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A Study of Experiential Exhibition Format Using VR Technology at Sanxingdui Museum

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Abstract

This study explores the feasibility and potential of using virtual reality (VR) technology to enhance the museum viewing experience through digital media. In an increasingly digital world, museums face the challenge of adapting to changing visitor expectations. This study explores the integration of virtual reality and digital media as a means to engage, educate, and attract museum visitors in a novel, immersive way. By analyzing its advantages, challenges, and practical implications, this study aims to elucidate the feasibility of this transformative approach.

Keywords: *Virtual reality technology, digital media immersive experience, barrier-free viewing, innovation and interaction VR Technology Use, Heritage Conservation and Publicity*

1. Introduction

As a protector of cultural heritage, digital museum has become the development trend of new viewing in the future. In many places in China, VR wearing equipment is used to assist visitors to explain the exhibits, but there are practical problems such as the heavy equipment, the equipment explanation does not fully cover all the exhibits in the museum, and the limited immersive experience. But with the popularity of indoor destinations such as museums, digital age museums equipped with better virtual reality facilities and rich personalized content to satisfy visitors will soon become a reality in the future.

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1.1 Present Situation of Museums

With the outbreak of the end, Social activities are gradually resuming. especially holidays, It is difficult for visitors to museums or art galleries to purchase tickets. sanxingdui museum, for example, summer between July August, daily reception saturation, according to official statistics, new booking tickets hits more than 1.3 million times a day. Even if the organizer introduced the reservation system, it still cannot meet the demand for admission, the huge passenger flow also leads to the decline of the visiting experience, the opening of all age groups, making the crowded inside and outside the exhibition hall, which is easy to bring safety risks, but also is not conducive to the protection and display of cultural relics. Therefore, by analyzing the practical application of VR technology in Museum, this paper discusses the feasibility of using the combination of virtual reality and digital media to enhance in Sanxingdui Museum viewing experience.



Figure 1. Difficult to achieve the purpose of viewing due to the large number of people

2. Digital Media in Modern Museums

The shift from traditional museum exhibitions to digital museum exhibitions. This transformation is constantly popularized and accepted with the continuous progress of technology and the continuous improvement of user recognition and acceptance. In recent years, several common digital media in modern museums include: portable voice interpreter, artificial intelligence interactive screen, portable VR interpreter (youth version), etc., visitors rent equipment or play games to learn about the museum's collection or art. Among them, the most innovative and expensive equipment is the portable VR interpreter. Taking Sichuan Provincial Museum as an example, 360° panoramic VR is produced in important exhibitions. By wearing VR equipment, visitors can explain the exhibition area, and the induction system automatically plays the explanation pictures and audio, combined with the physical exhibits to improve the viewing experience.

3. Benefits of Digital Media in Museums

3.1 Immersive Experience

VR technology provides a very immersive experience, making visitors as if they are in a historical scene or cultural background. This immersion can stimulate the emotion and interest of the audience, allowing them to have a deeper understanding of the content of the exhibition. Immersive experience is a huge

advantage of VR in museums. By wearing a VR helmet, visitors are completely surrounded in a digital environment and feel themselves in a historical event or cultural scene. This sense of immersion helps the audience to understand and feel the story behind the exhibits more deeply. For example, if you are visiting a digital reconstruction exhibition of an ancient city, you can feel like you are walking down the streets of that city and feeling the atmosphere of ancient culture, an experience that traditional exhibitions cannot provide.



Figure 2. The Sichuan Provincial Museum has a VR Interpreter

3.2 Interactivity

Visitors can interact in a virtual environment, touch, rotate, and explore digital artifacts and exhibits. This interactivity not only increases the audience's sense of engagement, but also provides richer information and backstory.

VR adds interactivity to the museum experience. Viewers can interact with the exhibits through the handle, gesture recognition or other controls in the VR headset. They can touch, rotate, zoom, or shrink digitized artifacts to take closer detail. In addition, virtual guides and educational applications can provide relevant information according to the interests and needs of the audience, enabling visitors to customize their experience. This interactivity not only enhances their participation, but also deepens their understanding of the exhibits.

3.3 Personalized Experience

VR devices can provide personalized Tours and content according to the interests and needs of visitors. This personalization allows the audience to delve into the exhibits they are interested in without interference from other visitors.

3.4 No Space and Time limitation

VR technology can span time and space constraints, allowing visitors to visit inaccessible locations and historical periods. This is very useful for exploring distant cultures and history, and also helps in global audience participation. For example, some exhibits are not on display in the museum or are being maintained, so the digital visit through VR virtual reality technology does not have to worry about not seeing the exhibits you want to see. For professionals, the VR equipment that can be collected with HD data can meet the needs

of professionals for careful and long-term research on the more details of the exhibits.

3.5 Accessible Access

VR can offer more accessible options to meet the needs of a physically disabled audience. VR can remove barriers that may exist in the physical world, such as stairs or narrow passages. Another important advantage of virtual reality technology in museums is its accessibility. For physically disabled visitors, traditional museums may have some limitations, such as stairs, narrow passages, or exhibition space unsuitable for wheelchairs. But virtual reality can remove these barriers and make it easy to visit for everyone. Visitors simply wear a helmet and handle to explore all of the museum's exhibits, free of any physical barriers. This inclusive experience enables more people to enjoy the wonderful journey of culture and history.

3.6 Combination of Educational and Entertainment

VR can not only provide educational information, but also combine learning with entertainment. This makes the museum visits even more interesting, attracting audiences of all ages. Especially low age teenagers visiting groups, due to the cognitive or interest also need to cultivate, it is difficult to focus and cultural relics for a long time to visit the experience, often in the process of visiting, 2 to 4 hours because of the lack of tolerance, loud play affect public order and others visit experience of bad behavior, provide for low age audience interested in short time viewing experience of VR project can effectively link this kind of situation.

3.7 Conservation and Protection of Cultural Relics

Using VR technology, museums can create digital replicas that allow visitors to get close up at precious artifacts without damaging the original. This contributes to the protection and preservation of the artifacts.

In short, visiting the museum with virtual reality equipment provides a new and rich visiting experience, enabling them to have a deeper understanding of culture and history, while also providing the museum with an innovative way to digitalization and education. The development of this technology promises to continue to enrich the interaction and engagement in the museum field.

4.The Current Situation and Analysis of Visiting Experience in Museums

Successful case studies of museums combined with digital media. In 2004, the Louvre in France launched an online museum with 400,000 exhibits. In 2021, he cooperated with Louis Vuitton to carry out 3D scanning and restoration technology for "Goddess of Victory" and "Poser Awaken by Love", and made them into light and shadow works, combining cross-border and fashion shows. The British Museum launched the Virtual Reality Online Museum during the outbreak of VR technology in 2015. In 2017, it cooperated with the VR company oculus to launch the "Online VR Exhibition". The Russian Patriotic War Memorial Hall uses dome projection to let the audience feel the grandeur and heroism of the war. China Palace Museum, on the other hand, cooperates with the media platform to produce various interactive animations and films to enhance the interactivity of visitors and balance the digital and physical museum experiences.

4.1 Present Situation of Museum Visiting Equipment

The auxiliary visiting methods in museums show significant disparities. A comparative analysis, based on on-site experiences, was conducted to compare the existing auxiliary visiting methods employed by Guangdong Museum, Luzhou Museum, and Sanxingdui Museum. The analysis focused on factors such as

tour duration, equipment rental or manpower expenditure, and experiential feedback.

Table1. Existing ways of visiting and explaining

	Manual explanation	Intelligent voice navigation guide	Independent visit	Public account explanation
price	30~40 / person	23 / set 200 deposit	not have	10 Yuan / desk
content	More complete	More complete	same as	limited
Audience group	all	all	all	all
Convenience	Need to make an appointment	a limited number of	good	good
experience feeling	same as	same as	good	not have
interactivity	same as	not have	not have	not have
duration	90`150min	unlimited	unlimited	unlimited

According to statistics, VR equipment plays an important role in improving the visiting experience. Take Sichuan Museum as an example: The VR viewing commentator of Sichuan Museum, there are three floors in the museum, and the media content of a total of 42 exhibits in the museum is often more than one hour, so that visitors can visit by wearing equipment, and at the same time understand the historical background, excavation process, historical significance and purpose of use of the exhibits through VR equipment. Through vivid animation explanation, visitors can learn the most representative cultural relics of the whole museum efficiently in a limited time. The content is beautifully made and the animated characters are lifelike, which is very suitable for teenagers to rent VR glasses equipment and learn about the exhibits while visiting. However, VR virtual reality technology has not been widely used, and there are some shortcomings in practical application, such as poor interactivity, insensitive voice control function and limited exhibits. But the application of virtual reality technology is a good attempt, very popular and necessary.

4.2 Feasibility of Adopting Virtual Reality Technology in Sanxingdui Museum

Sichuan Provincial Museum adopts the form of VR equipment rental to provide exhibits for visitors. The addition of VR guide equipment in Sanxingdui Museum is bound to alleviate the problems such as too many personnel in the peak period, relieve the visiting pressure and improve the sense of visiting experience. And Sichuan province museum using the primary VR equipment, sanxingdui museum can adopt more advanced VR virtual reality equipment, break through the limitations of visual and auditory, increase human voice and gesture recognition function, according to the voice and gesture instructions, exhibits virtual image more diversified and personalized interactive operation, improve interactive. Increase the experience of the visitors.

5 .Conclusion

The impact of virtual reality technology on museum visiting experiences is multifaceted. From a practical perspective, virtual reality technology provides visitors with a more immersive experience, allowing them to get closer to exhibits and feel the authenticity of the museum environment. Through virtual reality technology, visitors can explore museums anytime, anywhere, transcending the limitations of time and space. This level of convenience enables greater participation in the cultural heritage preserved in museums. Moreover, virtual reality technology offers museum visitors richer interactive and learning opportunities. With virtual reality, visitors can interact with exhibits, gaining a deeper understanding of their history, cultural background, and artistic value. Additionally, virtual reality allows visitors to actively participate in the construction of virtual museums, becoming disseminators of knowledge and culture, thereby enhancing their knowledge base and sense of involvement. From an academic perspective, the impact of virtual reality technology on museum visiting experiences has been extensively researched. Academics widely recognize that virtual reality expands the scope of a museum visit and enriches visitors' experiential modes. Furthermore, research examines how virtual reality technology enhances visitors' learning outcomes and memory retention, strengthens emotional connections, and improves the quality of exhibition experiences. In conclusion, from both practical and academic perspectives, virtual reality technology has a positive impact on museum visiting experiences. It offers a more immersive experience, diverse interaction possibilities, and has undergone extensive scholarly investigation. However, the application of virtual reality technology in museum visits is still in its early stages, requiring further development and refinement to better meet visitors' needs and enhance the value of museum visits.

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