

# Leveraging the Metaverse to Empower the Living Inheritance and Innovative Dissemination of Taishan Shadow Puppetry

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ARTICLE INFO	ABSTRACT
Received: 20 Dec 2024	This paper explores how the metaverse can empower the living inheritance and innovative dissemination of Taishan shadow puppetry. It analyzes the current status and challenges of Taishan shadow puppetry, elaborates on the potential of the metaverse in this regard, proposes application strategies, and discusses challenges and solutions. The aim is to provide a theoretical foundation and practical guidance for promoting the sustainable development of Taishan shadow puppetry.
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## 1. INTRODUCTION

### 1.1 Taishan Shadow Puppetry

Taishan shadow puppetry relies on continuous inheritance to survive for more than 100 years and become Tai'an City, Taishan Shadow Puppetry Province Representative folk art

Taishan shadow puppetry originated in the late Qing Dynasty, initiated by the Zhai family in Tai'an, inspired by local opera traditions and Taishan mythology. Initially, it was merely a form of entertainment within the family. However, as the craftsmanship and performance techniques matured, it gradually spread to the public and became a means of livelihood. In its early days, performances were often held at Dongyue temple fairs, religious ceremonies, and village gatherings, closely intertwined with local religious and folk beliefs—this connection forms its artistic roots.

The development of Taishan shadow puppetry has been full of ups and downs. From the late Qing Dynasty to the Republic of China era, it entered a period of prosperity, with its performance areas expanding to regions surrounding Mount Tai. During this time, it integrated elements from various folk operas, forming unique vocal styles such as Lao Diao and Gu Diao. The craftsmanship of shadow puppet making also improved significantly. The fourth-generation inheritor, Lu Taichang, was a prominent figure in this era, widely acclaimed for his performances, greatly contributing to the dissemination of this art form. However, during the Cultural Revolution, Taishan shadow puppetry was classified as a product of “feudalism, capitalism, and revisionism” and suffered severe suppression. Performances were restricted, and its inheritance was disrupted.

It was not until the 21st century, with the Chinese government's increased emphasis on traditional culture, that Taishan shadow puppetry saw a revival. In 2006, it was listed as a National Intangible Cultural Heritage, ushering in a new era of revitalization and innovation. Contemporary inheritors

actively integrate modern elements into the art and utilize the internet and new media platforms to expand its influence, breathing new life into this traditional art form in modern society.

Taishan shadow puppetry is mainly distributed in Tai'an City and its surrounding areas in Shandong Province, including Feicheng, Dongping, Ningyang, and Xintai. Tai'an, as its birthplace, provides a rich cultural foundation for its development. The unique local culture and folk customs of these areas blend with Taishan shadow puppetry, mutually reinforcing and contributing to the art form's preservation and evolution.

Over time, Taishan shadow puppetry has been passed down for at least eight generations, primarily through family inheritance and master-apprentice transmission. Family inheritance was more common in the early days, such as within the Zhai family, while the master-apprentice model expanded its reach, allowing more people to learn and carry forward this artistic tradition.

The performance style of Taishan shadow puppetry is highly distinctive. It is best represented by the "Ten Skills in One" technique, where a single performer must simultaneously manipulate the puppets, narrate, and play musical accompaniment—demonstrating a high level of artistry and versatility. During performances, actors stand behind a white screen and use lighting to cast the shadow of the puppets onto the screen, accompanied by music and vocal narration to tell the story. The movements are intricate and lively, and the characters are vividly portrayed, providing the audience with a unique audiovisual experience.

The music of Taishan shadow puppetry is equally remarkable, incorporating elements of local opera, folk storytelling music, and Taoist music. Its main singing styles include Lao Diao, Gu Diao, and Qin Diao, which are selected based on different characters and plotlines. The rhythm is lively, the melodies are elegant, and the lyrics are often performed in the Tai'an dialect, enhancing the regional characteristics and realism of the performance, making it easier for audiences to connect with the stories.

### 1.2 The Metaverse Wave

As a significant trend in the digital era, the Metaverse is gradually transforming the way people interact socially, entertain themselves, engage in economic activities, and exchange cultures. The term "Metaverse" was first introduced by Neal Stephenson in his 1992 science fiction novel *Snow Crash*, describing a computer-generated virtual world where individuals could interact through digital avatars (Stephenson, 1992). Today, with technological advancements, the Metaverse has evolved from a conceptual idea into reality, driven by core technologies such as Virtual Reality (VR), Augmented Reality (AR), Artificial Intelligence (AI), Blockchain, and 5G high-speed network infrastructure (Mystakidis, 2022).

In recent years, many technology companies have actively invested in the Metaverse, accelerating its development. For example, Meta (formerly Facebook) launched the VR social platform Horizon Worlds, while Microsoft has been developing the "Industrial Metaverse" by utilizing digital twins to optimize manufacturing processes (Dwivedi et al., 2022). The Metaverse has also found extensive applications in cultural heritage preservation, with museums and cultural institutions increasingly leveraging VR and AR technologies to recreate historical scenes, safeguard traditional craftsmanship, and offer immersive cultural experiences (Choi & Kim, 2017).

The rapid growth of the Metaverse presents new opportunities for the preservation and dissemination of intangible cultural heritage. Through virtual environments, traditional skills can be digitally archived, artistic performances can be reconstructed and shared with global audiences, and interactive

experiences can be designed to enhance cultural identity and engagement (Guttentag, 2010). In this context, exploring how the Metaverse can empower the inheritance and innovative dissemination of Taishan shadow puppetry aligns with technological advancements and offers new pathways for the sustainable development of traditional culture.

## **2. CURRENT STATUS AND CHALLENGES OF TAISHAN SHADOW PUPPETRY**

Taishan shadow puppetry has strong vitality and wide influence, and is deeply loved by the masses. However, due to a series of factors such as social changes, it has declined. The inheritors of Shadow Puppetry are getting older, but few young people have learned and perfected this skill, leading to a loss of the audience. In the information age, Shadow Puppetry is no longer people's only entertainment choice. With the popularity of pop culture and art, traditional shadow plays are gradually fading from the public view.

There are three main reasons for this decline. First, the changing social background plays a role. In modern times, with the fast - paced lifestyle, popular culture is in vogue, and traditional Shadow Puppetry is slowly being neglected. Second, the form and content of Taishan shadow puppetry itself have problems. Although the performances are excellent, most plays are out of touch with reality, having a certain distance from contemporary audiences. Some plays have nothing to do with ordinary people's real lives, making the performance effect less impactful. Third, regarding art appreciation, the common people's aesthetics have changed. The rapid pace of life makes people prefer fast - paced performances. Fewer people take the time to appreciate ancient art sincerely. Even the number of people who can speak Taishan dialect is decreasing. Most young people are influenced by love songs and modern dances, and Taishan shadow puppetry lacks appeal to them, so its artistic charm cannot be fully displayed.

However, Taishan shadow puppetry faces numerous challenges in its inheritance and dissemination, Nevertheless, the rise of the metaverse offers new solutions to address these issues.

## **3.THE METAVERSE: A NEW HOPE FOR TAISHAN SHADOW PUPPETRY**

### **3.1Virtual Restoration and Preservation**

One of the most effective ways to achieve this is by harnessing the power of 3D modeling and virtual reality technology. This technology offers a remarkable opportunity to recreate the historical scenes of Taishan shadow puppetry performances, such as ancient theaters and folk festivals, which were once vibrant hubs of cultural activity. By recreating these environments in virtual space, audiences can be transported back in time, immersing themselves in the rich atmosphere of traditional performances. This not only provides a unique and engaging experience but also serves as a powerful educational tool, allowing people to gain a deeper understanding of the art form's historical and cultural significance. Simultaneously, digital preservation of puppet - making techniques and performance scripts is of utmost importance. Puppet - making in Taishan shadow puppetry is a meticulous and intricate process, passed down through generations. However, traditional methods of preservation are vulnerable to the ravages of time, such as physical deterioration and loss. Through digital means, these techniques and scripts can be preserved in a more secure and accessible manner. High - resolution images, 3D models, and digital recordings can capture every detail of the puppet - making process, from the selection of materials to the carving and painting techniques. Performance scripts, which are the heart of the shadow puppetry stories, can also be digitized, ensuring that they are not lost or forgotten. This combination of recreating historical scenes and digital preservation serves multiple purposes. It not only safeguards the cultural heritage of Taishan shadow puppetry but also makes it more accessible to a wider audience. For the younger generation, who are more accustomed to digital media, these virtual

experiences can pique their interest in traditional art forms. They can explore the historical context and technical details of Taishan shadow puppetry at their own pace, breaking down the barriers between generations and cultures. Moreover, this digital approach can also provide a platform for innovation. Artists and scholars can build on the digitized resources, experimenting with new ways to present and interpret Taishan shadow puppetry. For example, they can use the 3D models to create new virtual performances that blend modern elements with traditional ones, or they can analyze the digitized scripts to gain new insights into the art form's development over time. In conclusion, the utilization of 3D modeling and virtual reality technology, along with digital preservation, is a crucial step in ensuring the long-term survival and prosperity of Taishan shadow puppetry in the modern era.

### 3.2 Enhancing Audience Engagement

To enhance audience engagement and participation, the metaverse can offer innovative interactive experiences for Taishan shadow puppetry. By enabling users to manipulate virtual puppets, take part in virtual performances, and even customize their own storylines, the metaverse transforms passive viewing into an immersive and participatory experience. Furthermore, establishing dedicated social communities within the metaverse allows shadow puppetry enthusiasts to interact, share insights, and co-create content. This not only fosters a deeper emotional connection with the art form but also cultivates a sense of belonging, encouraging more people to actively engage in its preservation and innovation.

### 3.3 Global Dissemination

Taishan shadow puppetry has the potential to captivate audiences worldwide. However, reaching a global audience has been challenging due to physical distances and cultural differences. The metaverse provides a solution by creating a virtual space where people from all over the world can gather and experience Taishan shadow puppetry. Through virtual reality (VR) and augmented reality (AR) technologies integrated into the metaverse, individuals can immerse themselves in the world of Taishan shadow puppetry, regardless of their physical location. They can watch live performances, learn about intricate puppet-making techniques, and even interact with artists in real time. This direct engagement breaks down geographical barriers and allows the art form to resonate with diverse audiences.

Moreover, adapting Taishan shadow puppetry to different cultural backgrounds within the metaverse is crucial for its global dissemination. Every culture has its own unique values, beliefs, and aesthetic preferences. By incorporating elements that resonate with various cultural audiences into metaverse-based presentations of Taishan shadow puppetry, the art can become more accessible and relatable. For instance, when targeting Western audiences, well-known Western stories or themes could be woven into shadow puppetry performances while still preserving the essence of Taishan shadow puppetry. This adaptation not only facilitates cross-cultural exchange but also deepens intercultural understanding. It enables people from different backgrounds to appreciate the beauty of Taishan shadow puppetry through the lens of their own cultural experiences, fostering mutual respect and appreciation for cultural diversity.

In conclusion, the metaverse offers unprecedented opportunities for the global dissemination of Taishan shadow puppetry. By leveraging its borderless nature and adapting the art form to different cultural contexts, we can ensure that Taishan shadow puppetry reaches a global audience, promoting cross-cultural exchange and understanding on a grand scale. This approach not only contributes to the preservation and development of Taishan shadow puppetry but also enriches the global cultural landscape by fostering appreciation for this unique traditional art form.

#### **4. CHALLENGES AND SOLUTIONS IN METAVERSE APPLICATIONS**

**Challenges and Solutions in Metaverse Applications** The metaverse has emerged as a revolutionary concept with the potential to transform various industries, including the preservation and dissemination of cultural heritage such as Taishan shadow puppetry. However, like any new technology, its application in this context is fraught with challenges that must be addressed to ensure its successful integration. One of the primary technical challenges is the high cost of implementation

##### **4.1 High Cost**

Developing metaverse-based experiences for Taishan shadow puppetry requires significant investment in advanced technologies such as 3D modeling, virtual reality (VR), and augmented reality (AR). These technologies demand powerful hardware and software, as well as skilled professionals to create and maintain virtual environments. Additionally, large-scale data storage and processing required for immersive experiences pose a significant burden. According to the China Metaverse White Paper, high-end graphics processing units (GPUs) needed for realistic 3D rendering are expensive, and the development of VR and AR applications often involves complex programming and design work.

To overcome this challenge, the government and relevant cultural institutions could provide financial support through subsidies or grants. For instance, they could invest in research and development projects focused on optimizing metaverse technologies for cultural heritage applications, ultimately reducing costs in the long run.

Another technical hurdle is ensuring the stability and seamless integration of various technologies within metaverse platforms. Creating a realistic and immersive experience is a complex task, and issues such as latency can disrupt user engagement, especially during real-time interactions in virtual puppet shows. The China Metaverse White Paper emphasizes the need for reliable network infrastructure and advanced software algorithms to address these issues. To mitigate this, technology companies could collaborate with telecommunication providers to improve network speeds and reduce latency. Additionally, they could develop more efficient software architectures capable of handling complex interactions in the metaverse environment.

From a cultural perspective, maintaining the authenticity of Taishan shadow puppetry in the metaverse is a major concern. While adapting the art form for global audiences is important, there is a risk of diluting its unique cultural essence. The metaverse might tempt developers to oversimplify or distort traditional elements for mass appeal. To prevent this, cultural experts and shadow puppetry inheritors should be actively involved in the development process, ensuring that metaverse experiences accurately represent the art form, from puppet-making techniques to storytelling traditions.

Socially, ensuring public acceptance of the metaverse as a platform for cultural experiences is another challenge. As a relatively new concept, some people may be skeptical or resistant to its adoption. To increase acceptance, education and public awareness campaigns are essential. The China Metaverse White Paper suggests that promoting the benefits of metaverse-based cultural experiences—such as increased accessibility and immersive learning—can help shift public perception. For example, schools and community centers could organize workshops or demonstrations to introduce people to the metaverse and its potential for cultural heritage preservation.

In conclusion, while the metaverse offers great potential for Taishan shadow puppetry, addressing these challenges is crucial. By implementing proactive measures such as financial support, technological innovation, cultural preservation, and public education, the metaverse can become a powerful tool for the global dissemination and preservation of Taishan shadow puppetry.

## 5. CONCLUSION

The metaverse, with its unique sense of immersion, interactivity, and virtuality, breaks the limitations of time and space. On one hand, by creating virtual scenes, the audience can virtually be placed in the performance setting of Taishan shadow puppetry, experiencing firsthand the exquisite skills of the puppeteers and the captivating storyline. This greatly enhances the sense of experience and participation for the audience, making this traditional art form more appealing to younger generations. On the other hand, the digital storage and dissemination features of the metaverse effectively solve the challenges faced by Taishan shadow puppetry in terms of preserving materials and expanding its reach. With digital twin technology, the puppet-making techniques and performance processes can be fully recorded, providing valuable materials for future generations to inherit.

The future of the integration between the metaverse and Taishan shadow puppetry is promising. With ongoing technological advancements, the integration of the two will become more in-depth and diverse. In terms of content creation, more original works based on Taishan shadow puppetry in the metaverse may emerge, combining virtual reality, augmented reality, and other technologies to create more fantastical and vivid shadow puppet worlds. In the commercial application field, there may be innovative models such as metaverse virtual theme parks based on Taishan shadow puppetry, online ticket sales, and more, bringing new economic growth points to the development of shadow puppetry. Further research could focus on how to enhance the expression of cultural connotations in Taishan shadow puppetry within the metaverse, and how to build a more comprehensive user feedback mechanism to optimize the user experience.

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