

Analysis on the Development Trend and Application Technology of Digital Museum

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Abstract. With the development of science and technology and the change of the times, all kinds of industries are innovating the scientific and technological labor of network production. Museum is the base of popular science education and plays an important role in enriching people's spiritual life. It is the trend of the future to digitize the entity museum innovatively. This kind of innovation digitization is not simply to copy the cultural relics digitally, but by means of art (such as animation, scene restoration), through scientific and technological means, at the same time, the main line of expression is packaged in the story, and the story, immersion, interaction and experience are promoted by AR,VR digitization. And according to business logic, Reasonable layout to improve the operation of the museum.

Keywords: AR; VR; digitization; digital museum.

1. Introduction

With the continuous improvement of people's living standards and the rapid development of high and new technology, people also have a higher pursuit of spiritual life. In order to meet the needs of the masses, the opening and propaganda of museums have been intensified. At the same time, traditional museums rely on physical venues, which can easily cause congestion and noise of the environment, and some people are unable to visit the physical museums for various reasons, and digital museums emerge as the times require. Digital blog (Digital museum) or virtual museum (Virtual museum) adopts virtual reality technology, 3D graphics and image technology, computer network technology. Stereoscopic display system, interactive entertainment technology, special visual effect technology and other technologies completely present the three-dimensional way of the real entity museum to the museum on the network. Combined with the application of computer multimedia technology, it has the advantages of free browsing and simple interaction, can collect anything that can be digitized, and the information can be constantly updated and provided services on the network. Through information technology, the design is similar to the traditional museum type, and provides a new way of presentation and visiting experience, and the entity museum coexists, which is the extension of the physical museum and enriches the traditional exhibition form of the museum.

2. Development Trend of Digital Museum

The new trend of museum cause in our country is marked by the integration of Internet, science and technology and cultural field, and has entered a period of vigorous development. in the past 20 years, digital resources have been relatively improved in quantity and quality. Remarkable achievements have been made in the systematic construction of exhibition, service and operation, and the digital construction of museum has begun to take shape. In the future, artificial intelligence will play its role in changing the way of museum display and navigation, and the interaction and participation of audience will be improved. Artificial intelligence will provide technical support in museum individualization, knowledge and interaction at the same time. The attraction of exhibition comes from the application of AR, VR technology. Museum cultural relics the rational use of digital resources requires the creative transformation of "dead" cultural relics-the development of cultural and creative products, combined with digital technology, another possibility will be completely revealed. The following four aspects of museum digitization are described:

2.1 Digital Archives of Cultural Relics and Archaeological Information

With the rapid development of modern information technology and network popularization, the digital transformation of archaeological data management has become an inevitable trend. Digital information technology can achieve effective storage, rescue protection and utilization. Digital technology in archaeological excavations, database management provides technical services and guarantees for archaeological research. "Queen's mother and woman-a special exhibition commemorating the 40th anniversary of the archaeological excavation of the women's good tomb in Yin ruins, "in the special exhibition site of the Capital Museum, the buildings and a large number of cultural relics at that time were scientifically restored, and the digital technology was used to vividly show the audience the architectural structure of the tomb and the whole process of burying. VR technology shows its skill.

2.2 Digitally Save and Display Two-dimensional Texture and Three-dimensional Geometric Information

As the carrier of culture, cultural relics play an important role in the progress of human civilization. With human activities and natural weathering, the degree of damage to ancient cultural relics is deepening, and the preservation of cultural relics data has been put on the agenda. Digital cultural relics are the most scientific methods of preservation and acquisition of cultural relics data at present. At the same time, they can reproduce two-dimensional pattern patterns, and at the same time, they can record the original three-dimensional information for restoration through model making, 3D scanning, digital photography, 3D modeling and rendering all provide technical support for the digitization of cultural relics.

2.3 Virtual Reproduction of Cultural Relics

The virtual reproduction of cultural relics can be based on VR virtual reality technology, with the help of three-dimensional imaging to construct cultural relics model, by using network intelligent devices to make cultural relics entity images "live", participants can "immerse" ancient site scenes through wearable devices, observe and place cultural relics at 360 degrees through operable handles, and produce a sense of immersion through time and space, and the application of virtual reality technology in cultural relics protection engineering. It can enhance people's personal perception of traditional culture and produce more empathy. Tianshui Folk Museum not only uses three-dimensional scanning technology to restore, but also uses special-shaped projection technology to root the model pattern. According to the specific historical and cultural story to reproduce, its use of digital technology expression, from the sense, knowledge, touch to view, learn, touch, know, play.

2.4 Combine Virtual with Reality to Tell the Story of Cultural Relics.

Inheriting Chinese culture is the advantage and responsibility of museum industry. The museum industry keeps pace with the times in the process of the development of the times. It uses scientific and technological means to show the history, art, scientific value and spirit of the times. Through VR, AR, big data, the Internet and artificial intelligence as the infrastructure and innovation elements are constantly innovating.

3. Analysis of Application Technology of Digital Museum

With the expansion of the depth and breadth of digital application in the field of cultural heritage, there has been a comprehensive and extensive development from the protection of cultural relics to the display. The collection of cultural relics data has made deep development from graphic and image acquisition to 3D scanning and even holographic projection technology. in the aspect of network display, its display means include web page technology, virtual reality VR and 3D restoration. Network application is one of the important development directions of museum digitization, which can solve the problem that offline exhibition hall is difficult to solve.

The development of digital application in the field of cultural heritage has a long history. From protection to exhibition, the technology application at different levels has been developed in a relatively comprehensive way. The data collection of cultural relics in the field of protection has been developed from graphic acquisition to 3D scanning and even very advanced holographic reduction technology; The display on the network also has different levels of application, the display means mainly focus on the web content display, the application of "digital museum", "virtual museum" and other concepts, the main technical means include web page technology, virtual reality VR technology and 3D restore mode to display the site and exhibits. Network application should be a digital museum. An important development direction, the network can solve many offline pavilions cannot solve the problem.

3.1 Web Page Technique

With the maturity of Web2.0 technology, the construction and service of digital museum website have changed greatly. Including rich content, can be classified according to user preferences, browsing crowd classification organization management information materials and at the same time convenient for users to browse and use. Web 3.0 era interactive technology, digital museum users ask questions, enterprises will also make accurate judgment and recommendation to users according to the data they browse on a daily basis.

3.2 Virtual Reality

It is based on human-computer interaction, W graphics, multimedia technology and sensing technology, simulation of the virtual world to provide users with visual, auditory tactile and other multi-sensory lifelike simulation, through immersive (Immersion), interactive (Interaction) and imaginary (Imagination) to produce users as immersive. Due to the different participation methods, there are the following four kinds of quasi-reality systems: distributed virtual reality system, enhanced virtual reality system, immersive virtual reality system, and desktop virtual reality system.

3.3 Augmented Reality

At present, augmented reality mainly includes mobile handheld display, video spatial display and spatial enhanced display, and wearable display. Compared with the traditional VR technology, AR does not immerse users by creating a world, but by listening, hearing, seeing and touching virtual information, bringing the computer into the real world of users to enhance their perception of the real world. With the rapid development of science and technology, in addition to museums seeking new means such as digitization of collections to attract audiences, various cultural departments are also exploring the field of new technology. (Dutch National Museum of Antiquities), which applied AR technology to museums in the early days, used Microsoft HoloLens headset AR device, combined with image recognition and machine vision, to break the conditions of space and antiquities. Visitors visit more collections in digital form. AR technology is used in museums, including museums, to "restore" the true face of exhibits. The object of the "Resurrection" exhibition interacts with it, presents collections that cannot be displayed for the time being, creates AR games in museums, increases interest, AR navigation, virtual commentators during visits, comments and shares on museums and exhibits using AR hotspots, virtual disassembly and combination of complex systems, and free creation of AR experiences, which are provided to training and educational institutions to promote the interest of museum literary products.

4. Summary

Museums can protect and preserve cultural heritage by developing CD and DVD instead of microfilm and index cards, a technology that makes the museum's work easier and stores far more quantity and quality than previous tools. With the emergence of the new media Internet. Compared with traditional museums, digital museums have the following advantages:

1. Because of the non-renewable nature of the entity cultural relics, all the cultural relics in the traditional museum need to be carefully protected when displayed. The cultural relics are non-renewable and are the material and cultural heritage protected by the state. The damage of the cultural relics is a great loss to the state. The virtual cultural relics can be simulated by using high-tech digital technology, which can achieve the effect of real objects, meet the needs of customer experience, and increase the life span of cultural relics.

2. The digital museum has a variety of exhibits, through digital technology imitation to restore damaged cultural relics, the use of sound, light, electrical technology to combine, the display effect has been strengthened. Digital processing can help visitors understand history more truthfully.

3. As a reference of physical museum, digital museum builds virtual reality online museum through the combination of text, image, sound and multimedia technology, so that visitors can learn rich knowledge while visiting, which breaks the restriction of traditional museum. "they conduct online exhibitions based on entity exhibitions, or virtual exhibitions designed specifically for online, CD-ROMs, and display information, articles, reading content and works of museum activities." Its managers can be managed by urban tourism leaders who want to display cultural heritage, or they can be run by individual enthusiasts.

4. Due to the lack of physical space, digital museums can shuttle between pages and different columns, from browsing news, activity information to visiting exhibitions, appreciating collections, participating in learning and discussing, digital technology is very convenient, similar to traditional museums, interactive functions to enhance the frequency of use.

Acknowledgements

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(2) Design of clothing display Digital experience Hall of Jiangxi Garment College based on New Media Art Science and Technology Project of Jiangxi Education Department, Nov 2016 GJJ161209.

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