

Research on the Application of Technology in the Protection of Intangible cultural heritage in Mixed Reality

-- Taking Jingzhou Flower-drum Opera as an Example

Zewei Zheng

School of Art and Design, Wuhan Textile University, Wuhan, China

Abstract: Jingzhou Flower-drum opera is one of the well-known operas in Jiangnan Plain, Hubei Province, and was also included in the first batch of national Intangible cultural heritage list in 2006. Jingzhou Flower-drum opera has a long history, but with the rapid development of the digital era and the impact of emerging culture, Jingzhou Flower-drum opera has also encountered an irresistible inheritance crisis. As the further development of virtual reality technology, hybrid reality technology has attracted many young people's interest in its interactivity and creativity. Secondly, as an emerging industry, hybrid reality technology has a certain degree of progress in the times, and it also has a certain degree of agreement with the protection of Intangible cultural heritage. This paper will elaborate on the development of hybrid reality technology and the current protection situation of Jingzhou Flower-drum opera, analyze the difficulties and solutions currently facing, and discuss the inheritance and development of traditional Intangible cultural heritage from the perspective of how intangible cultural heritage survives in the digital era and how to integrate with hybrid reality technology.

Keywords: Mixed Reality; Jingzhou Flower-drum Opera; Inheritance and Development.

1. Cognition and Characteristics of Hybrid Reality Technology

1.1. Cognition of Hybrid Reality Technology

The birth of the first AR helmet in 1960, the birth of the concept of "virtual reality" in 1987, the emergence of the concept of "augmented reality" in 1990, and the popularity of the concept of Metaverse in recent years all mark the gradual improvement and development of the new human-computer interaction industry. Hybrid reality technology was initially proposed by Professor Steven Mann. In the 1970s and 1980s, in order to achieve visual effects that can be seen everywhere, Steven Mann designed wearable intelligent hardware, which was seen as a preliminary exploration of hybrid reality technology. With the release of Microsoft HoloLens in 2015, the concept of hybrid reality technology has also attracted more and more attention.

Hybrid reality technology is the combination of virtual reality and augmented reality in three-dimensional applications. Based on virtual reality technology, a hybrid environment immersion technology is established, which can allow the real environment and virtual images to interact. Virtual reality technology mainly focuses on online virtual display, which isolates the edge of virtual and reality, pursuing the ultimate immersion. Hybrid reality technology can perfectly integrate offline real life and virtual images, allowing virtual images to continuously interact with the surrounding environment. Changes in the surrounding environment will also affect the changes in virtual images, and more importantly, it pursues authenticity.

At present, MR has also developed rapidly, mainly reflected in technology and equipment. The devices are mainly headworn, hand-held and projection type. The typical headworn device is Microsoft HoloLens, which uses a

penetrating display to enable users to see the physical environment when using it. At the same time, it also supports Six degrees of freedom Mobile technology; Handheld devices are mainly mobile devices, and the IKEA Place application allows users to freely display home effects according to their own needs. Users only need to aim their phone camera at a certain area of the home, and can "place" their selected home in the room, quickly browse all products under the brand and freely mix and match to see the final effect; At the same time, projection technology can also support the implementation of MR, such as building stereo projection, effectively integrating digital animation with architecture, integrating architecture into the screen, and allowing animation and architecture to "interact".

In real life, human-computer interaction technology enables people to efficiently interact with virtual content. MR technology also provides users with an opportunity to interact in both the virtual world and real life. Moreover, MR technology can also play its advantages in multiple industry chains. In recent years, human-computer interaction technology has also played a great role in the protection and inheritance of intangible cultural heritage.

1.2. Characteristics of Hybrid Reality Technology

(1) 3D registration

3D registration is an important method in augmented reality systems, which to some extent solves the registration problem between virtual and real objects, including camera tracking and 3D object tracking. It allows virtual objects to be accurately aligned with the real world, truly building a bridge between virtual and real worlds.

(2) Virtual and Real Interaction and Authenticity

Through MR display devices, users can simultaneously see both the real environment and virtual holographic images,

integrating virtual objects into the real world. With the assistance of gestures, actions, vision, and other methods, interactivity is achieved, cleverly integrating virtual and reality, enhancing the user's experience.

2. Status Quo of Intangible Cultural Heritage Protection and Inheritance Crisis of Jingzhou Flower-drum opera

2.1. Analysis of the Status Quo of Intangible Cultural Heritage of Jingzhou Flower-Drum Opera

Jingzhou Flower-drum opera is a local opera art drama popular in Jiangnan Plain in Hubei Province. Since its germination in the light years of Daoguang in the Qing Dynasty, it has taken root in Jingchu while learning from other opera art experiences. It has a history of more than 200 years. Jingzhou Flower Drum Opera is rich in variety, with varied vocals, and is very artistic.

From 1953 to the present, Jingzhou Flower-drum opera has experienced vigorous development and low cultural tide. All professional troupes have always adhered to the spirit of their predecessors and actively created or adapted plays. In recent years, works have emerged in an endless stream with strong repercussions, such as Honghu Red Guards, Life Fairy Tales, Tea Reason, Civet Cat for Prince, Village Convention, Love of Pear Blossom, Filial Piety Child, Double Jade Cicadas. The achievements are undeniable, but the characteristics of the play are becoming weaker and weaker, this is a signal that creators need to be vigilant. In order to ensure that the culture of Flower-drum opera in Jingzhou can be passed on from generation to generation, in 1985, Jingzhou District Culture and Arts School was established. At the beginning, the enrollment was about 150 people. Later, with the improvement of the school's reputation, more and more people are interested in Jingchu culture, and the number of applicants is increasing year by year. Over the past 33 years of education, we have trained and delivered over 3000 outstanding graduates to society and professional art troupes.

Any artistic masterpiece is not immutable. Only through the polishing and rubbing of time can it condense into artistic crystals. A good play can create a kind of play. As one of the most popular plays in Hubei, Jingzhou Flower-drum opera cannot be separated from a series of indigenous traditional plays in addition to the innovative plays that have been constantly cast and arranged in recent years. Only by increasing the strength and speed of rescuing classics, can Jingzhou Flower-drum opera give full play to the essence of its performance to the greatest extent, and always perform new.

2.2. Jingzhou Flower-drum Opera Intangible Cultural Heritage Inheritance Crisis

Jingzhou Flower-drum opera has a history of more than 200 years, and has gone through the formative and mature stages. However, with the rapid development of the digital era in the 21st century, it has greatly compressed the development space of traditional drama. Jingzhou Flower-drum opera shows more traditional culture, such as Hu Jinyuan in White Fan Story, Song Jiang and Zhang Wenyuan in Wulong Courtyard. It mostly describes the traditional culture with typical characters as examples. In combination with the integration

of singing and performance, it forms a unique folk culture. Nowadays, entertainment projects have increased significantly in the information age, attracting the attention of most young people, and people's daily leisure activities have become more abundant, watching movies, online games, and more have taken up a lot of people's time, and their consumption psychology has undergone tremendous changes. The cultural environment of different eras has led to the gradual decline of the traditional theater market nowadays, and few people are interested in the traditional culture with inherent performance forms.

In addition, the rapid loss of audience is also a major crisis. The increasing richness of internet projects has attracted the attention of most young people, greatly reducing their interest in traditional drama. At the same time, the traditional drama still retains its original form of performance, and the inherent mode of traditional culture is obviously a little powerless to keep up with this era. As a result, the audience of Jingzhou Flower-drum opera has not changed much in the last century, which is mainly reflected in the middle-aged and elderly groups, and the young audience market has not been developed.

The decrease in audience has also led to a chain reaction of sustained economic downturn and talent loss in the industry. The cost of clothing, venues, transportation, and other expenses has not changed much over time, but has correspondingly increased. However, the number of viewers is decreasing, leading to an embarrassing situation of insufficient income. The downturn in team economic efficiency also indirectly leads to a decrease in the attraction of professional talents, many veteran actors who have worked for many years also have to face career changes in order to make a living. The challenges and crises faced by traditional drama today are unprecedented, so there is an urgent need for a new model and method to improve the current situation.

3. Application of Hybrid Reality Technology in the Protection of Intangible Cultural Heritage of Jingzhou Flower-drum Opera

3.1. Combination of Offline Interaction Form and Inheritance of Intangible Cultural Heritage of Jingzhou Flower-drum Opera

The inheritance of technology cannot be separated from people's participation in learning. The participation of mass groups is an important link to realize the combination of interaction and the protection of Intangible cultural heritage, and it is also an indispensable link. In the form of offline interaction, users' enthusiasm is fully mobilized, and the mixed reality technology is presented to people in the real environment, so that people can understand the background knowledge and cultural heritage in Intangible cultural heritage while watching, Users can experience the charm of Intangible cultural heritage, fully understand the technology in the process of participation, and participate in the protection of Intangible cultural heritage together in the experience.

The application of hybrid reality technology in Jingzhou Flower-drum opera is also irreplaceable. Virtual reality technology emphasizes more on an immersive experience, requiring the experimenter to achieve it in virtual space and to some extent deviate from reality; Augmented reality

technology allows the experimenter to watch Flower-drum opera actions in the virtual screen in the real environment, but it lacks long-term interactivity. In comparison, the application of hybrid reality technology will be more conducive to the protection of the intangible cultural heritage of Flower-drum opera. For example, if the experimenter wants to learn the skills of Flower-drum opera in real life, a virtual teacher of Flower-drum opera can correct his actions again and again in real time, it can reproduce the action essentials in the real world, and can continue to interact with each other. This is what virtual reality technology and augmented reality technology cannot achieve at present. The hybrid reality technology is used to build a real-world platform, and the image and action technology of the characters in the platform are integrated into the generation technology and binding technology. Each key technical action of Flower-drum opera can be perfectly preserved, and then it can be fully displayed in front of the experiencers. On this platform, everyone can learn from the intangible cultural heritage masters.

In fact, in the theme of the "Dazzling Intangible Cultural Heritage" section of the "Canal Intangible Cultural Heritage Exhibition" at the 4th Grand Canal Cultural Tourism Expo, the interactive nature of mixed reality technology was fully utilized around "Intangible Cultural Heritage+Technology", presenting the perfect integration of traditional culture and digital technology to the public. Through the combination of VR, AR, and MR technology, the one-way dissemination form of intangible cultural heritage has gradually evolved into a form of human-machine interaction, breaking through the limitations of time and space, allowing participants to immerse themselves in the production process of traditional handicrafts. In the "Digital Intangible Cultural Heritage Mixed Reality Experience Area", you can identify and match with the Virtual humans of intangible cultural heritage digital Paper Cuttings "Yunduoduo" and "Xililai", and the corresponding Virtual humans of intangible cultural heritage digital will imitate our every move, including walking, waving and even dancing.

The application of hybrid reality technology in Jingzhou Flower-drum opera also has high practical value. (1) It solved the teaching problem of Jingzhou Flower-drum opera. Because real-life teaching always involves issues related to time, space, and personnel, the combination of mixed reality technology greatly solves these concerns to a certain extent. There is no need to worry about not having the right time, being too far away from the place, and not being able to find a teacher. As long as you want to learn, you can achieve offline interaction through the reality platform it has built.

3.2. Build a Combination of Digital Data and Jingzhou Flower-drum Opera Intangible Heritage Protection

The existence of each cultural relic and culture is unique and unique. However, with the passage of time, many intangible cultural heritage cultures are facing the crisis of extinction. For example, Uyghur Muqam of Xinjiang, an art culture that combines song and dance, faces difficulties in its inheritance because of the evolution of the living environment and customs of a large number of local residents. Therefore, in order to prevent the occurrence of such problems, effective measures must be taken to protect the existing intangible cultural heritage.

Hybrid reality technology collects information through advanced digital technology, and images, images, sounds, and

products are all transformed into information permanent storage in an all-round way, and then are reproduced through digital Interaction design to give them comprehensive protection. Both post production, retrieval, and management have a positive impact. In the current era of information globalization, mixed reality technology can participate in protection through various new technologies and multimedia applications, and carry out active protection worldwide. It integrates and optimizes content with time tags for key protection, promoting its revitalization.

By downloading the 3D model library and actual image data related to the intangible cultural heritage of Flower-drum opera, combined with the holographic equipment equipped with hybrid reality technology, image output and scene restoration can be carried out, and the knowledge, concepts and technologies of intangible cultural heritage can be truly reproduced, so that the audience can be immersive in real-time interaction, thus providing immersive audio-visual experience and interactive experience. For example, the Shanghai Jiading Bamboo Carving Museum visualizes the production process of bamboo carving through precise digital extraction of models and hybrid reality technology. Moreover, the audience can also participate in the production process together, enhancing their interest in learning and deepening their understanding of Jiading bamboo carving culture.

Physical materials face certain constraints in the process of preservation and exhibition, that is, they must be exhibited in a specific time or place, mostly through the form of replicas. The dissemination speed and breadth of this exhibition method are slightly insufficient. The application of hybrid reality technology can supplement this deficiency. Hybrid reality technology includes a series of new technologies and artistic means such as 3D animation simulation technology, 3D scanning technology, and interactive devices. It can display physical materials more intuitively, completely, and artistically, effectively improving the effectiveness of physical exhibition and promotion work. In addition, hybrid reality technology is used to restore and simulate the relevant research and development process. In this process, the use of modern technology can improve the entertainment of physical resources, enhance people's interest in Flower-drum opera in Jingzhou, and thus boost the efficiency of physical exhibition and promotion of Flower-drum opera.

The construction of digital data can effectively display and spread the intangible cultural heritage. The protection of Intangible cultural heritage by mixed reality technology is not only limited to simple information storage protection, but also can promote its rapid spread through the network. Through the real interaction of individuals and 360-degree all-round display, it breaks the limitations of traditional display methods on time and space, and allows more social masses to access relevant information, Close to the daily life of the general public, enter the public's perspective, and awaken their sense of identification with it.

4. Thinking of Mixed Reality Technology in the Protection and Inheritance of Jingzhou Flower-drum Opera

In terms of technology, mixed reality technology requires too much data capacity to handle, which is constrained by current equipment and technology, resulting in this technology not being able to achieve 100% perfect and

accurate application, and there may be information loss, which cannot bring users the ultimate intangible cultural experience; Secondly, in terms of content, the content and form of Jingzhou Flower-drum opera's own story also need to be updated. The traditional Jingzhou Flower-drum opera has become a little "old" in both story content and form. In the face of the rapid development of the information society, the traditional slow rhythm singing method has been unable to meet the preferences of contemporary young people. Renewal does not mean total negation, but better keeping up with the aesthetic needs of the times. While ensuring the inherent characteristics of Jingzhou Flower-drum opera, it seeks breakthroughs in many aspects, such as singing, story carrier, performance form, music selection, etc., in order to achieve aesthetic and emotional resonance with the audience; The cultivation of professional talents is also a major challenge for future development. In fact, whether it is mixed reality technology or Jingzhou Flower-drum opera, there is a great demand for professional talents. In the context of the high development of informatization, only technical, applied and comprehensive talents in relevant professional fields can achieve the inheritance of Jingzhou Flower-drum opera based on mixed reality technology, and professional talents integrated through interdisciplinary comprehensive research ability, high-level digital technology and other aspects, It provides the possibility for the protection of future hybrid reality technology on intangible cultural heritage.

How to maintain the balance between technology and the intangible cultural heritage of Jingzhou Flower-drum opera is also an urgent consideration. MR technology is more an innovative form of application of cultural inheritance, and it cannot produce the ideas expressed by the culture itself. How to excavate deeper connotation and value from the culture itself to avoid excessive intervention of science and technology to achieve the long-term development of the culture itself is also a problem that deserves careful consideration. The effective implementation of hybrid reality technology has indeed solved the problems of time, space, etc., and has also brought more interactivity and innovative experiences to users, attracting a large number of users to participate in intangible cultural heritage experiences. However, it cannot be denied that this is more of a short-term novelty brought by the fun of technology. If other industries also use hybrid reality technology for innovative development, will it also cause a wave of excitement, Therefore, the inheritance of the intangible cultural heritage of Jingzhou Flower-drum opera should pay more attention to the refinement of its own content. Starting from its own cultural heritage, we should avoid the excessive use of science and technology breaking the value provided by the culture itself, truly realize the sustainable integration and development of technology and its own intangible cultural heritage, and bring new vitality to Jingzhou Flower-drum opera.

Mixed reality technology has brought new vitality to the long-term development of Jingzhou Flower-drum opera's intangible cultural heritage culture, but there is still a long way to go to explore in terms of technology, talent training, and the balance between the two. At present, mixed reality technology has not intervened in the relevant intangible cultural heritage industry in a large amount, and it is still in the early and middle stages of the experiment. There are still many difficult points that need us to overcome one by one, Realizing the perfect integration of MR and intangible cultural heritage industries in the future.

5. Conclusion

With the gradual acceleration of the scientific and technological process of modern society, Jingzhou Flower-drum opera and a large number of other Intangible cultural heritage are facing great challenges. Therefore, it is inevitable to correctly apply modern science and technology to achieve the protection and dissemination of intangible cultural heritage. As mentioned above, Jingzhou Flower-drum opera itself has many difficulties in its performance form, content, talent training and other aspects of development, and new technologies are needed to bring new vitality to this traditional intangible cultural heritage. The hybrid reality technology maximizes the interaction of reality, maximizes the sense of reality, and gives users a real sense of experience. The integration of it with Jingzhou Flower-drum opera can effectively display specific actions, preserve the intangible cultural heritage, and solve other problems such as the lack of teaching in time and space in a long-term manner, greatly improve the intangible cultural heritage experience, and encourage more people to participate in the inheritance of intangible cultural heritage. But in the inheritance of intangible cultural heritage, technology can always serve as an auxiliary tool, and the brilliance of technology cannot outweigh the charm of culture itself, which will lead to the dilemma of form surpassing content. Reasonably use mixed reality technology, improve the content quality of culture itself, protect the authenticity and integrity of cultural heritage as much as possible in the digital era, achieve two-way interaction between users and intangible cultural heritage in an accurate and efficient form, ensure the "double blossom" of form and content, and promote the prosperity and development of Jingzhou Flower-drum opera and other intangible cultural heritage.

References

- [1] Fu, Q. (2021). The Lotus in Yingri Is Different from the Red One -- On the characterization of Xia lotus in Jingzhou Flower-drum opera Red Lotus [J]. Drama House, (36): 52-53.
- [2] Luo, S. (2021). Scenarios, Emotions, Situations and Feelings of Jingzhou Flower-drum opera Red Lotus [J]. Chinese Drama, (06): 28-29.
- [3] Sun, H. (2020). The realistic scene of rural revitalization - the illumination and return of Jingzhou Flower-drum opera "The Village Moonlight Returns" [J]. Drama Literature, (06): 99-101. DOI: 10.14043/j.cnki.xjwx.2020.06.018.
- [4] Yin, Q. (2021). The survival status and development thinking of Jingzhou Flower-drum opera -- Taking Standing on the Flower Wall as an example [J]. Home of Drama, (14): 4-5.
- [5] Guo, T. & Fu, Y. (2019). Thoughts on the industrialization development of Intangible cultural heritage of traditional arts and crafts under mixed reality technology [J]. Journal of Hubei Open Vocational College,32 (21): 96-97.
- [6] Tian, Y.(2019). Research on Digital Restoration and Protection of Paleontology Based on Hybrid Reality (MR) Platform: Taking the Dinosaur Museum in Zhucheng as an Example [J]. China National Expo, (07): 210-211.
- [7] Wang, Z. (2021). Research on the Protection and Inheritance of Intangible cultural heritage Based on Hybrid Reality Technology [J]. Science and Technology Innovation, (19): 1-4. DOI: 10.15913/j.cnki.kjycx.2022.19.001.
- [8] Chen, S. (2021). Non legacy Curatorial Exhibition and Operation Exploration of the Canal Basin -- Taking the "Grand

- Canal Intangible cultural heritage" Exhibition as an Example [J]. Southeast Culture, (03): 142-147.
- [9] Zhang, Q. (2021). Practice and Research on the Infiltration of Mathematical Culture in Primary School Mathematics Teaching [J]. Intelligence, (21): 35-36.
- [10] Tina. & Ji, X. (2022). Connecting Modern Life to Bloom Charming Glory [J]. Going Global, (33): 10-11.
- [11] Song, Y. (2021). The Application of Intangible Cultural Heritage in Homestay Construction - Taking Guizhou Miao Embroidery as an Example [J]. Design, 34 (23): 58-60.
- [12] Wu, L. (2005). The History and Current Situation of Jingzhou Flower-drum opera [J]. Opera Art,84-91.
- [13] He, X. (2005). Theoretical Thinking on the Protection of Intangible cultural heritage [J]. Jiangxi Social Sciences,100-106.
- [14] Liu, K. (2005). Intangible cultural heritage from the Perspective of Human Nature [J]. Jiangxi Social Sciences, 96-102.
- [15] Zou, X. & Sun, J. & He, H. (2004). The Evolution, Development, and Prospects of Virtual Reality Technology [J]. Journal of System Simulation, 44-48.
- [16] Information on: <https://www.docin.com/p-2464169318.html>.