The virtual museum display mode under the perspective of "Internet +"

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Abstract: Under the perspective of "Internet+", this paper firstly determines the theme and content of the display through in-depth research and analysis of the collection. Then, according to different themes and contents, different display modes are designed, such as timeline and spatial layout. Finally, through the application of virtual reality technology, the audience can interact with the exhibits and deeply understand the cultural connotation and historical background of the collections. After simulation experiments, the design mode of this paper enables the audience to experience 97.15% of the collection and 98.66% of the interactivity. This shows that the virtualized exhibition in the field of "Internet+" can better eliminate the unfamiliarity between the collection and the audience and produce an immersive view, and has a broad application prospect.

1. Introduction

With the rapid development of Internet technology, the emergence of virtual museums has broken traditional museum displays' limitations and further improved museums' cultural communication function [1-2]. Virtual museums use digital and virtual technologies to display multiple aspects of cultural relics to the audience, enabling a more comprehensive understanding of cultural relics and historical context. This multidimensional presentation can meet the different needs of people for museums and provide an efficient and comprehensive way for visitors to visit [3]. Virtual museums have a unique sense of realism and immersion, enabling visitors to gain a deeper understanding of the exhibits and the cultural context behind them. Through this interactive presentation, visitors can experience the value and significance of the artifacts in a more intuitive way. The emergence of virtual museums not only provides a more convenient and efficient way for people to visit, but also provides new ideas and directions for the digital transformation of museums.

Several museums have already launched online virtual museum modules, and many other heritage display centers are experimenting with new display technologies. For example, the literature describes the creation of a virtual museum of Spanish costumes of the 16th century, which exists only in digital format and can be accessed through a computer or a digital tablet. The 3D model of one of the exhibition halls was created in Blender and finally everything was assembled in the Unity video game engine, where the interactive part was also done in Unity. A heuristic evaluation scale was established in the literature . The online virtual tour of the Forbidden City architecture exhibition was used as a case study for confirmatory factor analysis. The results show that the exhibition is visually realistic and interactive. The aforementioned literature mainly starts from the viewer's level of understanding and considers the interactivity between the collection and the viewer on a theoretical level, lacking practical exploration. Based on this, this paper designs a virtualized exhibition viewing model under the perspective of "Internet+". Using virtual reality technology, the main focus of the design is on the viewer's feelings, and the interactive behavior is integrated into the exhibition process. The applicability of the model is verified in the process of practice, in order to provide some reference for the research of virtual museums in terms of display methods and interaction means.

2. Virtual museums under the perspective of "Internet+"

2.1 Virtual reality technology under Internet+

The application of the "Internet +" strategy to the development of museums has led to the emergence of virtual museums [4-5]. The basic structure of virtual reality technology under Internet+ is shown in Figure 1. The virtual reality technology is used to collect all-round information from the exhibits of traditional museums, so that they can build a real world in a virtual environment, imitating a virtual fantasy that is recognized by the public's sense of sight, hearing, and touch in a specific range [6]. In the virtual museum, the audience can talk to and be influenced by the virtual fantasy with the help of certain technological tools and the usual natural environment.

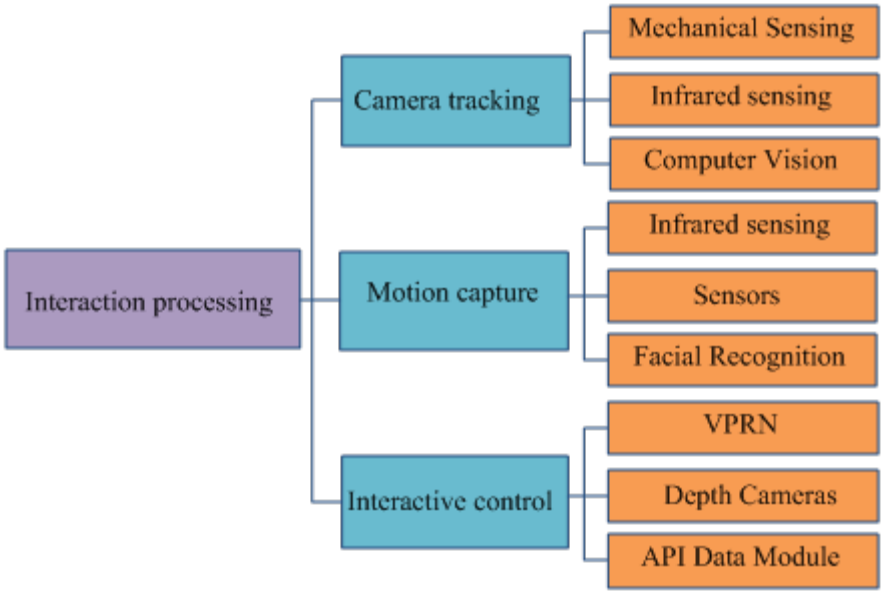

Figure 1 Basic structure of virtual reality technology

2.2 Virtualized Exhibition

Virtual museum virtualization exhibition is the use of virtual reality technology to display information collection and compression processing. Through the network and computer technology to form a virtual display space, the audience can be in the virtual display information space away from the real exhibits, to view the exhibition. The virtualized exhibition viewing mode of the virtual museum is shown in Figure 2.

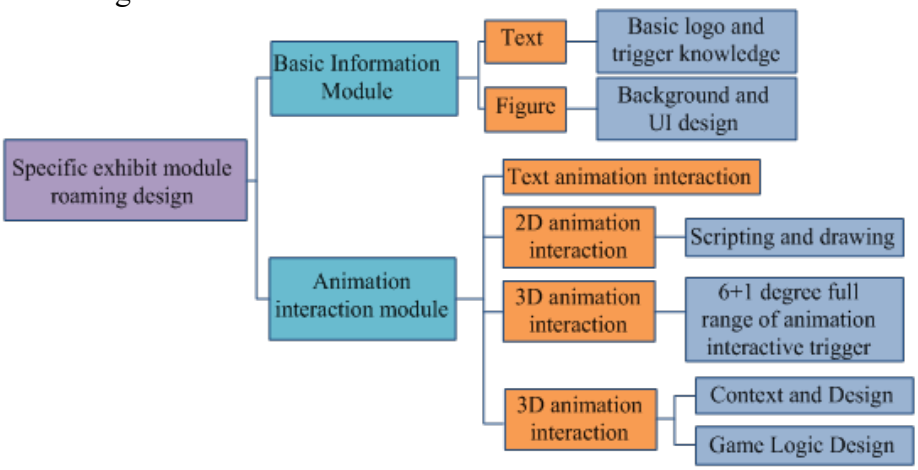

Figure 2 Virtual Museum's virtualized viewing model

In Figure 2, the service items of the virtualized exhibition contain the overall browsing of the exhibition hall, the display of exhibits and the introduction of exhibits and other related contents. The virtualized exhibition characteristics of the virtual museum are mainly reflected in the fun, interactivity, scalability and accuracy, etc. The key is interaction, and the audience has a high degree

of autonomy in the virtual museum.

The virtual museum display design is the integrated design of a number of technologies, can effectively mobilize the visitor's senses into the display, thereby increasing the interest of visitors, with a strong sense of infection and viewing performance. The study of virtual museum display design is mainly from the role played by the audience in the display, the way of receiving information on display, the audience's feelings of visiting, etc., highlighting the important position of the audience in the display. The use of digital display technology to achieve the research, display and information dissemination of digital exhibits and other display functions, providing a more humane digital display services for the audience.

3. Analysis of the simulation results of the museum display model

In this paper, we analyze the display mode of virtual museums in the context of "Internet+" and combine virtual reality technology, and design a virtual exhibition display mode. In order to verify the feasibility of the display model, this paper applies it to the actual exhibition process of the museum, the experiment selected museum A, gathered 500 visitors, the exhibition effect is shown in Table 1.

Table 1 The effect of the exhibition display

	Traditional Exhibition Viewing	Virtualized Exhibition Viewing
Visitor Attendance	382	491
Post-visit satisfaction	247	487
Degree of product dissemination	3.2	4.9

As can be seen from Table 1, Museum A has a large gap in the number of audience attendees before and after using virtualized exhibitions. The number of people who attended the traditional exhibition was 382 and the attendance rate was 76.4%, while the number of people who attended the virtualized exhibition was 491 and the attendance rate was 98.2%, and the satisfaction rate after viewing the exhibition was 97.4%. This indicates that the virtualized exhibition has a good feedback effect.

In order to further verify the interactivity and audience experience of this display model, Figure 3 shows the analysis results of the audience's experience after viewing the exhibition. The experience of visitors to the collection reaches 97.15% when they conduct virtualized exhibition viewing, which is 32.26% higher compared with the traditional exhibition viewing mode. In the process of in-depth interaction, the interactivity reached 98.66%, indicating that the virtualization mode of the virtual museum under the "Internet +" perspective can immerse the audience in the specific cultural relics and has a good interactive experience effect.

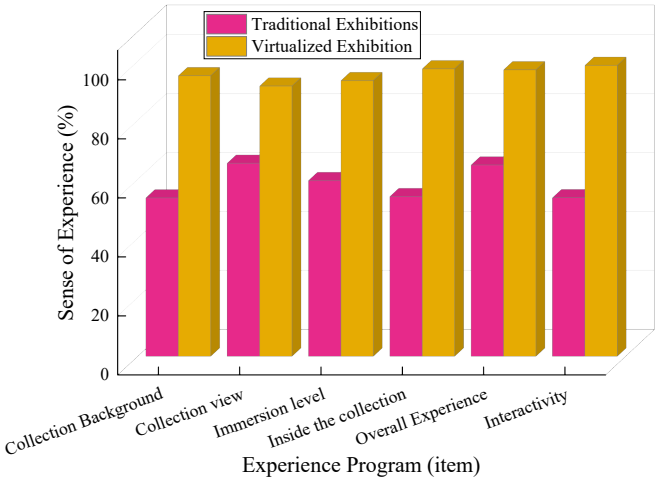

Figure 3 Analysis of virtualized viewing experience

On the basis of the above two simulation analyses, the overall situation of the virtualized exhibition is analyzed in this paper, and the overall situation during the exhibition is shown in Table 2. During the construction of the virtualized exhibition of the virtual museum, the degree of wear and tear on the collection is only 0.324%, and the conservation and development of cultural relics is achieved. The relatively low consumption in collection taking models and funds, the efficiency is good, and the government shows overall support for the construction. This shows that virtualized exhibitions can achieve upgraded perceptual, emotional and behavioral experiences between collections and visitors with minimal consumption of materials.

Table 2 The overall situation of the virtual museum

Breakage of the collection	0.324%
Time taken to take the mold of the collection	Three days
Funds used for construction	325,000
Government Support	Three supporting policies

4. Conclusion

In this paper, we use virtual reality technology to innovate the display mode of virtual museums under the perspective of "Internet+". Through the simulation of the real world, the information modeling of cultural relics, and the collection and compression of display information to form a virtual display space, so as to design a virtual exhibition display mode, and in practice to verify its application effect. The virtualization of the exhibition allows the audience to experience 97.15% of the collection, interactivity reached 98.66%, the wear and tear of the collection is only 0.324%. This shows that the virtualization mode of the virtual museum in the "Internet +" perspective can fully interpret the cultural landscape, expand the functional attributes of culture, and improve the sense of participation and immersion of the audience.

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