

Game Modeling Technology and the Cultural Transmediation of Chinese Tradition--Taking the Game "Black Myth: Wukong" as an Example

Haoran Jin

*DUT-RU International School of Information Science & Engineering, Dalian University of Technology, Dalian, China
juzi040920jhr@gmail.com*

Abstract. In the context of digital technology reshaping cultural communication, digital innovation of cultural intellectual property has become an important issue. This paper takes the game "Black Myth: Wukong" as the main case, around the theme of "cultural IP innovation path based on digital media", discusses how game modeling technology can be used as a translation language to achieve the extraction, reconstruction, and meaning regeneration of Chinese traditional culture. Through case analysis and text research, combined with cultural transmediation theory and digital media perspective, the study found that games transformed cultural heritage such as buildings and statues into interactive digital assets through high-precision scanning, procedural generation, environmental narrative and other technical means, significantly enhancing cultural immersion and reducing the cognitive barrier. At the same time, the game has built an open transmedia storytelling ecology, which has promoted players to change from receivers to participants and co-creators, effectively stimulated global players' interest in exploring China's deep culture, and driven the development of real cultural tourism. The research shows that game modeling technology is not only a cultural representation tool but also an important medium to promote the creative transformation and innovative development of traditional culture, providing a feasible path for the innovation and cross-cultural communication of cultural IP in the digital era.

Keywords: Digital Innovation, Cultural Intellectual Property, Game Modeling Technology, Cultural Transmediation, Transmedia Storytelling

1. Introduction

Today, digital technology has profoundly reshaped cultural production and dissemination, and the innovation and activation of cultural IP has become an important global issue. Modern game technology, with high-precision modeling and real-time rendering as its core, not only constructs an immersive experience space, but also becomes a new carrier for carrying, mediating and spreading traditional culture. It can transform abstract, static or geographically limited cultural heritage into tangible, dynamic and interactive digital assets, providing a new possibility for the "creative

transformation and innovative development" of traditional culture. Chinese traditional culture contains rich visual symbols and aesthetic systems, but its material and non-material details, such as ancient buildings, sculptures, patterns, etc., are often difficult to be widely perceived by the public due to geographical barriers and preservation conditions. 3D digital modeling, 3D scanning and other technologies can restore the shape, texture and historical traces of cultural entities with microscopic-level accuracy, enabling "digital archival" and "visual translation", thus breaking through physical limitations and promoting the contemporary regeneration of cultural values.

Black Myth: Wukong is a landmark case in this context. Based on the narration of Journey to the West, the game systematically digitally restores and immersively translates traditional cultural elements such as the Twenty-Eight Mansions sculptures of Shanxi Yuhuang Temple, the murals of the Yongle Palace, the Dazu Rock Carvings, etc. with the help of high-precision modeling and scene-building technology. Its development process integrates field scanning, literature research and digital reconstruction, so that traditional art can be "activated" in the virtual world in an interactive and perceptible form.

Taking Black Myth: Wukong as the main case, this study focuses on how game modeling technology can be used as a transmediation language to achieve the extraction, reconstruction and meaning reproduction of traditional cultural elements. Analyze its mechanism in promoting cultural immersion, lowering the cognitive barriers, and stimulating cultural interest. It also reflects on the issues of cultural fidelity, narrative integration and global communication in technical transmediation.

Through case analysis and text research, combined with cultural transmediation theory and digital media research perspective, this paper aims to show the specific path and internal logic of game technology for the contemporary transformation of traditional culture, with a view to providing theoretical and practical reference for the digital innovation and cross-cultural communication of cultural IP in the future.

2. Digital innovation and visual transmediation of cultural IP

Before entering the digital media era, traditional cultural resources mainly existed in a static and one-way transmission mode. New technologies in the digital media era provided a new method of communication for these static resources and opened up paths of innovation and communication for traditional cultural IP.

2.1. Evolution of cultural IP from static resources to dynamic transmedia storytelling

Henry Jenkins' "Transmedia storytelling" theory provides a core framework for understanding the evolution of IP. Transmedia storytelling is not a simple content translation, but refers to the same IP core that develops narrative expressions that are both interrelated and focused on each other through films, games, literature, and other media platforms, and jointly constructs a grand story world [1]. As a core medium, games have assumed the functions of laying the foundation of world outlook and in-depth experience, and further expand the narrative boundary through diversified cross-media practices.

In addition, cross-media narrative also strengthens the transformability of IP value. The symbolic value of cultural IP can be transformed into multiple value forms, such as commercial value and social value. Through the construction of virtual scenes, the game successfully transformed a series of heritage like ancient buildings into a digital experience that can be "toured, felt and shared", and realized the diversion of cultural values to the tourism economy [2].

2.2. Games as a medium of cultural transmediation: from cultural carrier to communication language

Traditionally, games are often regarded as containers for cultural communication that load and convey cultural content. However, recent game cases show that games and their various expressions have evolved into an active "transmediation language". The core of this transformation is that game media have transcended the level of merely displaying cultural elements and constructed a complete cultural experience system through their unique technicality, interactivity and sociality [3].

Among them, technicality refers to the basic framework constructed by modeling, rendering, scanning and other technologies for transmediation. Interactivity ensures that players can transform from "readers" to active meaning "participants" through interaction. Sociality enables players to extend their gaming behaviors to the community level and enhance their experience and sense of identity through community activities [4].

To sum up, through the act of "playing", players have completed the entire transmediation process of traditional culture. The establishment of these media characteristics provides a key theoretical framework for in-depth analysis of how game modeling technology specifically fulfills its transmediation function.

2.3. Game modeling technology - key tool for IP transmediation

Game modeling technology is a set of key tools to achieve the digital transmediation of cultural IP. Its development context and collaborative logic deeply reflect the transmediation from "reproduction" to "construction". This spectrum roughly covers two types of complementary technical paths: reality-based reproduction technology and rule-based modeling technology. The former takes measurement and 3D scanning as the core, digitizing cultural relics, buildings and other entities with high precision, providing the game world with "raw materials" of real texture and historical traces [5]. The latter focuses on active creation and combination in virtual space, ranging from manual shaping technologies such as polygon modeling and digital sculpting to rule generation systems represented by procedural modeling [5].

Through the collaborative operation of this set of technologies, motion capture technology lays the foundation for textural authenticity, manual shaping technology completes the detailed creation of cultural symbols, and procedural and modular technologies eventually combine these symbols into an infinitely expandable, narratable dynamic world. Thus, modeling technology, as an important tool to achieve Transmedia Storytelling, has become the core method to transmediate static IP resources into interactive and experiential forms.

3. The paths of transmediating traditional culture through game modeling technology

In the creation process of large-scale games, game development teams often use a variety of technologies in collaboration to transfer all details of material cultural heritage into the game's digital world. In this transmediation process, the game team needs to consider restoring the details of visual content such as buildings and props, as well as how to accurately express invisible in-depth ideas.

3.1. Fine reproduction of architectural and cultural relics details

Taking Black Myth: Wukong as an example, the Game Science team used a combined technical system of high-fidelity digital scanning and PBR rendering for the fine reproduction of ancient

buildings and Buddhist statues.

In terms of the structure and details of buildings and sculptures, the development team adopted a collaborative strategy of photogrammetry and laser scanning with millimeter-level precision. For immovable cultural relics such as Shanxi Foguang Temple and Chongqing Temple, the team obtained 3D data with an original point cloud density of 0.3 to 0.5 points per millimeter [6]. This "reality capture" technology ensures that mesostructural features, such as the tenon-and-mortise structures of building brackets and the knife-carving traces on Buddha statues' drapery, retain micron-level details in the digital model.

In computer graphics, raw scanned data must go through two processes—geometric reconstruction and material texturing—before rendering. At the geometric processing level, the development team retopologized and compressed the master model (with hundreds of millions of polygons) into a renderable derived model. Meanwhile, it baked normal maps and displacement maps at 16K resolution, transmediating the geometric details of the high-poly model into rasterized textures to achieve detail reproduction within the Unreal Engine 5 framework. The material system adopts the PBR metal-roughness workflow [6]. Combined with dynamic global illumination, it calibrates special materials such as sandstone weathered layers, painted gold foil, and wooden beam frames, and introduces the Disney BSDF model to simulate subsurface scattering effects [6]. This ensures that the performance of ancient buildings under different sunlight angles is consistent with field-measured spectral data, making the statues appear identical to the real objects under virtual lighting.

This full-chain precision control—from scanning and calibration to geometric simplification and material simulation—ultimately ensures that the cultural symbols in the game are not only visually "similar" but also "authentic" based on measurement standards. Details such as hanging sculptures and algae, which are difficult for players to see due to spatial constraints, have all been packaged into interactive digital texts, realizing the transmediation from "invisible" to "hyper-realistically visible."

3.2. Create oriental artistic conception through environmental interaction

To convey the unique "artistic beauty" of the East, the game transforms the cultural background that needs to be explained into "concrete and perceptible dynamic visual symbols", endowing traditional cultural symbols with vitality.

In terms of long-shot depiction, most pictures adopt ink wash blank space, referring to common techniques in Chinese painting, restrain colors, and use environmental narration to create a solemn atmosphere of "orderly heaven and earth, life and death cycle" [7].

In terms of close-range interaction, the game transforms oriental artistic conception into interactive environmental variables through a unified particle physics framework. The clouds and incense in the game are not pre-rendered animations, but sparse particle swarms generated in real time by a position-based dynamics system, with accurate calculations performed only at the focus of the player's field of vision [8].

Through each stick swing and meditation, overseas players physically understand that Wukong's "monster" title is not a demon in the Western context, but another kind of life in the context of Eastern legends. In this multi-level environment, words are not needed; just letting players perceive Eastern philosophical propositions through scenes can bypass language loss, making traditional Chinese culture more effectively spread at the spiritual level through this hidden form [7].

4. Form and effect of game modeling technology in traditional culture communication

As a new communication medium, the special effect of games is that they can enable players to be well immersed in the cultural relics displayed in the game world. This immersive experience will greatly enhance players' interest in subsequent field visits to cultural sources, thus having a positive impact on the cultural tourism economy of the cultural birthplaces.

4.1. Creating a virtual museum-style cultural reproduction

In the development of *Black Myth: Wukong*, Game Science's high-precision reproduction of ancient buildings and statues has achieved a display effect similar to that of a virtual museum in terms of communication form. Every weathering trace and structural proportion perceived by players in their exploration has established deep cultural credibility. This accurate digital preservation and innovative transmediation directly stimulate players' interest in on-site visits and research on real cultural heritage [9].

According to the theory that "the medium is the extension of man" games, as a composite medium, greatly extend people's perceptive ability and exploration initiative, allowing players to transcend physical limitations and "visit in person" those cultural scenes separated by time and space. Attracted by the game content, a large number of players discussed the original allusions behind the plot in the community, or shared their discoveries, completing the identity expansion from "game players" to "culture lovers" or even "junior researchers" [10].

4.2. Effective promotion of games as local cultural tourism

According to the data of the "2025 China Game Industry Annual Conference", under the influence of *Black Myth: Wukong*, the online search volume of "Shanxi Tourism" has increased by more than 3178% year on year, and the views of relevant social media topics have exceeded 40 billion. The ticket revenue of relevant scenic spots soared to 160 million yuan, driving the prosperity of accommodation, catering, transportation, retail and other related industries. The data indicate that the popularity of games is not limited to cyberspace, but has become a real driving force for tourism.

Research shows that when players go through battles, puzzle-solving and plot exploration in virtualized ancient buildings, they will form a "pre-experience" memory. When players visit the "battlefields" where they fought in the virtual world, this memory is more driving than traditional promotional videos in motivating players' intention to visit historic sites [11]. This form of experience shortens the psychological distance between historical relics and contemporary audiences, transforming "virtual viewing" into a strong impulse for "on-site viewing".

4.3. Discussion on potential risks and enlightenment behind technology transmediation

Although game modeling technology has obvious effects in spreading traditional culture, there are also potential risks and disputes that cannot be ignored in the process of technology transmediation.

As an entertainment product, games inevitably need to be adapted and artistically treated in the process of creation, such as modifying the building proportions and changing the plot of the original work. If these adaptations lack sufficient academic support, they may lead to players' misunderstanding of history and culture. In addition, as a commercial product, in order to cater to the market aesthetics, the modeling style may unconsciously move closer to the aesthetics of mainstream commercial games, weakening the characteristics of local culture.

To solve the above problems, the game team should try its best to cooperate with cultural heritage protection institutions and historical researchers, and create reasonably under professional guidance. This is not only a respect for the culture itself, but also an important way to enhance the cultural connotation of the game itself and enhance commercial competitiveness.

5. Conclusion

The deep development of digital media provides a new path for the innovation of cultural IP. The case of Black Myth: Wukong shows that modern game technology has become an efficient "language" for transmediating and activating traditional culture. This study reveals the key role of game modeling in promoting the "creative transformation" of culture by analyzing its technical paths and communication effects.

At the level of technological transmediation, games transform cultural heritage such as ancient buildings and statues into interactive digital assets through high-precision scanning and procedural generation, and integrate philosophical concepts such as "artistic conception" and "emptiness" into experiences through environmental narration and dynamic interaction, making technology itself a medium for shaping cultural cognition.

In terms of communication mechanism, the game has built an open Transmedia Storytelling ecology, transforming players from passive receivers into active participants and meaning co-creators. This participation has significantly lowered the threshold of cultural cognition and stimulated global players' interest in exploring Chinese traditional stories and profound culture.

The practice has also produced significant spillover effects: the immersive scenes created by the game have been effectively transformed into real tourism driving forces, boosting the growth of the local cultural tourism economy. At the same time, as a "cultural guide", the game guides international players from surface symbols to an in-depth understanding of values and philosophy, and promotes the effective international dissemination of culture.

To sum up, the practices represented by Black Myth: Wukong have formed a set of referable digital methodologies for cultural IP: ensuring cultural authenticity through technical accuracy, constructing immersive experiences through interactive narrativity, activating content reproduction through community participation, and realizing multi-dimensional value transformation through transmedia integration. This indicates that cultural inheritance has evolved from one-way output to a deep participation model centered on experiential interaction and emotional resonance, providing a practical blueprint for the revival and global dissemination of traditional culture in the digital age.

References

- [1] Zhang, Y., & An, N., & Qi, C. (2025). Research on the Success Elements of Animation IP: Creativity, Marketing, and Globalization. *Scientific and Social Research*, 7, 126-131.
- [2] Dan, B. (2025). The Translation and Dissemination of Shanxi Cultural Tourism in the Context of AIGC --Taking Black Myth Wukong as an Example. *Journal of Western*, (20), 87-90.
- [3] Li, J., Zhou, Z. (2025). Digital games promote the international communication of fine traditional Chinese culture: take black myth: Wukong as an example. *Journal of University of Electronic Science and Technology of China (Social Science Edition)*, 27(02), 121-128.
- [4] Wu, Y. (2025). Innovative Adaptation and Scene-Based Dissemination of Classic Cultural Images: Black Myth·Wukong as a Cross-Media Art. *Journal of North University of China (Social Science Edition)*, 2025-04.
- [5] Mikushina, A. (2020). Creation of modular 3D assets for video games. Bachelor's thesis, Czech Technical University in Prague. ČVUT Repository.
- [6] Apollonio, F. I., Fantini, F., Garagnani, S., & Gaiani, M. (2021). A Photogrammetry-Based Workflow for the Accurate 3D Construction and Visualization of Museum Assets. *Remote Sensing*, 13(3), 486.

- [7] Xiang, Y. (2025). Translation of Cultural Symbols and Global Cultural Dissemination Effect of "Black Myth: Wukong". *Advances in Social Sciences*, 14(8), 715-719. the
- [8] Macklin, M., Müller, M., Chentanez, N., & Kim, T.-Y. (2014). Unified particle physics for real-time applications. *ACM Transactions on Graphics*, 33(4), Article 153.
- [9] Rubio, C., Barriga, N.A., Ingram, B., Luna-García, H., Besoain, F. (2025). Exploring Procedural Content Generation of Environments for Virtual Museums: A Mixed-Initiative Approach. *Heritage*, 8, 134.
- [10] Zhang, J., Zhou, Z. (2025). Thick Power: the adaptations of Journey to the West and the interaction between the Chinese youth and Black Myth: Wukong from the perspective of Cultural Empowerment Theory. *Int. j. anthropol. ethnol.* 9, 6.
- [11] Wang, S., Yu, J., Yang, W., Yan, W., & Nah, K. (2025). The Impact of Role-Playing Game Experience on the Sustainable Development of Ancient Architectural Cultural Heritage Tourism: A Mediation Modeling Study Based on S-O-R Theory. *Buildings*, 15(12), 2032.