CCKGOVERNANCE IN THE DIGITAL ERA: A practical approach in the Northwest mountainous region, Vietnam

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ABSTRACT: *This study examines institutional governance challenges facing Community Cultural Knowledge (CCK) under digital transformation in Vietnam's Northwest Mountainous Region. It identifies systemic weaknesses of the prevailing centralized governance model in addressing CCK's dual character as both a Digital Public Good and a Common-Pool Resource (CPR). Using a mixed-methods design (N=20 in-depth interviews; N=190 survey responses), the study identifies four interrelated failures. First, institutional fragmentation and the absence of effective meta-governance result in non-interoperable data silos across agencies (80% confirmation). Second, a legal vacuum persists, as conventional intellectual property regimes fail to provide sui generis protection for collective CCK ownership, generating widespread concern over misuse (65%). Third, a persistent digital divide constrains meaningful participation by knowledge holders due to infrastructural and capacity deficits. Finally, the research confirms a strong demand for subjectivity, with 90% of respondents seeking formal co-decision-making authority. The study concludes that hierarchical governance is structurally inadequate. It proposes a co-governance framework based on three pillars: legally mandated sui generis protection, the establishment of Community Knowledge Boards (CKBs) for shared decision-making, and targeted digital enfranchisement programs. This framework offers a viable pathway toward institutional effectiveness, cultural justice, and long-term sustainability.*

Keywords: *Community Cultural Knowledge; Digital Governance; Co-Governance; Institutional Fragmentation; Indigenous Data Sovereignty.*

I. INTRODUCTION

The contemporary geopolitical landscape increasingly mandates digital transformation, positioning the creation of a Digital Society as a strategic objective for national development and administrative modernization. In Vietnam, this is formalized through the National Digital Transformation Program [1], requiring the integration of digital technologies across socio-economic life, notably within cultural heritage management [2]. Success hinges not only on technology deployment but on institutional capacity to govern digitized social assets, particularly CCK, ethically and effectively [3].

The Northwest Mountainous Region exemplifies a context of rugged terrain, economic marginalization, and high ethnic diversity, hosting groups such as the Thai, Mong, and Dao. The region is a repository of CCK, encompassing indigenous languages, ritual arts, traditional subsistence ecology, and collective memory, crucial to local identity, social cohesion, and environmentally and culturally sensitive development. Digitization offers tools to preserve this heritage [4] but also introduces risks of commercial exploitation and legal ambiguity [5].

Implementation of CCK digitization faces structural and practical barriers. Project-based administrative management [6] causes inconsistent execution and poor interoperability among provincial digital platforms [7]. Existing intellectual property laws are ill-suited to protect collective CCK ownership [8], generating community concerns over unauthorized exploitation [9]. Moreover, a persistent digital divide—unstable connectivity [10] and limited digital skills—excludes key custodians, such as artisans and elders, from governance [11].

These intertwined challenges necessitate a shift from hierarchical management to equitable, effective institutional design [12]. This study rigorously examines the operational, structural, and institutional issues in Northwest CCK governance. Its objectives are: (1) to analyze current governance arrangements and inter-agency coordination difficulties; (2) to identify critical gaps in Digital Intellectual Property (DIP) protection and digital capacity; (3) to propose a phased Co-Governance model prioritizing sustainability, legal legitimacy, and active participation of source communities.

II. THEORETICAL FRAMEWORK

Governance of CCK in the digital era requires a multi-layered theoretical framework that goes beyond centralized administrative paradigms. This study integrates four complementary approaches—the Digital Society/Public Goods approach, the Knowledge Governance (KG) framework, the Indigenous Data Sovereignty (IDS) lens, and the CPR/Co-Governance model—to diagnose institutional deficits and propose governance solutions for Vietnam's Northwest Mountainous Region.

1. The digital society and public goods approach: context, classification, and research gaps

The governance context is shaped by the global transition toward a Digital Society, in which digital technologies function as foundational infrastructure. Digital Governance refers to the State's strategic deployment of digital tools to manage public resources and enhance administrative performance [1]. In Vietnam, this orientation is embedded in national policies such as the National Strategy for Cultural Development [3] and the Digital Transformation program [8], positioning digitization as a strategic priority for cultural preservation and inclusive growth.

Digitized CCK exhibits a dual nature that complicates governance design. It functions as a Digital Public Good due to non-rivalrous consumption and potential non-excludability in digital environments [11], justifying public investment. Simultaneously, CCK remains a CPR rooted in communal practices, requiring collective control [8]. This duality creates a central governance dilemma: maximizing public accessibility while safeguarding communal ownership. Failure to reconcile these logics risks either fragmentation or uncontrolled exploitation [9].

This dilemma is intensified by the Digital Divide, which extends beyond infrastructure to include skills and effective ICT use [10]. In the Northwest, digital exclusion undermines procedural legitimacy by marginalizing custodians from decision-making (T4) and compromises authenticity by limiting community validation (T3) [12]. Digital Enfranchisement is therefore a prerequisite for legitimate and effective CCK governance, requiring targeted regional infrastructure and capacity-building [13].

Research Gap 1 lies in the dominance of technology-focused digital heritage studies that overlook vertical institutional fragmentation within state bureaucracies [2], [4], [14]. This study reframes fragmentation (T1) as a consequence of governance models prioritizing technical control over inter-agency coordination, resulting in non-interoperable digital assets [12], [13].

2. The KG framework and institutional deficits

The KG framework provides a diagnostic lens for analyzing how formal rules and informal norms shape knowledge governance within administrative systems [14]. It distinguishes between control-based mechanisms, which rely on hierarchical authority and support technical standardization, and coordination-based mechanisms, which emphasize trust and horizontal collaboration and are essential for governing tacit, community-embedded knowledge.

In the Northwest, excessive reliance on hierarchical control has produced institutional fragmentation. Agencies optimize sector-specific objectives rather than system-wide outcomes, consistent with bounded rationality [6]. The absence of a formalized meta-governance mechanism inhibits horizontal coordination and reinforces data silos [4], [14]. From a KG perspective, these failures indicate that CCK governance requires institutional arrangements centered on coordination rather than control, pointing toward co-governance as the appropriate corrective mechanism.

3. Indigenous data sovereignty (IDS) and the legal imperative

CCK's collective and intergenerational character necessitates a governance framework grounded in the rights of knowledge holders. The IDS lens foregrounds community self-determination and ethical control over culturally derived data [15].

Digitization exposes CCK to risks of digital enclosure and unauthorized exploitation. Conventional intellectual property regimes are structurally inadequate, as they rely on individual authorship and fixed forms, creating a legal vacuum (T2) that fosters mistrust and strategic self-censorship [5], [11]. These risks underscore the necessity of community control for ethical governance.

Research Gap 2 concerns the lack of empirical guidance on operationalizing Sui Generis protection within developing-state administrative contexts. While IDS establishes the normative need for collective rights, existing studies focus on legal principles rather than institutional implementation. This study addresses the gap by situating Sui Generis protection within a co-governance architecture that enables enforceable access and benefit-sharing mechanisms.

Establishing Sui Generis legal protection is therefore a non-negotiable prerequisite. It functions both as a risk-mitigation mechanism against exploitation and as a trust-building foundation that encourages comprehensive community participation.

4. The CPR and co-governance model

Synthesizing institutional fragmentation (T1), legal deficiency (T2), digital exclusion (T3), and the demand for subjectivity (T4), this study identifies Co-Governance as the most appropriate institutional response. Drawing on CPR theory [8], co-governance distributes authority and responsibility between state institutions and CCK custodian communities.

Co-governance operates as an optimization strategy by introducing CKBs that enable horizontal coordination and embed communities directly in decision-making processes. This arrangement operationalizes Sui Generis protection and enhances long-term sustainability [2].

Justice underpins effective co-governance. Procedural justice is achieved through formal community participation in decision-making, while distributive justice is realized through access and benefit-sharing mechanisms that align governance rules with local conditions and support cultural preservation [12].

Taken together, these two research gaps underscore the need for an integrated institutional framework capable of diagnosing fragmentation while operationalizing collective rights in practice.
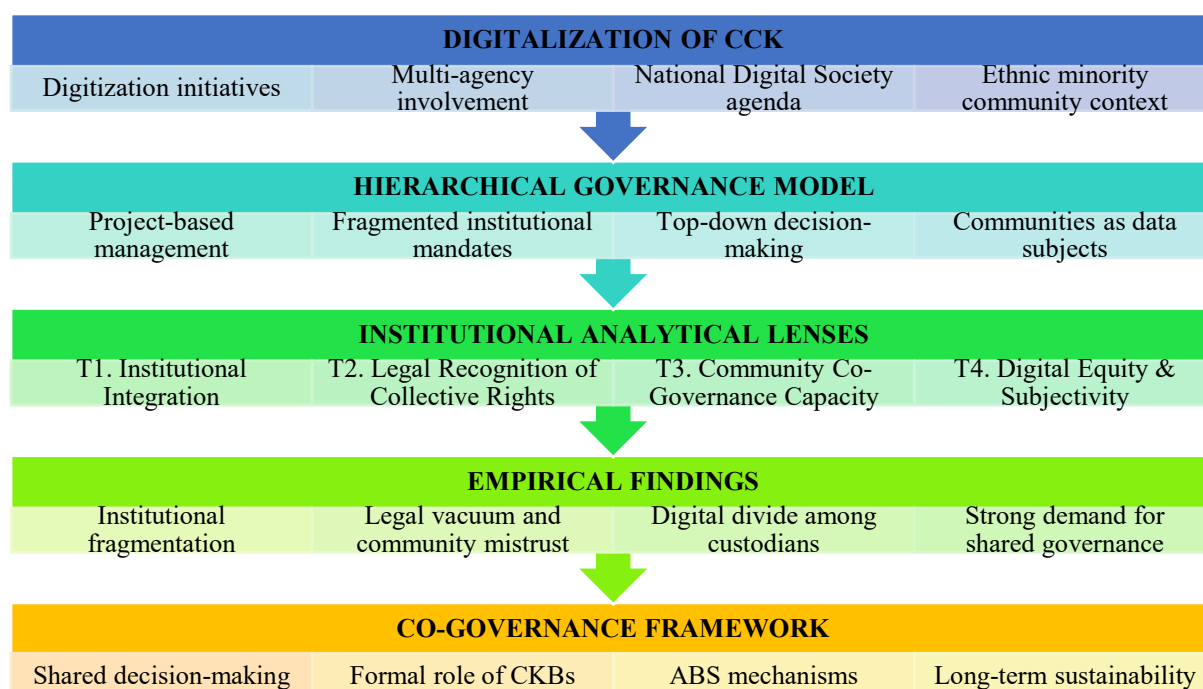
DIGITALIZATION OF CCK			
Digitization initiatives	Multi-agency involvement	National Digital Society agenda	Ethnic minority community context

HIERARCHICAL GOVERNANCE MODEL			
Project-based management	Fragmented institutional mandates	Top-down decision-making	Communities as data subjects

INSTITUTIONAL ANALYTICAL LENSES			
T1. Institutional Integration	T2. Legal Recognition of Collective Rights	T3. Community Co-Governance Capacity	T4. Digital Equity & Subjectivity

EMPIRICAL FINDINGS			
Institutional fragmentation	Legal vacuum and community mistrust	Digital divide among custodians	Strong demand for shared governance

CO-GOVERNANCE FRAMEWORK			
Shared decision-making	Formal role of CKBs	ABS mechanisms	Long-term sustainability

Figure 1. *Institutional Analytical Framework for the Governance of Digitized Community Cultural Knowledge*
Source: Author's synthesis, 2025

Building on the analytical framework, this study conceptualizes the governance of digitized Community Cultural Knowledge (CCK) as an institutional process shaped by interacting structural, legal, and socio-technical conditions. The framework clarifies how hierarchical, project-based governance arrangements generate fragmentation, legal uncertainty, and exclusion of primary knowledge holders, thereby constraining the realization of CCK as a digital public good. By integrating institutional integration, collective rights recognition, community co-governance capacity, and digital equity as interconnected analytical lenses, the framework provides a systematic basis for interpreting empirical evidence. It also explains why Co-Governance emerges not as a normative preference but as an institutional necessity. This framework thus guides both the empirical analysis and the formulation of policy-relevant recommendations in subsequent sections.

III. METHODOLOGY

This research employs a qualitative-dominant mixed-methods design to conduct a comprehensive analysis of the institutional reality underpinning CCK governance. This deliberate methodological choice allows for the integration of deep institutional insights derived from qualitative inquiry with empirical quantification of structural barriers provided by quantitative data, thereby enhancing the overall rigor and applicability of the findings [16]. The study is framed as a Case Study focused on the Northwest Region of Vietnam, utilizing data collected from provinces noted for both high ethnic diversity and active CCK digitization initiatives (e.g., Son La, Dien Bien, Lai Chau, Yen Bai, Hoa Binh and Lao Cai).

1. Data collection strategy

Core empirical evidence was generated through semi-structured In-depth Interviews (N=20). A purposive sampling strategy was employed, which was essential for capturing expert and experiential knowledge across the governance ecosystem:

- *Management and policy group (N=10)*: Included provincial directors/deputy directors (from Departments of Culture, Information, and Planning) and senior academics. Interview protocols rigorously explored inter-agency coordination mechanisms, regulatory efficacy, and perceived institutional barriers.

- *Community and practice group (N=10)*: Comprised traditional artisans, village elders, and local cultural functionaries. Protocols focused on their direct experiences with digitization projects, perceptions of digital risk, collective ownership rights, and demands for governance participation.

All interviews were recorded with informed consent, meticulously transcribed *verbatim*, and subsequently translated for accurate analytical processing.

A supportive quantitative survey (N=190) was administered to local residents within the study area. This component served a crucial function in providing empirical context by quantifying the scale and severity of practical barriers related to the Digital Divide. The survey instrument measured:

>   *(1) self-reported quality of Internet access (used to quantify infrastructure poverty);*
>   *(2) frequency of engagement with digital cultural platforms;*
>   *(3) self-assessed digital literacy skills (used to quantify the capability gap).*

The resultant descriptive statistics provided a robust factual basis to substantiate the severity of the structural issues identified qualitatively.

2. Data analysis protocols

The analysis protocol adhered to high standards of methodological transparency:

- *Qualitative Analysis (Thematic Analysis):* The transcribed interview data was systematically analyzed using Thematic Analysis. This involved an intensive process of initial coding, searching for emergent themes, reviewing, and defining them, culminating in the robust identification of the three core thematic findings presented in the subsequent section.

- *Quantitative Analysis (Descriptive Statistics)*: Survey data was processed using descriptive statistics (frequencies and percentages). These quantifiable results were not used for statistical inference but were strategically woven into the discussion sections to empirically ground the practical context of the qualitative findings.

IV. RESULTS AND DISCUSSION

Analysis of empirical data from N=20 in-depth interviews and N=190 survey responses identified four interrelated institutional themes that undermine the effectiveness and sustainability of digitized CCK in Vietnam's Northwest Mountainous Region. These themes reflect systemic governance deficiencies rather than isolated technical problems, thereby substantiating the need for institutional reform. Using Grounded Thematic Analysis, all qualitative codes were synthesized into four dominant themes (T1–T4). Table 1 summarizes these findings, linking each theme to empirical evidence from community members and provincial managers, and mapping them to corresponding policy imperatives. Collectively, the themes reveal structural failures that impede the transition toward effective Digital Governance.

Table 1. *Summary of core findings and direct policy implications*
(Based on grounded thematic analysis, N=20)

Code/Core Theme	Detailed Empirical Finding	Supporting Qualitative Evidence	Direct Policy Implication
T1/Institutional Fragmentation (KG Failure)	The digitization and archiving systems lack horizontal integration and interoperability across provincial agencies (Culture, ICT, Tourism), leading to non-communicating data silos.	*Manager Interview:* "The data is scattered; there is no common platform. Each Department creates its own page, making quality control very difficult."	Propose an Integrated Governance Model with a formalized, provincial-level Meta-Governance coordination unit to enforce standardization.
T2/Legal Vacuum (Digital IP Protection Deficiency)	The absence of specific mechanisms/regulations to protect the DIP and collective ownership rights of CCK leads to pervasive concerns over unauthorized exploitation.	*Management & Community Interview:* "There is no clear law on protecting an ancient song if someone takes it and sells it. The villagers are very concerned."	Mandate the establishment of a Sui Generis Digital Copyright Framework for CCK to regulate benefit-sharing and enforce compliance.
T3/Digital Divide (Technical/Capability Barrier)	CCK custodians (Artisans, Elders) possess low foundational digital literacy and are concerned about network security, compounded by insufficient	*Community Interview:* "We only know how to use Zalo to call. Digitization is good, but I am afraid of being tricked or clicking on strange places."	Prioritize investment in Broadband Infrastructure to core cultural areas and develop specialized Digital

	quality network infrastructure access.		Enfranchisement training programs for elders.
T4/Demand for Subjectivity (Co-Governance Imperative)	The community demands to move beyond being mere data providers to actively participate in management decisions and equitable ABSfrom digital exploitation (e.g., digital tourism).	*Community Interview:* "If money is made, the villagers must be consulted, and that money must return to the village for preservation."	Establish a Co-Governance Mechanism granting community representatives formal veto or co-decision-making power over the exploitation of sensitive cultural data.

Source: Compiled by the Author based on research data, 2025

Table 1 confirms that the prevailing hierarchical, project-based governance model is institutionally inadequate. Governance failure emerges as a systemic pathology rather than a technological limitation. Institutional fragmentation (T1), legal deficiency (T2), digital exclusion (T3), and the demand for subjectivity (T4) jointly frame the governance challenge as one of coordination, justice, and legitimacy. The following subsections examine each theme.

1. T1 – Institutional fragmentation and sub-optimal resource management

Institutional fragmentation constitutes the most significant structural barrier. 80% of management interviewees reported a lack of interoperability across provincial digitization initiatives, resulting in disconnected data silos governed by separate mandates and short-term project cycles. The absence of a permanent coordinating body leads to inconsistent metadata standards, weak quality control, and limited capacity for centralized data aggregation.

This fragmentation reflects the limitations of a control-based Knowledge Governance model applied to a resource requiring horizontal coordination. The resulting cost of non-interoperability is both financial—through duplicated investments—and strategic, as authorities are unable to conduct cross-cultural analysis for evidence-based planning. Fragmentation also produces accountability deficits, making responsibility for data quality and loss difficult to assign. These findings empirically justify the need for an integrated governance model with a formal provincial coordination unit.

2. T2 – Legal deficiency in digital ip protection and risk of exploitation

The second theme highlights a profound legal vacuum in protecting the collective DIP of CCK. 65% of interviewees expressed concern over unauthorized exploitation, reflecting the inadequacy of individual-centric intellectual property regimes to govern collective, intergenerational knowledge. Initial consent for documentation provides no enforceable control over secondary digital use, creating a perception of vulnerability.

This deficiency generates a moral hazard that encourages strategic self-censorship, as custodians withhold culturally sensitive knowledge. Such behavior compromises the completeness and long-term viability of the national digital archive. The findings provide strong policy justification for a Sui Generis legal framework to mitigate exploitation risks, recognize collective ownership, and establish binding ABSmechanisms. Without addressing this legal vacuum, digitization efforts remain ethically and economically fragile.

3. T3 – The dual barrier to equitable participation and validation

The third theme concerns the Digital Divide as a dual barrier of infrastructure and capability. Survey data indicate that 36,84% of respondents rated internet access as poor or very poor, while qualitative evidence reveals limited digital skills among primary knowledge holders.
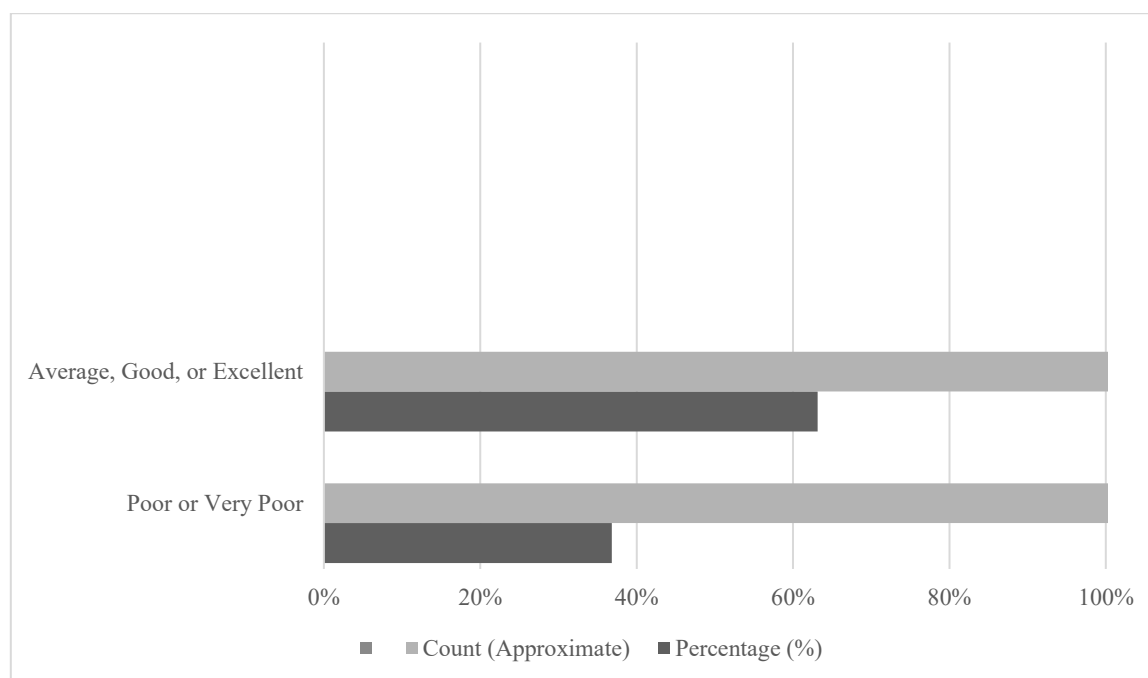
Figure 2. *Community assessment of broadband access quality (n=190)*

Source: Author's own, N=190 survey data, 2025

This dual barrier systematically excludes custodians from digital governance, undermining inclusivity and data integrity. Exclusion leads to two major operational consequences. First, authenticity is compromised when validation and metadata curation are outsourced to third parties, increasing the risk of cultural misrepresentation. Second, Access and Benefit Sharing (ABS) mechanisms become functionally ineffective if community representatives lack the digital capacity to monitor usage or manage digital transactions. These findings demonstrate that Digital Enfranchisement—through targeted broadband investment and culturally tailored digital literacy programs—is an operational prerequisite for effective Co-Governance rather than a supplementary social objective.

4. T4 – The demand for subjectivity and shared responsibility in governance

The most critical finding concerning institutional evolution is the strong and multidimensional demand for community subjectivity in governance, reflecting a shift from passive data provision toward substantive participation. This demand is particularly evident among key community custodians—village leaders and master artisans—who hold primary responsibility for safeguarding and transmitting CCK.

Table 2. *Community demand for subjectivity and shared responsibility in CCK governance (N = 10)*

Governance dimension	Measurement indicator	Agreement (%)	Mean score (1–5)
Participation in strategic decision-making	Desire to participate in decisions on digitization priorities	88.9	4.6
Control over secondary data use	Demand for consent before commercial or third-party use	92.3	4.7
Benefit-sharing mechanisms	Expectation that revenues return to the community	91.5	4.8
Monitoring and accountability	Willingness to engage in oversight of digital platforms	84.6	4.3
Overall demand for shared governance	Composite index of governance subjectivity	**89.8**	**4.6**

Source: Author's synthesis of in-depth interview data with key community custodians (village leaders and master artisans), 2025.

Note: Agreement percentages reflect the proportion of respondents expressing strong or very strong agreement across coded interview responses. Mean scores are calculated using a five-point Likert scale (1 = strongly disagree; 5 = strongly agree).

As indicated in Table 2, agreement levels across governance dimensions remain consistently high, ranging from 84.6% to 92.3, with a composite subjectivity index of 89.8% and a mean score of 4.6 out of 5. These results demonstrate that community expectations extend beyond symbolic consultation toward meaningful involvement across the digital lifecycle of CCK, including strategic decision-making, control over secondary data

use, benefit-sharing, and accountability. The normative foundation of this demand is illustrated by the following statement: *"If money is made from the village's culture, the villagers must be consulted, and that money must return to the village for preservation."*

This evidence provides a clear empirical rationale for transitioning toward a Co-Governance model. The demand for shared authority is grounded in two interrelated justice claims. First, procedural justice requires formal participation in decisions concerning digitization priorities and secondary uses, particularly commercial exploitation. Second, distributive justice requires that benefits derived from CCK return to source communities to support cultural preservation and intergenerational transmission. These justice-based claims directly validate the need for institutional mechanisms such as CKBs endowed with formal co-decision-making authority, alongside ABS arrangements embedded within a Sui Generis legal framework. By integrating custodians into governance structures, co-governance transforms hierarchical management into a partnership model grounded in shared responsibility, thereby enhancing legitimacy, trust, and long-term sustainability in the digital governance of CCK [8].

5. The Co-Governance imperative

Taken together, the four themes demonstrate that the existing hierarchical governance model is structurally incapable of managing digitized CCK as a complex digital common-pool resource. Fragmentation, legal vulnerability, exclusion, and legitimacy deficits collectively undermine sustainability. Co-Governance emerges as a necessary policy instrument to ensure institutional effectiveness and cultural justice. Its success depends on the simultaneous fulfillment of three conditions: legal security through Sui Generis protection (T2), institutional mandate via empowered CKBs to overcome fragmentation and meet participatory demands (T1, T4), and digital enfranchisement to ensure functional inclusion (T3). Without this integrated approach, digitization efforts will continue to produce fragmented assets, exacerbate community risk, and fail to realize their intended contribution to the national digital economy.

V. CONCLUSION

1. Concluding summary of institutional challenges

This study provides a systematic institutional analysis of CCK governance within the digital landscape of Vietnam's Northwest Region, employing a mixed-methods approach. The findings demonstrate that national ambitions for a sustainable Digital Society are constrained by three interrelated challenges: persistent institutional fragmentation driven by project-based management; a significant legal vacuum in Digital Intellectual Property (DIP) protection that generates community mistrust; and a continuing digital divide that marginalizes primary CCK custodians. Together, these challenges confirm the structural inadequacy of hierarchical, control-based governance models in managing culturally sensitive digital resources. The most salient empirical finding is the widespread community demand for Co-Governance, reflecting a clear shift from passive participation toward shared responsibility and decision-making authority.

2. Strategic policy recommendations for institutional reform

Based on these findings, four strategic policy directions are proposed to address the identified institutional deficits.
- *Mandating systemic institutional integration:* To overcome fragmentation (T1), a permanent Inter-agency Coordination Authority should be established above existing departmental silos. This body must be granted enforceable authority to standardize data input, metadata, and preservation protocols across provincial departments in line with national e-Government guidelines. Financial mechanisms should transition from short-term project funding to sustained governance funding to ensure long-term interoperability and asset maintenance.
- *Legal framework reform to secure collective rights:* Addressing the legal vacuum (T2) is essential for rebuilding trust. The central government should expedite the adoption of a Sui Generis legal framework for CCK that explicitly recognizes collective ownership and moral rights. This framework must incorporate mandatory ABS provisions within all commercial licensing arrangements, ensuring that a defined share of revenues is returned to CKBs to support cultural sustainability.
- *Institutionalizing community Co-Governance:* To operationalize shared responsibility (T3), CKBs must be formally institutionalized with legal standing. Their role should extend beyond consultation to include binding participation in the review and approval of commercial licensing and usage protocols related to CCK. This redistribution of authority constitutes a necessary institutional adjustment to secure legitimacy and sustained cooperation from knowledge holders.
- *Targeted investment for digital equity:* To address the digital divide (T4), public investment should prioritize high-quality broadband infrastructure in ethnic minority villages. This must be complemented by culturally tailored digital literacy programs for elders and artisans, focusing on practical governance-related skills such as platform navigation, secure data monitoring, and communication with authorities.

3. Research limitations and Directions for further study

Several limitations should be acknowledged. The qualitative sample, while purposively selected, cannot capture the full diversity of governance practices across all ethnic communities. The survey component was descriptive and did not permit causal inference, and reliance on self-reported data introduces potential bias. In addition, the study did not assess long-term institutional behavior or test the proposed Co-Governance model through pilot implementation. Future research should therefore employ longitudinal or experimental designs to evaluate institutional durability and practical feasibility.

4. Final statement

The sustainable development of Vietnam's Digital Society in culturally diverse regions such as the Northwest depends fundamentally on effective CCK governance. Transitioning from fragmented, hierarchical management to an inclusive Co-Governance framework—anchored in Sui Generis legal protection and supported by targeted digital equity investment—is not an optional reform. It is an institutional imperative to ensure that digitization advances cultural justice, community trust, and holistic national development.

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