

International Conference of Art And Creative Technology Malaysia
Borneo Cultures Museum Sarawak, Kuching, Sarawak, Malaysia, 23 - 24 October 2024
Organiser: Faculty of Art, Sustainability and Creative Industry, Sultan Idris Education University (UPSI), Malaysia

Preservation and Transmission the Door God Paintings (DGP) through Digital Technology in the Context of the Metaverse

Cai Yuanyuan¹, Wan Aida Wan Yahaya^{2*}

** Corresponding Author*

¹ Assistant Professor, Department of Animation, Chengdu Academy of Fine Arts, Sichuan Conservatory of Music, Sichuan, China

² Assoc. Prof. Ts. Dr., College of Creative Arts, Universiti Teknologi MARA, 40450, Shah Alam, Selangor, Malaysia

2021821586@student.uitm.edu.my, wanaida486@uitm.edu.my
Tel: +60169200912

Abstract

Traditional Chinese woodblock New Year paintings, especially DGP, hold significant cultural value but face preservation challenges. The Metaverse and digital technologies offer innovative solutions for safeguarding this art form. This paper examines the use of virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) for high-fidelity digitization, dynamic presentation, and interactive experiences. Using qualitative research and interviews, it analyzes digital technology's role in protecting intangible cultural heritage and proposes a systematic strategy to ensure the continued preservation and modern innovation of DGP.

Keywords: Digital Ar; DGP; Strategies and Methods; New Year Paintings

eISSN: 2398-4287 © 2025. The Authors. Published for AMER by e-International Publishing House, Ltd., UK. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Peer-review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers). DOI: <https://doi.org/10.21834/e-bpj.v10iSI36.7604>

1.0 Introduction

New Year paintings, also known as Door God Paintings (DGP), are folklore symbols of Chinese New Year culture with profound historical significance (Jia, 2022). Traditionally, they served to guard homes against ghosts, evil spirits and demons (Zhang, 2022). Rooted in the belief in witchcraft and spirits, door gods like Qin Qiong and Yuchigong became representative of protection and blessings, widely spread by people (Tung-Ching Su *, 2022). Therefore, DGP in the many categories of New Year's paintings, compared to folk stories, opera New Year's paintings, etc., DGP sales accounted for the largest proportion. From ancient times to the present, people's utilitarian mentality generally believes that the image of the door god not only defends the home, but also symbolizes good luck and peace (Wu, 2019).

Over time, utilitarian views prioritizing wealth and happiness replaced traditional beliefs, leading to the transition from military door gods to civil and wealth-oriented depictions. Despite these changes, DGP have retained their charm and cultural value even in contemporary forms. However, rapid societal changes and the collision of traditional and modern cultures have brought significant shifts in their forms, inheritance, and innovation. Today, DGP are not just traditional folk art but also modern cultural and creative products (Zou, 2016).

Preserving traditional craftsmanship while embracing innovation has become critical. Originality, a key characteristic of folk art (Ye & He, 2024), faces challenges in a modern context constrained by environmental and societal dynamics. Researchers must navigate this balance by leveraging digital technologies to restore the originality of inheritors and handmade artifacts. Integrating traditional techniques with new-age technologies is a crucial research focus. Protecting DGP's originality while incorporating modern aesthetics is

vital. Igor Boznikov, Secretary of the Embassy of the Russian Federation in China (Feng, 2020), described traditional woodblock prints as cultural codes that bridge Chinese traditions and modern art, requiring thoughtful exploration. In study, researchers usually act as “movers” rather than inheritors, tasked with preserving DGP’s originality while promoting sustainable development.

This study explores DGP’s originality and innovation through interviews with traditional inheritors and contemporary designers. Inheritors highlighted the cultural depth and production process of DGP, embedding historical memory and national emotions in their work, see Fig. 1 below. Contemporary designers, leveraging digital technology, created digital DGP that retain traditional charm while meeting modern aesthetic demands (Juan, 2015).

Digital technologies like virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) are critical tools for preserving and revitalizing DGP. VR creates immersive environments, AR overlays traditional elements onto real-world settings, and AI analyzes and reinterprets designs while preserving cultural essence. Internet platforms and social media further enhance dissemination through digital museums and interactive formats, ensuring broader reach and appeal (Ye & He, 2024). By combining tradition with digital innovation, DGP can sustain their relevance and cultural significance in modern society. This study underscores the importance of technology in preserving the originality of traditional New Year paintings while fostering their development for new generations.



Fig. 1: Photos of production process of traditional DGP
(Source:) Provided by the artistic inheritor

2.0 Literature Review

The Metaverse is the post-reality universe, a perpetual and persistent multiuser environment merging physical reality with digital virtuality. It is based on the convergence of technologies that enable multisensory interactions with virtual environments, digital objects and people such as virtual reality (VR) and augmented reality (AR) (Mystakidis, 2022). In the context of the meta-universe, the ancient folkloric art of DGP faces many challenges. The traditional production technique and art form of the New Year's paintings relies mainly on handmade and oral traditions, with wooden plates being carved for printing and then coloured for painting. The custom of purchasing DGP and posting them at home during the New Year festivals to pray for the safety of the family and for the success of all things has continued to this day.

However, with changes in the environment, technology and people's living customs, traditional handmade New Year's paintings have gradually become part of modern people's memories, and the necessity of oral transmission has become less and less (Han, 2013). There are fewer and fewer masters and disciples, and the number of inheritors is gradually decreasing as the old generation of inheritors is getting old, and the inheritance is facing the dilemma of having no successors. From the literature combing, the current research scholars mainly adopt the research method of oral interviews with the inheritors in terms of protection and inheritance. These inheritors, as the 'backbone of the New Year's Paintings', need to be loyal to the tradition, be familiar with the classics of the New Year's Paintings, and have a sense of reverence for the cultural roots, but there are fewer and fewer chances to conduct interviews with such groups (Feng, 2017). When the traditional way of learning from masters is no longer adapted to the needs of modern society, the inheritors seem to lose the true value and significance of their inheritance, and the New Year's Paintings lose their unique charm.

Thus, in the context of the new era of rapid development, the perspective of research scholars has shifted from the inheritors to the direction of technological empowerment, and different views on digital preservation and inheritance have been put forward (Wei, 2015). For example, Qiao Xiaoguang, a professor at the Central Academy of Fine Arts, raised the issue of cultural ecology in the Internet era, and criticised the phenomenon of 'cultural logistics' in the era of non-legacy, which caused consumer groups to lose focus on the cultural connotation of non-legacy, and focus only on the craftsmanship of the object itself (Feng, 2020). There are other scholars who believe that, from an artistic point of view, if the inheritance of folk art is mainly based on fun, interactivity and technological modernisation means, the protection of the original ecology will be reduced to empty talk. Therefore, in the process of integrating and transforming New Year's culture and folk art with science and technology, finding innovative methods and strategies to maintain originality and sustain vibrant development has become a research gap that needs to be filled urgently in exploring this field. Based on the existing problems of cultural disconnection between folk inheritors and modern technicians as well as the singularity of research methods, the following three points are proposed:

1. What strategies should be used in the digital preservation and dissemination of DGP in the context of the meta-universe?
2. How to resolve the cultural fault line between folk inheritors and modern technicians?

3. How to enrich the research methodology so as to better realize the digital preservation and dissemination of New Year paintings?

The purpose of this study is to explore a set of systematic and comprehensive digital preservation and dissemination strategies for DGP through in-depth excavation of meta-universe related technologies. Using virtual reality (VR), augmented reality (AR) and other digital technologies to create an immersive experiential environment, we present the DGP to the public in a more vivid and three-dimensional way, breaking the limitations of the traditional communication methods in terms of space and time as well as the forms of expression. With the social attributes of the meta-universe, a global community of New Year's paintings enthusiasts is constructed to promote exchanges and sharing among people from different regions and cultural backgrounds, thus broadening the scope of dissemination of the DGP. At the same time, digital storage technology is used to establish a special digital resource library of New Year paintings to ensure that their cultural elements, artistic characteristics and other information can be preserved in a complete and long-lasting manner, so as to provide a solid data foundation for subsequent research, innovation and dissemination.

Further, an effective bridge of communication and co-operation is constructed to eliminate the cultural fault line between folk inheritors and modern technicians. Through the organisation of projects and activities involving both parties, such as joint workshops and seminars, folk inheritors and modern technicians have the opportunity to have in-depth exchanges to enhance their understanding of each other's cultural and technical fields. Modern technicians are encouraged to learn in-depth the traditional skills and cultural connotations of folk inheritors, so that they can better preserve and pass on the original authenticity of the New Year paintings when they carry out digital creations and technical applications (Wei, 2015). At the same time, folk inheritors are guided to contact and understand modern digital technologies, so that they can realise the potential of these technologies in preserving and spreading the culture of New Year's Paintings, and are inspired to actively participate in the process of digital transformation, thus realising the organic fusion of traditional folk culture and modern digital technologies (Wang, 2020).

At the same time, diversified research methods are explored to provide more comprehensive and in-depth support for the digital preservation and dissemination of DGP. In addition to traditional methods such as documentary research and oral interviews, introduce interdisciplinary research perspectives, such as cultural anthropology, digital art, and communication studies, to analyse the DGP from multiple dimensions, and to excavate their deeper cultural values and artistic charms. Use big data analysis technology to collect and analyse user data in the process of digital preservation and dissemination of DGP, including users' interests and preferences, interactive behaviours, etc., so as to adjust and optimize the preservation and dissemination strategies based on these data. In addition, experimental research is conducted to try different combinations of digital technologies and presentation methods, and assess their impact on the cultural dissemination effect and audience acceptance of DGP, so as to screen out the most effective research methods and practice modes.

3.0 Methodology

This study uses some methods to explore in depth the digital preservation and dissemination strategies of door gods paintings in the context of the meta-universe.

Firstly, qualitative interviews are used (Yin, 2020). On the one hand, interviews were conducted with traditional artists and folk inheritors of different ages and identities to understand their views on the inheritance of DGP. In the opinion of these inheritors, maintaining the originality and regionality is the key element for the inheritance of folk culture. On the other hand, interviews were conducted with young people who are interested in the contemporary inheritance of traditional New Year's paintings and have mastered certain digital technology. They believe that the originality of folk art is fundamental to passing on the soul of the nation, but that the use of technology is more effective in promoting and spreading the art and attracting new forces to join in. Moreover, on the basis of retaining the original characteristics of the door god painting, the art form and material can be appropriately removed or replaced, using modern aesthetics to attract the attention of young people, and using the Internet virtual world of entertainment, utilitarianism, fun to spread and promote, which is more in line with the needs of the times.

Secondly, the adoption of practical deduction method. Combining VR (virtual reality), AR (augmented reality) and AI (artificial intelligence) technologies, the creation of the Gate God is reconstructed twice and data collection is carried out. Through technical processing and thematic analysis (Boyatzis, 1998), the cultural symbols and artistic characteristics of these technologies in the inheritance of DGP are explored in depth, and innovative practices are carried out for the integration of technology and art (Ali, 2019).

Third, the use of comprehensive technology. Virtual reality technology is used to restore the craft recipe or production process passed down from generation to generation by the inheritors, and to record the characteristics of DGP in different regions as well as the personal thoughts of the inheritors (Cai Yuanyuan, 2023). With the help of all-round digital scanning and filming technology, the original heritage data is preserved and integrated into VR (Ye & He, 2024). Moreover, each piece of work is interpreted through VR virtual reality technology, so that the audience can enter the painting and deeply understand the stories and cultural connotations, and then presented in the form of short video, animation and other forms, integrating with the modern trend culture to achieve innovative development. AR augmented reality technology opens up new ways and means for the inheritance of DGP through the conversion from real scenes to virtual characters.

4.0 Findings

Virtual reality (VR) technology provides a groundbreaking approach to preserving and reviving traditional Door God Paintings (DGP) (Dalal, 2024). By leveraging precise 3D modeling (David Koller, 2009), VR reconstructs the regional settings and folklore scenes integral

to DGP. Detailed 3D models of traditional villages and ancient workshops, derived from fieldwork data, restore architectural and street layouts with accuracy. Combined with spatial audio technology, VR immerses users in local folk sounds, such as the engraving processes during DGP production and traditional tunes sung by folk artists. This comprehensive sensory experience transports users to the original environments where DGP were created, fostering a deeper appreciation for their authenticity and cultural significance.

Augmented reality (AR) technology offers unparalleled interactivity, enriching the presentation and understanding of DGP. AR overlays traditional DGP elements onto real-world settings, creating engaging augmented experiences (Dalal, 2024). For instance, AR devices allow users to visualize vivid DGP depictions on the doors of traditional houses. Interactive features enable users to explore detailed information about regional cultural backgrounds, artistic styles, and folk stories associated with DGP. This dynamic interactivity not only enhances understanding but also strengthens the connection between regional cultural heritage and modern real-world contexts, making DGP's cultural essence more accessible.

Blockchain technology ensures the secure and authentic storage of digital data related to DGP. Its tamper-proof nature protects the integrity of oral histories, production records, and cultural research findings. By securely storing these data on a blockchain, researchers establish a reliable foundation for restoring DGP's originality and locality within the meta-universe. Blockchain technology prevents data tampering or loss, guaranteeing the preservation and accuracy of cultural heritage for future generations.

Artificial intelligence (AI) technology further advances the preservation and innovation of DGP. AI algorithms analyze patterns, colors, and lines within traditional DGP, linking them to regional cultural databases for precise identification of styles and meanings. Beyond preservation, AI supports innovation by generating new DGP works that retain traditional authenticity while aligning with modern aesthetic preferences. By incorporating regional cultural elements, AI-created DGP expand the cultural influence of these traditional artworks within the meta-universe, engaging broader audiences and ensuring their relevance in contemporary contexts.

Collectively, these advanced technologies, like VR, AR, blockchain, and AI provide innovative solutions for the preservation, enrichment, and dissemination of DGP. They enable a seamless blend of tradition and digital innovation, ensuring the enduring significance of DGP as a vital component of cultural heritage while fostering wider appreciation and interaction in the digital era.

5.0 Discussion

The question of whether the virtual world of the meta-universe can better restore the originality and locality of traditional DGP was explored. Among them, the advantages of digital art is the key aspect, digital art is based on digital technology, with the help of computers, software, digital equipment, etc. to create, store, disseminate and display works of art, which has the characteristics of reproducibility and dissemination, interactivity and dynamics, etc (Zou, 2021). For traditional artists and folk inheritors, the use of digital video filming and the use of digital equipment to create, store, disseminate and display works of art is the key aspect. For traditional artists and folk inheritors, the use of digital video filming and the recording of oral history of the original text is an important way to restore the locality and originality of the door god painting.

At the same time, the use of real-life scanning to restore the production process of traditional skills, especially the digital scanning of all stages of the traditional process under the inheritor's mnemonic, aims to build the cultural ecological environment in the virtual world, so that the virtual image of the older generation of inheritors can enter the young people's field of vision, which helps to reproduce and visualise the older generation of inheritors about the 'skills'. This helps to reproduce and visualise the dual inheritance knowledge system of 'skills' and 'memory' of the old-generation inheritors, so as to narrow the distance between the younger generation and the 'cultural strangeness', and let them truly feel the rural folklore, belief culture and the restoration of the original ecological environment in the meta-universe.

At the digital technology level, in addition to the previously mentioned means of digital image shooting and live scanning, there are other technologies that can play a helpful role in restoring the originality and locality of the traditional DGP in the virtual world of the meta-universe.

From the perspective of cultural inheritance, as an ancient folkloric folk art, DGP carry rich historical and cultural connotations and national spirit. Through this study, this precious cultural heritage can be better protected and inherited so that it can be continued in the new era. Using technologies such as virtual reality (Dalal, 2024), augmented reality and artificial intelligence, it not only preserves the originality of traditional crafts and techniques, but also adapts to the development needs of modern society and injects new vitality into the inheritance of traditional culture.

From the perspective of artistic innovation, this study provides new ideas and methods for the innovative development of New Year's Paintings. Combining modern technology with traditional folk art and incorporating modern trendy cultural elements not only attracts the attention and participation of the younger generation, but also promotes the innovative development of the art of New Year's Paintings. The innovation of form and material on the basis of retaining its original features enriches the artistic expression of the New Year's Paintings and expands the space for its artistic development.

In terms of social development, this study helps to promote the development of cultural industries. The digital preservation and dissemination of DGP can lead to the development of related cultural industries, such as digital cultural creative industry and virtual reality industry. At the same time, by combining the DGP with folktales and myths to create new cultural utilitarianism, it can better satisfy the needs of consumer groups and promote the upgrading of cultural consumption.

In addition, this study has the value of international cultural exchange. It promotes Chinese DGP to the world, demonstrates the unique charm of Chinese folk culture, promotes exchanges and integration between the cultures of different countries and regions, and enhances the international influence of Chinese culture.



Fig. 2: These photos illustrate the preservation and transmission of DGP through AR, AI and VR tool
(Source:) Provided by the author

6.0 Conclusion and Recommendations

The findings highlights how combining tradition with digital innovation can sustain the relevance and cultural significance of Door God Paintings (DGP) in contemporary society. Digital technologies such as virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) have emerged as transformative tools to preserve, reinterpret, and promote DGP effectively. VR technology allows for the recreation of immersive cultural experiences that closely resemble traditional environments, making the historical and artistic significance of DGP accessible to a wider audience. Similarly, AR enhances engagement by superimposing traditional DGP elements onto real-world settings, creating interactive experiences that bridge the gap between past and present (Dalal, 2024).

AI plays a pivotal role in analyzing intricate designs, patterns, and cultural contexts of DGP, enabling accurate preservation of their originality while supporting innovation. AI can also aid in generating new works that retain the essence of traditional artistry while incorporating modern aesthetics, making them more appealing to younger generations. Additionally, blockchain technology can ensure the integrity and authenticity of digital records associated with DGP, providing a secure framework for their preservation.

Emerging communication platforms like social media, online exhibition spaces, and virtual museums further facilitate the global dissemination of DGP. These platforms allow audiences worldwide to appreciate and interact with this unique cultural heritage, fostering international cultural exchange. Integrating DGP into popular entertainment forms, such as digital games and interactive storytelling, can also attract broader audiences and ensure the sustainability of this art form in modern contexts.

Despite the promising opportunities presented by digital innovation, challenges remain. The primary limitation of this study lies in the fact that current digital practices of DGP have not yet fundamentally transcended the expressive paradigm of two-dimensional decorative art. Whether viewed through AR scanning, generated as three-dimensional images via AI, or placed within VR environments, their essence remains a digital reproduction and mediatized presentation of traditional flat paintings, rather than a cultural creation constructed according to the three-dimensional spatial logic of the metaverse with independent entity attributes. These initial explorations aimed at "translating the flat into the three-dimensional" still face significant constraints in terms of visual immersion, spatial interactivity, and the organic integration of cultural symbols.

Future research should focus on achieving paradigmatic transformation and ontological reconstruction of Door God culture within a three-dimensional context, with the core objective of constructing native metaverse "3D Door God" digital assets and their interactive application frameworks. This requires interdisciplinary collaboration among arts, computer science, and design studies, focusing on the following pathways:

1. Three-Dimensional Translation of Artistic Language: Investigating how to systematically transform visual symbols from traditional DGP—such as form, color, and ornamentation—into design standards and modeling methods that align with three-dimensional aesthetic styles;
2. Technology Integration and Narrative Interaction: By integrating high-precision modeling, real-time rendering, and intelligent interaction technologies, creating digital entities that not only carry cultural essence but also possess dynamic responsiveness and narrative functions, enabling them to become active, participatory nodes within the metaverse.

Striking a balance between tradition and modernization requires careful collaboration between inheritors and technologists. Ensuring that digital interventions respect the cultural integrity of DGP while embracing innovation is essential. Collaborative workshops, interdisciplinary research, and education initiatives can foster mutual understanding and bridge generational gaps, ensuring that DGP remain rooted in their cultural origins while evolving to meet contemporary needs.

In conclusion, the integration of digital technology provides a pathway for the sustainable preservation and evolution of Door God Paintings. By leveraging tools like VR, AR, and AI while respecting their cultural essence, DGP can continue to thrive as a vital aspect of Chinese cultural heritage and a source of artistic inspiration for future generations.

Acknowledgement

I would like to express my heartfelt gratitude to my supervisor, Dr. Wan Aida Wan Yahaya, whose guidance and support have been invaluable throughout this research. I am also deeply thankful for the financial support provided by the Sichuan Province Philosophy

and Social Sciences Key Research Base, Digital Culture and Media Research Center of UESTC, under the 2024 General Project "Research on Digital Protection and Inheritance Strategies of DGP Based on the Metaverse Platform" (Project No. SC24DCM10), for its critical support in making this study possible.

Paper Contribution to Related Field of Study

This paper contributes to the field by introducing the systematic approach to integrating digital technologies such as VR, AR, and AI with traditional folk art. It provides a model for preserving and revitalizing intangible cultural heritage, ensuring its relevance and sustainability in the digital era.

References

- Ali, M. A. M. (2019). Chinese Traditions Folk Art Festivals and Symbolism.
- Boyatzis, R. E. (1998). Transforming qualitative information: Thematic analysis and code development., *Thousand Oaks, CA: Sage*.
- Cai Yuanyuan, W. A. W. Y. (2023). Research on the application of interaction design with aesthetic experience in folk art. *HRMARS*, 13, 1128-1146. <https://doi.org/10.6007/IJARAFMS/v13-i2/18195>
- Dalal, S. A. (2024). Virtual Reality (VR) and Augmented Reality (AR) : A Thriving Technology.
- David Koller, B. F., and Greg Humphreys. (2009). Research Challenges for Digital Archives of 3D Cultural Heritage Models.
- Feng, J. (2017). *Original Ecology Neo Generation-International Forum on Contemporary Inheritance of Traditional Nianhua*. Culture and Art Press.
- Feng, J. (2020). *Research on New Year Pictures* (Vol. 2020 winter). Culture and Art Publishing House. www.caaph.com
- Han, J. (2013). *The Art Characteristic of Hunan Tantou New Year Pictures* (Publication Number Y2326394) Hunan Normal University].
- Jia, Z. (2022). THE STUDY OF YANGLIUQING NEW YEAR PICTURE.
- Juan, H. F. (2015, Nov 07-08). Digital Inheritance of the Art of Folk New Year Pictures. *Advances in Social Science Education and Humanities Research* [Proceedings of the 2015 2nd international conference on education, language, art and intercultural communication]. 2nd International Conference on Education, Language, Art and Intercultural Communication (ICELAIC), Kaifeng, PEOPLES R CHINA.
- Mystakidis, S. (2022). Metaverse. *Encyclopedia*, 2(1), 486-497.
- Tung-Ching Su *, T.-C. W., Ming-Hung Wun and Cheng-Wei Wang. (2022). Style Recognition of Door God Paintings by Hypothesis Testing for Texture Features of Painting Patterns. <https://doi.org/https://doi.org/10.3390/app12052637>
- Wang, F. (2020). The Reappearance of Chinese Traditional Culture Elements in Contemporary Fashion Show.
- Wei, L. (2015). *Application and Research on New Year Pictures' Door-god Elements in Silk Screen Creation* (Publication Number 12012D433) Hubei University of Technology]. CNKI.
- Wu, K.-m. (2019). Woodcut Movement. In *Oxford Art Online*. <https://doi.org/10.1093/oao/9781884446054.013.90000138505>
- Ye, P., & He, J. (2024). Enhancing Digital Chinese Painting in Interior Design with Deep Learning and Virtual Reality. *Computer-Aided Design and Applications*, 163-177. <https://doi.org/10.14733/cadaps.2024.S16.163-177>
- Yin, X. (2020). Digital Media Analytics Towards an Understanding of Content Design.
- Zhang, Z. Y. a. A. (2022). Ritual and Magic" in Buddhist Visual Culture from the Bird Totem.
- Zou, S. (2021). Research on the Application of VR Animation Technology in Traditional Folk Game Demonstration.
- Zou, Y. M. (2016, May 28-29). Development and Utilization of Tongyu New Year Picture Cultural Industry. *Advances in Social Science Education and Humanities Research* [Proceedings of the 2016 international conference on economy, management and education technology]. 2nd International Conference on Economy, Management and Education Technology (ICEMET), Chongqing, PEOPLES R CHINA.