

Blockchain For Transparent Governance and Public Health: A Context-Sensitive Strategic Framework For Developing Nations

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Abstract

Purpose – The paper aims to investigate how blockchain technology can be strategically applied to enhance accountability, transparency, and operational integrity in governance and public health systems within a developing country context. The participants of the study were key stakeholders from government, healthcare, civil society, academia, and the technology sector in the Philippines.

Design/methodology/approach – A qualitative exploratory research design was employed using semi-structured interviews with twelve purposively selected informants. Data were analyzed thematically following Braun and Clarke’s six-phase framework. The analysis was guided by blockchain governance theory, responsible innovation, and digital trust frameworks.

Findings – The results revealed four core themes: governance transparency, health data integrity, adoption challenges, and ethical and social considerations. These themes informed the development of a four-pillar Strategic Framework for Accountability, which integrates governance transparency mechanisms, health data resilience, institutional readiness, and ethical inclusion. The findings further indicated that blockchain’s transformative potential extends beyond its technical design, offering mechanisms to restore institutional trust, safeguard health data, and strengthen credibility in procurement, land registration, and health systems.

Research limitations/implications – As the present study only examined blockchain adoption in the Philippine setting, future research may expand the framework through cross-national comparisons, larger sample sizes, and mixed-method evaluations to assess blockchain’s long-term impacts on institutional performance, equity, and trust.

Practical implications – The findings of the study provide policymakers and institutions with a context-sensitive roadmap for blockchain adoption. The framework emphasizes regulatory foresight, stakeholder education, citizen participation, and organizational capacity as prerequisites for sustainable implementation. These insights can guide governments and health agencies in integrating blockchain ethically and effectively.

Social implications – The study highlights blockchain’s potential to promote inclusive and transparent public services by addressing corruption, data fragmentation, and inequitable access. By embedding ethical safeguards and participatory mechanisms, blockchain adoption can strengthen citizen trust and contribute to resilient governance in developing nations.

Originality/value – The study offers one of the first empirically grounded frameworks that unites blockchain applications in governance and public health within a developing country context. By synthesizing theoretical perspectives with field insights, it advances blockchain scholarship while providing a scalable and ethically grounded model for transparent and accountable public service delivery in Southeast Asia and beyond.

Keywords: blockchain governance, public sector accountability, digital trust, health data resilience, trust, responsible innovation

INTRODUCTION

Public institutions in developing nations continue to struggle with systemic inefficiencies that erode trust, weaken service delivery, and compromise accountability. Persistent problems such as corruption in procurement processes, fragmented land and records management, and unreliable health data

infrastructures have consistently undermined governance performance and diminished public legitimacy. These weaknesses are often rooted in outdated administrative systems and opaque procedures that fail to ensure transparency, inclusivity, and ethical accountability. As these deficiencies persist, demand has grown for digital innovations that not only enhance efficiency but also strengthen trust, resilience, and public confidence in government services.

Blockchain has emerged as a promising solution because of its defining attributes of decentralization, immutability, and transparency. Unlike conventional centralized systems, blockchain generates verifiable and tamper-proof records, facilitates secure data-sharing across multiple stakeholders, and embeds accountability within administrative workflows. Prior studies demonstrate its potential to reduce corruption and enhance institutional credibility, particularly in high-risk domains such as public procurement, land registration, and health records management [35, 24]. Global initiatives—including Estonia's e-governance platforms, India's blockchain-enabled land registries, and African blockchain-based health systems—illustrate how the technology can reinforce institutional trust and operational integrity. Nevertheless, adoption in the Global South remains fragmented, constrained by scalability challenges, regulatory ambiguity, and uneven stakeholder readiness.

In the Philippines, blockchain projects remain largely experimental and sector-specific, often limited to pilot initiatives without comprehensive institutional or ethical frameworks. While such efforts highlight blockchain's potential, they have delivered only incremental improvements rather than systemic reform. Existing scholarship has underscored blockchain's role in promoting transparency and curbing corruption [31] and emphasized the importance of governance models that align with contextual and cultural realities [22]. Yet, a research gap persists: although blockchain has been explored in governance and health separately, few studies have developed a holistic, context-sensitive roadmap that unites these domains within a single strategic framework tailored for developing nations.

This paper addresses that gap by examining blockchain's strategic application in governance and public health through a qualitative inquiry involving government officials, healthcare administrators, digital governance specialists, and civil society advocates. Its originality lies in the development of a four-pillar Strategic Framework for Accountability that integrates governance transparency, health data resilience, institutional readiness, and ethical inclusion into a unified model. By advancing an interdisciplinary and ethically grounded framework, the study contributes to blockchain governance scholarship while offering a scalable and contextually relevant roadmap for public sector transformation in Southeast Asia and other developing regions.

To achieve this aim, the paper is structured as follows. The next section presents the theoretical foundations underpinning blockchain governance, responsible innovation, and digital trust. This is followed by the methodology, outlining the qualitative design, data collection, and thematic analysis procedures. The subsequent section reports the empirical findings, organized into four themes that informed the framework. The discussion then integrates these findings with existing theory and global adoption cases to highlight contributions and limitations. Finally, the conclusion outlines implications for policy and practice while suggesting directions for future research on blockchain-enabled governance and health reform.

Theoretical Basis

The integration of blockchain into governance and public health can be conceptualized through three interrelated perspectives: blockchain governance theory, responsible innovation theory, and digital trust frameworks. These perspectives frame blockchain not merely as a technical artifact but as a socio-technical system that redefines accountability, transparency, and inclusivity in public sector reform. By situating blockchain within these lenses, this study provides a theoretical foundation for examining its institutional, ethical, and operational implications in fragile governance environments.

Blockchain governance theory positions blockchain as a governance mechanism capable of decentralizing authority and embedding compliance into automated processes. Unlike traditional bureaucratic systems that are often opaque and vulnerable to manipulation, blockchain introduces decentralized consensus, immutable audit trails, and programmable smart contracts that minimize opportunities for corruption

[35]. In domains such as e-procurement, these features promote transparent competition, limit discretionary authority, and strengthen accountability, thereby addressing inefficiencies that conventional reforms have failed to resolve [13, 7]. Broader governance frameworks have further defined blockchain principles around transparency, adaptability, and legitimacy in public decision-making [20], underscoring its potential to enhance both operational efficiency and long-term institutional resilience.

Responsible innovation theory complements this perspective by embedding blockchain within a socially conscious framework that prioritizes fairness, inclusivity, and societal well-being. In health systems, where privacy, equitable access, and ethical safeguards are critical, responsible innovation provides a lens through which blockchain adoption can be evaluated beyond technical feasibility [1]. This perspective has gained relevance in the post-pandemic context, where secure but adaptable infrastructures are required for vaccination tracking, clinical trials, and electronic health records [28, 36, 19]. Ethical debates in personalized digital health further demonstrate that blockchain adoption must integrate principles of consent, autonomy, and justice to protect patients and vulnerable populations [21]. Responsible innovation thus situates blockchain not only as a disruptive technology but also as a tool for sustainable and ethically grounded transformation in healthcare and governance.

Digital trust frameworks reinforce blockchain's strategic relevance by directly addressing institutional mistrust, particularly in fragile governance systems. By ensuring immutability and verifiability, blockchain can restore confidence in record management and policy enforcement, especially in historically vulnerable domains such as land registration [32]. However, adoption in developing contexts requires culturally grounded trust mechanisms, given widespread skepticism toward centralized authorities and new digital infrastructures [11]. When aligned with governance structures, blockchain also has the potential to improve economic transparency and strengthen citizen trust in both governance and health systems [30]. Trust, therefore, is not only a technological output but also a socio-political condition essential for blockchain adoption in developing nations.

Taken together, these three perspectives conceptualize blockchain as more than a digital efficiency tool. Rather, it represents a governance innovation capable of driving structural reform, embedding ethical responsibility, and building citizen trust. Despite this, scholarship remains limited in demonstrating how these theoretical constructs can be operationalized into a unified, context-sensitive framework. This study addresses that gap by synthesizing blockchain governance, responsible innovation, and digital trust into an empirically grounded model that illustrates how blockchain adoption can be both ethically justifiable and practically feasible in fragmented institutional environments such as the Philippines and the wider ASEAN region.

Statement of Objectives

This study examined the role of blockchain in enhancing governance and public health by pursuing three objectives: (1) analyze the applications of blockchain in procurement, land registration, and records management; (2) evaluate the implications of blockchain for vaccination tracking, pandemic response, and health data integrity; and (3) develop a Strategic Framework for Accountability based on the findings of the study.

METHODOLOGY

This study employed a qualitative exploratory research design, deemed appropriate for examining the context-specific integration of blockchain technology in governance and public health. Given the scarcity of empirical work in this domain and the novelty of blockchain adoption in the Philippine public sector, a qualitative approach enabled an in-depth exploration of diverse perspectives, institutional dynamics, and implementation challenges. The research was conducted in Cebu City and Metro Manila, which provided relevant settings due to their rapid digital transformation alongside persistent governance and structural limitations.

A total of twelve key informants were purposively selected from sectors actively engaged in digital governance, blockchain initiatives, and public service delivery. Participants included public health administrators, government officials, blockchain developers and consultants, academic researchers, and civil society advocates. Eligibility required at least two years of relevant professional experience and

voluntary consent to participate, while individuals lacking domain expertise were excluded. Recruitment continued until code and meaning saturation were reached, ensuring the dataset was sufficiently rich to support theoretical development [34].

Data were collected through semi-structured interviews that were designed to elicit perspectives on the societal impacts of blockchain, regulatory gaps, associated risks, and practical applications. All interviews were audio-recorded, transcribed verbatim, and subjected to thematic analysis using Braun & Clarke's six-phase framework. NVivo software facilitated systematic coding, pattern recognition, and theme development. The analysis produced four overarching themes: governance transparency, health data integrity, adoption challenges, and ethical and social considerations. Research rigor was reinforced through peer debriefing, member checking, and constant comparison, which collectively enhanced the credibility, dependability, and confirmability of the findings.

Ethical approval for the study was obtained from the College Institutional Review Board prior to data collection. All participants provided informed consent after receiving a detailed briefing on the study objectives, procedures, and confidentiality safeguards. To ensure anonymity, identifying information was removed, and pseudonyms or role-based labels were assigned in transcripts and reports. Data were stored in encrypted files with access limited to the principal investigator. The study was conducted in accordance with the ethical principles of autonomy, beneficence, non-maleficence, and justice, consistent with the Declaration of Helsinki and national research ethics guidelines.

The qualitative design was particularly justified as it captured the lived experiences and insights of key stakeholders in ways that quantitative approaches could not. This methodology provided flexibility to uncover emergent themes in a rapidly evolving technological field and offered a nuanced understanding of how blockchain could be operationalized in fragile governance contexts. By bridging theoretical frameworks with empirical evidence, the approach ensured that findings were not only academically rigorous but also contextually relevant for guiding institutional reform and policymaking in developing nations.

RESULTS AND DISCUSSION

Theme 1: Enhancing Transparency and Accountability in Governance

Blockchain was recognized as a transformative tool for strengthening accountability and transparency in governance. By generating immutable and verifiable records, it reduced opportunities for corruption, improved citizen trust, and streamlined administrative functions such as procurement, land registration, and public records management. Informants emphasized, however, that its success depended on political will, stakeholder awareness, and robust digital infrastructure to address persistent issues of data integrity and bureaucratic inefficiency.

Sub-theme 1: Public Procurement Processes. Public procurement was consistently identified by participants as one of the most corruption-prone functions of government, with recurring issues such as favoritism, overpricing, and fraudulent awarding of contracts undermining institutional credibility. One procurement officer emphasized, "Processes are often delayed due to verification issues, and questionable contracts slip through the cracks without proper oversight," while another highlighted that "a blockchain ledger would streamline bidding, reduce paperwork, and prevent contract awarding that lacks transparency." These insights illustrate how blockchain technology can offer a decentralized and tamper-proof ledger to document bids, contract awards, and project milestones, thereby minimizing bureaucratic inefficiencies and closing loopholes that enable manipulation. By enabling real-time and verifiable access to procurement records, blockchain strengthens accountability and fosters public trust, which is especially critical in high-value projects where transparency has historically been compromised [23, 14].

Sub-theme 2: Land Registration Systems. Participants highlighted that land title conflicts and document fraud remain persistent challenges for both local and national governments, often resulting from outdated systems, missing files, and the absence of a centralized verification mechanism. As one records manager explained, "Land titles get lost or altered too easily under our current system. Blockchain offers a way to protect these records and restore public confidence." In this context, blockchain provides a secure and immutable platform for digitizing land records, ensuring that ownership histories remain tamper-proof

and accessible to authorized stakeholders in real time. By integrating smart contracts, property transfers can be automated, validated, and permanently recorded, thereby reducing the risks of double-selling, human error, and fraudulent alteration. Such innovations not only improve the efficiency of titling processes but also strengthen transparency, enhance legal security, and restore public trust in land administration systems [18].

Sub-theme 3: Public Records Management. Informants consistently underscored that public documents remain highly vulnerable to unauthorized access, data loss, and retroactive modification, challenges that weaken institutional reliability and diminish public trust. As one municipal IT officer explained, “In my experience with civil registration, we’ve encountered missing or outdated files due to system errors. Blockchain could provide a secure backup and track any changes transparently.” In response to these issues, blockchain technology offers an immutable and tamper-resistant ledger that secures vital records such as birth certificates, licenses, and permits, ensuring that any changes are transparently auditable over time. By enhancing data integrity and enabling real-time verification by authorized institutions, blockchain strengthens institutional accountability and reinforces the credibility of government documentation systems [9, 26]. Furthermore, this technological innovation not only safeguards against manipulation but also improves the efficiency of record management by reducing redundancies and preventing systemic errors that frequently afflict paper-based archives. However, without sufficient digital infrastructure and stakeholder readiness, blockchain adoption may be reduced to a technical safeguard with limited systemic impact, underscoring the necessity of pairing technological reform with institutional preparedness.

Theme 2: Strengthening Data Integrity and Security in Public Health

In public health data management, blockchain technology offers interesting answers to persistent problems, especially when it comes to protecting sensitive health data's security, integrity, and transparency. Blockchain provides a decentralized, irreversible way to store and retrieve vital health data as digital health systems develop. Participants emphasized its potential to increase confidence among stakeholders in patient care and public health initiatives, streamline information exchange, and improve data accuracy. These advantages are particularly relevant in fields like clinical research, immunization tracking, and electronic health records.

Sub-theme 1: Electronic Health Records (EHRs). Participants emphasized the urgency of developing patient-centered electronic health records that are accessible across healthcare facilities, with one IT administrator observing, “There are frequent issues with lost or inconsistent patient records when transferred between hospitals. A blockchain-based EHR system would allow authorized providers to access the same updated data, minimizing errors.” Blockchain offers a decentralized and tamper-proof alternative to fragmented databases, ensuring real-time accessibility while safeguarding data accuracy and privacy [33]. Such integration not only improves continuity of care but also strengthens patient safety by reducing errors caused by outdated or incomplete medical histories [4]. Moreover, blockchain fosters institutional trust by providing transparent audit trails of medical record access, thereby ensuring compliance with ethical and regulatory standards. It also enhances collaboration among healthcare providers by enabling secure interoperability across diverse medical systems, which supports more efficient and coordinated patient care. Nevertheless, without adequate infrastructure, standardized protocols, and trained personnel, blockchain-based EHRs may remain underutilized, reducing their potential to deliver systemic transformation in healthcare delivery.

Sub-theme 2: Vaccination Tracking and Verification. Accurate and verifiable vaccination records were identified by participants as essential for public immunization programs and outbreak management, with one regional officer stating, “We’ve seen how manual vaccine tracking during the pandemic led to duplicated entries and missing data. Blockchain could provide a single source of truth to verify every dose given.” Blockchain provides a tamper-proof and decentralized system that ensures vaccination data remains accurate, time-stamped, and accessible to authorized institutions, thereby reducing risks of duplication and fraudulent reporting [27]. This system also improves cross-agency coordination, enabling health authorities to track immunization progress in real time and make rapid, evidence-based decisions [16]. Furthermore, blockchain promotes transparency in vaccination campaigns by providing immutable audit trails that strengthen public trust in health initiatives. It also enhances efficiency in data

management by streamlining the verification process, particularly in large-scale immunization drives during emergencies. Nevertheless, without adequate digital infrastructure and interoperability mechanisms, blockchain adoption in vaccine tracking may face implementation barriers that limit its capacity to support comprehensive health system responsiveness.

Sub-theme 3: Clinical Trials Data Management. Informants stressed that accurate and transparent data recording is critical to uphold scientific validity in clinical trials, with one research ethics officer noting, “There’s always a concern that clinical trial data can be altered or selectively reported. Blockchain ensures that once data is logged, it cannot be changed without leaving a trace.” Blockchain’s immutable and time-stamped ledger secures trial data against manipulation, providing an auditable record that reinforces accountability throughout the research process [12]. This capability safeguards data integrity, thereby promoting ethical practices and strengthening confidence among regulators and research stakeholders [17]. In addition, blockchain enhances collaboration by offering a shared and transparent data platform, ensuring that multi-site trials can maintain consistent reporting standards. It also improves regulatory compliance by enabling oversight bodies to monitor trial processes in real time, which reduces the risk of selective disclosure. Nevertheless, without clear policies on data ownership and standardized adoption protocols, blockchain-based trial systems may struggle to gain widespread institutional acceptance, limiting their potential impact on clinical research.

Theme 3: Addressing Challenges in Blockchain Adoption

Participants noted several challenges hindering the widespread adoption of blockchain technology, despite its recognized potential in enhancing transparency and efficiency in public health and governance. Key barriers include inconsistent stakeholder readiness, limited digital infrastructure, and the absence of comprehensive regulatory frameworks. Informants emphasized that while blockchain offers robust security and transparency, its effective implementation requires more than technological deployment. Institutional reform, skilled human resources, and strong policy backing are essential to support long-term integration. Without these foundational elements, blockchain risks becoming an underutilized innovation rather than a transformative force. Addressing these gaps is critical to unlocking its full potential in the public sector.

Sub-theme 1: Technological Scalability and Performance. Informants emphasized that blockchain adoption in large-scale public systems must be capable of processing high transaction volumes efficiently, with one ICT officer remarking, “It’s not enough that blockchain is secure. We also need it to process thousands of transactions quickly, like in land records or vaccination drives.” Scalability challenges remain critical, as government and health systems require rapid processing during peak activity, particularly in services that demand real-time verification [10]. Blockchain’s potential to streamline workflows and ensure reliable access depends heavily on system optimization and robust digital infrastructure [8]. Furthermore, interoperability across multiple agencies is vital to prevent service delays and ensure seamless integration with existing platforms. Performance limitations not only risk slowing down operations but also threaten to undermine public confidence in digital governance reforms. Nevertheless, without targeted investments in infrastructure and adaptive system design, blockchain may exacerbate inefficiencies rather than enhance efficiency, particularly in contexts with limited technological readiness.

Sub-theme 2: Regulatory and Legal Frameworks. The absence of comprehensive regulations was consistently raised as a barrier, with one legal policy analyst cautioning, “Right now, we don’t have clear rules on blockchain. Who owns the data? Who is responsible for errors? These must be addressed before we implement anything.” Informants agreed that unresolved questions of data ownership, liability, and interoperability across jurisdictions fuel institutional hesitation [29]. Clear legal frameworks are essential to define accountability, protect data rights, and ensure compliance in critical domains such as health and land administration [2]. Establishing regulatory clarity would foster institutional trust and accelerate adoption by reducing risks associated with uncertainty. Additionally, aligning national policies with international standards could facilitate cross-border collaboration and governance efficiency. However, without coherent legal guidance, blockchain initiatives risk remaining fragmented and vulnerable to disputes that undermine long-term integration in public services.

Sub-theme 3: Stakeholder Awareness and Education. Informants repeatedly highlighted that a lack of digital literacy hampers blockchain adoption, with one consultant stating, “I’ve met officials who think blockchain is just a new database system. There’s a major knowledge gap that must be bridged before we can expect adoption.” Awareness and training initiatives are critical to overcoming misconceptions and equipping stakeholders with the technical understanding needed for responsible implementation [25]. Building institutional capacity through targeted programs enhances confidence and facilitates buy-in among local officials and frontline health professionals [5]. Such initiatives also strengthen long-term readiness by cultivating digital literacy across diverse sectors, ensuring that blockchain solutions are fully utilized. Furthermore, stakeholder education fosters collaborative governance by aligning institutional priorities with technological opportunities. Yet, if capacity-building remains inadequate, even well-designed blockchain systems may be misused or underutilized, limiting their transformative potential in public governance and health.

Theme 4: Ethical and Social Considerations

In addition to legal and technological issues, informants emphasized the significance of social and ethical considerations while using blockchain. Building public trust, guaranteeing equal access, and preserving individual privacy were the main topics of discussion. These factors are essential for the ethical application of blockchain in the fields of health and public service.

Sub-theme 1: Patient Consent and Privacy. Participants emphasized that blockchain systems must uphold privacy rights when handling sensitive medical data, with one IT lead remarking, “Just because data is secure doesn’t mean it should be accessible to everyone on the chain. Patients must still have the right to control who sees their information.” Blockchain enables legally binding consent protocols that allow patients to maintain control over their data while ensuring transparency in access and use [3]. Such safeguards balance innovation with confidentiality, particularly in government-managed health systems where trust is fragile [21]. In addition, blockchain fosters accountability by embedding privacy-by-design principles that ensure access rights are consistently enforced. It also reassures patients that advances in digital health will not compromise their autonomy, thereby strengthening system legitimacy. Nevertheless, without robust ethical standards and consistent enforcement mechanisms, privacy protections risk being undermined, leaving sensitive health information exposed to misuse.

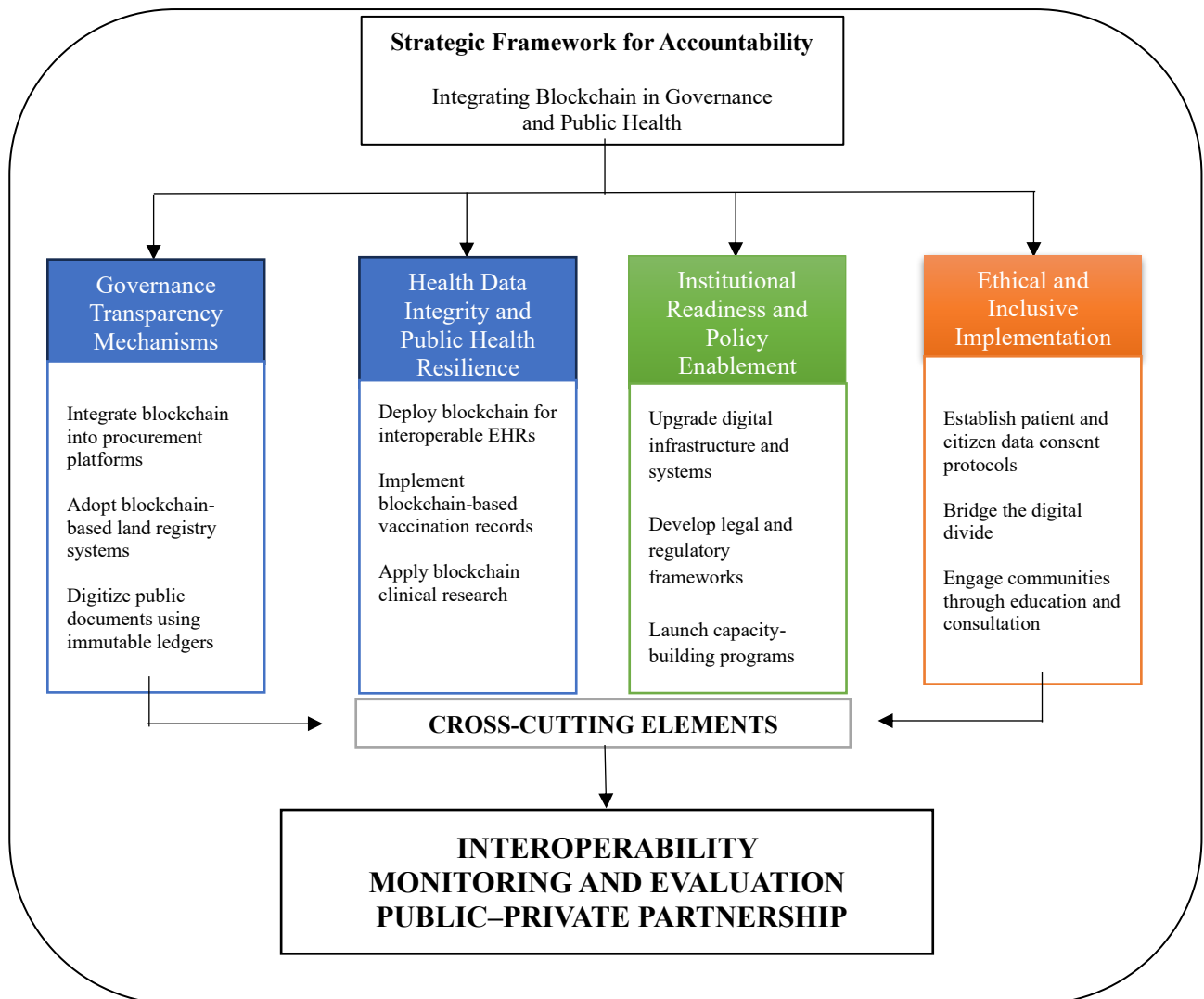
Sub-theme 2: Equitable Access to Technology. Concerns were raised that blockchain may exacerbate inequality by excluding marginalized groups, with one civil society representative asking, “If blockchain-based systems replace paper-based ones, what happens to those without internet access or smartphones?” To mitigate these risks, inclusive infrastructure and accessibility features must be prioritized so that blockchain solutions benefit not only urban or technologically literate populations but also underserved communities [15]. Designing systems that are user-friendly and adaptable to varied socio-economic conditions ensures broader participation and prevents the reinforcement of the digital divide [6]. Moreover, equitable access safeguards social legitimacy by demonstrating that digital governance innovations can enhance fairness rather than deepen exclusion. It also promotes resilience by allowing vulnerable groups to participate fully in essential health and governance services. However, without deliberate policy interventions to address accessibility gaps, blockchain risks becoming a driver of technological inequality rather than a solution for inclusive development.

Sub-theme 3: Public Trust and Acceptance. Trust was consistently identified as a prerequisite for blockchain adoption, with one local governance officer noting, “People need to know how this benefits them. Otherwise, it’s just another ‘government project’ they don’t trust.” Transparent communication and citizen engagement are therefore critical for demonstrating blockchain’s value and fostering acceptance [35]. Trust is also strengthened when systems address concerns related to data privacy, institutional reliability, and accountability, ensuring that users perceive tangible benefits [29]. Beyond fostering acceptance, trust-building initiatives improve the perceived legitimacy of digital reforms and encourage sustainable participation. They also create a foundation for long-term system resilience, as citizens become active stakeholders in the governance process. Yet, if engagement strategies remain superficial or inconsistent, public skepticism may persist, limiting the transformative potential of blockchain in governance and health.

Framework Generated

The study developed a framework demonstrating how the interconnected pillars of governance transparency, health data resilience, institutional readiness, and ethical inclusion influence the strategic adoption of blockchain in governance and public health systems within developing nations.

Figure 1
 Strategic Framework for Accountability



Note. The authors

The Strategic Framework for Accountability translates the technological potential of blockchain into actionable pathways for governance and public health in developing contexts. The framework is structured around four interrelated pillars. First, Governance Transparency Mechanisms apply blockchain to procurement, land registration, and public records, thereby reducing corruption, mitigating fraud, and strengthening institutional trust. Second, Health Data Integrity and Public Health Resilience focus on securing interoperable electronic health records, ensuring reliable vaccination tracking, and safeguarding the integrity of clinical research data. Third, Institutional Readiness and Policy Enablement emphasize the establishment of supportive regulatory environments, investments in digital infrastructure, and the development of organizational capacities necessary for effective adoption. Fourth, Ethical and Inclusive Implementation underscores the importance of patient consent, privacy protection, and equitable access, particularly for marginalized and underserved groups.

In addition to these pillars, the framework integrates cross-cutting components—interoperability, monitoring and evaluation, and public-private partnerships—which serve to enhance sustainability and

collaborative governance. Collectively, these dimensions provide policymakers with a roadmap that aligns technological innovation with ethical safeguards and institutional reform. The broader implication is that blockchain adoption must be approached not merely as a technical intervention but as a governance innovation requiring legal clarity, citizen trust, and inclusive participation. By embedding these principles, the framework offers a scalable and adaptable model for other developing nations seeking to promote transparency, accountability, and resilience in public service delivery.

CONCLUSION

This study investigated how blockchain technology can be strategically applied to strengthen accountability, transparency, and operational integrity in governance and public health within a developing country context. Drawing from the perspectives of twelve key informants representing government, healthcare, civil society, academia, and technology, the research developed a four-pillar Strategic Framework for Accountability, highlighting governance transparency, health data resilience, institutional readiness, and ethical inclusion. The findings underscore that blockchain's potential extends beyond its technical affordances, functioning as a mechanism for restoring institutional trust and enhancing credibility in critical areas such as procurement, land registration, and health data management. In the Philippine setting—characterized by uneven digitalization, infrastructural limitations, and regulatory uncertainty—the framework offered a context-sensitive and ethically grounded roadmap for transitioning from fragmented pilot initiatives toward systemic adoption. The results further demonstrated that blockchain integration requires more than technological deployment, as sustainable adoption depends on regulatory foresight, stakeholder education, participatory governance, and institutional innovation. By operationalizing Blockchain Governance Theory, Responsible Innovation, and Digital Trust into a unified and empirically grounded model, the study advances theoretical discourse while addressing a critical gap in blockchain scholarship, particularly its dual-sector application in governance and healthcare.

Policy and Practice Implications and Future Research Directions

Blockchain adoption in governance and public health offers significant opportunities to enhance accountability, transparency, and trust in developing contexts. This study demonstrates that effective implementation requires not only technological deployment but also policy coherence, regulatory foresight, and institutional readiness. By situating blockchain within the realities of Southeast Asia, the study contributes to the literature on digital governance by presenting a context-sensitive framework that integrates technological innovation with ethical safeguards and institutional reform [20, 30].

From a policy and practice perspective, governments, health agencies, and development organizations should prioritize capacity building, citizen education, and inclusive regulation to ensure sustainable blockchain adoption. Investments in digital infrastructure and training are essential to equip civil servants, healthcare administrators, and technology specialists with the competencies required for responsible use [2, 5]. In addition, public-private partnerships and collaborative governance models can enhance institutional legitimacy, resource mobilization, and accountability across sectors, particularly in fragile governance environments [6, 29]. By embedding blockchain within participatory governance strategies, policymakers can address corruption, strengthen data integrity, and reinforce health system resilience.

The findings also underscore blockchain's social implications. In contexts marked by corruption, inequitable access, and public mistrust, blockchain has the potential to act as a catalyst for transparent and inclusive governance. When combined with citizen engagement and culturally grounded implementation strategies, blockchain-enabled frameworks can empower marginalized groups, safeguard patient privacy, and promote long-term institutional legitimacy [3, 21]. Such integration highlights that blockchain adoption is not only a technical innovation but also a tool for social transformation.

Despite these contributions, the study acknowledges limitations and proposes future research directions. The focus on the Philippine setting calls for cross-national comparative studies to validate the framework across different governance contexts [11]. Future studies may also employ mixed-method or longitudinal designs to evaluate blockchain's long-term impact on institutional performance, equity, and citizen trust [34]. Additionally, sector-specific applications—such as disaster management, pharmaceutical supply

chains, and social protection programs—offer opportunities to expand the framework’s applicability [12, 16]. These directions will allow researchers to refine, test, and scale the model, ensuring its relevance for diverse institutional and cultural settings.

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Conflict of Interest Statement

I have no conflict of interest to disclose.

AI Disclosure

I declare that this manuscript was prepared without the assistance of artificial intelligence. Hence, the content of this paper is original.

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