Research on Information Visualization Design Method Based on Emotional Concept in Cultural Heritage Protection

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Abstract: With the rapid development of virtual reality technology and Internet technology, countries all over the world have gradually tended to carry out digital protection of intangible cultural heritage. As a new technical means, information visualization has been relatively mature in other fields. Information visualization technology will adopt advanced technologies such as artificial intelligence interaction, virtual reality, digital library and database to provide scientific protection means for intangible cultural heritage. In view of the current situation of cultural heritage protection and information understanding, it is proposed to use information thinking to guide the overall planning of digital cultural heritage projects, and use information design model and information design principles to design information management, information presentation and information dissemination in digital cultural heritage. By analyzing the truth, goodness and beauty of rationality, sensibility and intellectual wisdom in information design, the digital protection of cultural heritage is transformed into a systematic protection, the sustainability of cultural context and the effective dissemination of civilized spirit. This paper puts forward the necessity of this study from the perspective of information understanding and cognition; Secondly, it analyzes its feasibility and complexity. Applying information visualization to cultural heritage protection requires information acquisition, interpretation, re conception and re construction.

1. Introduction

With the rapid development of the network era, with the wave of digital information revolution, there is a huge amount of data pouring into people anytime and anywhere, as well as people's demand for rapid understanding and dissemination of this information [1]. People can deeply feel that the Internet brings not only fast-moving news information or convenient communication between relatives and friends, but also "statistical data" closely related to life, such as hot news topics, real-time traffic congestion and real-time bus [2]. Information technology has changed our views on time, space and living state. Under the new technical background, social background, cultural background and economic background, we have new thoughts on design [3]. When many developed countries, such as the United Kingdom, the United States and Japan, put forward cultural creativity as a new growth point and breakthrough of national economy, Chinese leaders also realized the importance of design for China's transformation from a manufacturing power to a creative power and a design power [4]. Where the content of creativity comes from, people naturally pay attention to the cultural heritage under the background of the era of informatization, globalization and networking [5]. Digital cultural heritage constructs multi-dimensional national cultural content dissemination and diversified forms of cultural heritage preservation through information technology [6].

The cultural heritage industry integrated with the information industry creates the overall customer experience through information design, redesigns the cultural content through the change of media mode, and then generates social capital value. Through high and new technologies such as reverse engineering and virtual reality, it creates an "efficient and low consumption" industrial form of information economy, so as to drive the sustainable development of global tourism and museum industry, Develop interactive experiential cultural and Expo education of "teaching in fun" to provide new opportunities for the development of cultural and creative industries [7]. Aiming at the current situation of cultural heritage protection and information understanding, this paper proposes

to use information thinking to guide the overall planning of digital cultural heritage projects, and use information design model and information design principles to design information management, information presentation and information dissemination in Digital Cultural Heritage [8]. High precision information visualization technology develops new practical auxiliary systems or means based on the rapid development of computer network through advanced information technology to serve the sustainable development of Intangible Cultural Heritage [9]. It will provide digital acquisition, sorting, storage, query and retrieval through text, image, audio, video and three-dimensional data information related to intangible cultural heritage, and further establish digital database and digital cultural heritage museum to serve the protection, development and utilization of Intangible Cultural Heritage [10]. Applying information visualization technology to intangible cultural heritage is not only to protect and preserve them, but also to reinterpret them through new methods and means, give them new meanings, and make them always closely related to our real life.

2. Information Visual Design

2.1 Concept Discrimination of Information Visualization

Information is the carrier of knowledge. It is divided into visual information and non visual information. Visual information mainly refers to graphics and images, rather than visual information, including language, text, numbers, formulas, etc. As different carriers, each kind of information has its own unique properties. For example, language is suitable for exchanging simple messages between the two, but graphical expression is a better form for the trend of stocks, which can give people a quick and in-depth understanding. Visualization is "trying" to express information graphically. It is not a new concept. People used tables, curves, charts and other methods to express various statistical data long ago. With the development of computer technology, visualization has become a special field of computer graphics. Vision is the main source of human information. About 80% of information in people's daily life comes from vision, and 50% of brain nerve cells are connected with vision. The visualization of information processing can make full use of human visual potential and brain function, which is the fundamental reason for the emergence of visualization technology. With the development of information technology and network application, there are more and more abstract data, such as financial data, business information, document collection and so on. These abstract data are characterized by many dimensions, no shape, difficult to find corresponding natural objects and various forms. In addition to the need to store, transmit, retrieve and classify these massive data, it is more urgent to understand the relationship and development trend of data. In fact, behind the surge of data, there are many important information. People hope to analyze it at a higher level in order to make better use of these data.

2.2 Characteristics of Information Visualization

Information visualization deals with the relationship between massive information and information carrier. Information visualization applications rely on the basic features that human perception systems can naturally and quickly understand: color, size, shape, motion and proximity. Information system designers use these features to improve the data density of displayed information. Because it is very easy for us to understand such features, and each feature can be used to represent different attributes of data, excellent visualization technology not only makes it easier for us to perceive information, but also more information at one time. The application of information visualization enables us to better understand complex systems, improve decision-making ability, and explore information that we may not know. Through analysis, it is considered that scientific rationality, artistic sensibility and cognitive intellectual wisdom are the three characteristics of information visualization, as shown in Figure 1:
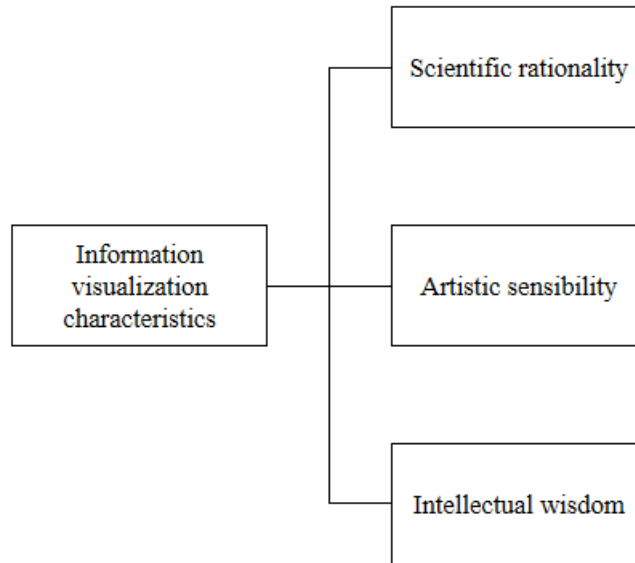
Fig.1 Characteristics of Information Visualization

The emergence of computer information system enables people to make more effective use of existing data and find more valuable information. The development of computer information system has gone through a long and tortuous road. Through information visualization design, the cultural heritage is presented more realistically, which reduces the information distortion and loss of indirect secondary data generated during information collection and processing, and ensures the authenticity, integrity, confidentiality, availability and controllability of information. As a new scientific field, most of the research work on information visualization is still in the development of new technologies and the construction of some meaningful new systems. At the same time, some practical tools for information visualization have begun to appear.

3. Cultural Heritage Protection

3.1 Application of Information Visualization in Cultural Heritage Protection

At present, the development of digital protection technology for intangible cultural heritage is mainly in the following aspects, as shown in Figure 2:
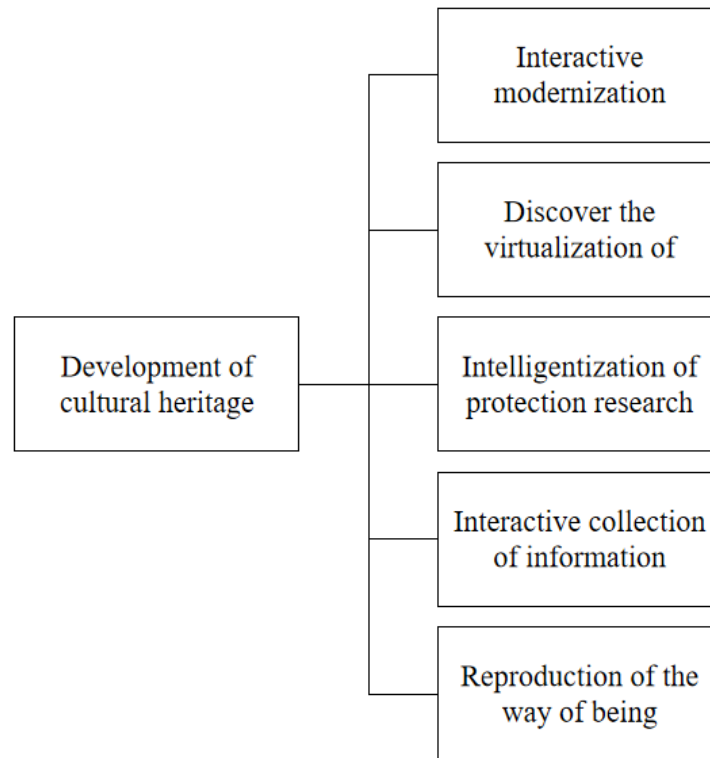
Fig.2 Development of Cultural Heritage Protection

Develop digital information acquisition technology, multimedia virtual scene modeling technology and virtual scene coordinated display technology of intangible cultural heritage, so that users can have zero distance contact with cultural relics, realize full interaction between users and cultural relics, restore the original appearance of cultural relics through information visualization technology, display virtual cultural relics and simulated display of unearthed environment, and enhance reality technology, Realize the perfect superposition of existing sites, relics and the original appearance, and display the historical stories behind the cultural relics. Virtual reality technology, computer graphics and image processing technology and multimedia technology are used to collect and sort out the data of the archaeological site, so as to form a multi-dimensional data model of the archaeological site, so as to simulate the virtual excavation process, carry out the pre virtual experiment of archaeological teaching and real archaeology, and reproduce the archaeological excavation process in an all-round, multi-level and vivid way. Using the sound and image retrieval technology of intangible cultural heritage and computer-aided design system, through the integration of cutting-edge technologies such as 3D image acquisition, image processing and reverse engineering in information visualization technology, the cultural relics are scanned three-dimensional, so as to realize the full recording of one-dimensional, two-dimensional, three-dimensional and even multi-dimensional information of cultural relics information. The use of digital technology for academic classification and information storage of cultural heritage, and the establishment of informative symbol database and material database. Optimize the characteristics, create a high-grade Museum, and realize the "wall free museum", that is, a digital virtual museum convenient for interaction. Virtual reality technology is used to reproduce the cultural existence modes of traditional handicrafts, such as production mode, use mode, consumption mode, circulation mode, communication and inheritance mode.

3.2 Significance of Cultural Heritage Protection and Inheritance

Digital cultural heritage protection is beyond the geographical and physical constraints of real traditional cultural heritage protection. In the new stage of social development, it has changed from "material orientation" to "information orientation". Based on digital information, it has expanded the on-site service of real cultural heritage protection to a more extensive and in-depth information service beyond time and space. Digital cultural heritage protection is the development and

supplement of real cultural heritage protection, which is the basis and source of digital cultural heritage protection. Information technology has changed people's way of thinking and behavior. This study hopes to find out different ways of thinking used to guide the methods of digital cultural heritage, then analyze the behavior mode of information visualization design on this basis, and reveal the "explicit relationship" and "hidden logic" between cultural heritage and information visualization, Lay a solid foundation for information visualization research. The traditional technical means of intangible cultural heritage protection are mainly photography, photography and other methods. With the continuous development of science and technology and the increasing difficulty of intangible cultural heritage protection, traditional technical means can no longer meet the needs of current protection work. Under the situation of our demand for higher precision technical means, with the continuous innovation and development of computer multimedia technology, the digital information acquisition and preservation means of intangible cultural heritage were born. Zero distance contact with cultural relics through interactive functions, such as being in and participating in the archaeological excavation process and cultural relics restoration in the virtual scene. The development of interactive technology breaks through the boundaries of time and space, making users feel immersive.

4. Conclusions

Applying information visualization technology to the protection of intangible cultural heritage will theoretically form a digital communication theory for the protection and promotion of intangible cultural heritage, provide a new way and method for the protection of intangible cultural heritage, and expand the service space of information visualization technology. From the content level, the establishment of a digital information database of Intangible Cultural Heritage Based on information visualization technology and the construction of a virtual digital museum with interactive function comply with the requirements of the development of the information age. From the technical level, for the application of information visualization technology, it shows the reverse engineering technology for intangible cultural heritage, three-dimensional rapid modeling technology, virtual scene display technology, document and image retrieval technology of material library, and computer-supported cultural relics restoration technology, which expands the application of computer-aided design in the protection of intangible cultural heritage. Future design is a multi-dimensional creative perspective with rich and broad performance and multiple ways to connect the world network. Evolving new ways to create things and create new cultural experiences is the best possible way. I believe that the final future design will help us establish a new creative culture. The information visualization design in digital cultural heritage is the visual "reproduction" design of information for cultural heritage protection.

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