

Space of Sense, Streamline of Wisdom-- Theory and Practice of Digital Museum Research on the Application of Automobile Detection and Diagnosis Technology in Automobile Maintenance

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Abstract: Developments in information and communication technology have opened up new options for the interpretation of museum exhibits. Contemporary technology provides many ways for museums to interpret. To display and interpret cultural and natural heritage and to communicate with a wider audience, the combination of digital images must be an important function of the museum.

1. Introduction

In 1990, the library of congress launched the American Memory program. Digital technology is beginning to enter the field of public education and communication. In 1996, the virtual heritage network was launched in the United States. In 2001, the heritage information network of Canada partnered with the museum community to establish the virtual museum of Canada. In 2001, IBM Tokyo research institute cooperated with the Japanese ethnology museum in the “global digital museum” project. The “digital Forbidden City” in China's Palace Museum; In 2001, the Ministry of Education of China launched the “construction of modern distance education online public resources -- university digital museum construction project”. Since then, a series of new concepts around computer network information technology, such as museum digitization, virtual museum and digital museum, have increasingly appeared in the public eye.

Compared with other concepts, it can be considered that digital museum is an aggregation in the process of museum digitization. It basically covers all previous digitization concepts and applications, and its concept itself is still developing.

2. Theory

Generally speaking, digital museum is a museum that USES virtual reality technology, three-dimensional graphics and images technology, computer network technology, three-dimensional display system, interactive entertainment technology and special visual effect technology to present the physical museum in a three-dimensional way . Digital museum has the characteristics of information entity virtualization, information resource digitization, information transmission network, information utilization and sharing, information provision intelligence, information display diversification and so on. [1] the interaction between the audience and the museum and between the audience and the collection can be preliminarily achieved, bringing more vivid and interesting experience to the audience. At present, “digital museum generally has three modes: single museum mode, which takes the resources of the museum as the organization unit of digital information and mainly digitizes and displays the collections of the museum on the Internet; Group library mode -- link together the websites of museums with similar influence scope or the same category to form a group of websites; Integration model - a group of museum resources as a digital information organization unit, dedicated to the integration and re-layout of the museum's digital content. [2]

However, in today's emerging digital museum, the relationship, integration and contradiction between digital museum and virtual museum, museum website, physical museum and virtual museum, digital museum have been controversial in the industry. In many cases, despite its

reputation as a digital museum, it is still a website or a three-dimensional experience site. At the same time, whether digital museum can replace physical museum, whether the real efficiency of digital museum is worthy of its high investment, operation and maintenance costs, and how to extend the relationship between digital museum and audience have also been troubling museum practitioners. For a while, it seemed that the digital museum had reached its bottleneck.

The author believes that digital museum and physical museum should not be contradictory and replace each other, but should be complementary, bearing and means of each other. "In fact, in today's highly developed information technology, to the understanding of the history, culture, cultural relics is no longer a practitioner of proprietary, exploration and study of the public is also an indispensable resource, only for the integration of these resources, saving and sharing can truly play the role of museum public cultural platform, and to set up public and historical and cultural bridge." [3]

3. Practice

Nanjing museum is the second largest museum in mainland China and one of the three largest museums in China. It is the earliest museum in China, a large-scale comprehensive national museum, a national comprehensive museum of history and art, and a national key museum.

As the person in charge of winning the bid for the project of Nanbo digital museum, the author had the honor to participate in the whole process of its concept formation, design and implementation. At the beginning of the creative design of Nanbo digital museum, we positioned it as a museum that pays attention to use, a museum that combines real and imaginary, a museum with emotion, a museum with infinite development and a platform for sharing cultural and museum resources. And make it: a museum of reality and virtual integration, a museum of passion and fantasy, a museum of endless views.

3.1 Clues

If this is an era of change, an era of innovation, an era of change from thought to form to aesthetics to behavior. So, what hasn't changed? Emotion!

Hegel said: "human emotions externalize into a variety of moral, legal, institutional, ethical... Is the universal source of power that drives the development of human history."

As Shakespeare said: the world is a stage, you and I are all clever. What is performed on this stage is a play that never ends, and it is human emotion that gives it its eternal power.

And then we were enlightened.

Selection to promote "emotions" as the clue of historical factors, the "figures" of history, and driven by the emotion of characters "behavior" and a variety of results - "evidence" of the role of behavior, to mix into scenes vivid historical play, make the character, behavior, and physical evidence under the series of emotions no longer isolated and uncommon.

3.2 Streamline

Considering the audience's visiting habits, we set two streamlines in the physical pavilion of the digital pavilion. One is in line with the traditional visiting habits of the time line, one is to arouse the resonance of the emotional line.

The spatial layout takes time as the clue. It starts from the childhood of civilization and goes through the development of various dynasties. Finally, it takes the audience as a member of "civilization development" and realizes "eternal life". Human civilization has its own laws of development, beginning and ending [2]. The old civilization died out and a new one took its place. Civilization, too, is like a living thing, born, grown, competed, decayed and reborn again and again.

3.3 Means

With the rich content and form of media, the choice of the audience is more and more inclined to the direction of "satisfying the id", but with the idea of "surpassing the ego". We must "suit" the audience, that is, use new and shocking digital media means, the content of the melodic line to

attract the audience, “diligent and persuasive”, really achieve the goal of “museum that pays attention to use”.

Therefore, in the implementation of the exhibition, we adopted the following means:

3.3.1 Combination of Traditional Interaction and Multimedia Interaction

“Happy life” exhibition area -- scenery of the southern metropolis

In order to convey the detailed information of scene map of southern metropolis, we adopted the methods of “attracting audience” and “magnifying details” -- five secret doors were opened on the projection wall of the long scroll, and the small screen was embedded to show more detailed images. For example, the acrobatic picture in the long scroll, the audience next to it first saw the scroll, and then found that someone opened the secret door in front of the painting to “peep”, which aroused curiosity, and when they got close to the scroll, they saw more elaborate acrobatic performances. Through this picture-in-picture combination of multimedia images, we can accurately and effectively convey to the audience the large scenes and exquisite details of the prosperity of the market.



Fig.1 Dynamic Version of “Scene Map of Southern Metropolis” Embedded Screen

3.3.2 Display the New Technology of Display and the Interaction between the Space and the Audience, So That the Audience Can Become Part of the Exhibition

In order to show the seclusion and arrogance of the late Qing dynasty, we combined multimedia with space and decoration to create a small room of insular style in the center of the exhibition hall. The whole room is enclosed by glass, with only one entrance and exit, built-in Chinese traditional furniture, and the small screen plays “opera”, “garden”, “cuisine” and other quintessence of Chinese culture. Glass wall whole cover one-way glass film, the audience outside the room can clearly see inside, but after entering the room can only see four mirrors, metaphor of the late Qing dynasty “egotism” mentality.

This is actually an “inducement” device, the audience is attracted to the film in the room at the same time, become someone else's “scenery”. The audience, together with the room and the multimedia in the room, make up a lively exhibition item.

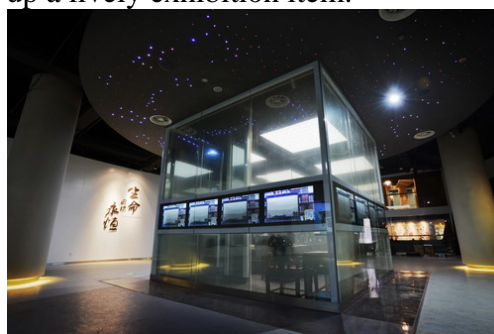


Fig.2 Appearance of “Egotism” Exhibition Item

3.3.3 Online, Offline and Mobile Terminal Interaction, Emphasizing Virtual and Real, Network and on-Site Full Interaction:

3.3.3.1 Image Interaction of “Because of Love” Exhibition

Few people ever think of leaving their belongings on display in a museum. When we set up the “emotional streamline” of the Nanbo digital museum, we specially set the “love” unit, to show the love stories of the past generations, and at the same time, the audience can also “show their love” here. On the projection screen are the love stories of Xiang yu and Yu ji, while on the opposite photo wall are pictures or portraits of famous couples in the past generations.

Viewers can scan the two-dimensional code on the wall with the virtual library, mobile phones, tablets and other mobile terminals, and push their couple photos and wedding photos to the screen on the page after the jump [3]. You can write your own poems and push them to the LED screen; You can even make your own movie and send it to the projection screen. With the eternal and universal topic of “love”, it has become a hot spot of audience interaction. The Nanjing museum successfully held an audience interaction activity here during the Chinese valentine's day in 2014. The white-haired couple and the lovers across the ocean are here to express their love for each other. Love and modern technology have made a perfect dialogue!



Fig.3 Love Tree and Hanging Screen of “Because of Love” Exhibition Item

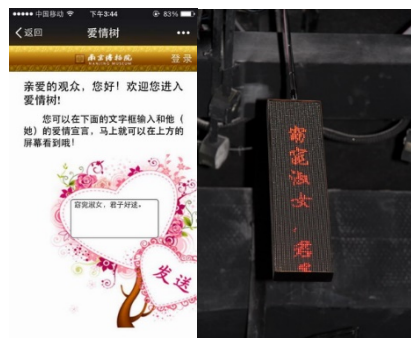


Fig.4 Interactive Interfaces of “Because of Love” Exhibition Item

3.3.3.2 Voice Interaction of the “Silk Road of Civilization” Exhibition

Not only images, but also a platform that can generate interaction through sound -- “silk road of civilization”

Here, visitors can not only browse the cultural exchanges between China and foreign countries. Moreover, you can record your real voice through the physical or virtual library. These voices are recorded, stored and played according to the region or language selected by the visitor. Its accumulation constitutes a sample of contemporary human behavior and makes the behavior itself a museum collection and exhibition object.

3.3.3.3 Comment Interaction of “Because You Are Eternal” Exhibition Item

At the end of the streamline of the physical pavilion, we also provide visitors with the “because you are eternal” exhibition item, which is full of fun and comments.

The basic picture of the exhibition project presents a vast cosmic sky scene. When the audience

edits and comments as required, the planets named after the editor can be found in the above star field. Both physical and virtual libraries can be operated and displayed. When the editing is completed, it can be evaluated, and those who fall below the standard will be disqualified from naming. The planet will automatically become a planet without host and can be redefined. If there are different users editing the same topic, there will be a competitive mechanism, and the name right will be determined by the evaluation system.

3.3.4 Combination of Multimedia and Physical Model:

3.3.4.1 Transparent Screen and 3d Printing:

Transparent screens and 3D printing are not new, but they are rarely used in museums. We use these two technologies to combine the reproduction of real cultural relics with virtual images, so that the audience can see the volume and structure of real cultural relics, as well as the overlapping dynamic image interpretation.

Before the transparent screen is placed on the replica, the screen plays the corresponding digital content interpretation, and what the audience sees is the superimposed picture of the real thing and the virtual image. This unit uses simple, novel techniques to attract audiences and convey complex information.

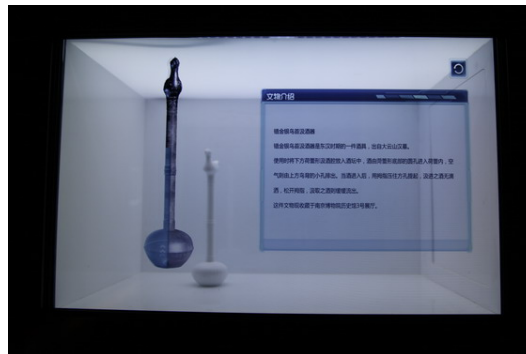


Fig.5 Interaction between Transparent Screen and 3d Printing for “Hot-Blooded Youth” Exhibition

3.3.4.2 Combination of Sand Table Model and Phantom Imaging

In the transitional part of “expansion and integration”, according to the spatial position, we set up a sand table model imitating the “map of the capitals of song and Ming dynasties”. In an area of about 25 square meters, miniature models of the imperial city, palaces, neighborhoods, dwellings, dynamic figures and river boats are arranged, which vividly show the urban life and urban space in the heyday of China's feudal society.

This form of sand table model is popular and easy to understand. In this seemingly ordinary miniature model, we present the dynamic classical opera image on the real model stage in the form of phantom image, which is like a finishing touch and arouses the interest of visitors.



Fig.6 Stage of “Phantom Imaging”, Exhibition Item “Expansion and Fusion”

In the process of digital museum space and multimedia design, we try to find the possibility of integrating with exhibition space and strengthening the appeal of content.

This concept is implemented in several exhibition areas of the digital museum.

“Hot-blooded youth” unit, we take “flag” as the visual symbol of this exhibition area as the

projection screen.

In the top gun section. We adopt three independent large-size projection screens hanging down from the top as the core of the exhibition area. On the one hand, the closure caused by the giant screen is broken, so that the audience can see the rotating corridor behind the giant screen through the gap, and get through the space and sight. More importantly, the large longitudinal projection screen simulates and exaggerates the image of “monument”, and creates a moderate sense of “grandeur”, “grandeur” and “oppression” in terms of space power, which is more in line with the “emperor” theme of the exhibition area.



Fig.7 “Top Gun” Exhibition

4. Conclusion

The digital museum of Nanjing museum has put forward a variety of innovative applications of multimedia, which is a tortuous and arduous but fruitful attempt, with both happy harvest and errors.

We hope to put forward innovative ideas and concepts for the construction of digital museums, and provide useful references for more museums, exhibitions and multimedia professionals. The future digital museum will evolve into a “smart museum” with stronger participation, interaction and experience. We believe that the future digital museum will play a greater role in reflecting the seven common functions of museum collection, preservation, repair, research, exhibition, education and entertainment.

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