, tablets, and other smart devices.

AR technology has also been frequently used in the exhibition design of Chinese museums. In most cases, virtual exhibits can be generated based on the real ones by scanning the appearance or the pictures of exhibits. In Foshan, Guangdong, the "Foshan AR Museum Project" has been introduced to four museums, including Lingnan Wine Culture Museum, Shijingyi Liu Ziying Art Museum, Dongpeng Mingshan Ceramics Museum, and June Museum. When appreciating the museum's collections, visitors can present the complete 3D three-dimensional appearance of the exhibits on the interface of their mobile phones only by opening the Baidu APP and scanning the specific identification map of the exhibits through the smart device terminal. Then, on the interface, they can realize multi-angle rotation, zooming, detail viewing and other operations on the exhibits with finger commands. Overall, AR technology has such advantages as wide acceptance of users, portability, and simple operation, thus being suitable for most users.

3.3 Interface Virtual Technology

Interface virtual technology belongs to non-immersive VR technology, where people can use the electronic screen as the interface window to view the virtual scene and interact with the screen simply by interface buttons. This technology has lower technical requirements and costs, as well as higher operability and product popularity in equipment and screens than VR technology and AR technology. A typical example is 360o panoramic roaming, which means transforming two-dimensional static graphics into three-dimensional stereoscopic graphics via modern information technologies based on static graphics to construct a three-dimensional space [5]. Through smart devices and relevant software, audiences can interact with or operate in the virtual space constructed. Moreover, this technology shares some highlights with VR technology, such as breaking through the limitations in location, operation space, time, and other fields.

In China, representative works based on interface virtual technology are the "360o Roaming the Forbidden City" launched by the Palace Museum and the "Pineapple Folding Stage" of the Shanghai Museum. The two present targets with this technology in a 360o and stereoscopic manner. The Cantonese Opera Art Museum in Guangzhou, which has the characteristics of Lingnan gardens, is divided into north and south shores. The south shore is the main museum for exhibitions, while the north shore is focused on the exhibition and inheritance of Cantonese opera culture. Interface virtual technology has been introduced by this museum to connect the architectural space, exhibitions, Cantonese opera stage, and others of the north and south shores, allowing audiences to enjoy visiting the Cantonese Opera Art Museum simply with buttons on the electronic screen. In the current context where the epidemic blocks traveling to a certain extent, attempts are also made to apply this technology to the online museum, so that people can experience the museum remotely instead of traveling and waiting in line.

4. Value Embodiment of Interactive Narrative Exhibition Design of Museums

In the interactive narrative exhibition design of museums, curator designers, technicians and cultural inheritors combine excellent human civilization with new media interactive technologies, and perform multi-disciplinary integration to create a virtual and dreamlike space for audiences. In general, museums mainly have three-layer functions, collecting and protecting cultural relics, conducting professional research and museological research, and showcasing the collected cultural relics and documents to the public for inheriting the culture and maximally performing the educational function. In this regard, interactive narrative exhibition design provides assistance for museums to better fulfill the three functions, thus promoting the positive role of museum exhibitions and improving the competitiveness of museums.

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4.1 Collection, Protection and Exhibition of Cultural Relics

Interactive narrative exhibition design means scanning and analyzing cultural relics with modern information technologies, and then reconstructing their appearance and connotations by combining virtual simulation technologies and multimedia platforms. First of all, the damages to the cultural relics, such as the damage caused by camera flash, can be reduced when audiences visit and experience museums. Second, it can record the cultural relics to a large extent, thus providing future research of cultural relics with information and image visualization to better collect and preserve cultural relics. An example is the scanning of porcelain in the Song Dynasty, analysis and recording of related information by AR technology. To have a better understanding of a collection, audiences can scan the actual porcelain or even its photos by smartphones, thus creating virtual holographic three-dimensional porcelain from the Song Dynasty. Third, through simple operations on the interface, audiences can also learn the historical background, production process and other extended information of the collection. Further, VR technology is also a tool to simulate the porcelain from the Song Dynasty for the generation of virtual images. Also, with head-mounted glasses, museum researchers and archaeology professionals can conduct immersive research of the cultural relics, thus preventing damages caused by repeated contact.

4.2 Improvement of the Satisfaction of Visitors

In traditional museums, the process of visiting museum exhibitions is dominated by self-service viewing, narration by museum staff, or simple introductions by videos. This form of exhibition is single, focusing on the fixed one-way output of information, where audiences as the output objects receive information passively. The long-term use of this form tends to cause the fatigue of visitors towards museums and cultural relics.

In contrast, interactive narrative exhibition design is focused on offering both visitors and exhibits a two-way method for information communication. Introducing new media interactive technologies to the exhibition design of museums has become the mainstream, where exhibits are displayed to the public in a more vivid, intuitive and interesting way by utilizing modern information technologies and subverting the traditional concept of exhibition means. Audiences can conduct conversations and interactions with cultural relics via head-mounted glasses, smart devices, or touchscreens. For instance, the use of VR technology to introduce Lingnan garden architecture will lead audiences to a virtual Lingnan garden environment, allowing them to learn more about the characteristics of Lingnan gardens through the senses of hearing, vision, touch, and so on. The traditional Han cultural elements are even incorporated into the characteristics of Lingnan gardens. For instance, when entering the virtual Lingnan garden and traveling through the scenery of the Lingnan garden to a stage for Guangdong Cantonese opera or lion dance performance, audiences can experience a variety of cultural presentations in one place, which remarkably satisfies their needs to experience. While adhering to the system design principles, interactive narrative exhibition design significantly improves the satisfaction of visitors by allowing them to have an immersive experience.

4.3 Enhancement of Cultural Identity and National Pride

As museums serve as a calling card of a city, the demand and expectations of the public for museums experience an upward trend. In essence, museums aim at cultural transmission, while the demand for museums by the public is embodied in better accepting more excellent culture from them. In the meantime, museums are also reflecting on how to maximally promote the traditional excellent culture of China. In this context, new media interactive technologies will undoubtedly provide significant technical support for the exhibition design of museums. Specifically, VR technology, AR technology, interface virtual technology and other new media interactive technologies can be used to "listen" to what the exhibits and cultural relics intend to say to tourists, as well as what tourists would like to know from them. Overall, increasing the application of interactive exhibition design in museums is an effective way to shorten the distance between visitors and exhibits, promote the value transmission of traditional culture, and enhance the national pride of visitors.

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5. Conclusion

Museums are public places to display and transmit human civilization. With the rapid development of globalized 5G high-tech technology and the annual growth of national material living standards, the introduction of new media interactive technologies into exhibition design of museums has become a trend in the current development of the Chinese museum industry. While providing museums with a new way of cultural dissemination, interactive narrative exhibition design also offers audiences a new way of "listening" to cultural relics and lays emphasis on their sense of participation, so that they can realize the goals of leisure and entertainment while acquiring historical and cultural knowledge. In addition, the interactive narrative exhibition design can support museums to maximally fulfill their functions, better inherit the culture and demonstrate the sentiment of cultural relics and museums. In the future design of museum exhibitions, new media interactive technologies will become a major link to drive its development.

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