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Application of Multimedia Technology in the Exhibition Design of Memorial Museum

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Abstract. to study the application of multimedia technology in the exhibition design of the memorial museum, firstly, it is necessary to understand the status quo of multimedia technology in the exhibition design of the memorial museum. After investigation, it is found that the main features are a wide range of applications. The animation, the picture and the sound are linked through a digital display way with relatively stable image and content, which deepens people's impression and provide people with good visual experience. Secondly, it is necessary to understand the application of multimedia technology in the exhibition design of the memorial museum. The main contents are: multimedia stereoscopic painting display, phantom imaging display, interactive display, online memorial museum education. Finally, it is necessary to explain the advantages of this technology method and reflect the value of multimedia technology in the exhibition design of the memorial museum.

Keywords: multimedia technology, memorial museum, exhibition design, interactive display.

1. Introduction

The innovative development of multimedia technology has been more widely applied in many industries, and the maturity of Internet, big data and other scientific and technological means has promoted the informatization development of construction of memorial museum [1]. The staff of memorial museum can display the exhibits with ornamental value through the network and electronic memorial museum, and people can download relevant information while browsing in the hall [2-3].

Display is the main cultural function of memorial museum, and the best place for multimedia display is memorial museum. People go to the memorial museum for a variety of reasons, and then find more valuable things on their own. In this process, the emergence of multimedia technology can better interpret the exhibits without the need for special personnel to explain them, thus reducing the waste of personnel [4-6].

In the exhibition design of memorial museum, the effective application of multimedia technology can better preserve and integrate the essence of traditional culture, optimize the management, display and education of the public, and achieve all-round services. At the same time, the exhibition design of the memorial museum should also be updated in a timely manner in combination with the situation of participants, so as to be closer to life and reality and provide people with better experience [7-8].

2. The Status Quo of Multimedia Technology Applied on the Exhibition Design of Memorial Museum

2.1 The Wide Application of Multimedia Technology

The design of the display cabinet of the memorial museum needs to refer to the orientation of the hall, and then give a general description of the display. This content can be achieved through multimedia technology, such as people can watch a film with a shocking effect or find information through the touch screen. After the participation of multimedia technology, there are two intuitive ways of product display. One is the simple multimedia display; the other is the dynamic system of interactive operation. This digital display method with stable image and content can connect animation, picture and sound to deepen people's impression. For example, a 360° ring screen movie is displayed, and the computer is processed and controlled by graphics, animation, and text, and the video is played through a digital projector.

Through the form of multimedia technology and the lighting effect of the stage, the scenes of some battles in the memorial museum are reproduced, thus reflecting the technical characteristics. This display design method combined with the application of multimedia technology in the exhibition hall has become one of the characteristics of the memorial museum.

2.2 Integration of Multimedia Technology in Temporary Exhibitions

In the memorial museum, temporary exhibitions of different levels and different themes will be exhibited. This method can absorb a large number of audiences and increase the popularity of the memorial museum. In order to increase the audience's attention to the exhibition, the memorial museum can increase the freshness and infectivity of the exhibition through novel and diversified exhibition design. In this process, it is necessary to combine the actual situation of the exhibition site (table 1) to design and correctly apply the interactive glass hard display screen, ring screen movie and so on.

Table 1. The museum displays the questionnaire of space scale

Exhibition type	Display form	Width (m)	Length (m)	Floor height (m)	Area (m^2)
Exhibition hall	Single display	12.7	21.4	12.7	280
Exhibition hall	Single display	44	35	10.9	3000
Exhibition hall	Single display	54.2	28.7	4.3	1500
Exhibition hall	Single display	53.2	16.6	18.7	870

3. Application of Multimedia Technology on the Exhibition Design of Memorial Museum

3.1 Multimedia Three-dimensional Painting Display

In the display design of memorial museum, the exhibition can be carried out in the form of multimedia three-dimensional painting, which is an innovative multimedia display mode combining influence technology and scene synthesis technology. It uses a perspective method to distinguish itself from general painting and paints on the ground canvas with this opposite technique. After the picture is completed, it can also be photographed to produce a three-dimensional visual effect, thus embodying the immersive characteristics.

For example, in the exhibition of the memorial museum, people may not be able to understand the value of the historical objects through a single noun, especially the unique objects of different dynasties. However, through the form of this kind of multimedia three-dimensional painting, the value of historical relics can be simply reflected, so that people can understand these objects more deeply. The multimedia technology design of this process requires the overall grasp of spatial scale (table 2) to present the best picture effect as far as possible.

Table 2. The integral hold of dimensional dimension

Sense of dimensions	Cognition dimension	Identification dimension	Balance dimension
Behavioral style	Observation	Operating dialogue	Interpretation and evaluation
Cognitive style	Instinct	Participation experience	Think
Behavioral expression	Passively accept the size of the space and compare it with its physical size and daily objects to make a preliminary perception of the intimacy and adaptability of the space.	Actively participate in the exhibition and interaction of the display space, and begin to pay attention to architectural details, forms, symbols, light, materials and other details in the space	Take the initiative to interpret and evaluate the sense of spatial scale and seek for the best sense of scale

3.2 Phantom Imaging Display

In the exhibition design of memorial museum, some exhibits are of high value due to the characteristics of the exhibition hall itself. The main purpose of exhibition design is to better display these values. For example, in the "Treasure Tiger Hill" exhibition hall of the Suzhou Museum, the designer used the 3D phantom imaging system to create a translucent space, projecting the dynamic image of the Suzhou Museum's first-class cultural relics - the five-generation secret porcelain lotus bowl in the center of space. The all-round display allows the audience to observe the precious cultural relics suspended in the center of the exhibition hall from all angles and understand the composition and the details of cultural relics. This kind of combination of virtual and real exhibition not only increases the appreciation of the exhibition, but also gives the audience the most direct visual impact, which has been strongly recognized by visitors. This kind of display method combined virtual and real not only increases the appreciation of the exhibition, but also gives the audience the most direct visual impact, which has been strongly recognized by visitors.

This process applies the technical means of phantom imaging. Since the introduction of this technology into China, it has been applied in memorial museum and science and technology museum. However, in actual application, it combines the superposition of real shape and light and shadow effect. In this process, it is also necessary to pay attention to mastering multi-machine and multi-directional camera technology, using human visual and psychological characteristics to present the captured images into the theme model landscape in the set box.

3.3 Interactive Display

In the exhibition design of the memorial museum, interactive display way can be adopted to create an exhibition understood by the general public without excessive academic atmosphere. In the exhibition of memorial museum, attention should be paid to the application of technical methods in the design, so as to create a better display effect. This process adds multimedia elements, such as animation, audio and other multimedia databases, which can achieve the introduction of animal and plant images, as well as the ecological appearance of the environment at that time.

The staff of the exhibition hall can make a variety of background knowledge introduction through the contents of the exhibition, and let the audience make their own choices through animation and video. This method can increase the interest in participating in the exhibition, stimulate the interest in learning, and facilitate the acquisition of knowledge more directly. It enables the audience to experience nature, humanity, traditional skills, science and traditional living conditions, and at the same time, stimulates their imagination and creative potential. According to the statistics of relevant experts, this kind of exhibition is becoming more and more popular among the audience, especially the youth audience. At the same time, this has become an important aspect of humanized education of memorial museum.

Take a certain period of time of memorial museum as an example, its personnel composition and visiting way are shown in the figure below.

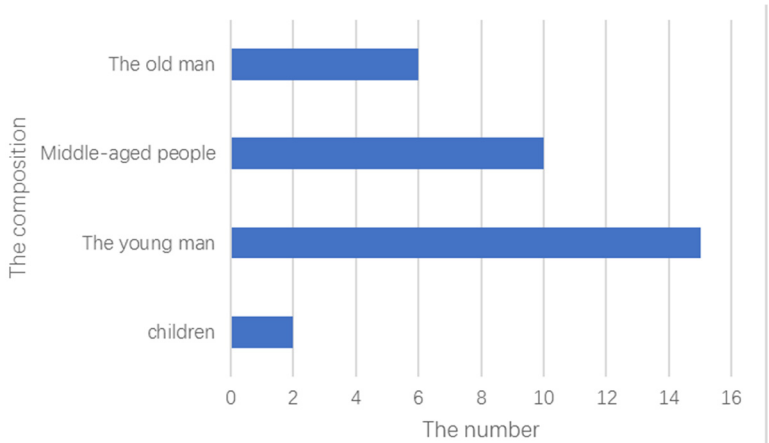

Figure 1. Composition of visitors

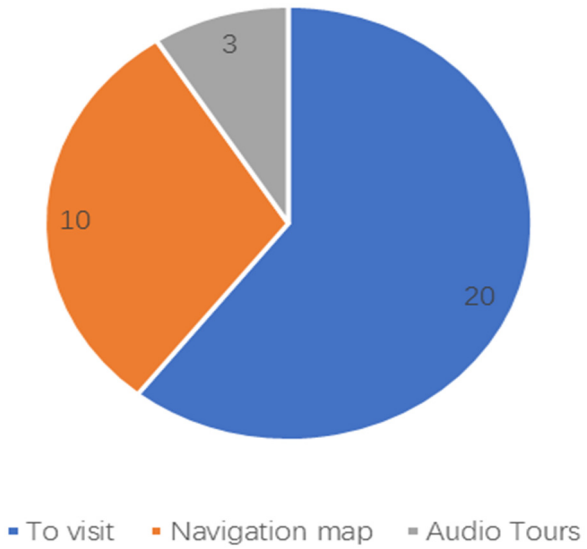

Figure 2. Way of visiting

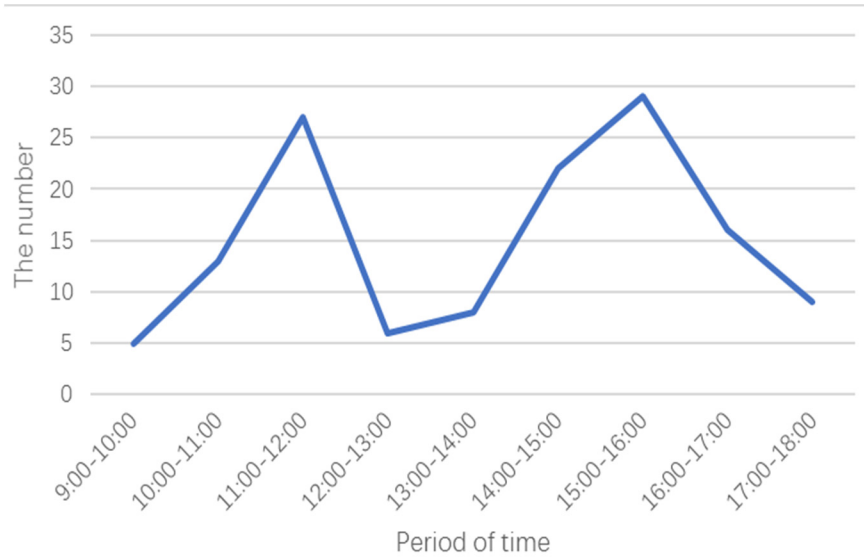

Figure 3. Time distribution of visitors

At the same time, it is necessary for the memorial museum to build an online exhibition platform in the hall and move the fine exhibitions in the memorial museum to the computer. And it is necessary to combine the basic exhibition with the temporary exhibition, combine the fixed exhibition with the moving exhibition, combine the independent exhibition with the joint exhibition, so as to realize the diversity of the exhibition and enable the audience to enjoy the entertainment during the break, thus achieving better effect. In addition, the whole memorial museum should build a series of distinctive exhibition halls to form an interactive display mode.

3.4 Online Memorial Museum Education

In order to protect ancient books, the reading room in the memorial museum is usually closed to the public, which brings a lot of trouble and inconvenience. The memorial museum should make full use of multimedia technology to carry out online memorial education, and an online reading room can be established. For example, the staff of memorial museum can investigate the reason and time of visitors (table 3 and table 4), provide electronic textbooks in the online memorial museum, bring convenience for the audience to learn relevant knowledge, and interact with the public through online reading or downloading, so as to promote the rapid development of public art.

Table 3. The reason for visiting the memorial

Reason for visit	Percentage
Individual interest	35.86%
Travelling and visiting	40.23%
Accompanying relatives and friends	11.95%
Organization of school and company	3.27%
Others	4.35%

Table 4. Time required to attend the memorial

Time required for visit	
Within 30 minutes	11.97%
About an hour	47.82%
About 2-4 hours	38.03%
More than 4 hours	2.18%

Today, audiences acquire knowledge and information in a different way than before. The mechanical and boring way of imparting knowledge is no longer applicable. Audiences prefer to obtain knowledge and information from plots. For this reason, the memorial museum should restore and reconstruct the use environment and background of the exhibits, and use 3D physical object landscaping, virtual image, site restoration and other means to facilitate the imaging of written records, so as to restore human history and natural features and give the audience an immersive feeling.

In addition, the memorial museum should have affinity, so that people can easily integrate into the museum and get personal experience while acquiring knowledge and information. It should integrate the exhibits, knowledge, and information contained in them into the plots and stories, show the contents of the exhibits in the form of stories, and achieve the communication of information, content, interest and entertainment between the exhibition and the audience, so that the audience can acquire knowledge in entertainment.

4. The Advantage of Multimedia Technology

Information has become the main feature of economic life in the 21st century. In recent years, many memorial museum websites have come into people's view and become an important way for the exhibition information of memorial museum. However, on the one hand, there is no authoritative exhibition information database in China, and most websites are not updated in a timely manner. On the other hand, the new exhibition center has begun to pay attention to the construction of information infrastructure, but most facilities are still backward. In order to meet the personalized service needs for customers, the memorial museum should speed up the information construction, adjust the market information collection plan, timely maintain customer relations with the help of the network, establish accurate exhibition database, and provide useful guidance for the research and development of the exhibition. In addition, the memorial museum should timely maintain and update the website information, focus on creating an intelligent memorial museum, so as to provide convenience for the exhibition of cultural relics.

5. Conclusion

The application of multimedia technology is also an important concern for the security management of the museum collections. For cultural relics that are nationally protected and not suitable for external exhibitions, its cultural background can be made into multimedia courseware and displayed to the audience in the form of three-dimensional imaging and animation, which not only satisfies the curiosity of the audience, but also effectively protects the collections. The application of multimedia technology has played a good role in promoting the security management of the memorial museum. While innovating the service content and changing the service mode, it also

provides the audience with a safe and comfortable environment, improves the safety management of the memorial museum, and achieves a win-win result.

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