

# Application of Digital Modeling Technology in the Protection of Intangible Cultural Heritage

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**Abstract:** Intangible cultural heritage is an irreplaceable precious cultural resource. Under the premise of scientific protection and rational utilization, the application of modern scientific and technological means can break through the bottleneck that is difficult to sustain for the protection and utilization of cultural heritage. This article is based on the protection of intangible cultural heritage based on digital modeling technology. Based on the "tacit" feature of intangible cultural heritage, digital collection, storage, extraction and other technologies are used to fundamentally change the way of protection and utilization. It should be displayed from physical protection. The on-site protection display is transformed into a digital protection display, so that intangible cultural heritage resources can be effectively protected and used by 7.2%.

**Keywords:** Digital Modeling Technology, Intangible Cultural Heritage, Heritage Protection, Big Data, Remote Monitoring

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## 1. INTRODUCTION

In the digital age, the combination of museums and digital technology enables people to browse the fine collections of museums around the world and enjoy 3D immersive visits and exhibitions at home and without leaving the house. The digital museum has undoubtedly expanded the space and means of museum display, and allowed the end of the exhibition to survive forever. Professor Chen Jianxian, deputy director of the Intangible Cultural Heritage Protection Center of Central China Normal University, said, "The number of Chinese netizens is huge, and the 'digital museum' helps more people quickly understand intangible cultural heritage." Domestic digital museums are relatively mature. "Forbidden City" and "Digital Dunhuang" [1-7].

At the same time, local cultural databases in various ethnic regions are also under active construction, aiming to collect intangible cultural heritage materials scattered among the people. Among the more representative ones are: Inner Mongolia ethnic folk cultural heritage database, Shaanxi cultural heritage database, Qiang intangible cultural heritage dynamic image database, Qiang intangible cultural heritage static image database, Qiang intangible cultural heritage 3D action database, Miao intangible cultural heritage image database and so on. The establishment of these databases uses the world's advanced image and digital technology to explore new ways of intangible cultural heritage protection. On the other hand, because the shadow puppet craftsmanship includes two levels of craftsmanship and shadow puppet performance, both the inheritors are required to master sophisticated production procedures and craftsmanship, and the performers are also required to have deep performance skills, which cannot be mastered overnight. Also, as the inheritors of the older generation continue to die, no one after the shadow puppet crafts and performances seriously threatens the inheritance and development of this folk art [8-12].

"A piece of cowhide is actually happy, anger, sorrow and joy, half of the face is full of loyalty, traitor and evil." As an intangible cultural heritage protection project, the ancient folk traditional art: shadow puppetry (dengsha) is one of the

puppet theaters widely circulated in China. The reputation of "one of the best in China". At present, there are seven shadow puppet genres in China, including the Qin Jin Shadow System and Luanzhou Shadow System. Among them, the "living fossil" of shadow puppetry is the shadow puppetry in Huaxian County, Shaanxi. World movie theater originated in China, Chinese movie theater originated in Shaanxi, and Shaanxi movie theater originated in Huazhou. Huaxian shadow puppetry enjoys the reputation of "the founder of the film" in the world. With the rapid development of world economic integration and modernization, shadow puppetry has a narrowing foundation for survival. On the one hand, with the rapid spread of modern industrial civilization in the West and the invasion of Western cultural transmission methods, in the process of strong culture eroding weak and marginal cultures, my country's cultural ecology is undergoing tremendous changes, and the shadow puppets as cultural heritage and their living environment are seriously threatened. On the other hand, because the shadow puppet craftsmanship includes two levels of craftsmanship and shadow puppet performance, both the inheritors are required to master sophisticated production procedures and craftsmanship, and the performers are also required to have a deep foundation in performance skills, which cannot be mastered overnight. Also, as the inheritors of the older generation continue to die, no one after the shadow puppet crafts and performances seriously threatens the inheritance and development of this folk art. The development of the times has allowed various technologies to appear in our lives at an incredible speed. Things that could only be imagined before have become reality under the current rapid development of technology [13-18].

And AR technology is undoubtedly one of the best. It is a relatively new technology at present, and there is still a lot of room for development. The characteristics of AR technology do determine whether it can be used in the protection of intangible cultural heritage. Shine. At present, this technology can be used in a variety of ways to protect intangible cultural heritage. AR superimposes a virtual dimension on the display. Through digital collection, restoration and reproduction, display and dissemination, it adds to the digital protection of cultural heritage. More possibilities, let the cultural

inheritance glow with new vitality. As mentioned in the three issues of protecting intangible cultural heritage, modern people are pursuing advanced things, but forget to protect the very important intangible cultural heritage. Moreover, there is about to be a fault in the professional talents in this field. Only a very small number of young people. People are willing to engage in this type of industry. I think if these two points are combined, that is, the combination of AR technicians and the protection of intangible cultural heritage, it will better solve the first problem [19-24].

## 2. THE PROPOSED METHODOLOGY

### 2.1 The Digital Modeling Technology

At present, the protection of intangible cultural heritage has been widely concerned and valued by academia. However, as far as the protection of material cultural heritage products of folk arts and crafts is concerned, there is still a lack of comprehensive and in-depth investigations, data collection, and research on diversified protection methods. There are relatively few researches on the protection methods of each type of intangible cultural heritage. These products reflect the aesthetic taste and thoughts and feelings of the working people in our country, and have profound traditional cultural connotations and aesthetics. The protection methods of traditional intangible cultural heritage products are mainly collection, recording, sorting, filing, preservation, and research of intangible cultural heritage products. In addition, it uses traditional media to establish a database and a special museum, organize and record written materials, classify pictures and physical materials, and preserve relevant information for intangible cultural heritage research and protection; at the same time, it publishes related books and photographs of various types.

The archives of intangible cultural heritage are publicized to the public through traditional media such as television and radio[2]. The traditional form of intangible cultural heritage protection requires a lot of material resources, and the publicity is small, and the protection effect is low. It can be seen that it is a very low-carbon protection method. In recent years, the protection of my country's intangible cultural heritage has mainly carried out a series of cultural content integration and innovation from the aspects of system construction, publicity and display, and personnel training, in order to enhance the modern perception of traditional culture or skills, and improve the quality of intangible culture or products. Market Competitiveness. Since my country established the "Intangible Cultural Heritage Protection Law" in 2006, the State Council and the General Office of the Ministry of Culture have issued a series of "intangible cultural heritage" protection documents. The construction of intangible cultural heritage information database includes: storage system, description system, data processing integration system, retrieval system, backup system and database security and sharing, etc., using network technology, multimedia technology, document retrieval and other technologies, combined with mainstream Internet B/S technical structure, using the constantly mature new including the "Opinions on Strengthening the Protection of Intangible Cultural Heritage" and "Further Increase "Notice on support for non-genetic inheritors to carry out transmission activities" etc. These documents start from the perspective of the excavation.

### 2.2 The Intangible Cultural Heritage Protection

Develop digital information acquisition technology for intangible cultural heritage, multimedia virtual scene modeling technology, and virtual scene coordinated display technology to enable users to contact cultural relics at zero distance, realize complete interaction between users and cultural relics, and restore the original appearance of cultural relics through information visualization technology, Carry out virtual cultural relic display and unearthed environment simulation display, augmented reality technology, realize the perfect superposition of existing ruins, relics and original appearance, and display the historical stories behind the cultural relics. Use virtual reality technology, computer graphics and image processing technology, and multimedia technology to collect and organize data at the archaeological site to form a multi-dimensional data model of the archaeological site, thereby simulating the virtual excavation process, and conducting archaeological teaching and the pre-virtualization of real archaeology Experiments reproduce the process of archaeological excavation in an all-round, multi-faceted and vivid manner.

Using intangible cultural heritage sound, image retrieval technology and computer-aided design system, through the integration of 3D imaging, image processing, reverse engineering and other cutting-edge technologies in information visualization technology, the cultural relics are scanned in three dimensions to realize the one-dimensional and two-dimensional information of cultural relics. Full records of three-dimensional, three-dimensional and even multi-dimensional information. In the digital age, the combination of museums and digital technology enables people to browse the fine collections of museums around the world at home and without leaving home, and enjoy 3D immersive visits and exhibitions. The digital museum has undoubtedly expanded the space and means of museum display, and allowed the end of the exhibition to survive forever. Professor Chen Jianxian, deputy director of the Intangible Cultural Heritage Protection Center of Central China Normal University, said, "The number of Chinese netizens is huge, and the digital museum' helps more people quickly understand intangible cultural heritage." Domestic digital museums are relatively mature. "Forbidden City" and "Digital Dunhuang". At the same time, local cultural databases in various ethnic regions are also under active construction, aiming to collect intangible cultural heritage materials scattered among the people.

Inheritance and development of intangible cultural heritage, and carry out the recording, preservation and promotion of intangible cultural heritage. In August 2011, Foreign Languages Publishing House released the e-book application of "Traditional Folk Art".

### 2.3 The Application of Digital Technology in the Protection of Intangible Cultural Heritage

Based on the iPad tablet computer IOS3.2 system. At present, there are only a few science and technology museums is stored in the device in the form of data alone, it will lose its original color, but if it is combined with AR technology, its visual effect, degree of restoration and other aspects are relatively perfect. Augmented reality technology the biggest advantage in the protection of intangible cultural heritage is that it has a very high degree of restoration, and it will not be

lost or even lost in the process of normal circulation of intangible cultural heritage.

In addition, the emergence and development of digital technology and museums in China that have virtual display terminals of certain folk art or intangible cultural heritage in individual regions. However, these display devices have large limitations and small applications, which restrict the inheritance of intangible cultural heritage. And protection cultural heritage storage, display, publicity and education, but also has the legitimacy and possibility of internalizing intangible cultural heritage in its own way. We combine the two so that the experienter can intuitively feel the beauty of intangible culture, and at the same time, the experienter in this way can also feel the interest of these intangible cultural heritage.

For the recording of the singing of Huaxian shadow puppet theater, digital technology has just played its irreplaceable advantage. There are two types of shadow puppet singing, Wanwanqiang and Meihu, which are popular in Shaanxi, Gansu, Qinghai and other places. Wan wanqiang belongs to the banqiang body, and its tone is divided into flowery, flat, and crying. The tones are soft and soft, elegant and clear, delicate and euphemistic.

### 3. CONCLUSIONS

Applying digital modeling technology to the protection of intangible cultural heritage, theoretically speaking, this will form a digital communication theory for the protection and promotion of intangible cultural heritage, providing a new way for the protection of intangible cultural heritage at the same time, it expands the service space of digital modeling technology. From the content level, the establishment of a digital information database of intangible cultural heritage based on digital modeling technology and the construction of a virtual digital museum with interactive functions conform to the requirements of the development of the information age. From a technical perspective, for the application of digital modeling technology, it demonstrated reverse engineering technology for intangible cultural heritage, three-dimensional rapid modeling technology.

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