The Innovative Practice of The Digital Transformation of Qinqiang Opera Masks

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Abstract

Qinqiang Opera masks, as a vital symbol of Chinese traditional opera culture, face growing challenges in inheritance and engagement amid rapid digital transformation. This study aims to preserve and revitalize Qinqiang Opera masks through innovative digital practices. By integrating image recognition, semantic modeling, and user-centered interaction design, the research establishes a comprehensive digital system for mask extraction, semantic encoding, and personalized redesign. A digital platform allows users to generate character masks based on specific personality traits, while applications such as somatosensory-based display and mask projection technology provide immersive cultural experiences. The findings demonstrate that digital transformation not only facilitates cultural preservation but also expands the possibilities for public participation, creative reinterpretation, and cultural industry integration. This work contributes to the sustainable development of intangible cultural heritage by bridging traditional artistry and emerging technologies.

Keywords: Qinqiang Opera Masks; Digital Design; Innovative Practice

Introduction

Qinqiang Opera, known as the "ancestor of Chinese Bangzi Opera," holds significant cultural importance as a representative of China's intangible cultural heritage. It has played an essential role in preserving traditional Chinese values and fostering cultural identity, particularly in Northwest China. Qinqiang's bold performance style, expressive vocal techniques, and emotionally driven narrative

content contribute to its high artistic value. However, the development, inheritance, and protection of Qinqiang face multiple challenges in contemporary society, where digital transformation and globalization are reshaping cultural engagement. The protection and promotion of Qinqiang not only meet growing cultural and spiritual needs but also enhance the soft power of Chinese culture on a global scale (Wang, 2022).

In recent years, the intersection of digital technology and traditional culture has become a growing area of interest. There is a pressing need to explore how digital tools can be leveraged to revitalize Qinqiang Opera, especially its iconic masks. Qinqiang's visual and auditory elements, including masks, costumes, and vocal styles, hold tremendous potential for digital reinterpretation. New media technologies, such as virtual exhibitions, digital reconstructions, and interactive media, offer opportunities to expand the reach of Qinqiang to younger and more tech-savvy audiences (Xiao, 2021). The application of these technologies ensures that traditional forms, like Qinqiang, can continue to thrive in a modern, digital world.

Moreover, the importance of digital communication strategies in preserving cultural heritage is increasingly recognized. As digitalization permeates various sectors, the innovative development of Qinqiang through virtual platforms and digital experiences becomes crucial. The potential for creating immersive experiences through augmented reality (AR) and virtual reality (VR) technologies highlights new pathways for cultural preservation. These advancements can help bridge the gap between tradition and modernity, ensuring that Qinqiang's cultural legacy remains accessible to future generations.

Research objectives

1. To investigate the extraction and digital encoding of Qinqiang Opera masks based on color and texture features.

2. To explore the construction and application of semantic word packages for the digital redesign of Qinqiang Opera masks.

Literature review

Italian scholar Poula De Bernardi (2019) described the application of digital communication methods in the Turin Museum in Italy in the book "Museum Digital Innovation: The Role of Digital

Communication Strategies in Torino Museums": Turin, as one of the first cities in Europe to enjoy new technologies, took the lead in catching the digital express train and used classified communication to display museum culture. Its Baroque, Rococo and neoclassical French architecture is presented dynamically through digitalization, allowing people to experience Turin's culture, art and customs without leaving home.

Upamanyu Madhow (2008) proposed in the article "Fundamentals of Digital Communication" that the establishment of a physical communication system is the basis of cultural communication. By classifying content and specialized communication for different audiences, the communication rate can be effectively improved.

In "Design of Virtual Public Resilience Spaces of Traditional Cultures", He (2020) combined digitalization with visual arts and traditional culture, allowing traditional culture to be spread in places with high traffic, and conducted a detailed analysis of traditional cultural elements, and on this basis, classified, integrated and disassembled them to construct a collection with common symbolic cultural characteristics. This not only promotes the diversified digital communication of traditional folk culture, but also collects a large number of suggestions on the improvement of visual arts, aiming to solve existing problems and meet people's aesthetic needs.

Since the 1990s, China's digital cultural heritage research has mainly focused on the digital reproduction and mining of material cultural heritage such as ancient ruins, ancient buildings, grottoes, murals, and sculptures, as well as intangible cultural heritage such as music, opera, and ethnic folk customs, and achieved important results. Domestic scholars have also applied the currently popular digital technology to the research of Chinese cultural resources, conducted many explorations and proposed innovative technologies and algorithms. For example, Lu Yao et al. (2005) proposed a virtual tourism system system, focusing on the analysis of key technologies such as human–computer interface and network virtual reality.

Although some research focuses on the combination of Qinqiang Opera Opera masks and modern art, overall, research in this field is still in the preliminary exploration stage. Some studies have tried to integrate elements of Qinqiang Opera Opera masks into modern visual art, design and popular culture to explore the possibility of cross-cultural communication. However, these studies mostly focus on the fusion of superficial art forms, without in-depth exploration of the cultural significance behind this fusion and its impact on the inheritance of Qinqiang Opera Opera masks culture.

Research Methodology

This study combines the methods of online user experience research, user research and design research to systematically carry out the digital design and application research of Qinqiang Opera masks. The specific methods are as follows:

1. Online user experience research:

Expert audience information collection: Collect feedback information from Qinqiang Opera masks experts, artists and drama enthusiasts through online questionnaires and interviews to analyze their understanding and use needs of Opera masks. This process helps determine the main direction of Opera masks digital design, ensures that the digitalization solution can meet the professional needs of expert audiences, and improve user experience satisfaction.

Data analysis: The collected user feedback data is processed through statistical analysis and qualitative analysis methods, focusing on analyzing users' preferences for different Opera masks colors and patterns, as well as their expectations for digital design and display effects. These data provide a specific basis for subsequent design and development, making digital design more in line with users' actual needs.

2. User research and design research:

Problem identification and design solutions: Combining expert feedback and challenges in the current inheritance of Qinqiang Opera masks, key issues such as inadequate color reproduction and texture loss were identified. Solutions, like improving image recognition algorithms and enhancing detail accuracy, were proposed to make digital representations more realistic.

Target population sampling: Surveys were conducted among various target groups, including experts, scholars, actors, and fans, to gather multi–perspective feedback. Different groups provided insights on the accuracy of digitized masks, aesthetics, and ease of use, ensuring the design process was well–rounded.

3. Expert criticism and test audience feedback:

Expert analysis: Qinqiang experts reviewed and critiqued the digitized masks, offering professional suggestions for improvement, ensuring the cultural accuracy and scientific integrity of the designs.

Test audience feedback: During the final design stage, a test group provided feedback on the digital masks' ease of use and cultural interpretation, allowing adjustments to the system interface and functionality to enhance user experience and engagement with Opera mask culture.

Research Results

1. Digital Extraction, Encoding, and Redesign of Qinqiang Opera Masks

1.1 Extraction of Opera masks content based on color and texture features

The digital design of Qinqiang Opera masks includes the digital collection of existing Opera masks, mainly extracting color and texture features. Qinqiang Opera masks is the most colorful type in opera, highlighting complex characters through exaggeration. The main color of the Opera masks usually symbolizes the character's quality, personality and temperament. For example, red represents loyalty and integrity; black represents bravery and straightforwardness; white symbolizes treachery and insidiousness. The Opera masks patterns are also very rich, often using patterns such as bats, swallow wings and butterfly wings, combined with exaggerated nose and mouth pits to depict mask expressions. The cheerful and optimistic Opera masks has relaxed eyebrows and eyes, while the sad or violent ones have frowned eyebrows and eyes. The patterns of each part vary, but there are certain rules.

Qinqiang Opera masks pays attention to the sense of form and maintains standardization in the changes, which is specifically manifested in the diversification of spectra. The same Opera masks may belong to different spectra. The spectra are mainly divided into two categories: basic spectra, which are distinguished by composition and color characteristics and are applicable to multiple roles; role spectra, which are divided according to the degree of identity of the role, and the two exist alternately.

We digitally encode the Opera masks so that it can be stored and processed in the computer. Through spectrum division, key pattern division and color arrangement, a basic digital format is formed, including whole face and three-tile face spectrum. The patterns are classified according to the eyebrows, eyes, nose, mouth and forehead. The colors are divided into primary color, secondary color, boundary color and lining color. The techniques include rubbing the face, wiping the face and hooking the face.

Digital acquisition mainly uses image recognition technology to achieve digital storage by extracting the color blocks and texture patterns of key positions of the Opera masks. Each color block has its color semantics. Based on the historical and cultural background, the artist creates the pattern of the corresponding role. The digital arrangement and storage of the patterns of existing Opera masks will provide a reliable reference for subsequent artists and help the inheritance of Opera masks culture. For example, Jing Ke's Opera masks adopts the three-tile Opera masks style, with a dagger pattern (representing the identity of an assassin), red accounts for 65% (symbolizing bravery and justice), white accounts for 35% (symbolizing cunning and scheming), black accounts for 25% (symbolizing uprightness and decisiveness), and yellow accounts for 8% (symbolizing bravery and brutality).

1.2 Construction of semantic word packages based on Opera masks

Based on the standardized digital format of Opera masks, we constructed a semantic word package for Opera masks to realize the digital processing of Opera masks. There are two ways to build a word package library: one is manual entry to establish a basic digital format; the other is intelligent entry based on the basic prototype through machine learning.

We established a computer database based on the digital format of Opera masks, and enriched and improved the database through manual entry and machine learning. At the same time, we constructed corresponding semantic descriptions and Opera masks comparisons to visualize the differences in Opera masks. For example, Zhao Gao and Cao Cao's Opera masks are both white whole faces, Zhao Gao's eyebrows are treacherous eyebrows, and Cao Cao's are condensed eyebrows. The two tend to be similar in historical evaluation, but there are differences due to different eras and identities.

1.3 Redesign of Opera masks based on semantic word packages

By processing Opera masks patterns, we store Opera masks data in the computer and index and match it with the constructed Opera masks word package database to form a Opera masks redesign platform. Users can create character Opera masks with corresponding personalities based on existing Opera masks data.

The basic process includes: first describing the main personality, secondary personality, secondary personality, identity and class attributes of the Opera masks character; then extracting keywords based on historical materials, refining and describing the character's personality. The computer generates Opera masks that meets the indicators based on user data and completes the preliminary

screening; the user then manually screens based on the aesthetics. The system records the user's selection process and generates corresponding screening indicators based on the data. After a certain number of samples are collected, they are used as a reference for the system to generate Opera masks later.

2. Digital application of Qinqiang Opera masks

2.1 Opera masks display system based on somatosensory

Motion capture technology can accurately record the movement of the human body in three-dimensional space, including whole-body movements, hand movements and mask expressions. The Opera masks display application based on somatosensory captures the user's gestures through the somatosensory device, and the computer camera identifies the mask feature points to achieve the drawing and personalized display of the Opera masks. This application can be used for the digital display of physical museums and the inheritance and popularization of Opera masks culture.

2.2 Opera masks display based on mask projection

mask projection display uses Omote virtual mask technology to combine real-time tracking with projection mapping technology. First, we use 3D laser scanning to create an accurate mask model, then add patterns or animations to the model, and install motion trackers at key points on the face to achieve real-time tracking projection. Through virtual mask technology, we draw digital Opera masks on the user's face in real time and display the personalized Opera masks created by the user. Different from traditional display methods, this display allows users to not only see the final effect, but also experience the painting process, which increases their interest in Opera masks culture.

2.3 Digital mask display

First, through an in-depth analysis of Qinqiang Opera mask makeup, this study focused on the core elements of mask, such as color, type, expression and composition. As an important part of Chinese opera culture, Qinqiang Opera masks makeup is not only a medium of artistic expression, but also a heritage of cultural symbols (Figure 1). Different colors represent different personalities and destinies of the characters, while the rich types and compositions of mask show the diversity of Qinqiang characters. By interpreting these elements, this study has laid a solid foundation for the digital design of Qinqiang Opera masks makeup.

Figure 1 Qinqiang Opera Masks (Source: Chen, 2018)

Next, the study used Cinema 4D (C4D) software to transform the flat image of the Qinqiang Opera masks into a three-dimensional model. In this process, C4D provides powerful modeling tools that can accurately present the complex patterns and delicate details of the mask (Figure 2). Although the initial white modeling stage is not rendered, it provides a good foundation for subsequent texture and light and shadow processing. The unrendered white model retains the basic structure of the mask, making it more extensible when entering the rendering stage (Figure 3).

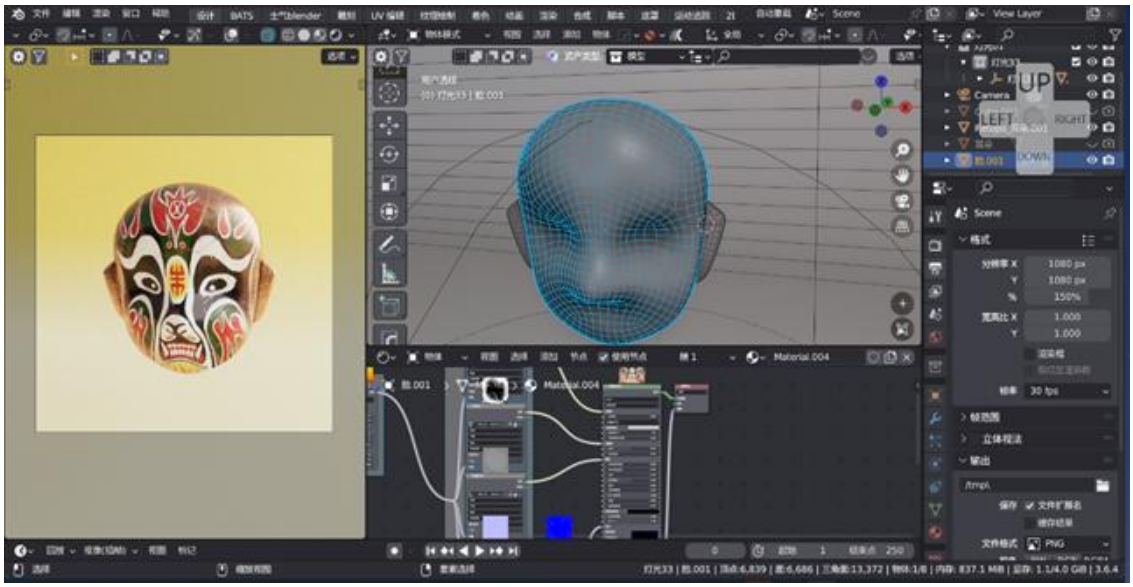

Figure 2 Qinqiang Opera Masks 3D model design process

(Source: Constructed by the researcher, 2024)

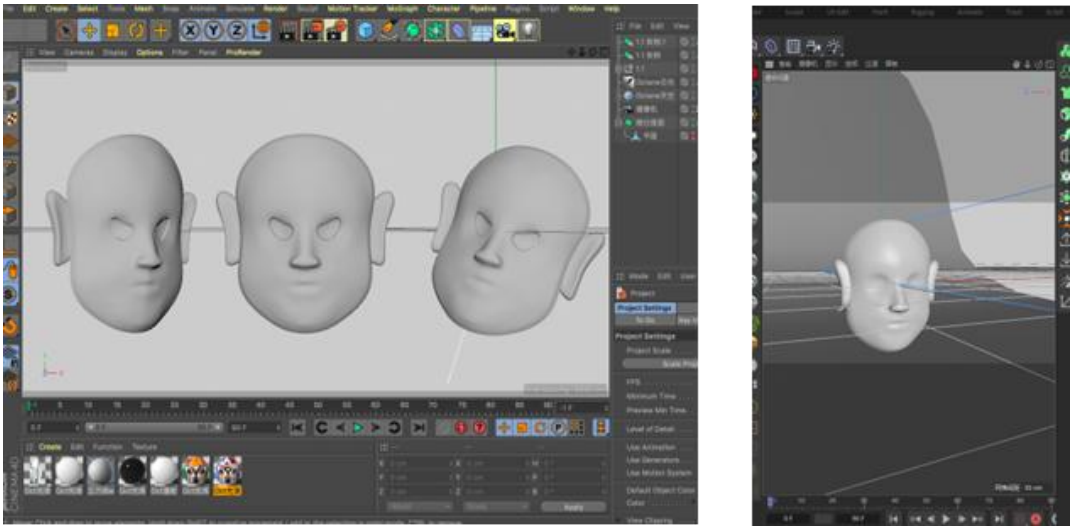

Figure 3 Qinqiang Opera Masks Unfiltered white mold (Source: Constructed by the researcher, 2024)

Subsequently, the 3D model was rendered using the Octane Render (OC) engine, making the digital image of the Qinqiang Opera masks more vivid and lifelike. As an industry-leading rendering tool, the OC engine can simulate realistic light and shadow effects, making the texture and color levels of the mask more delicate. The final fully rendered 3D image not only highly restores the traditional beauty of the Qinqiang Opera masks, but also gives it a visual impact in the digital age (Figure 4).

Figure 4 Qinqiang Opera Masks 3D model stereoscopic rendering

(Source: Constructed by the researcher, 2024)

On this basis, the research introduced Touch Designer technology to further transform the 3D model of Qinqiang Opera masks makeup into a real-time interactive artwork composed of 30,000 particles. Through creative programming, these particles are organized into a point cloud array, and the interaction with the audience forms a dynamic visual experience. Touch Designer is not only a technical tool, but also a new carrier of artistic expression. With the assistance of this technology, Qinqiang Opera

masks makeup is not only digitized, but also becomes a core element in digital interactive art. The dynamic changes of point cloud particles add a new expressiveness to the mask makeup, making it look brand new. In the next step, the research plans to add sound effects to further enhance the visual experience, so that the audience can feel the dual impact of hearing and vision at the same time during the interaction process, deepening their sense of immersion (Figure 5).

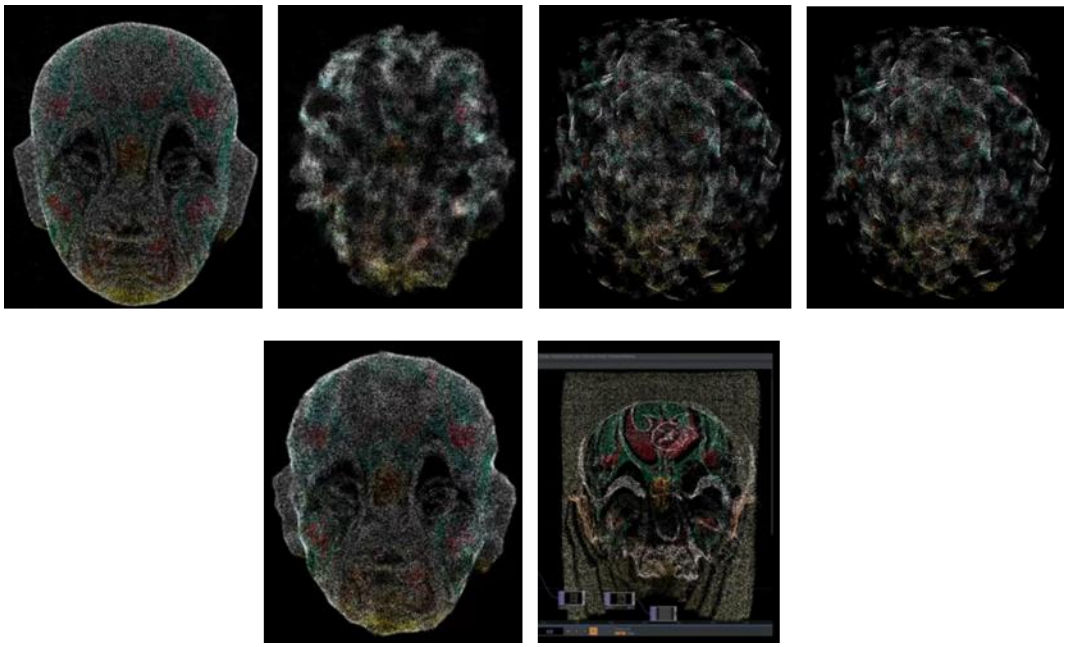

Figure 5 Qinqiang Opera Masks particles present dynamic effects

(Source: Constructed by the researcher, 2024)

This interactive digital art installation successfully revived the cultural essence of Qinqiang Opera masks makeup, ingeniously integrating traditional art with modern technology. Through the combination of particle images, animation and interactivity, the research constructed a virtual digital space, which gave Qinqiang Opera masks makeup a new form of expression in the digital age. Compared with traditional static mask makeup, the introduction of Touch Designer has given it a more diverse and rich form of expression, opening up new possibilities for artistic creation. This cross-border cooperation between technology and art not only enhances the audience's viewing experience, but also promotes the cultural revival of Qinqiang Opera masks makeup. In this immersive experience, the audience can personally experience the integration of technology and culture and art, and witness the rebirth and inheritance of Qinqiang Opera masks makeup in the digital age.

2.3.1 Specific measures for the digitization of intangible cultural heritage

In the process of promoting the digitization of intangible cultural heritage, the adoption of specific measures can effectively improve the efficiency and effectiveness of the protection and dissemination of intangible cultural heritage. Media innovation is an important means of digitizing intangible cultural heritage. Through advanced digital technologies such as virtual reality (VR) and augmented reality (AR), the intangible cultural heritage Qinqiang Opera masks can be extended from traditional theater performances to virtual space. For example, audiences can watch Qinqiang Opera masks performances through VR devices, experience the perspective of actors, and even participate in opera performances. This immersive experience can break the spatial limitations of traditional opera, transform the audience from passive spectators to active participants, and enhance the effect of cultural communication. At the same time, AR applications can also be designed to combine Qinqiang Opera masks with real scenes, so that audiences can watch Opera masks performances anytime and anywhere through mobile phones or tablet devices. This innovative media form can break the time and space limitations of cultural communication and enhance the audience's sense of participation. In terms of the construction of the cultural supply system, digital communication needs to change from the traditional one-way communication model to a multi-directional interactive model. In the process of digitizing Qinqiang Opera masks, a multi-platform and multi-channel communication method can be used to form an online and offline integrated interactive cultural communication network. For example, Qinqiang performances can be broadcast in real time through live broadcast platforms, and interactive discussions can be carried out on social media to form real-time interactions between audiences and performers. In this way, not only can the scope of communication be expanded, but also the audience's participation can be improved, and the effect of cultural communication can be enhanced. In addition, the construction of a co-creation and sharing platform is also an important measure for the digitization of intangible cultural heritage. Through digital platforms, the public can not only be recipients of culture, but also creators of culture. For example, audiences can design their own Qinqiang Opera maskss on virtual platforms and share them with others through social media. This co-creation model can enhance the public's sense of participation in intangible cultural heritage and provide more possibilities for cultural innovation.

2.3.2 Innovative transformation of intangible cultural heritage digitalization

In the process of intangible cultural heritage digitalization, innovative transformation is crucial. It is not only a digital reproduction of traditional culture, but also a comprehensive upgrade of the form of cultural communication. Immersive experience and scene-based display are important directions for the digitization of intangible cultural heritage. Through the display method of multi-sensory integration, the three-dimensional presentation of intangible cultural heritage content can be achieved. For example, in the digital display of Qinqiang Opera masks, multiple senses such as vision, hearing, and touch can be combined to allow the audience to not only "watch the play" but "enter the play". For example, in virtual reality, the audience can participate in the Qinqiang performance from a first-person perspective and experience the actor's role transformation and emotional expression. This immersive experience not only enhances the cultural transmission effect, but also allows the audience to more deeply understand and feel the unique charm of intangible cultural heritage in the interaction. At the same time, the integration of intangible cultural heritage culture and industry is also an important direction of innovative transformation. In the era of digital economy, cultural resources need to be combined with modern industries in order to gain wider recognition and development in the market. Taking Qinqiang Opera masks as an example, the digitized Qinqiang Opera masks can be combined with the cultural tourism industry to develop into cultural and creative products with regional characteristics, such as digital artworks, virtual souvenirs, etc. These products can not only be used as tourism

Discussion

Compared with other studies on the digitization of intangible cultural heritage, the innovation of this study lies in the in-depth discussion of the specific cultural symbol of Qinqiang Opera masks, and the systematic study of its digitization process from multiple angles such as cultural protection, dissemination, and industrial integration, solving several core problems of intangible cultural heritage in the digitization process.

1. Intangible cultural heritage life cycle management from storage to consumption: Traditional research focuses more on the digital preservation or display of intangible cultural heritage, while this study extends the focus to the life cycle management of intangible cultural heritage as a cultural product.

This study not only focuses on the digital storage and reproduction of Qinqiang Opera masks, but also emphasizes how to transform it into a consumable cultural product through digital technology, realize the marketization of cultural resources, and enhance the social and economic benefits of culture.

2. Transformation of communication from transmitter to audience: Compared with other studies that mostly stay on the cultural communication model centered on the transmitter, this study breaks through the traditional one-way communication thinking and proposes a communication transformation strategy oriented by audience needs. This idea emphasizes that through interaction and co-creation, the audience can become participants and creators of cultural communication, and enhance the penetration and sense of participation of culture.

3. Media innovation and scenario display: This study pays special attention to the application of media innovation in the process of digitalization, and proposes to build an immersive and scenario-based cultural experience through technologies such as virtual reality (VR) and augmented reality (AR), so as to enhance the interactivity and experience of intangible cultural heritage display. This new digital display method breaks through the time and space limitations of traditional cultural display, so that intangible cultural heritage is no longer limited to offline stages or museums, but can be spread through multiple online platforms to expand cultural influence.

4. Innovative path for the integration of intangible cultural heritage and industry: This study proposes a development path for the integration of intangible cultural heritage and industry, emphasizing that the digital Qinqiang Opera masks is not only a cultural symbol, but can also be developed into a cultural and creative product with economic value through the combination of digital economy and cultural tourism industry. This integration of culture and economy not only promotes the dissemination of intangible cultural heritage, but also opens up a new development model for the intangible cultural heritage industry, achieving a win-win situation for cultural protection and economic development.

5. Cultural ecological construction of co-creation and sharing: Compared with other studies that focus more on the one-way process of cultural inheritance and protection, this study further emphasizes the ecological construction of cultural co-creation and sharing, and proposes the concept of providing a co-creation platform for the public. Through digital platforms, the public is not only the recipient of culture, but can also become the producer and disseminator of cultural content by participating in co-creation. This innovation provides new impetus for the sustainable development of intangible cultural heritage and enhances the interactivity and social participation of culture.

Overall, this study solves the conflict between cultural inheritance and modern consumer demand in the process of intangible cultural heritage digitization through a multi-dimensional comprehensive discussion of cultural protection, technological innovation, and industrial integration, and proposes a cultural, economic, and participatory intangible cultural heritage digital development path. These novel research perspectives provide important theoretical support and practical guidance for the future development of intangible cultural heritage digital communication.

Conclusion

This study achieved the following results through an in-depth analysis of the digital protection and dissemination of Qinqiang Opera Opera masks intangible cultural heritage. First of all, it is confirmed that the full life cycle management strategy of intangible cultural heritage digitization from storage to consumption can effectively improve the sustainability of intangible cultural heritage culture. Secondly, this study proposes a new model of communication transformation based on audience needs, breaking the traditional cultural communication model through media innovation and scene-based display. Finally, this study transforms cultural resources into cultural assets, innovatively proposes a path for the integrated development of intangible cultural heritage and industry, and provides a theoretical basis for the marketization of intangible cultural heritage. At the application level, this study successfully explored how to realize the commercial transformation of intangible cultural heritage through digital technology by building an interactive digital platform and developing cultural and creative products. Especially in the process of digital protection and display of Qinqiang Opera masks, an immersive experience built through technologies such as virtual reality has significantly improved the effect of cultural communication and promoted the development of the cultural tourism industry.

Suggestions

1. Theoretical Suggestions

Strengthen the depth of research: Although this study has achieved important results in the digital protection of Qinqiang Opera masks, the depth and breadth of related research still need to be further strengthened. It is recommended that future researchers further expand the research on the

protection of intangible cultural heritage under different cultural backgrounds, especially to conduct a more systematic discussion on the diversity and differences of culture.

Improve research methods: This study mainly adopted the methods of literature analysis and case study. It is recommended that future research can combine more quantitative analysis and empirical research to further verify the actual effect of the digital protection of Qinqiang Opera masks. The integration of multiple methods can provide a more comprehensive theoretical support for the protection of intangible cultural heritage.

Policy guidance suggestions: From a policy perspective, the digitization of intangible cultural heritage requires strategic support and investment at the government level. It is recommended to formulate relevant policies to encourage enterprises and scientific research institutions to participate in the digital protection and innovation of intangible cultural heritage and form a multi-party collaborative intangible cultural heritage digital ecological system. At the same time, policies should focus on the construction of long-term mechanisms to ensure that the digitization of intangible cultural heritage is not only a short-term project, but a sustainable cultural project.

2. Policy suggestions

Establish a cultural digitization policy framework: The government should formulate clear cultural digitization development policies to promote the digitization of traditional culture such as Qinqiang. By setting up special funds and cultural projects, we support the systematic project of digitalizing cultural resources, and provide policy benefits and technical support for cultural enterprises.

Improve digital cultural infrastructure: It is recommended that the government strengthen the construction of digital cultural infrastructure in the northwest region, improve the digitalization capacity of local cultural communication, narrow the urban-rural digital divide, and ensure that cultural resources can be shared and inherited in a wider area.

Promote the integration of culture and technology: It is recommended that government policies focus on promoting the deep integration of culture and technology, encourage cultural innovation and entrepreneurship, especially the application of emerging technologies such as virtual reality and artificial intelligence in the cultural field, and build an immersive and interactive digital cultural experience platform.

3. Application suggestions

Integration of interdisciplinary research: Future research can further explore the interdisciplinary integration between digital technology and cultural heritage protection. For example, combining psychology, education and other disciplines, study the impact of digital Qinqiang Opera masks on public cultural identity, and the actual application effect in education and cultural communication.

Comparative study from an international perspective: In the future, the digitization of Qinqiang's intangible cultural heritage can be compared with the protection of intangible cultural heritage in other countries and regions, learn from international experience, explore the globalization model and localization development path of cultural digital protection, so as to promote the international dissemination of China's intangible cultural heritage.

Innovative development of intangible cultural heritage IP products: In the future, we can further explore how to develop intangible cultural heritage IP products with market potential through digital technology, such as Qinqiang Opera masks cultural and creative products, virtual reality experience projects, etc. By combining intangible cultural heritage with modern consumer culture, we can promote the marketization of cultural resources and promote the two-way development of culture and economy.

Building an intangible cultural heritage digital education platform: It is recommended to build an intangible cultural heritage digital education platform for different age groups in the future, introduce traditional culture such as Qinqiang into school and community education, and enhance the public's awareness and participation in intangible cultural heritage. In this process, we can combine online and offline interactive education methods to promote the popularization and inheritance of intangible cultural heritage.

Combination of intangible cultural heritage digitization and cultural tourism: In the future, we can further explore the in-depth combination of intangible cultural heritage digitization and cultural tourism industry, and attract more tourists to understand and participate in the digital experience of Qinqiang intangible cultural heritage through the design of cultural tourism products and experiential cultural projects, so as to promote the development of local cultural economy.

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