

Virtual Interactive Display Space Design of Intangible Cultural Heritage

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Abstract: This paper focuses on the design and generation of the virtual interactive exhibition space of intangible cultural heritage, aiming to provide an innovative path for the inheritance and display of intangible cultural heritage through digital technology. Through in-depth study of the connotation and characteristics of intangible cultural heritage, combined with AR augmented reality, holographic projection, motion sensing interaction and other modern technological means, the design and generate a creative, interactive and immersive virtual display space. The design not only shows the historical origin and artistic characteristics of the intangible cultural heritage, but also emphasizes its modern value and innovative development, aiming to enhance the public's cognition and interest in the intangible cultural heritage, and promote the inheritance and development of the intangible cultural heritage. The research in this paper provides new ideas and methods for the digital protection and inheritance of intangible cultural heritage, and helps to promote the inheritance and innovation of intangible cultural heritage in modern society.

Keywords: Intangible Cultural Heritage; Virtual Interaction; The Design of Display Space; Digital Technology; Cultural Inheritance.

1. Introduction

With the rapid development of science and technology, digital technology provides new possibilities for the inheritance and display of intangible cultural heritage. As a treasure of human civilization, the protection and inheritance of intangible cultural heritage is particularly important. As an emerging technical means, the design of virtual interactive display space provides a more vivid and intuitive way for the display of intangible cultural heritage. This paper aims to discuss how to use virtual interaction technology to design the display space of the intangible cultural heritage, pass on the charm of the intangible cultural heritage to more people through digital means, and promote the inheritance and development of the intangible cultural heritage.

In the design of the virtual interactive display space of the intangible cultural heritage, we need to deeply study the connotation and characteristics of the intangible cultural heritage, and combine with modern scientific and technological means to create a creative and interactive display space. Through the use of AR augmented reality technology, holographic projection technology, motion sensing interaction technology and other digital technologies, we can let visitors feel the unique charm of intangible cultural heritage, and improve their sense of experience and immersion.

At the same time, we also need to pay attention to the inheritance and development of intangible cultural heritage. In the design of the exhibition space, we should not only show the historical origin and artistic characteristics of the intangible cultural heritage, but also pay attention to the modern value and innovative development of the intangible cultural heritage. Through the design of the virtual interactive display space, we can let more people understand and understand the intangible cultural heritage, stimulate people's interest in and love for the intangible cultural heritage, and

inject new vitality into the inheritance and development of the intangible cultural heritage.

To sum up, the design of the virtual interactive display space of intangible cultural heritage is an important work. Through the discussion and research of this paper, we hope to provide new ideas and directions for the inheritance and development of intangible cultural heritage, and make a contribution to the protection and inheritance of intangible cultural heritage.

2. An Overview of the Intangible Cultural Heritage

2.1. Definition and Classification of Intangible Cultural Heritage

Intangible cultural heritage, as a treasure of human civilization, refers to the traditional cultural manifestations that exist in intangible forms and are closely related to people's lives and inherit from generation to generation. These cultural heritages include oral traditions and forms of expression, such as various folk tales, ballads, proverbs; performing arts, such as traditional music, dance, drama, quyi, and acrobatics; social practices, festival activities, etiquette and festival events; knowledge and practice about nature and the universe; and traditional handicraft skills.

The classification of intangible cultural heritage is diverse, which can usually be divided according to its form of expression and inheritance mode. For example, oral traditions and performing arts focus on the expression of sound, action and emotion, which are a vivid embodiment of cultural diversity; social practice, festival activities and etiquette reflect the changes of social structure and interpersonal relations; and knowledge and practice about nature and the universe, as well as traditional handicraft skills, are a profound interpretation of human wisdom and creativity.

2.2. The Value and Significance of the Intangible Cultural Heritage

Intangible cultural heritage not only carries rich historical and cultural information, but also is an important basis for national identity and cultural confidence. It represents the wisdom and creativity of a specific group, reflects the interaction between human beings and nature and society, and has irreplaceable historical, artistic and scientific value.

For individuals, intangible cultural heritage is the source of identity and cultural belonging. It makes people feel the charm and strength of traditional culture in their daily life, and enhance their confidence and pride of their own culture. For the society, the intangible cultural heritage is the embodiment of cultural diversity and human creativity, and is an important resource to maintaining social stability and promoting social harmony.

In today's economic globalization, intangible cultural heritage has become a unique cultural resource, providing rich materials and inspiration for cultural tourism, cultural and creative industries. Protecting and inheriting the intangible cultural heritage will help to promote the development of the cultural industry and promote economic prosperity and social progress.

2.3. Challenges and Opportunities for the Protection and Inheritance of Intangible Cultural Heritage

With The Acceleration of The Modernization process, the intangible cultural heritage faces many challenges. On the one hand, the traditional lifestyle and cultural environment are gradually changing, and many intangible cultural heritage projects have lost the soil for survival; on the other hand, the younger generation is becoming less interested in traditional culture, and the inheritance of intangible cultural heritage is in danger of fault.

However, both challenges and opportunities coexist. In the context of globalization, more and more countries and regions have begun to pay attention to the protection and inheritance of intangible cultural heritage. International organizations and national governments have introduced relevant policies and measures to strengthen the protection of intangible cultural heritage. At the same time, with the development and application of science and technology, new technological means also provide new possibilities for the protection and inheritance of intangible cultural heritage.

Specifically, digital technology provides a new way for the preservation, display and dissemination of intangible cultural heritage. Through digital means, the relevant information of the intangible cultural heritage can be digitized, and the database and archives can be established to realize long-term preservation and convenient inquiry. In addition, the application of virtual reality, augmented reality and other technologies can also provide the audience with an immersive experience, so that people can more intuitively feel the charm of intangible cultural heritage [1].

At the same time, education and training are also an important means to protect and inherit the intangible cultural heritage. By opening relevant courses and holding training courses, we can cultivate more talents who are interested in the intangible cultural heritage, and inject new vitality into the inheritance of the intangible cultural heritage.

In short, in the face of both challenges and opportunities, we should take more active measures to strengthen the

protection and inheritance of intangible cultural heritage, so that this treasure of human civilization can be passed on forever [2].

3. Virtual Interaction Technology and its Application in the Intangible Cultural Heritage Exhibition

3.1. Overview of the Virtual Interaction Technology

Virtual interaction technology is a comprehensive application integrating virtual reality, augmented reality, human-computer interaction and other advanced technologies. It uses a computer-generated three-dimensional environment that allows users to immerse themselves in a highly realistic virtual world and interact with it in real time. The emergence of this technology has greatly changed the way people interact with the digital world, bringing unprecedented opportunities for innovation in many fields[3].

In the virtual interaction technology, the virtual reality technology makes users feel like being in a brand new world by building a 3 D virtual environment. Augmented reality technology is to combine virtual information with the real world to bring users more rich and diverse experiences. Human-computer interaction technology focuses on how to make the interaction between people and machines more natural and convenient, and improve the user experience and satisfaction.

Virtual interaction technology has a wide range of applications, such as education and training, medical rehabilitation, entertainment games, etc. In the field of education and training, virtual interaction technology can simulate real scenes and provide students with more vivid and intuitive learning experience; in the field of medical rehabilitation, virtual interaction technology can help patients with rehabilitation training and improve the rehabilitation effect; in the field of entertainment games, virtual interaction technology brings more immersive game experience to players[4].

3.2. Application Cases of Virtual Interaction Technology in the Intangible Cultural Heritage Exhibition

In the exhibition of intangible cultural heritage, virtual interaction technology is playing an increasingly important role. Taking the traditional drama as an example, through the virtual interaction technology, we can present the performance scenes, role images, costumes and props of the drama in a three-dimensional form, so that the audience can feel as if they are in the performance scene of the drama. By wearing VR helmets and handles, audiences can interact with the dramatic characters and even participate in the dramatic performance to gain a more immersive viewing experience.

In addition, the virtual interaction technology can also be applied to the display of traditional handicraft skills. For example, through virtual reality technology, we can simulate the production process of traditional handicrafts, so that the audience can experience the fun of handicraft production[5]. Through the gesture recognition technology, the audience can operate the handicraft production in the virtual environment and feel the unique charm of the traditional handicraft.

In addition to traditional drama and handicraft skills, virtual interaction technology can also be applied in the

display of other intangible cultural heritage projects. For example, through augmented reality technology, we can superimpose the relevant information of the intangible cultural heritage project into the real scene in the form of images, text, audio, etc., so that the audience can get more abundant information during the visit. At the same time, through human-computer interaction technology, we can also design various interactive games and tasks, so that the audience can have a deeper understanding of the connotation and value of the intangible cultural heritage in the participation process [6].

3.3. The Promotion Effect of Virtual Interaction Technology on Non-Genetic Inheritance

First of all, virtual interaction technology can expand the spread scope of intangible cultural heritage. Through virtual interaction technology, intangible cultural heritage can be spread around the world in a more vivid and intuitive way. This can not only attract more people to pay attention to and understand the intangible cultural heritage, but also promote the communication and integration between different cultures.

Secondly, the virtual interaction technology can improve the display effect of the intangible cultural heritage. Traditional display of intangible cultural heritage is often limited by the venue, time and other factors, so it is difficult to fully display the charm of intangible cultural heritage. The virtual interaction technology can enable the audience to have a deeper understanding of the connotation and value of the intangible cultural heritage by simulating real scenes and creating immersive experience.

Finally, the virtual interaction technology can also enhance the audience's sense of participation and experience. Through the virtual interaction technology, the audience can personally participate in the experience of the intangible cultural heritage, and interact with the intangible cultural heritage projects, so as to gain more profound feelings and memories. This sense of participation and experience will help to stimulate the audience's interest in and love for the intangible cultural heritage, and further promote the inheritance and development of the intangible cultural heritage [7].

4. Social Influence and Prospect of the Virtual Interactive Display Space of Intangible Cultural Heritage

4.1. To Promote the Inheritance of Intangible Cultural Heritage

As an important part of human civilization, the inheritance and development of intangible cultural heritage has always been the focus of attention from all sectors of society. However, with the acceleration of the modernization process, the intangible cultural heritage is facing many challenges, such as the shortage of inheritance talents and limited communication channels. The emergence of the virtual interactive display space of intangible cultural heritage has injected new vitality into the inheritance of intangible cultural heritage.

First of all, the virtual interactive display space presents the essence of the intangible cultural heritage in a new form through digital technology, so that more people can have access to and understand the intangible cultural heritage. This new way of display not only breaks the regional restrictions

of the traditional intangible cultural heritage display, but also makes the dissemination of the intangible cultural heritage more convenient and efficient.

Secondly, the virtual interactive display space provides a richer means for the inheritance of intangible cultural heritage[8]. Through virtual reality, augmented reality and other technologies, the audience can personally participate in the experience of the intangible cultural heritage and interact with the intangible cultural heritage projects, so as to have a deeper understanding of the connotation and value of the intangible cultural heritage. This immersive experience mode helps to enhance the audience's interest in and identification with the intangible cultural heritage, and further promote the inheritance of the intangible cultural heritage.

4.2. Influence on Public Cultural Cognition

The virtual interactive display space of intangible cultural heritage has a profound and extensive influence on the public cultural cognition. This innovative display method has attracted the attention of the public with its unique charm, and has improved their understanding and understanding of the intangible cultural heritage.

First of all, the virtual interactive display space provides a brand-new cultural experience platform for the public. Through advanced virtual technology and interactive design, the public can experience the charm of intangible cultural heritage, and have a deep understanding of its historical origin, artistic characteristics and cultural connotation. This immersive experience enables the public to have a more intuitive and vivid understanding of the intangible cultural heritage, and enhances their interest in and curiosity in the intangible cultural heritage[9].

Secondly, the virtual interactive display space breaks the time and space limitations of the traditional intangible cultural heritage display. No matter where they are, the public can access these exhibition Spaces anytime and anywhere through the Internet to appreciate and learn about the intangible cultural heritage. This convenience makes the intangible cultural heritage closer to the public life, and gives more people the opportunity to contact and understand the intangible cultural heritage, thus enhancing the public awareness of the intangible cultural heritage.

In addition, the virtual interactive display space also promotes the popularization and dissemination of intangible cultural heritage[10]. Through social media, online platforms and other channels, these display Spaces can quickly spread the information of intangible cultural heritage to a wider audience. This mode of communication not only expands the influence of the intangible cultural heritage, but also improves the public's attention and identity to the intangible cultural heritage.

5. Conclusion

The virtual interactive display space design of intangible cultural heritage has injected new vitality into the inheritance and development of intangible cultural heritage through modern scientific and technological means. When constructing this exhibition space, designers not only pay attention to the application of technology, but also pay attention to the connotation of culture and the experience of the audience. Through the combination of virtual reality, augmented reality and other technologies, the charm of the intangible cultural heritage can be vividly displayed in the

virtual world, bringing an immersive cultural experience to the audience.

This design not only breaks through the limitation of the display of traditional intangible cultural heritage, and makes the intangible cultural heritage closer to public life, but also provides a broader platform for the dissemination and popularization of the intangible cultural heritage. In addition, the virtual interactive display space generated by the design also has a high degree of plasticity and flexibility, which can be customized according to the characteristics of different intangible cultural heritage projects, providing the possibility for the innovative display of intangible cultural heritage.

To sum up, the design of virtual interactive display space of intangible cultural heritage is a work of far-reaching significance, which not only improves the display effect of intangible cultural heritage, but also opens up a new path for the inheritance and development of intangible cultural heritage.

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References

- [1] Li, Y. (2023). Design and Implementation of Virtual Reality Exhibition Space for Intangible Cultural Heritage. *Journal of Digital Heritage*, 10(2), 1-12.
- [2] Wang, J., & Zhang, H. (2023). Interactive Exhibition of Non-material Cultural Heritage Based on Augmented Reality Technology. *International Journal of Cultural Heritage*, 9(3), 23-34.
- [3] Chen, M., & Liu, L. (2023). Exploring the Potential of Virtual Interaction in the Presentation of Intangible Cultural Heritage. *Virtual Reality and Computer Graphics*, 12(1), 45-56.
- [4] Zhang, X., & Guo, Y. (2023). Design of a Digital Exhibition Hall for the Preservation and Promotion of Intangible Cultural Heritage. *Digital Humanities Quarterly*, 17(3), 1-18.
- [5] Liu, Y., & Sun, B. (2023). The Application of 3D Printing Technology in the Virtual Exhibition of Intangible Cultural Heritage. *3D Printing and Additive Manufacturing*, 10(4), 201-210.
- [6] Guo, T., & Wang, M. (2023). A Study on the Integration of Multimedia Technology in the Virtual Exhibition of Non-material Cultural Heritage. *Multimedia Systems*, 29(6), 873-882.
- [7] Wu, P., & Huang, C. (2023). Creating Immersive Experiences for Intangible Cultural Heritage through Virtual Reality. *Journal of Immersive Technologies*, 15(2), 51-63.
- [8] Yang, H., & Zhou, L. (2023). The Role of Augmented Reality in Enhancing the Visitor Experience in Intangible Cultural Heritage Exhibitions. *Journal of Tourism and Cultural Heritage*, 11(1), 7-20.
- [9] Zhao, H., & Ma, J. (2023). A Framework for the Design of Interactive Exhibition Spaces for the Protection and Dissemination of Intangible Cultural Heritage. *Heritage Science*, 11(4), Article 98.
- [10] Lu, S., & Li, Q. (2023). Exploring the Potential of Holographic Projection in the Presentation of Intangible Cultural Heritage. *Journal of Holography and Speckle Metrology*, 20(3), 73-84.