From Technological Utopia to a New Carrier of Civilization: Discourse Generation and Cultural Practice of Chinese-style Cultural Metaverse in the Global Context

Jia Dongjiao
Tongji University

Abstract

In the global wave of digitalization, the metaverse has shifted from a speculative concept toward a concrete arena for cultural, technological, and social experimentation. While much scholarship focuses on Western, technology-driven models, this paper examines the emerging paradigm of a Chinese-style cultural metaverse, in which digital tools are applied to preserve heritage, reframe cultural narratives, and foster international dialogue. Drawing on an interdisciplinary framework that combines cultural semiotics, the sociology of technology, and policy analysis, the study analyzes three representative case studies—the Dunhuang murals, *Digital Central Axis* in Beijing, and the *Black Myth: Wukong* game project. Through these examples, the paper argues that the Chinese cultural metaverse illustrates both opportunities and limitations in integrating cultural continuity with digital innovation. By situating these practices within global debates on the metaverse, the paper contributes a non-Western perspective to ongoing discussions about how digital environments can function not only as sites of technological experimentation but also as carriers of cultural and civilizational values.

Keywords:
Cultural Metaverse; Digital Heritage; Virtual-Physical Interaction; Civilization Dialogue; Global Digital Culture

Introduction

Since its popularization in science fiction and the technology industry, the concept of the metaverse has often been framed as a technological utopia. From Neal Stephenson's Snow Crash to Mark Zuckerberg's rebranding of Facebook as Meta, the metaverse has frequently been imagined as a parallel virtual world where blockchain, cryptocurrencies, and neural interfaces promise to transcend the limits of the human body. Scholars such as Katherine Hayles have noted that this framing reflects a broader digital savior complex, the belief that technology alone can resolve social and cultural challenges by offering a disembodied form of digital immortality.

While influential, this Western, Silicon Valley centered narrative is neither the only nor the inevitable way of imagining the metaverse. In recent years, Chinese cultural institutions, policymakers, and creative industries have developed a different set of practices, often described as a cultural metaverse. These initiatives employ digital tools not simply to create parallel digital realities, but to preserve and reinterpret cultural heritage (Zhan & Sun,2022; Xie & Zhang,2024), re-engage collective memory (Hu & Huang,2025; Huang, Xia & Tie, 2023), and promote cross-cultural dialogue (Qian & Chen,2023; Zhao & Wei, 2022). Examples include the Dunhuang Academy's blockchain-authenticated digital murals, the

interactive exhibitions of *Digital Central Axis* in Beijing, and the global circulation of games such as *Black Myth: Wukong*.

This paper asks: How should we define the Chinese-style cultural metaverse? What are its practical characteristics? And what global value might it hold in the current climate of civilizational tension? Addressing these questions is important because most metaverse research remains focused on technological or economic dimensions, with limited attention to cultural and civilizational perspectives.

To explore these issues, the study adopts an interdisciplinary framework drawing on cultural semiotics, the sociology of technology, and policy analysis. It focuses on a small set of representative case studies to illustrate both the potential and the limitations of China's approach. The paper proceeds in four steps: (1) reviewing existing literature and defining the concept of the Chinese cultural metaverse; (2) outlining the methodological approach; (3) analyzing selected case studies; and (4) discussing the broader implications for global digital civilization.

Literature review and research issues

The global development of the metaverse has been accompanied by competing narratives about its purpose and value. In Western discourse, the metaverse is often conceptualized as a technological utopia—a fully immersive, data-driven world that promises liberation from material constraints. This vision, rooted in Silicon Valley's techno-humanist ideology, emphasizes individual autonomy, virtual property, and digital immortality (Hayles, 1999). Scholars in digital culture studies have critiqued this approach as a continuation of technological determinism, in which social progress is assumed to follow from innovation itself (Srnicek, 2017; Fuchs, 2022).

In contrast, recent Chinese academic and policy discussions have proposed the concept of a "cultural metaverse"—a digital ecosystem where culture, rather than technology or capital, constitutes the central organizing principle (Xie & Gao, 2023; Zhang & Liu, 2024). Rather than treating the metaverse as a "virtual parallel world," Chinese scholars tend to describe it as a continuation of civilizational development through digital media. This perspective draws inspiration from Qian Xuesen's 1990s translation of "Virtual Reality" as *Lingjing* (Spiritual Realm), which implies that virtuality should extend, rather than escape, the real world (Wang, 2023).

Within China, the National Cultural Digitization Strategy (2021-) has further institutionalized this approach by encouraging integration between cultural preservation and technological innovation. A growing body of domestic research has explored how digital museums, immersive exhibitions, and AI-driven heritage reconstruction can strengthen cultural continuity while contributing to the digital economy (Su, 2024; Zhao, 2022).

Despite these valuable contributions, two critical limitations remain.

First, much of the existing Chinese-language scholarship employs normative or ideological language, framing the "Chinese-style cultural metaverse" as inherently superior to Western models. This has limited its impact within global academic discussions.

Second, few studies provide empirical or comparative analysis linking Chinese practices to broader global metaverse debates. The relationship between technological innovation, cultural authenticity, and civilizational dialogue therefore remains underexplored.

To address these gaps, this study situates the Chinese-style cultural metaverse within international scholarship on digital heritage, cultural governance, and media technology. Works by Bolter and Grusin (1999) on remediation, Jenkins (2006) on participatory culture, and Parikka (2020) on media ecologies offer valuable frameworks for understanding how digital systems transform cultural memory. Building on these insights, the paper examines how Chinese cultural and creative industries interpret and apply similar principles within their own philosophical and institutional contexts.
Accordingly, the research focuses on three interrelated questions:

Q1 Definition: How can the "Chinese-style cultural metaverse" be conceptualized as a model of digital civilizational development?
Q2 Practice: What specific characteristics and mechanisms define its practical operation?
Q3 Global relevance: In what ways might these practices contribute to cross-civilizational understanding and dialogue in the digital age?

Research Perspectives and Methods

The study adopts an interdisciplinary qualitative approach to examine how China's emerging "cultural metaverse" integrates technological innovation with cultural continuity. The methodology combines three complementary perspectives: cultural semiotics, the sociology of technology, and policy analysis. Together, these frameworks allow the research to explore both symbolic meaning and institutional structure in the development of the Chinese-style cultural metaverse.

1. Cultural Semiotics

This dimension focuses on how traditional cultural symbols are digitally reconstructed and reinterpreted in virtual environments. It examines how meaning is generated when heritage artefacts, visual motifs, or philosophical ideas are translated into digital form. By analyzing semiotic transformations in digital exhibitions and immersive media, the study evaluates whether these virtual expressions preserve, distort, or expand cultural significance.

2. Sociology of Technology

From a sociological perspective, the metaverse is viewed as a socio-technical system shaped by the interactions between state institutions, industries, and users. This part of the analysis explores how technological infrastructures—such as VR platforms, blockchain authentication, and AI-driven content creation—mediate cultural participation. Attention is given to the ways in which digital tools enable or constrain the public's engagement with heritage and identity formation.

3. Policy and Governance Analysis

The study also situates the Chinese cultural metaverse within the broader framework of national digital governance. It examines how government strategies, such as the National Cultural Digitization Strategy, influence metaverse development and regulate emerging issues related to intellectual property, cultural authenticity, and data ethics.

Case Selection and Analytical Process

Given the wide range of metaverse-related projects in China, the study employs a purposeful sampling strategy. Three representative cases were selected according to their cultural significance, level of technological integration, and international visibility:
Dunhuang Digital Murals Project: a model for blockchain-enabled heritage authentication.
The interactive exhibitions of *Digital Central Axis* in Beijing: an example of AR/VR-mediated cultural preservation and public education.
Black Myth: Wukong: a commercial cultural product that reinterprets classical mythology through digital storytelling.
Each case is analyzed through three guiding questions:

- What cultural narratives are being translated into digital form?
- What technologies and institutional frameworks enable these translations?
- What tensions or limitations arise in the process?

The analysis relies on textual interpretation, media observation, and policy document review. Primary materials include project reports, media coverage, official digital platforms, and academic commentaries. These are triangulated with secondary literature in English and Chinese to ensure analytical rigor and cross-cultural comparability.
In summary, the methodological design emphasizes balanced interpretation rather than ideological evaluation. By combining cultural, technological, and policy-oriented perspectives, the study aims to reveal both the achievements and contradictions within China's cultural metaverse practices, contributing to a more globally informed understanding of how digital technologies reshape civilizational expression.

The Definition of the Chinese-Style Cultural Metaverse: A Digital Continuation of Civilization

The term "Chinese-style cultural metaverse" refers to a framework in which digital technologies are applied to the preservation, reinterpretation, and dissemination of cultural heritage. Rather than creating an entirely virtual parallel world, this model treats the metaverse as a continuation of civilization—an evolving medium for transmitting cultural memory and fostering civilizational dialogue in the digital age.
Philosophically, this perspective builds on long-standing Chinese ideas about the interdependence of the virtual and the real. Classical concepts such as the unity of heaven and humanity (天人合一) and the mutual generation of being and non-being (有无相生) suggest that the virtual world is not separate from the physical one but represents a different mode of perceiving and expressing reality. The scientist Qian Xuesen's translation of "virtual reality" as Lingjing ("Spiritual Realm") captures this continuity: technology serves as a tool for extending human creativity and cultural meaning, not for escaping the real world.
In this sense, the Chinese-style cultural metaverse may be defined as a "culture-centered, technology-enabled, and reality-linked" system that uses digital media to reactivate cultural heritage, reinterpret traditional values, and encourage new forms of participation. It

emphasizes reproduction rather than replacement: technology is valued as an instrument for sustaining cultural vitality, not as an autonomous force of progress.
The defining features of this model can be summarized in three interrelated dimensions:

Cultural Essence and Philosophical Foundation

The Chinese cultural metaverse derives its core logic from an understanding of culture as a living continuum. It's a process through which digital innovation serves the transmission of civilizational meaning. Digital reconstructions, such as virtual exhibitions of Dunhuang murals, are conceived as means to extend cultural life across time and space. They aim to evoke recognition and emotional connection, enabling users to engage with cultural heritage in immersive, participatory ways. Anchored in the dialectical underpinnings of Chinese philosophical thought—most notably the interdependence of being and non-being (you wu xiang sheng, 有无相生) and the holistic unity of humanity with the cosmos (tian ren he yi, 天人合一)—the Chinese-style cultural metaverse reframes virtuality not as a detachment from the tangible world but as a dynamic, tech-enabled conduit for amplifying cultural cognition and creative articulation.

A representative case that embodies this principle is the *Digital Dunhuang* project. For over three decades, the Dunhuang Academy has employed digital technologies to protect and reinterpret the ancient murals of the Mogao Caves, which face severe deterioration due to natural and human factors. By combining AI-based digital restoration, 3D laser scanning, and VR/AR virtual exhibition technologies, researchers have achieved millimeter-level precision in mural reconstruction. The project not only realizes the "digital immortality" of endangered art but also transforms static relics into dynamic media for cultural participation and education.
For instance, the *Digital Dunhuang* Resource Library and the newly launched Digital Cangjing Cave Database allow global audiences to explore, annotate, and co-create content derived from the murals. Visitors can virtually navigate the caves, engage in interactive storytelling, and experience the artistic *aura* (lingyun, 灵韵) of the murals without endangering the originals. As Professor Fan Jinshi has emphasized, while murals cannot live forever physically, they can achieve continuity through digital spirit, which is a manifestation of the Chinese cultural worldview that culture transcends materiality.
Through this integration of technology and tradition, the Digital Dunhuang initiative demonstrates how the Chinese cultural metaverse embodies a philosophy of renewal rather than replication. Technology becomes a vessel of cultural vitality, echoing the Confucian ideal of "carrying forward the Way" (cheng dao, 乘道) through adaptive transformation. The project exemplifies how the Chinese-style metaverse operationalizes its philosophical foundation: merging technological progress with moral, aesthetic, and civilizational meaning to ensure the ongoing life of culture in digital form.

Technological Mediation and Innovation Logic

The model operates through a reciprocal relationship between cultural demand and technological development. For instance, 3D scanning and VR visualization allow museums to preserve artefacts that might otherwise deteriorate, while AI-assisted content creation supports creative reinterpretations of traditional stories. Projects such as *Black Myth:*

Wukong exemplify how commercial game design can simultaneously promote cultural visibility and innovation. The technological logic of the Chinese-style cultural metaverse rests on the dynamic interaction between technological mediation and cultural innovation. In this framework, technology is not an external driving force imposed upon culture but a mediator of meaning—a medium that enables culture to regenerate within digital environments. This approach transcends both technological determinism and cultural essentialism, proposing instead a co-evolutionary model in which digital innovation and cultural inheritance shape one another.

A vivid manifestation of this mediation is found in the development of the digital game *Black Myth: Wukong* (Heishenhua: Wukong), a landmark in China's digital cultural production. Created by the Game Science studio, the game adapts the classic *Journey to the West* narrative into a 3A-level interactive world, combining cutting-edge rendering technologies with the expressive aesthetics of traditional Chinese art with great success of over 28 million copies sold globally within months of release.

From a technological perspective, as Zhu Xiaofeng (2024) notes, its production integrated cinematic-quality motion capture, real-time ray tracing, and Unreal Engine 5's nanite and lumen systems to achieve film-level visual fidelity. The workflow was accompanied by narrative localization, which is a commitment to rendering cultural depth through technology. The games embody the innovation logic of the Chinese-style metaverse: technological precision serves as the vessel for cultural resonance. The development team used 3D-scanned reconstructions of heritage sites, such as the Yungang Grottoes, Shuanglin Temple, and the Hanging Temple, to create immersive spaces where ancient architecture and mythic imagination coexist. In this sense, *Black Myth: Wukong* does not merely simulate tradition but digitally reactivates it, transforming static cultural symbols into interactive experiences. As Li Junxin (2025) observes, this process achieves the "creative transformation and innovative transmission" of traditional culture, making mythological imagery accessible to global audiences through an emotionally engaging, game-based medium.

Equally significant is the game's philosophy of interactive narrative. The player, referred to as "the destined one" (tianming ren,天命人), navigates moral and existential dilemmas mirroring classical Chinese concepts of fate, self-cultivation, and transcendence. The branching storyline and adaptive gameplay structure exemplify how technological interactivity mediates philosophical reflection—the metaverse as an arena for moral inquiry and aesthetic contemplation. Through interactive immersion, sound design and narrative further deepen this effect. Traditional instruments such as the *guqin*, *xiao*, and temple bells create a sonic atmosphere resonant with spiritual contemplation. The script's use of classical Chinese diction and chapter-style storytelling transforms the philosophical triad of Confucian ritual (li), Daoist harmony (he), and Buddhist compassion (bei) into experiential gameplay. *Black Myth: Wukong* transforms the Confucian-Daoist-Buddhist synthesis of *Journey to the West* into a living discourse of digital civilization. This synthesis of virtual realism and artistic stylization achieves the Confucian-Daoist-Buddhist aesthetic of "harmony between the real and the imagined" (实与虚, 情与景). In this way, *Black Myth: Wukong* enacts technological mediation as cultural semiotics: every visual, auditory, and interactive layer encodes a worldview, turning digital play into an act of philosophical engagement.

Furthermore, the production process itself reflects collaborative technological innovation, which is a convergence of artistic, computational, and philosophical disciplines. The game's art design drew from traditional ink painting and stagecraft, while its soundscape integrated *qin* melodies, Buddhist chants, and modern electronic music. This fusion of sensory registers aligns with the Chinese aesthetic ideal of *he er bu tong* (harmony without uniformity), translating cultural philosophy into digital form.

Through *Black Myth: Wukong*, the Chinese-style cultural metaverse demonstrates that technological mediation is not a neutral conduit but a creative principle. It fuses material innovation with symbolic expression, generating a feedback loop between algorithmic precision and aesthetic imagination. By turning ancient narratives into interactive experiences, it redefines technology as a cultural language—a means by which tradition not only survives but evolves within global digital modernity. In this sense, technology becomes the medium of civilizational continuity: a means by which Chinese philosophical, aesthetic, and emotional worlds enter global digital discourse.

Value Orientation and Civilizational Dialogue

The cultural metaverse promotes values of inclusivity, collective memory, and intercultural exchange. Initiatives like the Digital Central Axis project in Beijing or the Sino–French collaborative performance 20,000 Leagues Under the Sea use digital tools to foster cross-cultural participation. In this way, the Chinese-style metaverse contributes to global dialogue by offering a practical example of how technology can mediate between heritage preservation and cultural exchange.

A paradigmatic example of this value orientation is the *Digital Central Axis* (数字中轴·小宇宙) project in Beijing. Developed collaboratively by the Beijing Municipal Cultural Heritage Bureau, the Beijing Central Axis World Heritage Application Office, and Tencent, this initiative represents the world's first immersive digital heritage experience created with gaming technology. Over three years of development and 542 iterations, it digitally reconstructed the 7.8-kilometer-long Beijing Central Axis—from Yongding Gate in the south to the Bell and Drum Towers in the north. By integrating high-definition photogrammetry, procedural generation (PCG), AI-based modeling, and cloud gaming. The result is a hyper-realistic, explorable digital environment encompassing 2.2 million buildings, 300,000 trees, and over 15TB of 3D data assets. The project's philosophical core lies in its threefold articulation of the Central Axis's value, the physical axis (material heritage and urban morphology), the historical axis (civilizational continuity across dynasties), and the conceptual axis(the Chinese worldview of balance, harmony, and centrality). By translating these intangible concepts into interactive experiences, the *Digital Central Axis* transforms abstract heritage value into an embodied, participatory narrative. Users can experience imperial processions, ritual spaces, and architectural symbolism through interactive storytelling, puzzle-solving, and time-travel simulations, reinterpreting the moral order of the "center" (zhong) as both a spatial and ethical principle of Chinese civilization. In the virtual re-creation of the Central Axis, users encounter a spatial philosophy rooted in *zhongzheng hehe* (中正和合, centrality and harmony), where the balance between heaven, earth, and humanity is expressed through urban geometry. The project links ancient civilization ideals with modern public ethics, transforming technological experience into civic consciousness. The integration of the "Digital Watchman" system allows citizens and visitors to become co-stewards of world heritage: by scanning QR codes

and uploading field observations, they actively participate in conservation monitoring. This redefines public heritage participation from passive spectatorship to active co-creation, aligning with UNESCO's "Operational Guidelines for the Implementation of the World Heritage Convention" emphasizing *Outstanding Universal Value* (OUV) and community involvement. It also builds international bridges—cooperating with digital heritage experts from UNESCO, ICOMOS, and European digital twin projects—showing how Chinese urban heritage can inspire new frameworks of global cooperation in digital heritage protection.

From a civilizational perspective, this case embodies the Chinese metaverse's value orientation toward mutual learning among civilizations. The *Digital Central Axis* narrates Chinese urban philosophy—rooted in ritual, order, and moral harmony—through global digital languages of visualization and interactivity. In doing so, it transforms China's heritage narrative from an object of national pride into a platform for global understanding. The immersive digital reconstruction of the Central Axis not only preserves history but reactivates it as a living, dialogic space—where users from any culture can explore the moral geometry and humanistic wisdom of Chinese civilization.
In short, the Chinese-style cultural metaverse does not claim to replace other models but offers an alternative way of integrating technology with cultural meaning. Its significance lies in demonstrating how digital technologies can function as civilizational carriers—tools for connecting the virtual and the real, the local and the global, and the past and the future.

The Practical Characteristics and Logic of the Chinese-Style Cultural Metaverse

The development of the Chinese-style cultural metaverse reflects an ongoing effort to integrate digital technologies with cultural interpretation and social participation. Rather than viewing technology as an autonomous driver of change, this model treats it as a medium that strengthens cultural expression and civilizational continuity. Its practical characteristics can be understood through three interrelated aspects: heritage-based innovation, technological mediation with humanistic focus, and participatory collaboration. These features do not suggest a closed or unique model but illustrate one approach among many to exploring the interaction between culture and technology in contemporary society.

Digital Heritage Reconstruction: Extending Cultural Lifespans through Technology

A recurring theme in recent cultural-technology initiatives in China is the use of digital tools to renew and communicate historical and artistic traditions. The emphasis is on how technology can support the preservation, documentation, and reinterpretation of cultural materials. At its foundational level, Heritage-Based Innovation means to use digital tools to preserve and reconstruct cultural heritage that is vulnerable to time or physical degradation. High-precision scanning, 3D modeling, and blockchain verification enable the creation of "digital twins" of artifacts and monuments, ensuring that cultural memory can be transmitted to future generations.
For instance, the Dunhuang Digital Murals Project, developed in collaboration with technology companies, employs blockchain certification to verify and archive digital replicas of ancient Buddhist art. This approach not only protects the originals from damage

but also creates an open-access digital database for global scholars and artists. Through high-resolution scanning, AI-assisted mural restoration, and VR exhibition platforms, the project provides digital access to the Mogao Caves' mural heritage. These techniques enable researchers and the public to study and experience cultural artefacts that are otherwise fragile or inaccessible. The project shows how immersive media can complement traditional conservation, allowing long-term preservation and broader dissemination.

Such practices reflect a wider international trend in heritage management that uses digitization not as an end in itself but as a method for adaptive cultural transmission—linking historical documentation with contemporary educational and research uses.

Cultural Value Translation: Reinterpreting Tradition through Digital Media

Beyond preservation, the cultural metaverse facilitates the reinterpretation of traditional cultural symbols within contemporary contexts. It means to attempt to balance technical innovation with interpretive meaning. In this context, "technological mediation" refers to how digital systems shape cultural expression, audience experience, and aesthetic communication.

The digital game *Black Myth: Wukong* is a relevant case. Built with advanced rendering technologies such as Unreal Engine 5 and Nanite micro-polygon modeling, the game translates the classical narrative Journey to the West into an interactive form. Its design combines motion-capture realism with stylistic references to Chinese visual art and mythology. Players engage with themes of moral choice and transformation through gameplay rather than textual exposition.

This approach aligns with global discussions on how digital games can function as vehicles for cultural storytelling and ethical reflection. The case illustrates how production pipelines, artistic direction, and narrative design together create a form of technological humanism—using digital media to explore ideas traditionally expressed through literature and art.

Similarly, the *Digital Central Axis* project in Beijing applies game-engine and AI-assisted modeling to heritage interpretation. By reconstructing the 7.8-kilometer historical axis of the city in an interactive environment, it enables users to experience spatial, architectural, and historical information simultaneously. The project's structure of three interpretive "axes"—physical, historical, and conceptual—illustrates a systematic attempt to link digital representation with cultural analysis.

Civilizational Dialogue: Building Bridges across Cultures

At its highest level, the cultural metaverse functions as a platform for intercultural communication. By linking digital heritage initiatives to global networks, it supports collaboration and dialogue among diverse civilizations and concerns participation and collaboration among public institutions, private companies, and individual users. This participatory emphasis is consistent with current international practices that view cultural heritage and digital innovation as shared responsibilities.

The *Digital Central Axis* project in Beijing exemplifies this process. Through advanced 3D reconstruction and cloud-based interaction, it transforms the city's historical central axis into a global digital heritage site where users from around the world can participate in virtual tours and co-creation activities.

Within the *Digital Central Axis* initiative, the "Digital Watchman" system allows citizens and visitors to record field observations and report preservation issues through a mobile platform. The mechanism complements professional heritage monitoring by integrating citizen input into data collection. In addition, open competitions such as the Beijing Central Axis Cultural Heritage Inheritance and Innovation Competition invite students, designers, and technologists to contribute digital modeling, creative design, and educational applications.

These forms of participation expand the scope of cultural production from institutional curation to distributed collaboration. They also correspond with UNESCO's guidelines for community engagement and capacity-building in heritage management.

The Logic of Integration: Culture Driving Technology

Across these layers, the Chinese-style cultural metaverse follows a culture-driven innovation model, in which cultural demand guides technological application. This reverses the common pattern of "technology seeking purpose" and instead positions technology as a responsive instrument of cultural need. The process generates both tangible outcomes—such as digital archives, exhibitions, and games—and intangible effects, including renewed public interest in heritage and enhanced national cultural confidence.

Taken together, these practices suggest that the Chinese-style cultural metaverse operates as a hybrid framework linking cultural conservation, digital innovation, and public involvement. Its practical logic can be summarized as follows:

- Use of digital technologies for systematic preservation and documentation;
- Application of interactive and immersive media to reinterpret historical materials;
- Inclusion of multi-stakeholder collaboration in content creation and dissemination.

Rather than proposing a single model, these examples contribute to the broader global discussion on how metaverse-related technologies can support cultural sustainability. They illustrate one pathway for integrating technical progress with interpretive and educational goals, showing that the metaverse concept can function as a cross-cultural platform for the preservation and re-contextualization of heritage.

Together, these layers demonstrate how China's digital cultural initiatives aim to balance innovation with tradition—offering a pragmatic, culturally rooted model of metaverse development that emphasizes shared heritage over technological spectacle.

However, this model also faces notable limitations. For example, the commercialization of digital collectibles risks turning heritage into speculative assets, while aesthetic simplification can dilute cultural authenticity. Moreover, the governance of intellectual property and data ethics in virtual environments remains underdeveloped. Recognizing these tensions is essential for assessing how sustainable this model can be as it continues to expand.

The Global Value of the Chinese-Style Cultural Metaverse

In the current global context—marked by cultural fragmentation, digital inequality, and renewed debates on the "clash of civilizations"—the Chinese-style cultural metaverse offers a distinctive perspective on how technology can serve as a bridge rather than a boundary between cultures.

The discussion of the Chinese-style cultural metaverse gains significance not as an alternative to other models, but as a case study in how digital technologies can mediate between local cultural traditions and global networks of communication. Its global value lies in the potential to contribute practical and conceptual insights to three ongoing international conversations: the sustainable digital preservation of heritage, the integration of cultural diversity within global media ecosystems, and the use of immersive technology for intercultural education and dialogue.

Digital Preservation and Knowledge Sharing

Projects such as *Digital Dunhuang* demonstrate how long-term digitization can support both local conservation and international access to cultural resources. The open-access *Digital Dunhuang* database, which contains high-resolution imagery and metadata for thousands of murals, has become a shared research platform used by scholars and institutions worldwide. It offers a model for addressing challenges common to heritage conservation globally balancing physical preservation with public engagement and remote accessibility.

In this sense, the project contributes to the broader global effort to standardize digital archiving practices, similar to initiatives at the British Museum, the Smithsonian Institution, and Europeana. Its value lies not in technological exclusivity but in the way it coordinates cross-disciplinary collaboration between cultural institutions, engineers, and educators. The approach highlights how heritage digitization can combine scientific precision with interpretive transparency, contributing to the formation of interoperable cultural databases across regions.

The Dunhuang Digital Archive demonstrates how open access blockchain systems can allow international scholars to participate in digital restoration and annotation. Instead of centralizing ownership, this approach promotes shared stewardship of cultural resources. Similarly, collaborative initiatives such as the "Digital Silk Road" employ digital platforms to connect museums and archives across Asia, Africa, and Europe, encouraging equitable cultural exchange and joint preservation efforts. By enabling distributed participation, these projects move beyond narratives of technological or cultural dominance, supporting a more pluralistic and networked form of cultural globalization.

Cultural Diversity and International Communication

One of the most pressing challenges of digital globalization is the homogenization of culture under the influence of mass platforms. The Chinese cultural metaverse provides an alternative strategy by emphasizing the digital representation of local and minority cultures and explains how technology can preserve diverse cultural expressions that might otherwise disappear.

Digital cultural production in China, including works such as *Black Myth: Wukong*, has attracted a large international audience. Its global reach demonstrates that locally grounded

narratives can resonate across cultural boundaries when mediated through advanced production and interactive design. The game's success provides empirical data for the study of cross-cultural storytelling in digital media—how narrative adaptation, aesthetic translation, and player interaction shape global perception of traditional literature and mythology.

The game's use of cinematic techniques, motion-capture realism, and multilingual distribution shows that cultural specificity can coexist with global market standards. From a comparative perspective, it aligns with the trend of regionally distinctive digital games—such as Japan's Ghost of Tsushima or Poland's The Witcher series—that integrate local mythological content into globally accessible formats. The Wukong case therefore contributes to a broader comparative understanding of how national or regional traditions are reinterpreted through interactive media in a globalized industry.

This approach aligns with international efforts such as UNESCO's Digital Cultural Diversity Initiative, reinforcing the idea that technological advancement should enhance, not erase, cultural plurality. It also raises critical ethical questions about authorship, authenticity, and ownership that demand global dialogue and co-governance.

Immersive Heritage and Cross-Cultural Learning

Cross-cultural communication often suffers from what media scholars call a "cultural discount"—the reduced appeal of cultural products across different contexts. The cultural metaverse helps to mitigate this gap by transforming traditional symbols into immersive, emotionally engaging experiences that transcend linguistic and contextual boundaries.

The *Digital Central Axis* project extends this discussion into the field of urban heritage and public education. By creating an interactive digital reconstruction of Beijing's historic axis through game-engine technology, the project enables virtual exploration of an urban heritage site that has been inscribed on the UNESCO World Heritage List. The integration of multi-language narration, historical visualization, and participatory tools—such as the "Digital Watchman" system—supports not only domestic engagement but also international understanding of East Asian urban planning traditions.

At the 2024 Beijing Culture Forum, the project was presented as a case of how digital twins and immersive visualization can enhance global collaboration in heritage management. It suggests that the Chinese example contributes to a growing set of global methodologies for combining technical modeling with educational storytelling. Through interactive storytelling and participatory engagement, this project encourages empathy rather than exoticism, illustrating how digital media can nurture shared understanding among different cultural audiences.

From a research standpoint, the global relevance of the Chinese-style cultural metaverse lies in the transferability of its technical and institutional experiences. It shows several features: Interdisciplinary collaboration between cultural heritage experts, software developers, and communication scholars; public-private partnerships that integrate governmental cultural agencies with technology companies; Attention to accessibility and participation, using cloud computing and mobile applications to lower entry barriers; Alignment with international frameworks, particularly UNESCO's guidelines for digital heritage and community participation. These practices position the Chinese experience as part of a global dialogue about the responsible application of immersive and interactive

technologies in culture and provide empirical examples and operational lessons relevant to other societies exploring similar intersections of technology, heritage, and communication.

Conclusion and Discussion

This study has explored the development of the Chinese-style cultural metaverse as a model that integrates technological innovation with cultural inheritance and examined how digital technologies in China are being used to preserve, reinterpret, and internationalize cultural heritage. Together, these examples illustrate a consistent logic: the Chinese-style cultural metaverse evolves through collaboration between cultural institutions, technology industries, and diverse user groups, aiming to translate historical knowledge into accessible digital forms.

First, the Chinese-style cultural metaverse is defined not as a "virtual parallel world," but as a continuation of civilizational experience through digital means. Its conceptual foundation rests on the philosophical principle of the interdependence of the virtual and the real, where technology functions as a cultural instrument rather than an end in itself.

Second, its practical form can be understood as a three-tier system encompassing: (1) digital heritage reconstruction. Heritage-based innovation shows how digitization and immersive technologies can extend the life of historical materials without detaching them from their cultural meanings. The *Digital Dunhuang* initiative demonstrates how large-scale digitization supports both research and public education while addressing conservation constraints. (2) cultural value translation. Technological mediation with humanistic orientation highlights how interactive and immersive media can serve interpretive as well as technical purposes. In *Black Myth: Wukong*, advanced game engines and visual design are combined with narrative traditions, producing a hybrid form of digital storytelling that links moral reflection and entertainment. (3) civilizational dialogue.
Participatory collaboration underscores the growing importance of shared governance and user involvement in cultural projects. The *Digital Central Axis* project in Beijing integrates public participation into the management and interpretation of a world heritage site through accessible cloud platforms and interactive tools.
Case studies such as the Dunhuang Digital Murals, the Palace Museum Virtual Exhibitions, and the *Black Myth: Wukong* project show how digital platforms are being used to extend cultural lifespans, reimagine traditional narratives, and promote international cultural exchange. These cases all demonstrate the core logic of the Chinese cultural metaverse: using technology as a medium to preserve culture rather than replace reality, with three primary objectives: extending cultural longevity, reconstructing traditional narratives, and promoting international exchanges.

Three-Level Practical System of the Chinese Cultural Metaverse

Level	Core Concept	Case	Description
Digital Heritage Reconstruction	Extending the life cycle of historical materials through digital and immersive technologies without compromising cultural significance;	*Dunhuang Digital Murals*	Large-scale digitization supports academic research and public education, easing pressure on physical heritage conservation;
	Support research, public education, and address protection constraints	*Palace Museum Virtual Exhibitions*	Extending the Life of Cultural Heritage by Digital Technology
Cultural Value Translation	Human-oriented technology mediation, interactive media or immersive media with both interpretive and technical purposes; Linking Moral Reflection and Entertainment Function	*Black Myth: Wukong*	Combining advanced game engine, visual design and the narrative tradition of Journey to the West, it forms a hybrid digital narrative form, which integrates moral reflection and entertainment experience; Reinterpretation of the Connotation of Traditional Narration
Civilizational Dialogue	Participatory collaboration model, emphasizing shared governance and user participation in cultural projects; Promoting international cultural exchange and heritage co-creation	*Digital Central Axis project in Beijing*	The public participation is integrated into the management and interpretation of the world heritage through the cloud platform and interactive tools; Promoting International Cultural Exchange and Dialogue among Civilizations

Third, at the global level, these practices contribute to the broader conversation on digital humanism by emphasizing inclusive governance, emotional resonance in cross-cultural communication, and ethical approaches to cultural diversity. The Chinese experience demonstrates how digital technology can be aligned with social responsibility and cultural continuity rather than pure commercialization or technological determinism.

From a conceptual standpoint, these cases demonstrate how the metaverse can function as a cultural mediation framework rather than solely a technical innovation. The examined projects show that immersive technologies can sustain multi-layered relationships between documentation, representation, and public engagement. This suggests a potential methodological contribution to global heritage and media studies: the metaverse can serve as an analytical category to study the integration of digital production, aesthetic experience, and cultural continuity.

These findings also reinforce international discussions on digital sustainability—how virtual reconstructions, open data archives, and interactive design can support the long-term accessibility and relevance of cultural assets. By aligning with existing UNESCO frameworks and comparable international projects, these cases provide reference points for collaborative research across regions.

The reviewed initiatives suggest practical directions for cultural institutions and policymakers. First is integration of digital infrastructure and heritage policy. It means to establish technical standards and metadata systems that ensure interoperability and long-term maintenance of digital cultural assets. For instance, by referencing UNESCO's *Charter on/Guidelines for the Preservation of the Digital Heritage*, we could collaborate with technical institutions to establish unified metadata standards for digital cultural assets. Furthermore, integrating digital heritage preservation into national cultural digitization plans (such as the *National Cultural Digitization Strategy Outline* mentioned in the paper) and creating dedicated funds to support long-term maintenance would be beneficial. This will address the research question of "how to achieve digital sustainability of cultural heritage" and provide solutions to the pain points of isolation and easily outdated of digital assets.

Second is cross-sector collaboration. It means to build stable partnerships among museums, universities, and technology firms, with each party responsible for content operation, academic support and technology research and development, to pool expertise and resources. It is important to ensure that cultural institutions take the lead in content review, avoid cultural distortion caused by technology dominance, and realize the synergy between technology and culture.

Third is public participation. It means to design inclusive platforms that balance professional curation with user-generated input, ensuring both accuracy and engagement. For example, developing low-threshold interactive tools and opening diversified interactive channels to balance professional content and user-generated content. A typical example is the material open platform "ip.e-dunhuang" (https://ip.e-dunhuang.com) of the Digital Dunhuang project, which specifically sets up a "Co-created Works" module to encourage users to generate content based on digitized Dunhuang materials. These materials are reviewed by cultural relic experts before being made available to the public on the online platform. This kind of "participatory cooperation" mode promotes the transformation of cultural heritage from passive protection to active co-creation.

Last one is international exchange, meant to encourage comparative research and co-production projects that link digital heritage sites across countries. Particularly, we can promote the joint development of cross-border collaborative projects, such as establishing an open and shared joint database for digital murals or opening the technical standards for Dunhuang mural restoration to serve as a reference for global digital heritage conservation. These measures correspond with the global transition toward networked cultural ecosystems in which preservation, education, and creative industries increasingly overlap.

While the analyzed cases offer valuable insights, several limitations remain. The empirical scope is largely confined to high-profile projects with substantial institutional support, which may not represent smaller-scale or community-based initiatives. Future research could examine how local museums, independent developers, or non-profit organizations adapt metaverse technologies under different resource conditions. Besides, the current model still faces challenges related to commercialization, authenticity, and governance. Overreliance on market mechanisms risk turning heritage into speculative assets, while digital standardization may reduce the diversity of aesthetic expression.

Moreover, issues of data governance, intellectual property, and long-term access require continued evaluation. As digital platforms evolve, ensuring open standards, transparent data management, and cultural sensitivity will be crucial for sustainable development. International collaboration requires clearer frameworks for intellectual property, data ethics, and equitable participation.

Future research should therefore pursue three directions: First is comparative analysis. Systematically compare Chinese metaverse practices with similar initiatives in other regions to evaluate differences in governance, ethics, and cultural outcomes. Comparative studies across different regions would help identify shared challenges and diverse strategies in using immersive technologies for cultural purposes. Second is empirical research. Incorporate quantitative and ethnographic data to assess audience engagement and public perception. Third is governance innovation. Explore mechanisms for shared management of digital cultural resources, including cross-border regulations and standards for authenticity verification.

By addressing these challenges, future scholarships can move beyond national or ideological framings toward a globally dialogic understanding of digital civilization—one in which cultural diversity and technological progress advance together. The Chinese-style cultural metaverse, in this sense, represents not a fixed model but an evolving practice that invites international cooperation in shaping a more inclusive and ethically grounded digital future.

The Chinese-style cultural metaverse, as analyzed through the examples of *Digital Dunhuang*, *Black Myth: Wukong*, and *Digital Central Axis*, demonstrates one evolving approach to connecting technology and cultural heritage. Its global value lies in contributing empirical evidence and institutional experience to the broader debate on how immersive technologies can support cultural continuity, education, and dialogue.

By situating these practices within international frameworks, this study emphasizes that the development of digital culture is a shared global process. The interaction between local experience and global exchange will continue to shape how societies document, interpret, and transmit their cultural knowledge in digital form. In this context, the metaverse is not an endpoint but an ongoing experimental space for collaboration among technologists, scholars, and the public.

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About the author

Jia Dongjiao is a PhD Candidate at the Department of Arts and Cultural Industries, School of Humanities, Tongji University.
15615651209@163.com