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Research on Interactive Animation Design of Digital Intangible Cultural Heritage Museum

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Abstract: As a kind of mass education scene, online museum of intangible cultural heritage plays an important media role in the inheritance and promotion of regional history and culture. With the increasing development of mobile Internet, online museums break the time and space restrictions of traditional offline museums due to their convenience and easy communication, allowing the public to visit and learn the display contents of well-known museums without leaving home. Online museum, as an online museum education channel, has attracted more and more attention and participation from the public in recent years. This paper mainly introduces the virtual interactive animation experience design of online museum of intangible cultural heritage. Firstly, the concept of virtual interactive animation experience design and the interactive field, display and experience of online intangible cultural heritage museum are expounded. Then the design principle of virtual interaction technology is introduced. Finally, the design of virtual interactive experience of online museum of intangible cultural heritage is described in detail.

1. Introduction

This paper mainly introduces the virtual interactive animation experience design of online museum of intangible cultural heritage. Firstly, the concept of virtual interactive animation experience design and the interactive field, display and experience of online intangible cultural heritage museum are expounded. Then the design principle of virtual interaction technology is introduced. Finally, the design of virtual interactive animation experience of online museum of intangible cultural heritage is described in detail.

2. Overview

2.1 Concept of Virtual Interactive Animation Experience Design

Interaction design, also known as interaction design, was proposed by British designer Bill Moggridge in the 1980s. At the beginning, interaction design was mainly used for the design of man-machine interface, focusing on interactive expression as a category of digital equipment. The concept of interaction design applied in this paper is not limited to the interaction of man-machine interface, but mainly refers to the interaction of users in the virtual environment. This paper mainly takes interactive thought, experiential perception and technical presentation as the basic categories, and even includes emotional communication. Therefore, “interaction design” is also a behaviorist thought including sensory and participatory. It is necessary to conduct in-depth research on interaction design from multiple perspectives and layers, so that the development of interaction can realize intelligence and diversity and enrich its design connotation. To sum up, it can be seen that interaction design can greatly improve the communication and interest in the virtual environment.

2.2 Interactive Field of Online Intangible Cultural Heritage Museum

In order to change the viewing process of visitors in the online museum of intangible cultural heritage from passive to active, and make the information in the museum from one-way output to two-way transmission, interaction design should be well applied. The application ofinteractive animation design in the online museum of intangible cultural heritage requires consideration on both sides of the interaction, not only how the museum can better spread knowledge and culture to the audience, but also the influence of visitors' behaviors on the museum[1]. There are three main interactive fields of online intangible cultural heritage museums: interaction between human and technology; interaction between people and the environment; human interaction. For the display of intangible cultural heritage in museums, the interaction between people and cultural relics, between people and the museum environment, and between people are extremely important. A good way of interaction can not only increase visitors' interest in visiting, but also enable them to have a deeper understanding of cultural relics and give play to the unique artistic and academic value of cultural relics. The interaction between people and technology is shown in Figure 1, the interaction between people and the environment is shown in Figure 2, and the interaction between people is shown in Figure 3.

Fig.1 “Evolution of Painted Pottery Decoration” Mini-Game

Fig.2 Combination of Situational Presentation and Projection Technology

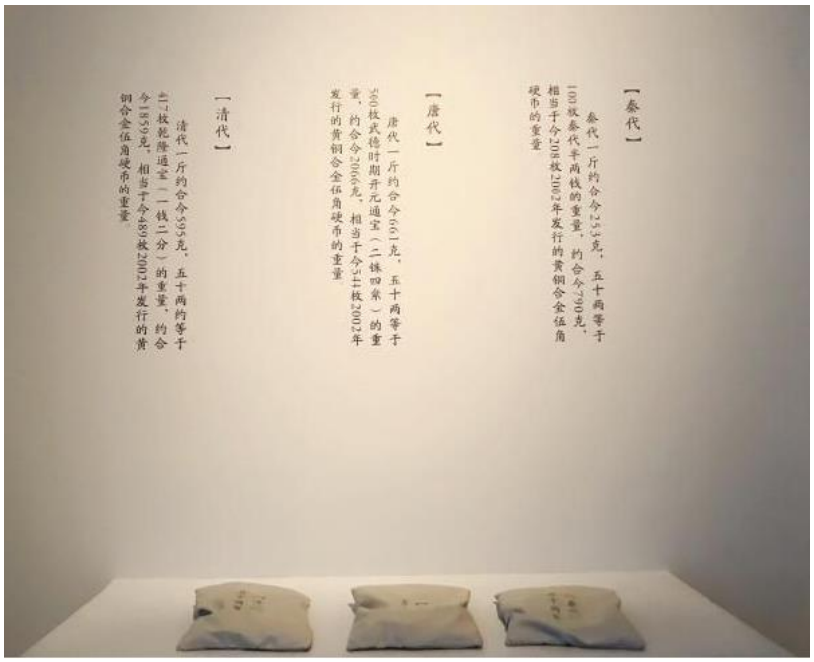

Fig.3 Communicating with Other Audiences to Meet Individual Learning Needs

2.3 Exhibition and Experience of Online Museum of Intangible Cultural Heritage

Today's society is an era of experience, “experience” has a profound impact on all aspects of social development, including economy, culture and people's life. The age of experience and the advent of the digital age mean that museums will offer more diverse and high-quality experiences to their visitors. In the era of “Internet +”, people are more eager to explore and discover knowledge in a convenient and fun way rather than passively receiving knowledge. In the era of “Internet +”, people are more eager to explore and discover knowledge in a convenient and fun way rather than passively receiving knowledge[2]. Immersion experience is one of the important ways of museum experience at present. Immersion is to make people concentrate on creating a virtual situation that simulates the real world to get pleasure and enjoyment. The immersive experience is to design an immersive atmosphere by integrating a variety of new media art, installation special effects, digital images and other technologies and equipment, with lighting, sound effects, etc., to fully mobilize the audience's senses and interact with the audience, so as to gather the audience's attention and enhance their emotions and experience. When the audience is immersed, they can have a deep impression on the content of the exhibition[3].

3. Design Principles of Virtual Interaction Technology

In the process of virtual interaction technology design, it is necessary to fully consider the behavioral feedback of the audience, and take the corresponding behavioral feedback as the starting point and standard of constructing the virtual world, so as to further optimize the sense of human-computer interaction experience. In the process of corresponding design, it is necessary to comprehensively consider the virtual environment, audience object, audience behavior, audience experience and other perspectives. As far as environmental design is concerned, it is necessary to take all kinds of scenes in the whole scene into comprehensive consideration, and effectively set many scene-oriented contents such as far, middle, near, special scene and virtual characters. In the design process of virtual characters, it is necessary to further refine the characters' gender, height and other characteristics, so that the overall immersive art can have a stronger authenticity in the expression process, so that the audience can effectively increase the sense of quality experience. In the process of designing the corresponding experience object, it is necessary to comprehensively consider the visual effects and artistic aesthetics of the whole object involved, and carry out effective design according to the corresponding way of human activities, so as to further enhance the sensory interaction between the overall design object and the audience. In terms of experience, it is necessary to further consider the audience's experience comprehensively. In the process of optimizing the experience, it is necessary to further enrich the design elements in the interaction process from the perspectives of objective aesthetics, subjective emotions, comprehensive knowledge and interactive ability, and effectively apply the expression techniques such as empathic feedback and iterative artistry[4].

4. Design of Virtual Interactive Experience for Online Museum of Intangible Cultural Heritage

4.1 Create Experience Cognitive Motivation Based on User Situation

Before using a product, users will expect the effect and form of the product after use according to their own needs and first impression of the product, and generate certain expectations for it, which will form some motivation to promote the occurrence of experience behavior [5]. In the construction of strategic content at the user context level, the strategy of creating situational atmosphere based on the exhibition theme is used to improve the user's interest before the exhibition and enhance the cognition of exhibition information. It uses narrative design to construct display information strategy to help users understand the operation methods of online exhibition viewing, and improves the contextualization and interest of exhibit content information through narrative form. To provide personalized exhibition mode strategy to create a humanistic exhibition guide experience, to meet the needs of leisure and learning functions of the personalized exhibition.

4.1.1 Situational Atmosphere Creation Based on Exhibition Theme

Maslow's needs put forward five levels of human needs, from low to high: physiological needs, safety needs, social needs, respect needs and self-actualization needs. As shown in the figure 4. The development of the museum's exhibition environment not only satisfies the material needs of the audience, but also continuously attaches importance to the spiritual experience of the audience. Many museums influence audiences' psychological feelings towards exhibitions through the creation of space atmosphere. For example, in 2016, in the exhibition item of “People on the Seashore” of Taizhou Museum in Zhejiang Province, designers used visual symbols representing Taizhou fishing village to restore specific scenes, making audiences feel as if they were in a fishing village after entering the exhibition hall. By creating a nostalgic theme atmosphere, Arouse the

historical memory of the fishing village in the past and bring the audience into the context of the theme, thus bringing better exhibition experience [6], as shown in Figure 5. Although the online exhibition is a restoration of the offline scene, due to the limitation of the exhibition form, the theme atmosphere feeling of viewing the exhibition space through intelligent devices will be greatly weakened. Therefore, it is necessary to integrate the theme element symbols into the visual design of the interface to create the situational atmosphere of the exhibition.

Figure. 4 Maslow's Hierarchy of Needs Theory

Fig.5 The Scene of “People on the Seashore” in Taizhou Museum, Zhejiang Province

4.1.2 Use Narrative Design to Construct Display Information

The purpose of online exhibition of intangible cultural heritage museum is to enable users to enjoy exhibitions conveniently through the Internet platform. However, due to the limitations of technology and other factors, the content information of exhibits in the online exhibition environment has been affected to a certain extent. Therefore, how to construct a clear display design in the virtual environment is the problem that online exhibition should consider. The core problem of display design is how to effectively express and convey information to the audience. Narrative theory includes three elements: narrator, medium and receiver. In museum exhibitions, designers are narrators, media are online exhibitions, and audiences are recipients of exhibition content[7], as shown in Figure 6. Compared with traditional exhibition design, narrative design has more advantages in exhibition theme expression, situational atmosphere creation and audience emotional experience. On the one hand, through the construction of the exhibition's development story to the audience, on the other hand, through the designer to create a story atmosphere, so that the audience in the process of experience from passive to active. Therefore, the structure of display information

can be systematically sorted out through the use of narrative design techniques in online exhibitions. Narrative itself is “storytelling”. Before the audience enters the exhibition, vivid and intuitive story clues are displayed in the pre-exhibition stage, which helps the audience to understand and recognize the exhibition content, so as to have in-depth understanding and experience after entering the exhibition. The narrative thinking method can fully mobilize the subjective initiative of users, so that the audience can take the initiative to understand and explore the display content. In this process, the audience also becomes the initiator of information experience.

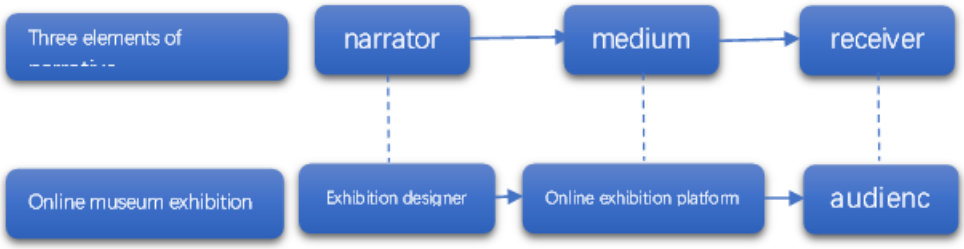

Fig.6 The Corresponding Relationship between the Three Narrative Elements and the Museum Online Exhibition Elements

4.1.3 Provide Personalized Exhibition Viewing Mode

The audience groups of museums are diverse, but the existing online exhibitions do not take into account the individual needs of user groups. The single online exhibition mode in the current museum cannot satisfy the audience with different functional needs and cognitive characteristics, which affects the exhibition experience of some audiences. The premise of engaging audiences is to make them feel that exhibitions and events are designed for them. By providing personalized exhibition modes, on the one hand, it can meet the needs of various user groups and provide various choices for the audience; on the other hand, personalized exhibition modes can adapt to different groups to some extent, thus improving the efficiency and experience of exhibition. For example, in addition to the adult version, a children's mode is also set on the website of Capital Museum to provide children with interesting animated videos and small games. Therefore, the design of exhibition mode can be classified according to the purpose of users. Users whose main purpose is learning are more concerned about the comprehensiveness and legibility of museum exhibits. In terms of the overall function of the exhibition, learning mechanism can be emphasized, such as setting learning goals for users. In the process of viewing the exhibition, it can reasonably feedback the users' research and learning progress on the contents of the exhibits. Users whose main purpose is leisure pay more attention to the entertainment and interest in the process of viewing the exhibition, so they can attract the attention of the audience through the visual effects and interactive functions of games in the exhibition interface, so that they can actively participate in the interaction of the exhibition.

4.2 Create Two-Way Interactive Feedback Mechanism Based on Environmental Situation

The museum reveals the visual context of the activities of the subject objects through the exhibition objects and the space environment and cultural atmosphere built by them, focusing on the “communication and interaction” between the audience and the exhibition objects in the environment[8]. Users interact in the environment created by the museum's exhibitions, further satisfying their viewing experience. Therefore, in the construction of strategy content at the level of context of online exhibition environment, the layout of exhibition interface is optimized by constructing logical and clear information function architecture strategy, and the operation efficiency of users in exhibition interface is improved by visualization and visualization of

information form. Create the presence experience strategy with multi-channel perception to improve the situational experience of online exhibition visitors; To provide communication channels, form experience optimization strategies, and provide users with feedback communication platform to meet the social needs of exhibition visitors.

4.2.1 Building an Information Function Architecture with Clear Logic

Information architecture organizes and classifies product information so that users can use products with a “sense of direction” so that users can browse product information more efficiently. The clear information architecture and interface framework layout enables users to quickly grasp the core and main functions of the product and understand what kind of help the product functions can provide for users. Therefore, it is necessary to construct a logical and clear interactive process in the design of information functional architecture. The main content information in the interactive interface of online exhibition is panorama display, so the main functions should be placed in the navigation bar, so that users can directly focus on the main functions of the exhibition after entering the exhibition, including search function, map navigation function, scene switching function and exhibit information function. When viewing exhibits, it is necessary to control the total number of pages viewed by users in one visit and simplify the pages to improve the efficiency of the operation task. Secondly, in order to better enhance the immersive experience of users, it is necessary to adjust the page layout of functional navigation to reduce the interference of visual information.

4.2.2 Multi-Channel Perception Creates Presence Experience

The psychologist Gibson believes that human perception is in the eyes, ears, nose and tongue, not in the brain. People do not “see” mechanically, people “see perceptively”. Perception refers to sensation and perception, and multi-channel refers to multi-sensory, which is the physiological and psychological feeling produced by the synergistic action of two or more sensory organs. In museums, people form subjective impression of museums, namely perception. On the basis of perception, they have a comprehensive understanding of information to form a complete cognition. Different senses will bring different perceptions to the audience. In the sensory interaction of museum online exhibition, the visual system and auditory system are mainly used. In the visual system, the elements such as point, line, Angle, surface, color, light and shadow can be combined to make the physical and chemical static into dynamic, and color and form elements can be used to decorate the environment of the interface, so as to affect the visual experience of the audience and play an attractive role. In addition, it is necessary to follow the visual process, that is, the visual orientation of the exhibition interface to the audience.

4.2.3 Provide Communication Channels to Form Experience Optimization

The audience is the service object of the museum's online exhibition, and also the information source to test the effect of the exhibition. With the development of museum digital construction, the ways to collect audience feedback are becoming more and more diversified. In addition to the traditional paper questionnaires, museums set up comment channels on their official websites. For example, in the exhibition introduction page of the Palace Museum, visitors can leave comments at the bottom after viewing the exhibition information. Visual message information can also stimulate the audience's interest in leaving comments. For the museum, the feedback of questions is also conducive to service optimization, so as to provide better experience and facilitate users to submit comments and check frequently asked questions. In the online exhibition, when the audience thinks and comments on the information of the exhibits, they can first set up message boards and questionnaires after the exhibition to collect user feedback, timely consider their views and needs,

and optimize the issues related to the online exhibition. In addition, a communication platform can be set up to allow the audience to actively participate in the group communication. At this time, the scope of dialogue is no longer limited to the audience and the exhibition, but expanded to the dialogue and interaction between the audience and the audience under the exhibition environment. The interaction through communication channels drives the participation of the audience and makes the audience become active explorers and learners.

5. Conclusion

Based on the above content, effective combination of the positive effect of virtualinteractive animation design technology in the construction of online intangible cultural heritage museum can help people to form a visual understanding of culture. As a new combination of science and technology and art, virtual experience has created a more reasonable design method. As an important feature of virtual experience, interaction cannot be ignored. Good interaction can enable designers to gain greater freedom in creation, so that the design is closer to the care of life, users get more dimensional enjoyment[9]. In the future, the construction direction of online museums of intangible cultural heritage should take serving audiences and spreading knowledge as the basic footing, combine online museums and traditional museums, complement each other's advantages and make progress together, so as to promote the harmonious and healthy development of online museums of intangible cultural heritage. In the process of maintaining the harmonious development of the construction of the online museum of intangible cultural heritage, on the basis of not affecting the functional positioning of the museum, we should make full use of the virtual interactive animation experience design method to design the interactive functions of the museum on the multi-level, multi-sensory and three-dimensional ground, establish the organic connection between users and exhibits, and improve the user experience[10].

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