

Representation, Audience, and Authority in the Digital Communication of Intangible Cultural Heritage: A Policy-Design Analysis Grounded in an Immersive Heritage Prototype in Ethnic-Minority China

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Abstract

The digital communication of intangible cultural heritage (ICH) in ethnic-minority China is frequently framed as a problem of technological capability. This article argues the reverse: digital ICH communication is a problem of representation, audience, and authority before it is a problem of technology, and the policy architecture currently governing it addresses the technological dimension far more fully than the other three. The argument is developed through an instrumental case constructed by design-based research — an Unreal-Engine-5 immersive prototype of four Yao rituals (wedding, Yellow Mud Drum, Dujie initiation, and the Panwang Festival) built and tested within the policy context of the Jinxiu Yao Autonomous County in Guangxi. The policy corpus and the prototype-development experience are read through Stuart Hall's representation and encoding/decoding theory, Laurajane Smith's Authorized Heritage Discourse, and Salah's reflexive-authenticity framework. On that basis the study identifies five recurring challenges: technology–culture asymmetry, an audience-differentiation deficit, an authority–authenticity tension, ambiguity over AIGC and community rights, and the sustainability of small-population transmission. It then proposes four policy responses calibrated for embedding within the existing Chinese institutional architecture. The framework is offered as a diagnostic baseline intended to structure, not to substitute for, the primary community-voice and audience-reception research that subsequent empirical work must supply.

Keywords: intangible cultural heritage, digital communication, media representation, audience reception, digital platforms, AIGC governance, ethnic-minority China

1. Introduction

The digital transformation of intangible cultural heritage (ICH) has become a global research and policy concern, drawing together cultural studies, communication research, museum studies, and the engineering disciplines that build digital heritage infrastructure (Aydın et al., 2026; Hou et al., 2022). At its centre is an unresolved tension: digital media extend the reach of intangible heritage to audiences and forms that traditional transmission cannot easily address, while raising questions of authority, authenticity, and participation that the digital form does not, in itself, answer. China occupies a significant position in this field. Over two decades it has built an institutional architecture of inheritor designation, inscription, and safeguarding (Liu, 2025), and it has made the digital transformation of ICH a sustained policy priority across recent five-year-plan cycles (Ministry of Culture and Tourism of the People's Republic of China, 2021).

The ethnic-minority regions of southwestern China are a particularly important site for this transformation. The Guangxi Zhuang Autonomous Region, with its substantial multi-ethnic population and established cultural-tourism economy, has been at the leading edge of investment in immersive heritage media, with the Jinxiu Yao Autonomous County among the most prominent recent sites of deployment. The technological capability of these deployments is considerable; what has developed more slowly is the policy and institutional architecture through which their cultural and communicative quality is to be evaluated and sustained.

This article advances a single argument. The dominant policy and industry framing treats digital ICH communication as a problem of technological achievement — of resolution, immersion, and platform reach. The framing is misleading. Whether an immersive experience or a short-video clip communicates Yao heritage well is not, in the first instance, a

function of its technical fidelity but of three communicative conditions: how the heritage is represented and by whom, how differentiated audiences decode it, and how the authority to define authentic representation is distributed. The current Chinese ICH policy architecture endorses community participation as a principle consistent with Article 15 of the 2003 UNESCO Convention (UNESCO, 2003), but it provides limited procedural operationalisation of that principle. The rapid maturation of generative artificial intelligence (AIGC) since 2023 has, in addition, introduced a community-rights and authenticity dimension that the pre-AIGC framework — including the Cyberspace Administration of China's (2023) Interim Measures — was not designed to address.

The argument is developed through an instrumental case constructed by design-based research. Rather than observing an existing commercial venue, the study draws on the design, development, and audience testing of an Unreal-Engine-5 immersive prototype of four Yao rituals, built within the policy context of Jinxiu and used here as the empirical site through which the policy–practice tensions are surfaced. Reading the policy corpus and the prototype experience through an integrated theoretical lens (Hall, Smith, Salah), the study identifies five recurring communication-governance challenges and proposes four policy responses designed to operationalise commitments the current architecture endorses in principle. The contribution is positioned within communication and media studies: it foregrounds representation, audience differentiation, and platform-mediated authority as the analytic core, and it is offered as a diagnostic baseline for the community-voice and audience-reception research that should follow.

2. Literature Review

The study intervenes in four overlapping bodies of work: the digital communication of ICH, the digital representation of ethnic-minority and indigenous communities, community-participation and indigenous-data-governance models, and the emerging scholarship on AI, ethics, and authenticity in heritage. These literatures have grown rapidly but largely in parallel.

2.1 Digital Communication of ICH and the Platform Turn

Research on digital ICH has moved beyond documentation toward treating digital heritage as a communicative and participatory practice (Aydin et al., 2026; Hou et al., 2022). Hou et al.'s (2022) review of embodied ICH digitisation is widely cited as the field's stocktaking moment: the technological repertoire has matured to the point where the limiting factors are conceptual and methodological rather than technical. Two methodological commitments recur: digital storytelling as a participatory transmission technique (Chai-Arayalert et al., 2026; Davidson & Reid, 2020; Permatasari & Cantoni, 2021), and immersive and 3D technologies as means of perpetuating rather than merely archiving heritage (Kantaros et al., 2026). A distinct and, for communication research, increasingly central strand examines short-video platforms. Yi's (2023) performance analysis of a Chinese craftsperson on Douyin shows how heritage practitioners negotiate between the top-down authority of policy and the horizontal mimesis of the platform. Wang et al.'s (2024) mixed-method study of ICH videos on the same platform finds that government-affiliated and inheritor groups dominate ICH presentation, yet audiences respond more favourably to content from outside those authorised positions. This finding bears directly on the questions of representation and authority pursued here. Chinese scholarship on digital ICH, however, has concentrated on technological capacity and platform design, with comparatively weaker engagement with the institutional and representational dimensions that the international literature foregrounds (Liu, 2025; Ren & Lam, 2026).

2.2 Ethnic-minority and Indigenous Representation in Digital Media

A second literature attends explicitly to cultural authority, community consent, and the asymmetries of representational power. In the Chinese context, Bao and Bromeo bin Bianus (2025) find that virtual exhibition halls for Guangxi Zhuang brocade deliver preservation and engagement benefits, but they raise concerns about the authentication of artisan voice when production is centralised in external design teams. At the Guizhou Provincial Museum, Sun and Ch'ng (2025) find that ethnic-minority stakeholders are largely absent from the design and curation of digital displays of their own heritage, and they argue for participatory design as the corrective. Cai and Ch'ng (2025) demonstrate, in turn, that community participation in virtual reconstruction is feasible and substantively shapes representational outputs. Internationally, Gibson's (2024) pointedly titled "Digitization Is Not Decolonization" articulates the principle to which the field is now responding: placing minority heritage in digital form does not, in itself, alter the authority relations that produced the original asymmetry. Taken together, this work establishes that digital representation is shaped not only by technological choices but by procedural ones — by who participates in design and whose voice is foregrounded.

2.3 Community Participation and Indigenous Heritage Governance

A third literature addresses governance: the procedural infrastructures through which community authority over digital cultural materials can be exercised in practice. Its central principle is that communities should hold meaningful authority over the reproduction, circulation, and reuse of their own cultural materials. This principle has been operationalised through the OCAP® framework in a Westbank First Nation collaboration (Gupta et al., 2022), the CARE Principles in

3D digitisation of indigenous heritage (DeHass et al., 2024), and the co-creation of soft-law mechanisms alongside formal IP structures in the Sámi heritage archives case (Tuominen et al., 2023). Across these cases the consistent finding is that genuine community governance requires not one-off consultation but ongoing institutional infrastructures — protocols, oversight, and accountability arrangements (Jones et al., 2023; Prosper et al., 2024). Although its empirical centre of gravity lies in settler-colonial contexts whose histories differ from southwestern China, the literature's procedural insights respond to the more general problem of asymmetry between institutional authority and community knowledge — the problem diagnosed in the present case.

2.4 AI, Ethics, And Authenticity in Heritage

The fourth and most rapidly evolving literature concerns AI in heritage settings. Beyond technical reviews (Li et al., 2026), two critical concerns dominate: the ethics of representation and inclusion (Wibawa & Rusnalasari, 2024), and the status of authenticity where the cultural object can be generated rather than recovered. Salah's (2026) reflexive-authenticity framework, developed below, is the most fully articulated response: conventional object-based authenticity becomes analytically inadequate once AI-generated content enters the heritage chain, and authenticity must be redefined as a procedural property linked to transparency of production and participatory curatorial authority. Mir (2026) argues from Kashmiri archival practice that community consent must be the design starting point and that extractive logics — heritage flowing outward from communities to platforms without reciprocal rights — must be actively resisted. The engagement between this AI-heritage literature and the indigenous-governance literature of Section 2.3 remains incipient, and its engagement with Chinese ICH policy more incipient still.

2.5 The Gap Addressed

No current study integrates representation-theoretic, governance-oriented, and AI-authenticity frameworks into a communication-and-policy analysis of digital ICH in a Chinese ethnic-minority context, grounded in a concrete immersive artefact and its audience testing. The present study addresses that gap.

3. Theoretical Framework

Three theoretical strands are combined into a single analytical lens. The integration is not a matter of theoretical elegance but of analytical necessity: the representational dimension is irreducible to the governance dimension, and the AIGC dimension to either.

3.1 Representation and the Encoding/Decoding Gap

Stuart Hall's (1997) account of representation is the foundational concept. Representation is not a neutral reflection of pre-existing meaning but a meaning-making practice through which cultural identity is actively produced. Selecting which ICH elements are digitised, foregrounded, or omitted is therefore a representational decision that shapes what audiences come to recognise as authentically Yao or authentically "ethnic-minority Chinese." Hall's (1980) encoding/decoding model adds a second, communication-specific move: the meaning a producer encodes and the meaning an audience decodes do not coincide, and audiences bring distinct interpretive resources to the same text. This gap is the conceptual home of the audience-differentiation problem developed in Section 7.2, where a heterogeneous visitor population — Yao community members, Han-majority visitors, other minorities, international tourists, educational groups — decodes a single encoded experience unevenly. Hall's later work on the politics of representation supplies the third move: representational practices are entangled with power, with the question of whether a digital experience speaks for or to a community being one of representational authority rather than communicative tone.

3.2 Authorized Heritage Discourse and the Question of Voice

Laurajane Smith's (2006) concept of Authorized Heritage Discourse (AHD) supplies the vocabulary for that authority question. Heritage, for Smith, is not a self-evident category of objects but a discursive formation: it is what authorised speakers — expert, state, or institutional voices — recognise as worthy of safeguarding, a recognition that can marginalise lived community practice. Digitisation does not, in itself, alter this authority structure; it can reproduce the AHD inside new technological forms or provide an occasion for its reform (Smith & Akagawa, 2009). The platform literature gives this an empirical edge: Wang et al. (2024) show authorised groups dominating ICH presentation on Douyin even as audiences gravitate elsewhere, and Yi (2023) shows practitioners caught between policy authority and platform logic — the AHD, in short, has been digitised. Smith's framework directly informs Challenge 3 (Section 7.3) and grounds Pillars 1 and 2.

3.3 Reflexive Authenticity in Algorithmically Mediated Heritage

Hall and Smith both wrote before generative AI matured as a force in cultural production. To address the AIGC dimension, the study draws on Salah's (2026) reflexive-authenticity framework. When a culturally themed image, voice, or narrative is generated by a model trained on a community's materials, the conventional authenticity test — verification against an

original — cannot be applied: there is no original, and the model distributes meaning-production across unattributable contributions. Salah redefines authenticity as a procedural and reflexive property: an artefact is authentic to the degree that its production process is transparent, its curatorial authority demonstrably participatory, and its surrounding infrastructure capable of continuous community oversight. Salah’s warning of “epistemic drift” — the gradual displacement of community-anchored meaning by plausible-but-unverified synthetic narratives at machine scale — names the specific risk that motivates Challenge 4 and informs Pillar 4.

3.4 An Integrated Lens

The three strands rest on three claims: digital ICH communication is a representational practice (Hall) before it is a technological deployment; the production of digital ICH content is governed by an authority structure (Smith) that digitisation can reproduce or reform; and AIGC restructures the question of authenticity (Salah), requiring a shift from object-based to process-based evaluation. Table 1 maps the strands to the challenges and pillars that follow. Figure 1 visualises this integration as a left-to-right flow from the theoretical strands through the five challenges to the four policy responses.

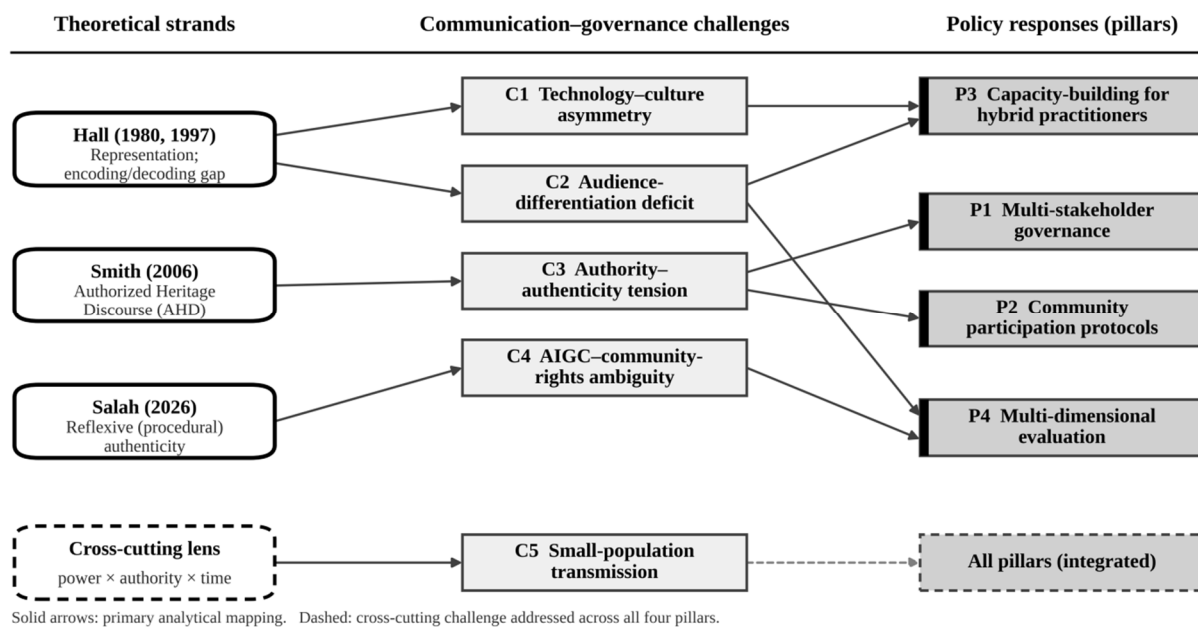


Figure 1. The integrated analytical framework: theoretical strands mapped to communication-governance challenges and policy responses

Table 1. Theoretical strands mapped to the challenge-pillar architecture

Theoretical strand	Primary concepts	Challenges	Pillars
Hall (1980, 1997)	Representation as constitutive; encoding/decoding gap; politics of representation	C1, C2	P3
Smith (2006); Smith & Akagawa (2009)	AHD as discursive formation; expert-state authority; community voice	C3	P1, P2
Salah (2026)	Authenticity as procedural; transparency of production; epistemic drift	C4	P4
Cross-cutting	Representational power × authority structure × procedural authenticity over time	C5	All pillars

4. Methodology

4.1 Design and Approach

The study adopts a qualitative, interpretivist design that integrates a document analysis of the national and regional ICH policy corpus with an instrumental case study (Stake, 1995; Yin, 2018) realised through design-based research. The case is not an existing commercial venue but an immersive heritage prototype designed, developed, and tested by the research team within the Jinxiu policy context; the prototype and its testing serve as the empirical site through which the policy-practice tensions are surfaced. Document analysis is treated not as the recovery of transparent records but as the reading of discursively constructed artefacts that both reflect and shape the field of action they describe (Bowen, 2009; Cardno, 2018). The policy corpus spans January 2017, when the State Council’s Opinions inaugurated the current ICH policy cycle, to early 2026. It comprises national instruments, Guangxi regional instruments, county-level plans, and the cross-

cutting 2023 AIGC measures, all located through official government and ICH portals. Chinese-language documents were analysed in the original, with selected passages translated by the research team to preserve discursive register (Birbili, 2000).

4.2 The Prototype as Instrumental Case

The prototype — a virtual interactive experience of four Yao rituals built in Unreal Engine 5 — is described in Section 6. For methodological purposes three features matter. First, it was constructed from primary field material: the research team photographed and recorded Yao villages, ritual settings, and artefacts (including Yellow Mud Drum and Dujie sites) and used these, together with 3D scanning and in-engine modelling, as the basis for digital assets. Second, it was tested with target audiences under controlled conditions. Third, its development surfaced precisely the representational, authority, and authenticity decisions that the theoretical lens predicts — decisions that an external document analysis alone could not have rendered visible.

The prototype was evaluated with 60 participants drawn by stratified quota sampling: 25 Yao, 25 Han, and 10 members of other ethnic minorities. Each completed an approximately 15-minute continuous experience of the four scenes, with full-session screen recording and behavioural logging, followed by a questionnaire and a semi-structured interview. This testing formed one strand of a wider doctoral programme that also included audience-perception and expert-consultation components. The audience-testing protocol received ethics approval from the relevant institutional review board (approval no. 600-576/2025; institutional identifiers withheld to preserve anonymity for blind review), and all participants provided informed consent prior to participation. The reception patterns, behavioural measures, and expert-consensus results these instruments yield fall outside the analytic remit of the present paper, which is concerned with policy design rather than audience psychology or human–computer interaction; they are the subject of separate empirical work. The present article is a policy-oriented and media-studies intervention with a different research object: it draws on descriptive features of the design and testing process to ground its policy-design analysis rather than presenting reception metrics as analytical claims. This division reflects a difference in research question and keeps the present paper’s claims at the policy-design level at which they are pitched.

4.3 Analysis, Reflexivity, and Limitations

The policy corpus and the design-and-testing record were analysed using reflexive thematic analysis (Braun & Clarke, 2019), with a hybrid coding strategy: deductive codes drawn from the theoretical framework (representation, AHD, reflexive authenticity) and inductive codes capturing patterns the framework did not anticipate. Themes were constructed iteratively and triangulated across document categories and the design record. The research team’s position is reflexively dual. The design and development team are not external observers of the design–policy interface but participants within it. This positionality is treated as an analytical resource, since it enables forms of design-process reflexivity an external researcher could not achieve. It is also acknowledged as a source of potential bias toward design-internal concerns. The challenge and pillar structures in Sections 7 and 8 emerged in part from the research team’s encounter with the policy gaps that became visible during development and testing, an epistemic standpoint distinct from, but complementary to, document analysis alone.

Three limitations frame the contribution. First, the study does not present primary community-voice findings or audience-reception results as analytical claims; it is positioned as a diagnostic and framework-building study. Second, the single-case design constrains cross-site generalisation, which is analytical rather than statistical in Yin’s (2018) sense. Third, the study addresses the immersive form of digital ICH and does not analyse the short-video platform ecology that constitutes the other major channel of contemporary ICH communication (Wang et al., 2024; Yi, 2023); that ecology is identified as a priority for subsequent work.

5. Policy and Regulatory Context

Chinese ICH governance is organised through a four-tier architecture — national fundamental law, national five-year planning, specialised national and regional plans, and county-level operational planning — intersected since 2023 by a cross-cutting AIGC regulatory layer (Table 2). At the base, the Law on the Protection of Intangible Cultural Heritage (National People’s Congress Standing Committee, 2011) establishes the inheritor-designation system and a principle of community-rooted safeguarding consistent with the 2003 UNESCO Convention, while the Tourism Law (National People’s Congress Standing Committee, 2013/2018) governs heritage-based cultural tourism. The five-year-planning instruments translate this foundation into time-bound commitments. The 14th Five-Year Plan and 2035 Vision (National People’s Congress of the People’s Republic of China, 2021) embed the digital transformation of heritage within cultural-confidence and ethnic-minority-protection objectives, a commitment carried into the corresponding sector plan (Ministry of Culture and Tourism of the People’s Republic of China, 2021). The 15th Five-Year Plan Recommendations (Central Committee of the Communist Party of China, 2025) extend it to the integration of AI and immersive technologies.

At the regional level, the Guangxi 14th Five-Year Plan for Cultural and Tourism Development (Guangxi Zhuang Autonomous Region Government, 2022) operationalises these commitments through a Digital Cultural Tourism Programme and dedicated provisions for ethnic-minority destinations. The Guangxi ICH Protection Regulation (Standing Committee of the Guangxi Zhuang Autonomous Region People's Congress, 2017) gives the national law regional force and requires ICH protection to be embedded in development planning. As of 2022 Guangxi held 70 national-level and 914 regional-level ICH items (Bin & Mo, 2022), making it one of China's most heritage-dense ethnic-minority regions. At county level, Jinxiu's plans (Jinxiu Yao Autonomous County People's Government, 2020, 2021) articulate an "ecological county, tourism-strong county" strategy and commit to immersive ICH infrastructure and the "World's Yao Capital" brand.

The cross-cutting AIGC layer — the Cyberspace Administration of China's (2023) Interim Measures — establishes content-safety, intellectual-property, and training-data obligations for AIGC services generally, but does not address the distinct community-rights questions that arise when ethnic-minority cultural materials enter AI training datasets or generated outputs. Read through Smith's (2006) AHD lens, the corpus exhibits a consistent pattern across all four tiers. Heritage authority is assigned to a defined set of authorised speakers: ministry officials, designated experts, and accredited inheritors. Community participation, by contrast, appears as a principle consistent with Article 15, but it is rarely operationalised through procedures that would give community voice traction against production decisions. The Chinese instantiation differs from the settler-colonial contexts in which AHD was developed, but the underlying dynamic — authority concentrated in expert-state speakers, community voice as principle rather than procedure — is structurally homologous, and the 2023 AIGC layer has so far reproduced rather than reformed it.

Table 2. The four-tier architecture of Chinese ICH governance with the cross-cutting AIGC layer

Tier	Representative instruments	Function
Tier 1: National fundamental law	ICH Protection Law (2011); Tourism Law (2013, rev. 2018)	Legal foundation; inheritor-designation system; community-rooted safeguarding
Tier 2: National five-year planning	14th FYP & 2035 Vision (2021); 15th FYP Recommendations (2025)	Strategic envelope, including digital and AI commitments
Tier 3: Specialised national & regional plans	National & Guangxi cultural-tourism plans (2021–2022); Guangxi ICH Regulation (2017)	Sector-specific priorities and regional implementation
Tier 4: County-level planning	Jinxiu 14th FYP (2021); Jinxiu Cultural-Tourism Integration Plan (2020–2030)	Project-level commitments at the implementation site
Cross-cutting: AIGC layer	Interim Measures for Generative AI Services (Cyberspace Administration of China, 2023)	Governs AIGC generally; not integrated with ICH-specific architecture

Note. Full bibliographic details for every instrument listed are given in the reference list.

6. The Case: An Immersive Yao-Ritual Prototype in its Jinxiu Context

6.1 The Jinxiu Setting

The Jinxiu Yao Autonomous County is among Guangxi's most prominent sites of digital ICH deployment. Its tourism economy has grown rapidly under a development strategy built around the "World's Yao Capital" brand and a complementary "China's Hometown of Yao Medicine" designation. In 2024 the county recorded 10.45 million visitor arrivals and RMB 10.25 billion in tourism revenue (Jinxiu Yao Autonomous County Statistics Bureau, 2025); in 2025 arrivals and total tourism revenue grew by a further 14.9% and 12.6% year on year, with domestic tourism revenue rising by 19.2% (Jinxiu Yao Autonomous County Statistics Bureau, 2026). Yet the cultural-transmission base on which this activity ultimately rests is far narrower than the headline figures suggest. At the 2020 census the county's Yao population stood at 48 557, or 37.26% of the resident population, distributed across five subgroups (Jinxiu Yao Autonomous County Statistics Bureau, 2021). That population supports a recognised inheritor cohort of only 19 — one designated at national level and 18 at autonomous-region level — whose average age is rising (Xinhua News Agency, 2026); the practitioners qualified to lead the Yellow Mud Drum, Dujie, and Panwang ritual segments are fewer still. The county's resident population has declined from 139 475 in 1990 to about 120 200 in 2025, with a large hukou-to-resident differential indicating substantial out-migration (Guangxi Zhuang Autonomous Region Statistics Bureau, 2026; Jinxiu Yao Autonomous County Statistics Bureau, 2025, 2026; Table 3). Annual visitor arrivals thus exceed the recognised inheritor cohort by more than five orders of magnitude. This is the demographic substrate against which any digital ICH infrastructure in the county must be read.

6.2 The Prototype

Within this context, the case examined here is a virtual interactive heritage experience — the Yao Four-Ritual Immersive Experience — developed in Unreal Engine 5 as a research prototype rather than a deployed commercial venue. It reconstructs four ritual contexts central to the county's ICH inventory: the Yao wedding ceremony, the Yellow Mud Drum, the Dujie initiation rite (including its "climbing the knife mountain" and "crossing the sea of fire" trials), and the Panwang

Festival. The experience unfolds in first-person perspective. It is structured not as open free-roaming but as a guided interaction loop: the visitor enters, inspects a sequence, completes it within a time window, and unlocks the next. This loop combines a phase-adaptive guidance strategy, delivered through a shigong (ritual-master) non-player character, with a multi-branch narrative logic. Environmental atmosphere is handled by a dynamic day–night and weather system (Ultra Dynamic Sky); digital assets were produced primarily through 3D scanning, field videography, and in-engine modelling derived from primary field material collected during fieldwork in Jinxiu.

The prototype's use of generative AI was deliberately bounded and is instructive precisely because of that. AIGC was applied principally to synthesise the shigong NPC's spoken ritual lines from a prepared Yao-context voice-line reference; the remainder of the cultural content was built from scanned, filmed, and modelled assets rather than generated. Even this limited application encountered, in microcosm, the provenance-and-consent questions that Section 7.4 develops at the policy level: there was no established procedure specifying whose authority should govern the synthesis of a ritual specialist's voice, or how community consent over such synthesis should be recorded. That a sparing, research-controlled use of AIGC already met an unspecified governance space is itself a finding about the policy architecture. Figure 2 presents the prototype of the VR environment, with the details showing: (1) the Yao wedding ceremony scene featuring the shigong NPC, (2) the Yellow Mud Drum scene, (3) the Dujie initiation rite, and (4) the Panwang Festival scene.



Figure 2. Visual design in the VR prototype

6.3 Audience Testing

The prototype was tested in situ with 60 participants stratified across Yao (25), Han (25), and other ethnic-minority (10) audiences. Each experienced the four scenes continuously for about 15 minutes while the system captured screen recordings and behavioural logs, including gaze dwell time, interaction failures and triggers, and disorientation or backtracking. Questionnaires and semi-structured interviews followed. Consistent with the division set out in Section 4.2, the analytical results of this testing fall outside the scope of the present paper. What matters here is that the testing population was, by design, culturally heterogeneous. This is the very condition under which Hall's encoding/decoding model predicts divergent decoding of a single encoded experience, and it is the condition that the audience-differentiation analysis in Section 7.2 takes up.

The encoding/decoding gap anticipated by the theoretical framework was immediately legible in the post-experience interviews. One Yao participant evaluated the experience against lived practice, noting that the ritual scene felt familiar but that some sequences seemed too theatrical compared with how elders conduct them in the village. A Han visitor, lacking that cultural schema, reported understanding the visuals yet being unsure which parts represented sacred ritual and which had been added for immersion. A third participant surfaced the procedural ambiguity of AI generation, developed fully in Challenge 4, observing that the synthesised voice sounded realistic but that its provenance was unclear. These contrasting decodings of a single encoded experience concretise the representational and governance challenges to which this analysis now turns.

Table 3. Key comparative indicators, Guangxi and Jinxiu (2025)

Indicator	Guangxi	Jinxiu
Resident population (2025)	49.89 million	120 200
Natural population growth rate (2025)	−0.90‰	−3.03‰
Ethnic-minority share of residents	~37.6% (Zhuang 31.4%)	37.26% Yao (2020 census; five subgroups)
ICH inventory (national / regional)	70 / 1115 (2025)	2 / 25 (2026)

Note. Guangxi resident population, natural growth rate, and ICH inventory: Guangxi Zhuang Autonomous Region Statistics Bureau (2026). Jinxiu resident population and natural growth rate: Jinxiu Yao Autonomous County Statistics Bureau (2026). Jinxiu Yao population share: Seventh National Population Census (Jinxiu Yao Autonomous County Statistics Bureau, 2021). Jinxiu ICH inventory: Xinhua News Agency (2026).

7. Five Communication-Governance Challenges

Applying the integrated lens to the policy corpus and the prototype experience surfaces five recurring challenges (Table 4). They are not independent silos but interconnected facets of one problem space, and each is presented through a common sequence: a theoretical entry point, its manifestation in the case, an international comparative reference, and the policy implication it carries.

Table 4. The five communication-governance challenges

Challenge	Theoretical anchor	Manifestation in the case	Pillar
C1 Technology–culture asymmetry	Hall (1997): representation as constitutive	Technical capability outpaces cultural-design capacity	P3
C2 Audience-differentiation deficit	Hall (1980): encoding/decoding	One encoded experience for a heterogeneous decoding audience	P3, P4
C3 Authority–authenticity tension	Smith (2006): AHD	Industry-timeline production vs. community-timeline consultation	P1, P2
C4 AIGC–community-rights ambiguity	Salah (2026): reflexive authenticity	AIGC voice synthesis with no provenance/consent procedure	P4
C5 Small-population transmission	Cross-cutting	Visitor scale vastly exceeds the ageing inheritor base	All

7.1 Technology–culture Asymmetry

Read through Hall's (1997) constitutive view, the generative work of an immersive experience depends not on the sophistication of its apparatus but on the depth of its cultural-design substrate. The case exemplifies the asymmetry. Producing a high-fidelity environment — dynamic sky, first-person interaction, scanned assets — was tractable with available tools. The cultural-design decisions were not. How a ritual sequence should be framed, what may be shown and what withheld, and how the shigong's authority should be represented all demanded competence that the technical pipeline does not supply and that the wider practitioner labour market produces only thinly. The international literature converges on this diagnosis: Sun and Ch'ng (2025) document ethnic-minority stakeholders' absence from digital-heritage design, and Gibson (2024) argues that digitisation does not, by itself, redistribute representational authority. The implication is that closing the asymmetry requires cultivating cultural-design capability (Pillar 3), not further technology investment alone.

7.2 Audience-differentiation Deficit

Hall's (1980) encoding/decoding model frames the second challenge precisely. The case prototype, like most digital ICH content, encodes a single experience, yet its tested audience was deliberately heterogeneous — Yao community members for whom the ritual content carries embodied prior meaning, Han-majority visitors with limited cultural-schema preparation, and other minorities reading through the horizon of their own traditions. A single encoded message is thus delivered to materially different decoding communities, producing systematically uneven cultural-meaning transfer. The platform literature reinforces the point at scale: Wang et al. (2024) find that audiences decode ICH short videos differently from how authorised producers encode them, gravitating toward non-authorised voices, and You (2025) shows young audiences decoding endangered heritage through frames distinct from those of bearer communities. The implication is twofold: design must anticipate the decoding gap rather than treat the audience as uniform, and evaluation must capture comprehension and meaning transfer, not engagement alone (Pillars 3 and 4).

7.3 Authority–authenticity Tension

Smith's (2006) AHD frames the third challenge. Traditional transmission routed cultural authority through elders, ritual specialists, and trained ethnographers, each able to veto misrepresentation at a specific link. Digital production instead distributes authority across many micro-decisions that are difficult to audit retrospectively. The tension becomes acute when production runs on industry timelines of weeks while community consultation runs on ritual and seasonal ones. In the case, decisions about how to render the Dujie trials or the Panwang sequence had no procedural channel through

which community authority could be exercised against the production schedule — community participation existed as principle, not procedure. Yi's (2023) account of a craftsperson negotiating between policy authority and platform logic, and Bao and Bromeo bin Bianus's (2025) finding of attenuated artisan voice in Zhuang-brocade virtual halls, document the same structure. The implication is a need for governance and procedural reform (Pillars 1 and 2).

7.4 AIGC and Community-rights Ambiguity

Salah's (2026) reflexive-authenticity framework frames the fourth challenge, which the case renders concrete. Synthesising the shigong's ritual voice through AIGC raised a question the conventional authenticity test cannot answer, because there is no single original utterance to verify against. No governance procedure existed either: nothing specified whose authority should sanction the synthesis of a ritual specialist's voice, or how community consent should be recorded. The Cyberspace Administration of China's (2023) Interim Measures address AIGC provenance in general terms but leave this community-rights dimension unspecified, and the ICH architecture does not fill the gap. Salah's "epistemic drift" names the longer-term risk: as generated cultural content circulates at scale, community-anchored meaning can be displaced by plausible-but-unverified synthetic narratives. The implication is a procedural-transparency requirement built into evaluation (Pillar 4).

7.5 Sustainability of Small-population Transmission

The fifth challenge is cross-cutting. The case county's visitor volume exceeds its recognised inheritor cohort by more than five orders of magnitude, and digital reach can substitute for transmission viability in policy attention and funding even though the former depends on the latter. Where digital scaling diverts resources or attention from the embodied apprenticeship on which the rituals depend, it can erode the very base it represents. Comparative work on small-population heritage — Jones et al. (2023) on intergenerational transmission through Māori archives, Zhao et al. (2026) on willow-weaving inheritance in Inner Mongolia — underscores that digital and embodied transmission must be designed as complements. The implication runs across all four pillars, and specifically requires that evaluation track whether digital reach correlates with, or substitutes for, in-community apprenticeship intake.

7.6 Interconnections

The challenges compound. The technology–culture asymmetry (C1) widens the encoding/decoding gap (C2) because culturally thin design encodes poorly for all audiences; the authority structure (C3) determines whether AIGC use is governed or ungoverned (C4); and all of these bear on whether digital communication supports or competes with embodied transmission (C5). Addressing any one in isolation yields attenuated returns — the rationale for an integrated rather than piecemeal policy response.

8. Four Policy Responses

The four responses below are designed to operate together as an extension of the existing Chinese ICH architecture rather than as a parallel intervention; they aim to operationalise commitments — particularly Article 15 of the 2003 UNESCO Convention — that the current architecture endorses in principle but underspecifies in practice. Each is stated at the level of policy design rather than operational detail (Table 5).

Table 5. The four policy responses

Response	Challenges addressed	Key international precedent	Chinese institutional anchor
P1 Multi-stakeholder governance	C3; C1, C4	Tuominen et al. (2023); DeHass et al. (2024); Gupta et al. (2022)	Cultural & Tourism Bureau; inheritor system
P2 Community participation protocols	C3, C4; C5	OCAP® (Gupta et al., 2022); CARE (DeHass et al., 2024); Mir (2026)	UNESCO 2003 Art. 15; inheritor consultation
P3 Capacity-building for hybrid practitioners	C1, C2; C5	Permatasari & Cantoni (2021); Shiri et al. (2021)	Higher & vocational education; inheritor appointments
P4 Multi-dimensional evaluation	C2, C4; C5	Prosper et al. (2024); Jangra et al. (2025)	Public-funding evaluation; ICH project assessment

8.1 Multi-stakeholder Governance

The first response addresses the authority–authenticity tension (C3) and is anchored in Smith's (2006) insight that the authority structure is the site at which reform has leverage. International precedent — the soft-law co-governance of the Sámi archives case (Tuominen et al., 2023), CARE-based governance for 3D digitisation (DeHass et al., 2024), and OCAP®-based bodies (Gupta et al., 2022) — converges on representing community, scholarly, and institutional voices within the governance body rather than only consulting them. The mechanism proposed is a formally constituted multi-stakeholder council for each major digital ICH project. Its members are community representatives with defined veto authority over red-line cultural questions, heritage scholars, technology specialists, and operations practitioners. The council operates against a published charter that defines decision rights and audit procedures. Adapted to China, the

council should be positioned within the existing Cultural and Tourism Bureau structure at the relevant level rather than as a parallel body, with community representation designated through the recognized inheritor system — rendering explicit and procedural the authority chain that the current framework endorses in principle but leaves procedurally unspecified.

8.2 Community Participation Protocols

The second response supplies the procedure through which that governance exercises authority, addressing C3 and C4 and anchored jointly in Smith (2006) and Salah (2026). Unspecified participation collapses into informal consultation responsive to good intentions but not to bad ones; Arnstein's (1969) distinction between consultation, partnership, and citizen control marks the difference the protocols seek. The mechanism comprises four elements: a pre-project consultation with documented community sign-off on cultural framing and red-line items; in-production review checkpoints (storyboard, alpha, release-candidate) at which the council exercises documented authority; a post-launch feedback mechanism with response timelines and a public modification log; and a community-share revenue arrangement returning a defined portion of project revenue to community-managed transmission funds. Following Tuominen et al. (2023), these are framed not as imports of Western legal apparatus but as soft-law mechanisms operating alongside, and consistent with, the formal Chinese ICH framework. The case underscores why a specific AIGC clause is needed here: a protocol step recording consent and provenance for any synthesis of community voices or imagery would have given the prototype's voice-synthesis decision the procedural channel it lacked.

8.3 Capacity-building for Hybrid Practitioners

The third response addresses the technology–culture asymmetry and audience-differentiation deficit (C1, C2), anchored in Hall's (1997) account of representation as a trained competence. The educational pipeline produces technology and cultural specialists separately, with few practitioners trained at the intersection — the gap the case made tangible. The mechanism comprises three complementary tracks: a tertiary integrated programme combining cultural-studies foundations with immersive-technology methods; a mid-career cross-disciplinary programme for existing practitioners; and, most distinctively, a community-rooted track that builds digital-production capacity within ethnic-minority communities themselves, positioning community members as producers rather than only as cultural sources (Permatasari & Cantoni, 2021; Shiri et al., 2021). The third track addresses C1 and C5 simultaneously by linking production capacity to the in-community knowledge base. Adaptation can build on Guangxi's existing regional higher-education infrastructure and on inheritor joint-appointment arrangements.

8.4 Multi-dimensional Evaluation

The fourth response addresses the audience-differentiation deficit and the AIGC ambiguity (C2, C4), anchored in Salah's (2026) reflexive authenticity. Evaluation that captures only engagement — visitor counts, satisfaction, reach — can detect neither the decoding gap of C2 nor the epistemic drift of C4. Building on Prosper et al.'s (2024) indigenous-assessment framework and Jangra et al.'s (2025) user-experience methodology, the mechanism proposes five evaluation dimensions: engagement; comprehension (cultural-knowledge retention and cross-segment connection); community acceptance (endorsement, complaints, modification requests); transmission viability (whether digital reach correlates with or substitutes for apprenticeship intake); and procedural transparency for AIGC content (the documentary record of training-data provenance, consent procedures, and human curatorial decisions). The fifth dimension is the framework's substantive innovation and the operational expression of Salah's procedural-authenticity construct; it should be applied to publicly funded digital ICH projects as a condition of continued funding, phased to let evaluators develop the necessary instruments, and integrated with existing ministry assessment registers.

8.5 Integration

The responses are interdependent. Pillars 1 and 2 must be implemented as a paired intervention — the council exercises authority through the protocols, and the protocols derive authority from the council. Pillar 3 operates on a longer, educational timeline and should begin in parallel rather than after. Pillar 4 should be phased, instituting engagement, comprehension, and community-acceptance dimensions first and the transmission-viability and procedural-transparency dimensions as their instruments mature. The integration logic — what to couple, what to sequence — is itself part of the contribution.

9. Discussion

The study makes three connected contributions. Theoretically, it demonstrates that digital ICH practice in ethnic-minority contexts cannot be adequately analysed through representation, governance, or authenticity frameworks alone: the three must be brought to bear together. In doing so it extends Smith's AHD framework to a non-settler-colonial context, showing that the expert-state/community asymmetry it diagnoses operates in structurally similar though historically distinct form. It also operationalises Salah's reflexive-authenticity construct as a concrete evaluation dimension. Methodologically and empirically, by grounding the analysis in a design-based research artefact it shows that the policy gaps in question are not

only legible in documents but encountered in practice — the AIGC-consent gap, for instance, appeared in the act of synthesising a single NPC voice. For policy, the identification of the AIGC community-rights dimension as a substantive gap may have particular salience as generative AI moves from emerging to mainstream production technology in the Chinese cultural-tourism sector.

The argument also speaks to the platform-focused communication literature it draws on. Wang et al. (2024) and Yi (2023) show, on Douyin, the same authority structure this study finds in immersive media and policy text: authorised speakers dominate production while audiences decode against the grain. That the pattern recurs across immersive and short-video forms suggests it is a property of the governance architecture rather than of any single medium — which is why the responses proposed here are pitched at the level of governance and procedure rather than of platform-specific design.

Three limits frame these contributions. The framework's transferability beyond the case remains an analytical hypothesis pending comparative work across the southwest ethnic-minority cluster. The analysis is, by design, inferential where direct community-voice and audience-reception data would be preferable; those data exist within the wider programme but are reported separately to preserve their distinct contribution. And the procedural-transparency dimension is calibrated for the current generation of generative AI and will require revision as the technology evolves.

10. Conclusion

This study has argued that the digital communication of intangible cultural heritage in ethnic-minority China is a problem of representation, audience, and authority before it is a problem of technology, and that current policy addresses the technological dimension more fully than the other three. Grounding the argument in an Unreal-Engine-5 prototype of four Yao rituals and its audience testing, read through Hall, Smith, and Salah and against the national and regional policy corpus, it identified five communication-governance challenges and proposed four integrated policy responses calibrated for the existing Chinese institutional architecture. Two conclusions consolidate the analysis: that the substantial Chinese investment in digital ICH has produced an industry-leading technical baseline while the institutional architecture for evaluating and sustaining its cultural quality has lagged; and that generative AI introduces a community-rights and authenticity dimension the current framework was not designed to address and that cannot wait for production practice to harden.

The framework is offered as a diagnostic baseline rather than a closed prescription. Its operational and normative refinement requires the primary community-voice research — Yao inheritor interviews, audience-reception analysis, and AIGC-production ethnography — that document analysis and a single design case cannot supply, together with extension to the short-video platform ecology that constitutes the other major channel of contemporary ICH communication. The policy-design choices made over the next five years will substantially shape whether digital communication becomes a genuine partner to embodied transmission or a competitor for the limited resources on which the long-term viability of ICH depends; this paper aims to provide the analytical and prescriptive infrastructure within which that work can proceed.

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Author contributions

Chao Gao conceived the study, designed and developed the prototype, conducted the fieldwork and audience testing, analysed the data, and drafted the manuscript. Natirath Weeranakin and Ratanachote Thienmongkol supervised the research, contributed to the theoretical framing and methodological design, and critically revised the manuscript. All authors read and approved the final version.

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References

- Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(4), 216–224. <https://doi.org/10.1080/01944366908977225>
- Aydın, S., Schnabel, M. A., Chowdhury, S., & Di Franco, P. D. (2026). Editorial: Digital heritage futures. *Frontiers in Computer Science*, 7. <https://doi.org/10.3389/fcomp.2026.1812123>
- Bao, S., & Bromeo bin Bianus, A. (2025). Enhancing the preservation and dissemination of Guangxi Zhuang brocade patterns through digital virtual exhibition halls. *International Journal of Research and Innovation in Social Science*, 9(10), 1791–1802. <https://rsisinternational.org/journals/ijriss/Digital-Library/volume-9-issue-10/1791-1802.pdf>
- Bin, Y., & Mo, Q. (2022, April 29). Guangxi comprehensively raises the level of intangible cultural heritage protection and transmission. *China Culture Daily*. http://www.mct.gov.cn/preview/whzx/qgwhxxlb/gx/202204/t20220429_932761.htm
- Birbili, M. (2000). Translating from one language to another. *Social Research Update*, 31. University of Surrey.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589–597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Cai, S., & Ch'ng, E. (2025). From memory to model: Engaging communities in the virtual reconstruction of their heritage. *Journal of Cultural Heritage Management and Sustainable Development*. Advance online publication. <https://doi.org/10.1108/JCHMSD-04-2025-0086>
- Cardno, C. (2018). Policy document analysis: A practical educational leadership tool and a qualitative research method. *Educational Administration: Theory and Practice*, 24(4), 623–640. <https://doi.org/10.14527/kuey.2018.016>
- Central Committee of the Communist Party of China. (2025). *Recommendations of the Central Committee of the Communist Party of China on formulating the 15th Five-Year Plan for national economic and social development*. https://www.gov.cn/zhengce/202510/content_7046050.htm
- Chai-Arayalert, S., Puttinaovarat, S., & Saetang, W. (2026). A crowdsourcing-based digital storytelling platform for preserving intangible cultural heritage: A case study of Southern Thai textiles. *Heritage*, 9(5). <https://doi.org/10.3390/heritage9050160>
- Cyberspace Administration of China. (2023). *Interim measures for the management of generative artificial intelligence services*. http://www.cac.gov.cn/2023-07/13/c_1690898327029107.htm
- Davidson, A., & Reid, P. H. (2020). Digital storytelling and participatory local heritage through the creation of an online moving image archive: A case study of Fraserburgh on Film. *Journal of Documentation*, 76(5), 1083–1110. <https://doi.org/10.1108/JD-09-2019-0190>
- DeHass, M. C., Collins, L., Taitt, A., & Raymond-Yakoubian, J. (2024). Ethical considerations in the use of 3D

- technologies to preserve and perpetuate indigenous heritage. *American Antiquity*, 90(1), 75–93. <https://doi.org/10.1017/aaq.2024.82>
- Gibson, L. (2024). Digitization is not decolonization: South Africa's Amagugu Ethu Museum project and colonial documentation in digital times. *Museum Worlds: Advances in Research*, 12(1), 31–46. <https://doi.org/10.3167/armw.2024.120104>
- Guangxi Zhuang Autonomous Region Government. (2022). *Guangxi 14th Five-Year Plan for cultural and tourism development*. <http://www.gxzf.gov.cn/zwgk/fzgh/zxgh/t12018699.shtml>
- Guangxi Zhuang Autonomous Region Statistics Bureau. (2026, April 9). *Statistical communiqué on the 2025 national economic and social development of the Guangxi Zhuang Autonomous Region*. <http://www.gx.xinhuanet.com/20260409/894a43eef0614f838b2d81a265cf9ab6/c.html>
- Gupta, N., Bonneau, N., & Elvidge, M. (2022). Connecting past to present: Enacting indigenous data governance principles in Westbank First Nation's archaeology and digital heritage. *Archaeologies*, 18, 569–593. <https://doi.org/10.1007/s11759-022-09466-x>
- Hall, S. (1980). Encoding/decoding. In S. Hall, D. Hobson, A. Lowe, & P. Willis (Eds.), *Culture, media, language: Working papers in cultural studies, 1972–79* (pp. 128–138). Hutchinson.
- Hall, S. (Ed.). (1997). *Representation: Cultural representations and signifying practices*. Sage Publications.
- Hou, Y., Kenderdine, S., Picca, D., Egloff, M., & Adamou, A. (2022). Digitizing intangible cultural heritage embodied: State of the art. *ACM Journal on Computing and Cultural Heritage*, 15(3), Article 55. <https://doi.org/10.1145/3494837>
- Jangra, S., Singh, G., & Mantri, A. (2025). Evaluating user experience in cultural heritage through virtual reality simulations. *Virtual Archaeology Review*, 16(32). <https://doi.org/10.4995/var.2024.22556>
- Jinxiu Yao Autonomous County People's Government. (2020). *Jinxiu Yao Autonomous County cultural-tourism industry integration development plan (2020–2030)*. <http://wlt.gxzf.gov.cn/zfxxgk/fdzdgknr/jytajg/t16822240.shtml>
- Jinxiu Yao Autonomous County People's Government. (2021). *Outline of the 14th Five-Year Plan and the 2035 long-range objectives of the Jinxiu Yao Autonomous County*. <http://www.jinxiu.gov.cn/xxgk/zfxxgk/fdzdgknr/ghjh/ghxx/zcqh/t9872769.shtml>
- Jinxiu Yao Autonomous County Statistics Bureau. (2021). *Main data bulletin of the Seventh National Population Census of the Jinxiu Yao Autonomous County*. https://www.thepaper.cn/newsDetail_forward_13114222
- Jinxiu Yao Autonomous County Statistics Bureau. (2025). *Statistical communiqué on the 2024 national economic and social development of the Jinxiu Yao Autonomous County*. <http://www.jinxiu.gov.cn/xxgk/zfxxgk/fdzdgknr/sjfb/tjgb/t20821800.shtml>
- Jinxiu Yao Autonomous County Statistics Bureau. (2026). *Statistical communiqué on the 2025 national economic and social development of the Jinxiu Yao Autonomous County*. <http://www.jinxiu.gov.cn/xxgk/zfxxgk/fdzdgknr/sjfb/tjgb/t27541625.shtml>
- Jones, P.-L., Mahelona, K., Duncan, S., & Leoni, G. (2023). Ngā taonga tuku iho: Intergenerational transmission using archives. *Ethical Space: The International Journal of Communication Ethics*, 20(2/3). <https://ethicalspace.pubpub.org/pub/udf7dinc>
- Kantaros, A., Ganetsos, T., Nakou, S., & Laskaris, N. (2026). Heritage 4.0: How applied 3D technologies and digital twins are redefining cultural preservation beyond replication. *Heritage*, 9(3). <https://doi.org/10.3390/heritage9030123>
- Li, X., Chiabrand, F., & Sammartano, G. (2026). Machine learning and deep learning for cultural heritage conservation: A bibliometric and task-oriented review. *Remote Sensing*, 18(4). <https://doi.org/10.3390/rs18040628>
- Liu, X. (2025). The application of digital technology in the protection and inheritance of intangible cultural heritage. *International Journal of Education and Social Development*, 2(3). <https://doi.org/10.54097/hv1vkr94>
- Ministry of Culture and Tourism of the People's Republic of China. (2021). *14th Five-Year Plan for cultural and tourism development* (Document No. 4 [2021]). https://www.mct.gov.cn/whzx/whyw/202106/t20210602_925173.htm
- Mir, A. S. (2026). What is worth preserving in digital archiving? Community, consent and an exploration of the psychology of digital archiving. *International Journal of Social Science Research and Review*, 9(1). <https://doi.org/10.47814/ijssrr.v9i1.3035>
- National People's Congress of the People's Republic of China. (2021). *Outline of the 14th Five-Year Plan for national economic and social development and the long-range objectives through 2035 of the People's Republic of China*.

- http://www.gov.cn/xinwen/2021-03/13/content_5592681.htm
- National People's Congress Standing Committee. (2011). *Law of the People's Republic of China on intangible cultural heritage*. http://www.npc.gov.cn/zgrdw/huiyi/lfzt/fwzwhycbhf/2011-05/10/content_1729844.htm
- National People's Congress Standing Committee. (2013/2018). *Tourism Law of the People's Republic of China* (Original work adopted 2013; second amendment 2018). http://www.npc.gov.cn/zgrdw/npc/xinwen/2018-11/05/content_2065666.htm
- Permatasari, P., & Cantoni, L. (2021). Participatory design to create digital technologies for Batik intangible cultural heritage: The case of iWareBatik. In *Interacción 2021*. https://doi.org/10.1007/978-3-030-78224-5_7
- Prosper, S., Rayburn, A., Ramirez, Y., & Punzalan, R. L. (2024). Indigenous digital projects: An assessment framework. *Information & Culture*, 59(1). <https://doi.org/10.7560/ic59104>
- Ren, K., & Lam, J. F. I. (2026). Knowledge graph-driven digital preservation of intangible cultural heritage: A cross-cultural comparative study of Chinese and Western implementation paradigms. *Humanities and Social Sciences Communications*, 13. <https://doi.org/10.1057/s41599-025-06186-9>
- Salah, M. (2026). Algorithmic memory: Towards reflexive authenticity in cultural heritage. *AI & Antiquity*, 2(1). <https://ai-antiquity.org/index.php/ai/article/view/13>
- Shiri, A., Howard, D., & Farnel, S. (2021). Indigenous digital storytelling: Digital interfaces supporting cultural heritage preservation and access. *The International Information & Library Review*, 54(2), 93–114. <https://doi.org/10.1080/10572317.2021.1946748>
- Smith, L. (2006). *Uses of heritage*. Routledge. <https://doi.org/10.4324/9780203602263>
- Smith, L., & Akagawa, N. (Eds.). (2009). *Intangible heritage*. Routledge. <https://doi.org/10.4324/9780203884973>
- Stake, R. E. (1995). *The art of case study research*. Sage Publications.
- Standing Committee of the Guangxi Zhuang Autonomous Region People's Congress. (2017). *Regulation of the Guangxi Zhuang Autonomous Region on the protection of intangible cultural heritage*. <https://law.pkulaw.com/chinalaw/18024547.html>
- Sun, X., & Ch'ng, E. (2025). Evaluating the management of ethnic minority heritage and the use of digital technologies for learning. *Journal of Cultural Heritage Management and Sustainable Development*. Advance online publication. <https://doi.org/10.1108/JCHMSD-03-2023-0024>
- Tuominen, I., Ballardini, R., Mähönen, J., & Pihlajarinne, T. (2023). Protecting and accessing indigenous peoples' digital cultural heritage through sustainable governance and IPR structures: The case of Sámi culture. *Arctic Review on Law and Politics*, 14. <https://doi.org/10.23865/arctic.v14.5809>
- UNESCO. (2003). *Convention for the safeguarding of the intangible cultural heritage*. United Nations Educational, Scientific and Cultural Organization. <https://ich.unesco.org/en/convention>
- Wang, H., Zhao, M., Hu, W., Ma, Y., & Lu, Z. (2024). Critical heritage studies as a lens to understand short video sharing of intangible cultural heritage on Douyin. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (pp. 1–21). ACM. <https://doi.org/10.1145/3613904.3642138>
- Wibawa, B., & Rusnalasari, Z. (2024). Navigating ethics and innovation: The role of AI in cultural heritage. *Harmonia: Journal of Music and Arts*, 24(2). <https://journal.idscipub.com/harmonia/article/view/905>
- Xinhua News Agency. (2026, May 27). Jinxiu: Guarding the intangible cultural heritage of the Yao homeland and striking a new chord for inheritance and development. *Xinhua Net*. <http://gx.news.cn/20260527/5708783cc68c49aab056fa9013efe4a7/c.html>
- Yi, Y. (2023). Negotiating performance between policy and platform — heritage practice of a Chinese craftsman on Douyin (TikTok). *International Journal of Heritage Studies*, 29(10), 1089–1109. <https://doi.org/10.1080/13527258.2023.2237495>
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.
- You, X. (2025). Cloud-based digital dissemination of Nüshu: Reviving an endangered intangible cultural heritage in modern China. *Journal of Education, Humanities and Social Sciences*, 35. <https://doi.org/10.54097/8mv5f934>
- Zhao, Y., An, N., & You, L. (2026). Weaving digital and traditional heritage: A lightweight ecosystem for willow weaving inheritance in Inner Mongolia. *Cogent Arts & Humanities*, 13(1). <https://doi.org/10.1080/23311983.2026.2623712>