

Technology Empowerment and Cultural Inheritance: An Analysis of Communication Challenges in Domestic VR Documentaries on Intangible Cultural Heritage

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Abstract. Virtual reality (VR) creates computer-generated three-dimensional environments that viewers can enter and interact with through head-mounted displays and related devices. When applied to documentary work, VR extends earlier new-media experiments by enabling cultural materials to be captured together with the spatial, performative, and affective conditions in which they are practiced. This is especially pertinent to Intangible Cultural Heritage (ICH), where transmission often depends on live demonstration, situated experience, and participant involvement rather than on written records. In China, however, VR documentary practices in the ICH domain are still at an exploratory stage: projects remain limited in number, production quality is uneven, and access to immersive equipment constrains dissemination. This article therefore examines how VR documentaries can operate as viable carriers for ICH in the domestic context. By discussing recent cases and typical production scenarios, it identifies the advantages and current bottlenecks of VR for ICH documentation and proposes directions for improving audience engagement and cultural communication.

Keywords: ICH VR documentary, virtual reality, communication challenges, technological empowerment, cultural inheritance

1. Introduction

As an essential carrier of human cultural diversity, Intangible Cultural Heritage (ICH) faces the dual challenges of globalization and modernization in its preservation and transmission. With its unique immersive and interactive characteristics, VR technology has become an effective tool to enhance the cultural experience of ICH and expand its channels of dissemination. However, the creation of VR documentaries focusing on ICH in China remains underdeveloped. Current works face multiple challenges, including the inherent technical limitations of VR, constraints in conveying cultural connotations, and limited audience acceptance. These factors have led to a significant gap between actual communication outcomes and initial expectations. This situation calls for an in-depth discussion on the appropriateness and effectiveness of VR technology in the communication of ICH culture.

2. The intrinsic limitations and challenges of VR technology

2.1. Technical dimension: the clash between expressive potential and inherent constraints

2.1.1. The immature VR ecosystem

At present, China's virtual reality (VR) technology is experiencing rapid growth, with continuous upgrades in hardware equipment. However, the domestic VR ecosystem as a whole remains in the exploratory stage. From an application perspective, VR devices have expanded from their initial focus on gaming and video to broader domains such as healthcare, education, and social interaction in recent years. Despite this expansion, most of these sectors are still in early development, and only a mature VR ecosystem can support the technology's integration into a wide range of usage scenarios [1]. From a creative perspective, the release of *Kindergarten in a Mountain Village* by Caixin Media in 2015 marked the birth of China's first VR documentary. Yet overall progress has been relatively slow. Compared to the well-established industrial production systems abroad, domestic VR documentary creation still exhibits early-stage characteristics—few works have been produced, quality varies greatly, and experimentation remains dominant. Aside from a small number of productions by mainstream state media platforms, most VR documentaries are produced by small studios or independent creators, lacking professionalism and standardized production processes. Many works rely on single, repetitive narrative techniques, making it difficult to effectively convey the cultural essence of intangible heritage or evoke emotional resonance among audiences.

2.1.2. Restricted immersive engagement

Current VR documentaries mainly rely on head-mounted displays (HMDs) and handheld controllers to place viewers “inside” a filmed or rendered environment and to let them interact with it physically. In practice, however, several hardware-driven issues still limit how immersive these experiences feel. Even devices advertised as 4K often deliver a lower effective resolution once the image is stretched across a wide field of view, so fine visual elements—embroidered patterns, gestures of a craftsman, surface textures of ritual objects—are not rendered with the clarity that intangible cultural heritage (ICH) materials require. This loss of detail reduces the sense of realism and, for some users, causes visual fatigue. Longer viewing sessions can also trigger discomfort. When the eyes are focusing on a pixelated or slightly delayed image, some viewers report dizziness, eye strain, or mild nausea, especially in room-scale scenes that encourage body movement. A further problem is latency: if the system cannot update the image quickly enough to match the viewer's head or hand movement, the visual channel and the vestibular system fall out of sync, and the user notices a lag. That mismatch is one of the main reasons people take the headset off early. Similar feedback was heard at the *Disappearing Pharaoh* exhibition: despite the exhibition's strong narrative appeal, a noticeable share of visitors reported dizziness after the VR segment and therefore paid less attention to the cultural content that followed. In other words, physiological reactions diverted attention away from the documentary message, weakening exactly the affective and educational impact that VR is supposed to enhance.

2.1.3. The challenges endemic to cinematic endeavors and on-site directorial tasks

Producing VR documentaries raises a second group of difficulties during shooting. Because 360-degree cameras capture everything around them, camera operators and auxiliary gear must be kept completely out of frame, and reflective surfaces have to be treated with special care. In the VR

documentary *Kunqu Nirvana*, for example, the crew placed the panoramic camera in the middle of a rehearsal space whose walls had mirrors; they had to cover nearby reflective areas with curtains so that the production team would not appear in the final stitch. This kind of spatial housekeeping is far more demanding than in conventional shooting. Panoramic rigs also make it harder to make last-second adjustments. Once the camera is placed, the director cannot simply “move in” for a close-up without entering the scene. As a result, movements of performers must be anticipated, and blocking has to be discussed with them in advance. This becomes particularly tricky when filming ICH bearers whose actions are fluid, tacit, or one-off. Another issue is performer awareness. Large VR setups can make participants unusually self-conscious—the well-known Hawthorne effect—so their performance looks staged, and the sense of cultural authenticity is reduced. When this happens, a take that is culturally valuable but unrepeatable may be lost. For documentary work, where many moments cannot be re-created, this is a serious cost.

2.2. Economic considerations: the dichotomy between substantial financial outlay and societal interest

Producing VR documentaries requires a substantial financial investment, particularly at the stage of hardware acquisition, where significant capital is indispensable. For instance, *Harvest of Change*, produced by The Des Moines Register in 2015, reportedly cost around USD 50,000 to make, while different accounts of *The Displaced* by The New York Times suggest production expenses of up to USD 100,000 per minute. High-end VR devices such as the Oculus Rift start at approximately USD 350, and this figure excludes essential auxiliary equipment—VR headsets, controllers, and other interactive devices—all of which further increase overall expenditure.

Moreover, financial input is not confined to the production phase. Continued investment is required during distribution, exhibition, or streaming to maintain the operational viability of VR documentaries. When the costs associated with producing VR content on intangible cultural heritage are transferred to end users—often through subscription-based streaming platforms—viewers may experience economic barriers to access. Such pass-through costs can limit audience reach, exclude certain user groups, and ultimately undermine the public-oriented, educational mission that intangible cultural heritage initiatives rely upon, namely broad civic participation, cultural inclusivity, and advocacy. From a macro-level perspective, this mode of high-cost dissemination appears misaligned with the social and cultural objectives of intangible cultural heritage protection. It therefore becomes essential to ask whether the cultural impact and outreach potential of VR documentaries can truly justify the magnitude of financial resources they consume. The core challenge lies in identifying a sustainable balance between economic viability and cultural value—an equilibrium that is indispensable if VR methodologies are to be meaningfully integrated into the preservation, mediation, and popularization of Intangible Cultural Heritage (ICH).

2.3. Visibility dilemma: the intersection of specialized niche and broad public appetites

Intangible cultural heritage (ICH), which is intrinsically public and communal in nature, encompasses folk and performing arts, social customs, and traditional craftsmanship. As has been observed, innovative modes of communication are essential to ensure its continuity and protection [2]. While virtual reality (VR) offers an immersive and novel pathway for disseminating ICH, it has not yet achieved widespread adoption. On the one hand, VR documentary production is costly, which severely restricts both the quantity and the accessibility of such works, resulting in a limited number of domestically produced ICH-themed VR pieces. On the other hand, the relatively high

price of VR devices constrains audience reach; many potential viewers have neither experienced VR technology nor become familiar with its usage scenarios, which in turn hampers broader uptake of VR-based ICH documentaries.

Furthermore, audiences remain habituated to traditional modes of documentary consumption, particularly via television and other mainstream media. This entrenched preference reduces the communicative effectiveness of VR documentaries on ICH when compared with conventional formats. At present, domestically released works such as *Kunqu Nirvana* and *Exploring Ancient Books* remain limited in number and modest in performance indicators—views, likes, and audience engagement—revealing not only the early-stage nature of the field but also discrepancies in production quality when compared to mainstream documentaries on similar topics. As a result, many potential enthusiasts remain passive observers of this emerging medium rather than active participants, demonstrating a prevailing reluctance to engage in VR-based experiential consumption.

3. The Complexities in conveying cultural inferences within ICH VR documentaries

3.1. A split between what VR shows and what ICH needs

Most VR documentary projects today still work with panoramic camera rigs, and those rigs naturally push creators toward a fairly uniform way of shooting. The camera is often fixed in one spot, sometimes raised on a tripod or a small dolly, but rarely moved through the space the way a conventional camera would be. To make sure the material can be stitched and played back smoothly on common headsets, focal length and framing are usually locked in advance, which makes the depth of the scene look stable but also a bit flat. For ICH subjects this becomes a real drawback. Crafts, music-making, or ritual performances often rely on close-ups to show “how the hand works” — the pressure of the knife, the way the thread is turned, the artisan’s concentration. In film and TV, directors would simply move in with a fast lens and blur the background so that viewers know exactly where to look. In VR, once the shooting point is fixed, you cannot easily “enter” the action with the camera. The viewer has to do the work instead, either by stepping closer in the virtual scene or by using a controller to zoom, which not all audiences are willing to do. Wide-angle lenses, which VR crews often use to secure a full 360-degree field, create another problem: edges of the scene may look stretched, tools and hands can appear longer than they are, and the whole workshop ends up looking slightly unreal. For documentary work — especially for ICH, where the goal is to preserve an authentic working situation — this kind of geometric distortion weakens the truth effect of the image. In the end, the immersive promise of VR is partly offset: viewers do feel “inside,” but they do not always receive the fine cultural information the piece wanted to convey, and the scene can start to look stylized rather than evidential.

3.2. Narrative shortcuts and the missing emotional hook

The same technical setup also shapes how stories are told. Because 360-degree cameras cannot be repositioned freely, directors have fewer options for varying shot size, changing perspective, or guiding attention. If they cut too often, the audience’s sense of presence drops; if they do not cut, the narrative can stall. Many teams therefore keep to longer takes to protect immersion, but this means classical montage — the main tool for building causality, tension, and character — is used much less than in ordinary documentaries. Runtime makes things tighter. A survey of 44 VR documentary pieces at festivals such as Sundance, Tribeca, and SXSW in 2016–2017 showed an average length of about 11–12 minutes [4]. On Chinese platforms, ICH-oriented VR segments are often even shorter

— sometimes only a few minutes, occasionally 15–16 minutes, and only individual projects like Millennial Artifacts try to reach 25 minutes. With so little time, creators have to pack background information, cultural context, and emotional build-up into a single, concentrated unit. If any one of these parts is weak, the audience will understand the craft but not necessarily care about the bearer. We can see this in episode seven of *Voices from the Greater Bay Area*: during the Cantonese opera section, almost three quarters of the 360-degree field is dark, and meaningful action is confined to a small segment of the view. Viewers then spend attention on “where to look” instead of on “what this performer is doing.” The emotional line — respect for the tradition, empathy for the performer, curiosity about continuation — is therefore only half achieved. Technically the piece is immersive, but narratively the energy leaks away.

3.3. On the custodianship of ethical boundaries and the question of authenticity

When comparing virtual reality (VR) documentaries with their conventional counterparts, two distinguishing features immediately surface: heightened immersion and varying degrees of interactivity. VR environments grant viewers an unusually active role in meaning-making, allowing them to navigate within designed spaces and, to some extent, influence the sequence or emphasis of what is experienced. This participatory agency inevitably challenges the ethical and representational assumptions long associated with documentary realism—assumptions premised on the camera’s claim to record events, subjects, and social realities with objective fidelity. Unlike traditional documentaries, VR documentaries construct “virtual worlds” through immersive technologies, often borrowing from game aesthetics and interaction logics. As a result, the line separating lived reality from simulated experience becomes blurred, and the representational pact between filmmaker and audience is rendered less transparent. This problem is especially salient in ICH-oriented VR works such as *Exploring Ancient Books*, which present 360-degree reconstructions and invite viewers to inhabit the role of historical scholars engaging with cultural artifacts. While such design enhances presence and engagement, it does so by offering an experience that is largely speculative rather than historically or ethnographically grounded. Herein lies a central paradox: VR is highly capable of mimicking material forms, spatial settings, and ritualized behaviors, yet it can simultaneously distance viewers from the very cultural essence ICH documentation seeks to safeguard. The notion of “authenticity” in such gamified or performative VR spaces thus becomes layered and unstable. Are we authenticating the artifact, the experiential illusion, the user’s affective response, or the authorial reconstruction? In media where the real and the artificial are structurally interwoven, the question “what counts as authenticity?” is no longer merely theoretical—it becomes the keystone for evaluating the legitimacy, ethics, and documentary value of ICH VR productions.

4. Audience reception of ICH VR documentaries

4.1. Audiences' experiential perception: between "wow" and "what is it about?"

VR documentaries, as a new way of telling stories in the digital environment, are very good at making people feel “I am there.” Headsets, spatial sound, and 360° images wrap the viewer in a scene, so first-time users often react first to the technology itself. They look around, test the controller, and try to see “how real it is.” At that moment, their attention is tied to sensory novelty rather than to the documentary argument. Because VR allows free exploration, viewers can move to parts of the scene that interest them personally — an object in the corner, a costume, a ceiling pattern — but this freedom also means they may miss the cues the director wanted them to follow.

When the topic is ICH, this becomes more obvious: the cultural meaning is often subtle, layered, or ritualized, and it usually needs a bit of guided buildup. If the user spends too much time “playing,” the emotional line — respect, empathy, or identification with the heritage bearer — remains underdeveloped. The result is an impressive experience but a shallow understanding. We have seen cases where the visual effect was strong but the cultural core stayed vague; these works tend to work better for small, spectacular subjects than for large, meaning-rich ICH themes that require explanation, context, or translation across regions. For this reason, VR pieces on ICH need to tie technological attraction back to story: spatial sound should point to the performer, interaction should unlock extra cultural information, and the scene design should guide, not distract. Only when the sensory layer and the narrative layer work together can audiences both enjoy “being inside” and grasp what the work wants to say about the practice, the community, and its value.

4.2. Acceptance: narrow reach, but room to experiment

So far, VR in documentary work is still experimental, and VR projects dedicated to ICH are even fewer. One basic obstacle is access. Head-mounted displays, suitable spaces, and staff support are still needed in many cases, which limits how many people can actually watch. The VR documentary *Exploring Ancient Books*, released in March 2023 at the National Museum of Classic Books, is a good example: it offered a well-designed, high-quality viewing experience, but it was only open in scheduled, time-limited sessions, so the total audience stayed small. Audience acceptance is also uneven because ICH itself is highly local and community-bound. What feels meaningful to one group may feel distant to another. At the same time, the participation of ICH practitioners matters: if inheritors are hesitant about headsets, motion capture, or staged reenactment, it becomes hard to produce persuasive VR content. In other words, technology on its own does not secure transmission — it needs both viewers who are willing to try and cultural bearers who are willing to be recorded in this way. The upside of being at an early stage is that formats are still open. Producers can combine VR with more familiar 2D documentaries, museum installations, or short-video promotion — something similar to the “secondary marketing” model used in some recent Chinese film releases, where the main work is supported by derivative interactive pieces. Projects such as *The China in Intangible Cultural Heritage* show that existing cultural narratives can be re-cut and re-staged for VR to make them more participatory. As devices become cheaper and distribution moves beyond museums to platforms, festivals, and schools, ICH-themed VR will be able to reach broader publics while still keeping the depth needed for cultural preservation.

5. Conclusion

At present, the creation of ICH-themed VR documentaries in China remains at an early exploratory stage. As an emerging cultural communication medium, this field inevitably faces a range of complex, multidimensional challenges. These challenges not only concern the technical limitations of VR itself but also deeply involve the accurate articulation of cultural connotations and the varying levels of audience receptivity to this novel format. Whether VR documentaries can effectively facilitate the dynamic transmission and widespread communication of intangible cultural heritage remains an urgent question requiring further reflection and study. To enhance their suitability and impact as a medium for cultural communication, ICH VR documentaries should integrate multiple communication channels, strengthen the excavation and interpretation of cultural depth, and optimize both audience experience and accessibility. Through the deep integration of VR technology

and documentary form, this emerging medium has the potential to open new pathways for the preservation, inheritance, and revitalization of intangible cultural heritage.

References

- [1] Gao, T. (2020). The practical dilemmas and development strategies of VR documentaries. *Young Reporter*, (05), 87–88.
- [2] Chen, L., & Lin, D. (2021, November 25). Exploring Fujian's "intangible cultural heritage" craftsmanship: A one-foot-long incense condenses the Maritime Silk Road, inheriting and developing into a 10-billion-yuan industry. *People's Daily Online*. <http://www.people.com.cn>
- [3] Liu, H. (2017). Virtual reality: The documentary nature of VR documentaries. *Young Reporter*, (20), 88–89.
- [4] Luo, X., & Yang, Y. (2017). The current situation, characteristics, and development dilemmas of American VR documentaries: Taking VR documentaries exhibited at the three major U.S. film festivals as examples. *Television Research*, (10), 82–84, 88.
- [5] Tang, J. (2021). A critical reflection on "interactive narrative" in VR documentaries: From the perspectives of interactive narratology and media ethics. *China Television*, (06), 89–93.