Discussion on the Application of Computer Digital Technology in the Protection of Intangible Cultural Heritage

He Shuai¹,Wu Yu¹,*

¹City College of Dongguan University of Technology, Dongguan 523000, Guangdong, China

*Corresponding author e-mail: heshuai0769@gdut.edu.cn

Abstract. With the globalization of global economy, the protection of intangible cultural heritage is facing a crisis of survival. Intangible cultural heritage is the crystallization of the wisdom of the working people of a country in past dynasties, with strong national characteristics. Applying digital technology to the protection of intangible cultural heritage can promote the inheritance, transformation and application of intangible cultural heritage. Since China put forward the information development strategy, it has become more practical to use digital technology to protect cultural heritage. Due to the imperfection of management mechanism and format specification, as well as the special nature of intangible cultural heritage, the development of digital means is still very difficult. In order to better protect the digital technology, this paper studies the important role of digital technology in the protection and inheritance of intangible cultural heritage, and further studies the deep development and application of digital technology in the protection and inheritance of intangible cultural heritage.

Keywords: Intangible Cultural Heritage, Digital Technology, Management Mechanism

1. Introduction

Since the 1990s, digital technology represented by information technology and network means has made great progress. Digital technology is not only widely used in various industrial fields, but also opens up a new way for cultural heritage protection [1]. In addition to various industrial fields, modern scientific and technological means have gradually been widely used in the intangible cultural heritage cultural industry, opening a new door and a new chapter for the development of cultural heritage protection [2]. Digital technology in intangible cultural heritage information collection, storage, processing and cultural communication, through digital transformation, makes the damaged culture
recover and lost culture reappear, adding a new perspective to interpret, on the basis of the protection of the original culture, to achieve more clarity and convenience [3]. Today, with the continuous development of digital technology, people gradually realize that digital technology has a role beyond traditional protection and development in the protection and development of intangible cultural heritage [4]. With the development of information technology and computer technology in recent years, as well as the development of digital storage hardware technology, intangible cultural heritage has been properly preserved through digitization. It is an inevitable trend to protect and develop intangible cultural heritage with the help of efficient digital technology [5]. With the development of information digitization technology with computer as the core, it brings a development opportunity for the protection of intangible cultural heritage.

In essence, the advantages of digital technology lie in the amount and efficiency of data processing. In recent years, the development of artificial intelligence has made great progress in the understanding and creation of data content. Digital technology can transform a lot of very complex information in intangible cultural heritage into measurable data, and then use these data to establish appropriate models, so as to provide a shortcut for the protection and development of Intangible Cultural Heritage [6]. In many countries, including China, the use of digital means to protect intangible cultural heritage has just begun. Due to the imperfect management mechanism and format specification, and the special nature of intangible cultural heritage, the development of digital means is still very difficult [7]. With the deepening of China's social informatization, digital protection of intangible cultural heritage is its inevitable development trend, and it is of great practical significance to explore the practice of its protection methods [8]. In the protection of intangible cultural heritage, the use of digital means provides more possibilities and development space. In order to better protect the intangible cultural heritage, this paper studies the important role of digital technology in the protection and inheritance of intangible cultural heritage, and further studies the in-depth development and application of digital technology in the protection and inheritance of intangible cultural heritage.

2. The role of digital technology in the protection and inheritance of intangible cultural heritage

2.1. Provide guarantee for the complete protection of intangible cultural heritage

Digital technology provides a lot of new acquisition and recording means for the protection of intangible cultural heritage, including graphic scanning, stereo scanning, holographic photography, digital photography, motion capture, etc. Digital storage technology also provides many new protection means for the protection of intangible cultural heritage, including the effective protection of intangible cultural heritage resources through database, disk array, optical fiber and network connection, as well as a series of relevant regulations and protocols. The application of digitization in the dissemination of intangible cultural heritage can further break the regional restrictions of intangible cultural heritage under different backgrounds, realize further communication between different cultures, ensure the objectivity and accuracy of cultural communication, and enhance the communication effect of Intangible Cultural Heritage [9]. It has become one of the main implementation contents of China's intangible cultural heritage protection project to use modern scientific and technological means such as digital multimedia to record, systematically and comprehensively precious, endangered and historical value intangible cultural heritage [10]. Digital protection of cultural heritage refers to the preservation, protection and re-promotion of traditional
cultural resources with the help of digital technology, respecting the original form of cultural heritage under a certain cultural background.

With the development and progress of society, we must realize that the original mode of moving intangible cultural heritage into museums is out of date, and it is not conducive to the inheritance and development of intangible cultural heritage. We must change the traditional concept of Museum database and establish a complete and comprehensive digital cloud data system by using cloud computing, cloud storage, cloud analysis, cloud playback, etc. Based on the unified platform of digital media, the digital museum integrates the intangible cultural heritage information of various media forms, and spreads it by means of telecommunication, wireless communication, Internet, cable TV and various digital TV networks, breaking the restrictions of specific time and place, and making it a new application platform suitable for mass communication under the condition of modern technology. Due to the different levels of software and hardware, the technical standards of data collection and preservation format adopted by China's intangible cultural heritage protection are different, which leads to data incompatibility among various protection departments. In view of the above problems, modern information technology should be adopted to match the construction of national digital library, digital museum and national cultural information resource sharing project.

Compared with the traditional protection methods, digital protection is more suitable for the characteristics of modern society. For intangible cultural heritage which is on the verge of being lost, it can be quickly recorded and saved, so as to strive for more time for the follow-up protection and development work and slow down the loss of intangible cultural heritage. The technology system is mainly composed of digital technology of intangible cultural heritage, scene modeling and behavior control technology, resource management and service technology, and visualization technology, as shown in Figure 1.

![Figure 1. Integration and application of new technology](image)

Intangible cultural heritage includes traditional cultural expressions and cultural space on which it depends. Single digital storage usually ignores the characteristics of cultural space on which it depends, so it is difficult to preserve intangible cultural heritage as a whole. No matter words, music, figures and images, all kinds of cultural contents gradually form global shared cultural resources in the process of intercommunication and mutual dissolution with the help of digital media, thus promoting
the spread of cultural achievements around the world and truly being recognized and accepted. The emergence of digital technology, using new scanning and digital photography technologies, can not only provide efficient information collection of intangible cultural heritage, but also transform existing textual and image data into digital storage. Thus, the protection of intangible cultural heritage can be carried out smoothly and for a long time. Modern digital information acquisition and processing technology can better sort out, collect and record the information of intangible cultural heritage, break through the display requirements and fidelity effects that traditional protection methods cannot achieve, and preserve these precious intangible cultural heritage more safely and for a long time. The emergence of digital technology, using new scanning and digital photography technologies, can not only provide efficient information collection of intangible cultural heritage, but also transform existing textual and image data into digital storage. Thus, the protection of intangible cultural heritage can be carried out smoothly and for a long time.

2.2. Provide support for the effective inheritance of intangible cultural heritage

In the final analysis, the difficulty of inheriting intangible cultural heritage is due to the change of production mode and living environment, while maintaining the original production mode, life style and even living environment is in conflict with the modernization goal of all mankind. Intangible cultural heritage will be influenced by natural environment and social environment as time goes by. With the continuous development of digital technology, these effects can be minimized. By using digital image art, history can be reproduced, and the process of the emergence, application, development and change of a certain intangible cultural heritage in history can be displayed through digital images, which can reproduce the lifestyle and state of people in different times under the influence of this intangible cultural heritage, and restore the historical and cultural background of intangible cultural heritage projects. Inheriting intangible cultural heritage can digitize traditional intangible cultural heritage resources and make them into visual virtual products for people to learn, exchange and innovate in intangible cultural heritage knowledge. Digital technology promotes the dissemination of intangible cultural heritage. The digitalization of intangible cultural heritage is to simulate the real scene of traditional culture through information technology and make it virtualized [11]. The application of digitalization in the inheritance of intangible cultural heritage not only provides the audience with the opportunity to reinterpret intangible cultural heritage, but also stimulates people's cultural consciousness and makes more people take the initiative to join the inheritance of intangible cultural heritage.

Digital technology has played an important role in the protection and inheritance of intangible cultural heritage, but its utility has not yet been fully developed. With the development of information technology, digital technology will play a greater role in the protection, inheritance and development of intangible cultural heritage. The real value of intangible cultural heritage lies in its rich cultural factors, which can be transformed into excellent cultural products with unique national style and local characteristics by means of production, circulation and sales, so that it can be reintegrated into the real society and enter people's daily life. There are essential differences between material and intangible cultural heritage in visualization technology. The former can be presented in the form of pictures, videos and animations. The latter's digital visualization is more of a knowledge visualization category, and its visualization forms are more focused on displaying cultural connotations. With the progress of science and technology and the development of digitalization and informationization, these key
technologies will be overcome and high-end equipment will be manufactured, which will greatly improve the productive protection ability of intangible cultural heritage.

3. The development of digital technology in the protection and inheritance of intangible cultural heritage

3.1. Construction of a comprehensive application system of new technologies for intangible cultural heritage

Intangible cultural heritage has been passed down through long-term practice and can represent a local culture, which includes various traditional cultural expressions and cultural spaces closely related to people's lives. After digital promotion and inheritance, people have a more comprehensive and in-depth understanding of intangible cultural heritage, and some intangible cultural heritages have more audiences. More and more people begin to accept them, learn from them and finally apply them. Intangible cultural heritage, which has undergone historical screening and passed down through long-term practice, can represent the culture of a region or even a nation. It is closely related to people's lives and has rich connotations. Using digitalization to record and store these cultural heritages, and simply presenting them in the form of texts, images, audio and video, it is difficult for users to fully express some cultural connotations [12]. Single digital storage ignores the unique cultural space characteristics among different cultures. Therefore, it is necessary to build a technical system for the protection and inheritance of intangible cultural heritage, in which digital technology, scene modeling technology and visualization technology are combined. The digital transformation of intangible cultural heritage breaks through the limitation of regional space, which helps the inheritors to integrate intangible heritage with practical needs, and makes it easier for the public to understand and accept.

Based on the liveness, tradition and integrity of intangible cultural heritage, and on the basis of detailed analysis and research on the systematic, complex and implicit characteristics of its knowledge, this paper explores the constituent elements of intangible cultural heritage knowledge from the perspectives of folklore, sociology, anthropology, aesthetics, history and psychology, and extracts the characteristics of knowledge and makes a summary of it. Intangible cultural heritage is easy to be digitized, networked and virtualized, and can be used to build interactive and open large-scale digital museums of intangible cultural heritage, audio-visual works, interesting games, virtual situations and industrial design products, and share the global resources by means of the Internet. Using digital virtual reality technology to realize the development and utilization of intangible cultural heritage, industrial production and management is conducive to the formation of new industries and derivative products, extending the industrial chain and increasing the proportion of cultural industries.

3.2. Construction of national intangible cultural heritage protection and inheritance technology system

In the digital development of intangible cultural heritage, the existing problems focus on the technical difficulties of interactive production of three-dimensional scenes of cultural activities and role animation. By applying digital technology to the protection of intangible cultural heritage, the traditional moral spirit can be presented from a brand-new perspective by digital means, which breaks through the limitation of time and space, expands the scope of communication, and makes the audience better nourished by traditional culture in the process of imperceptible influence. In practical
work, high-quality digital technical talents are scarce, which leads to the failure to give full play to the effect that digital technology should have achieved. Symbolization of intangible cultural heritage provides a way to transform cultural heritage resources into cultural capital [13]. We should provide realistic character models for the production of intangible cultural heritage inheritors' character animation by using the real touching character model creation technology, and generate character action animation efficiently by using the action data in the resource library. Finally, by means of knowledge, behavior modeling and interaction, the visual production of intangible cultural heritage resources is realized, effective interaction is realized on the built platform, and visual product communication is promoted. In the protection of intangible cultural heritage, digital technology should be actively used to make intangible cultural heritage form its own characteristic culture on the basis of protection and inheritance, thus creating greater economic and social benefits, improving China's international status and promoting China's faster and better economic development.

4. Conclusion

The inheritance or transmission of intangible culture is the people's self-choice of culture, and the use of external force is not a perfect solution. Information technology has fundamentally changed the way of production, dissemination and consumption of cultural products. Using information technology can improve the originality of cultural products, develop new cultural products and enhance the competitiveness and vitality of cultural industries. Due to the diversity of intangible cultural heritage, its cultural connotation, forms of expression and sources of knowledge are different. For the digital protection of intangible cultural heritage resources, it is necessary to establish a resource classification system, unify data technology standards, realize visual expression, build a comprehensive technology application system and build an interactive platform with multimedia. Nowadays, in order to better play the role of digitalization, we should re-integrate the existing intangible cultural resources, make a new evaluation on the basis of preserving the existing resources, and build a system with various types. Digital technology can make the process of protection and development of cultural heritage interesting, orderly and relaxed, and has the opportunity to become the mainstream technology of cultural restoration. China's information technology industry is developing vigorously, and the intangible cultural heritage resources have a broader prospect for rational development and utilization through digital technology, thus forming a characteristic industry in which culture, media and information blend.

Acknowledgments

The work is supported by Humanities and social science Youth Project of the Ministry of Education “Protection and Inheritance of Intangible Cultural Heritage under the Background of Digitalization - Taking” the Digital Inheritance of “ Production Technology of Dragon Boat ” as example"(Grant number:17YJC760014)

References

[1] Suárez, Rafael, Alonso A, Sendra J J. Intangible cultural heritage: The sound of the Romanesque cathedral of Santiago de Compostela[J]. Journal of Cultural Heritage, 2015, 16(2):239-243.
[2] Kwon H. Villagers’ agency in the Intangible Cultural Heritage designation of a Korean village ritual[J]. International Journal of Heritage Studies, 2016, 23(3):1-15.

[3] Yelmi, Pinar. Protecting contemporary cultural soundscapes as intangible cultural heritage: sounds of Istanbul[J]. International Journal of Heritage Studies, 2016, 22(4):302-311.

[4] Chen Rihong. City image communication based on digital intangible cultural heritage[J]. Packaging Engineering, 2015, 036(6):1-4.

[5] Li Wanfen. Protection and Utilization of Intangible Cultural Heritage in the Digital Background[J]. Cultural Industry, 2018, 99(02):32-34.

[6] Springstubb P. The Raw and the Cooked: The French Meal, or its Transubstantiation as Intangible Cultural Heritage[J]. Journal of Architectural Education, 2018, 72(2):217-229.

[7] Li Xianhong. The protection of intangible cultural heritage should take the path of active development[J]. Journal of Hengshui University, 2016, 85(01):53-56.

[8] Lv Yanru, Zhang Li. The innovative application of new media technology in the digital display of intangible cultural heritage[J]. Packaging Engineering, 2016, 37(10): 26-30.

[9] Chen Xinyu, Niu Yi, Deng Yubo, et al. Digital interactive technology of intangible cultural heritage based on somatosensory recognition[J]. Journal of Gansu Sciences, 2015, 27(2): 6-10.

[10] Wesener, Andreas. Adopting 'things of the little': intangible cultural heritage and experiential authenticity of place in the Jewellery Quarter, Birmingham[J]. International Journal of Heritage Studies, 2017, 23(2):141-155.

[11] Ott M, Dagnino F M, Pozzi F. Intangible Cultural Heritage: Towards collaborative planning of educational interventions[J]. Computers in Human Behavior, 2015, 51(10):1314-1319.

[12] Yalçinkaya, Elvan. Pre-service Teachers’ Views on Intangible Cultural Heritage and its Protection[J]. Anthropologist, 2015, 22(1):64-72.

[13] Artese M T, Gagliardi I. A Multimedia System for the Management of Intangible Cultural Heritage[J]. Crystallography Reports, 2015, 4(2):149-164.