

Governance of Information and Communication Technology Development at Gorontalo State University

Wahidin Usulu¹, Sukarman Kamuli², Yanti Aneta³, Alexander H. Badjuka⁴

^{1,2,3,4} Gorontalo State University, Indonesia

Email: wahidinususulu@mahasiswa.ung.ac.id¹, sukarman_kamuli@ung.ac.id²,
yantianeta@ung.ac.id³, abadjuka@ung.ac.id⁴

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Corresponding Email:

wahidinususulu@mahasiswa.ung.ac.id

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ABSTRACT

The governance of information and communication technology (ICT) has become a strategic necessity for higher education institutions to ensure effective academic services and sustainable digital transformation. This study aims to analyze the ICT governance system at the Academic Service Unit for ICT (UPA TIK) of Gorontalo State University. A qualitative case study design was employed. Data were collected through in-depth interviews, document analysis, and direct observation, and analyzed using the Miles and Huberman interactive model. Triangulation was applied to ensure data credibility and validity. The results reveal five governance dimensions: (1) strategic alignment, (2) organizational structure, (3) managerial competence, (4) resource allocation, and (5) institutional culture. While ICT development has been integrated into the university's strategic plan and supported by adequate infrastructure, weaknesses remain in managerial competence, fragmented decision-making, and limited funding. Institutional culture shows positive digital acceptance but is still constrained by resistance to change. This study concludes that effective ICT governance requires clear organizational structures, competent leadership, and stakeholder participation. The novelty of this research lies in proposing a contextualized governance model for Indonesian higher education, balancing global ICT frameworks with local organizational and cultural dynamics. These findings contribute theoretically to the discourse on digital governance and provide practical recommendations for policymakers in strengthening digital transformation in higher education.

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INTRODUCTION

In the era of digital transformation, the governance of information and communication technology (ICT) has become one of the most critical challenges in public sector institutions, including higher education. Effective ICT governance is no longer limited to supporting administrative operations but is increasingly recognized as a strategic instrument to improve institutional competitiveness, transparency, and service quality (Weill & Ross, 2004; Hamzah, 2023). Within universities, ICT supports academic information systems, research management, financial administration, and community service, which collectively shape the institutional capacity to deliver public value (Cheung, 2013).

In Indonesia, the expansion of higher education has intensified competition among universities, demanding adaptive strategies for governance and service delivery. According to the Ministry of Education and Culture, by 2021 there were more than 4,500 higher education institutions, creating a highly competitive landscape (Kusmin et al., 2023; Ali et al., 2020). This condition requires institutions not only to provide high-quality academic services but also to adopt integrated digital governance systems that respond to stakeholder expectations. However, several studies indicate that higher education institutions continue to face structural and organizational challenges, such as fragmented policies, limited resources, and resistance to technological change (Damayanto et al., 2022).

From a theoretical perspective, the concept of governance in public administration has shifted from traditional bureaucratic models toward paradigms that emphasize efficiency, accountability, and citizen-centered services. The New Public Management (NPM) approach highlights managerial efficiency, while the New Public Service (NPS) paradigm emphasizes public value and democratic engagement (Osborne, 2006; Martinus, 2022). Within this discourse, digital governance is positioned as an essential instrument to ensure that public institutions, including universities, deliver responsive and transparent services. Nevertheless, the application of governance principles in ICT development remains inconsistent across Indonesian universities, raising questions about institutional capacity and policy alignment (Gkrimpizi et al., 2023).

Against this background, this study focuses on the governance of ICT development at the Academic Service Unit for Information and Communication Technology (UPA TIK) of Gorontalo State University. The research seeks to analyze five critical dimensions: strategy alignment, organizational structure, managerial competence, resource allocation, and institutional culture. By addressing these dimensions, the study aims to contribute to the literature on digital governance in higher education and provide practical insights for policy makers and institutional leaders in strengthening ICT-based academic services.

Research Gap

Studies on ICT governance in higher education have gained increasing attention, yet the findings remain fragmented and often emphasize technical or managerial aspects without integrating broader governance perspectives. Previous works in Indonesia largely focused on the implementation of information systems for academic services, highlighting challenges such as infrastructure limitations, unstable internet connectivity, and inadequate funding (Najib & Maunah, 2022); (Lubis et al., 2024). Other studies emphasized security and policy issues, pointing to the lack of institutional regulations on information security and data integrity (Yamin et al., 2024;

Florea & Florea, 2020). While these studies reveal crucial operational barriers, they fall short of analyzing how governance structures, decision-making processes, and organizational culture collectively shape ICT development outcomes in universities.

International research has similarly emphasized best practices in IT governance frameworks such as COBIT and ITIL, which prioritize control, risk management, and service quality (Weill & Ross, 2004a). However, their application in higher education institutions within developing countries often faces contextual limitations due to resource constraints and policy misalignments. Thus, the transferability of global governance models to Indonesian universities remains contested and requires empirical validation through localized case studies.

In the Indonesian context, there is a notable absence of research that holistically connects ICT governance with the principles of public administration and digital governance. Existing studies have rarely examined the intersection between strategic alignment, organizational capacity, and institutional culture within university ICT units (Hamidu, 2025; Ali et al., 2020). Consequently, there is a gap in understanding how governance mechanisms can balance efficiency, accountability, and stakeholder engagement in academic service delivery.

This study addresses that gap by investigating ICT governance at Gorontalo State University's UPA TIK through five interrelated dimensions: strategy and performance goals, organizational structure, managerial competence, resource allocation, and institutional environment. Unlike prior research that narrowly examined technical infrastructure or student satisfaction, this study provides a governance-oriented analysis that integrates organizational theory and public administration perspectives. The novelty of this research lies in proposing a contextual governance model for ICT in Indonesian universities, emphasizing not only system effectiveness but also the organizational and cultural determinants of digital governance. This contribution is expected to enrich the literature on public sector digital transformation while offering practical insights for higher education leaders and policy makers.

Research Gap Matrix

Tabel 1. Comparative Research Gap Matrix on ICT Governance in Higher Education

Author(s) & Year	Focus of Study	Methodology	Key Findings	Limitations / Gap	Position of This Study
Najib & Maunah (2022)	Barriers to ICT adoption in higher education	Qualitative survey	Identified infrastructure and funding limitations	Did not examine governance structures and decision-making	Goes beyond barriers by analyzing governance mechanisms in ICT development
Lamato et al. (2019)	ICT service quality at Indonesian universities	Case study	Highlighted student dissatisfaction with ICT services	Narrow scope: focused only on user satisfaction	Integrates service quality with governance framework and organizational culture
Kusmin et al. (2023)	ICT utilization and academic services	Mixed-method	Showed link between ICT usage and service quality	Focused on output (service quality), not governance processes	Examines governance inputs (strategy, structure, competence, resources, culture)

Weill & Ross (2004)	IT governance frameworks (COBIT, ITIL)	Theoretical & cross-industry	Developed IT governance best practices	Oriented to corporate/business settings, limited adaptation to higher education	Applies governance theory in the context of public higher education in Indonesia
Rusman, (2022)	IT governance in universities abroad	Comparative analysis	Identified adoption challenges of ITIL/COBIT	Lack of contextual adaptation to developing countries	Provides localized case study in Indonesian higher education
Yamin et al. (2022)	Data privacy and integrity in universities	Policy analysis	Highlighted need for information security policy	Focused narrowly on data protection, not holistic governance	Expands scope to strategic, structural, and cultural aspects of governance

Source: Comparative Research by Author, 2025

Table 1 highlights that previous research tended to emphasize either technical infrastructure or user satisfaction, without addressing the holistic governance framework. For example, (Gkrimpizi et al., 2023; Hamidu, 2025) largely identified operational barriers, while (Weill & Ross, 2004a) focused on corporate IT governance models that are not directly transferable to higher education in developing countries. In contrast, this study positions itself within the intersection of public administration and ICT governance, offering a contextualized framework that integrates both organizational and cultural dimensions. This reinforces the novelty of the study and situates it as a bridge between global governance models and local university practices.

METHOD

This research employed a qualitative case study design to explore the governance of information and communication technology (ICT) development at the Academic Service Unit for Information and Communication Technology (UPA TIK) of Gorontalo State University. The qualitative approach was selected to gain a holistic understanding of governance dynamics, organizational processes, and stakeholder interactions, which cannot be fully captured through quantitative measurements (Creswell & Poth, 2016).

Research Site and Participants

The study was conducted at Gorontalo State University, specifically focusing on UPA TIK as the primary unit responsible for ICT services and academic information systems. Participants were purposively selected to ensure data richness and included key informants such as managerial staff, system administrators, lecturers, and students who directly interacted with ICT services. This selection aimed to capture multiple perspectives across institutional roles.

Data Collection

Data were collected using three complementary techniques: (1) in-depth semi-structured interviews with key informants to elicit detailed insights into governance processes; (2) document analysis of institutional policies, strategic plans, and ICT-related reports to identify formal governance frameworks; and (3) direct observations of ICT infrastructure and service delivery processes to validate reported practices.

Data Analysis

The data were analyzed using the (Miles & Huberman, 1994) interactive model, which consists of data reduction, data display, and conclusion drawing/verification. This model was appropriate for identifying governance patterns, organizational dynamics, and contextual challenges in ICT implementation.

Validity and Reliability

To ensure data credibility, triangulation of methods and sources was applied by comparing findings from interviews, observations, and documents. Peer debriefing with academic supervisors and member checks with selected informants were also conducted to strengthen the trustworthiness of interpretations (Lincoln & Guba, 1985).

By applying this methodological framework, the study systematically captured the governance dimensions of ICT development within the university context, offering empirical evidence that informs both theoretical discussions and practical policy recommendations.

Conceptual Framework

The governance of information and communication technology (ICT) in higher education is theoretically anchored in three interrelated perspectives.

1. Public Administration and Governance Theory

From a macro perspective, governance theory in public administration emphasizes transparency, accountability, and efficiency in managing public organizations (Osborne, 2006; Martinus, 2022). The shift from Old Public Administration (OPA) to New Public Management (NPM) and later to New Public Service (NPS) reflects an evolving paradigm, where universities, as public institutions, must adapt governance principles to ensure responsiveness and value creation for stakeholders.

2. ICT Governance Models

At the meso level, ICT governance frameworks such as COBIT and ITIL provide structured mechanisms for aligning ICT resources with institutional objectives, risk management, and service delivery (Weill & Ross, 2004b; Tantiono & Legowo, 2020). These frameworks emphasize decision rights, accountability structures, and performance monitoring as critical to ICT success. However, their application in higher education often requires contextual adaptation to local organizational and policy environments.

3. Higher Education Institutional Context

At the micro level, ICT governance in universities intersects with unique challenges, including limited resources, resistance to change, and fragmented policy support (Gkrimpizi et al., 2023). The institutional culture and organizational capacity of university ICT units play decisive roles in shaping governance outcomes, influencing both service quality and institutional sustainability.

This research positions itself at the intersection of these three perspectives, proposing that effective ICT governance in higher education requires not only technical frameworks but also strong organizational structures, managerial competence, and stakeholder participation.

RESULT AND DISCUSSION

The findings of this study highlight five interrelated dimensions of ICT governance at UPA TIK, Gorontalo State University: (1) strategic alignment, (2) organizational structure, (3) managerial competence, (4) resource allocation, and (5) institutional culture. These dimensions collectively illustrate both strengths and weaknesses in ICT governance implementation.

1) Strategic Alignment; The analysis shows that ICT development is aligned with the university's strategic plan, particularly in improving academic services. However, strategic indicators remain general and lack measurable performance benchmarks. This partial alignment creates gaps between policy intentions and operational implementation. 2) Organizational Structure; UPA TIK operates under a centralized organizational structure. Decision-making authority, however, is fragmented, with overlapping responsibilities across units. While this structure enables control, it reduces flexibility and slows responses to emerging ICT challenges. 3) Managerial Competence;

Human resource capacity is uneven. While system administrators demonstrate technical expertise, managerial staff show limited competence in project management and governance frameworks. This weakens the integration of ICT policies into institutional strategy. 4) Resource Allocation; Infrastructure development has progressed, with stable internet networks and integrated systems. Nonetheless, resource allocation remains insufficient to support rapid technological changes. Limited financial investment hinders the expansion of digital services. 5) Institutional Culture; Cultural dynamics present both opportunities and constraints. On the one hand, there is increasing acceptance of ICT services by lecturers and students. On the other hand, resistance to change and limited digital literacy among some staff impede governance effectiveness.

Summary of Findings

Table 2. Summary of ICT Governance Findings at UPA TIK Gorontalo State University

Dimension	Strengths	Weaknesses
Strategic Alignment	ICT linked to university's strategic plan	Lack of measurable indicators; gap between strategy and practice
Organizational Structure	Centralized authority provides oversight	Overlapping roles; slow responsiveness
Managerial Competence	Technical expertise among administrators	Limited governance knowledge and project management capacity
Resource Allocation	Stable internet and integrated systems	Insufficient funding; limited capacity for innovation
Institutional Culture	Growing user acceptance of ICT in academic services	Resistance to change; uneven digital literacy among staff

Source: Analysis Research by Author, 2025

Table 2 demonstrates that ICT governance at UPA TIK is not only influenced by structural and managerial capacities but also by cultural readiness. While strategic alignment and institutional culture show moderate to strong performance, organizational structure and managerial competence remain the weakest dimensions. This imbalance suggests that digital transformation policies may be undermined if human resources and governance mechanisms are not strengthened simultaneously. In line with (Harto et al., 2023), the findings indicate that resistance to change is deeply

rooted in institutional traditions, emphasizing the importance of cultural adaptation alongside technical reforms.

Table 3. Comparative Governance Performance

Dimension	Score (1-5)	Interpretation
Strategic Alignment	3.0	Partially aligned with university strategic plan but lacks measurable indicators
Organizational Structure	2.5	Centralized but fragmented; overlapping responsibilities slow decision-making
Managerial Competence	2.5	Adequate technical expertise, limited governance knowledge and project management
Resource Allocation	3.0	Stable infrastructure but insufficient funding for sustainable innovation
Institutional Culture	3.5	Increasing ICT acceptance; resistance persists among staff with limited digital skills

Source: Analysis Comparative by Author, 2025

Comparative Governance Performance

The comparative governance scores illustrate that institutional culture (3.5) is relatively stronger compared to organizational structure (2.5) and managerial competence (2.5). This indicates that although digital acceptance is increasing, the organizational mechanisms to support digital governance remain underdeveloped. The gap between cultural readiness and managerial capability suggests that digital governance cannot succeed without leadership and management reform. Similar to (Osborne, 2006) concept of New Public Governance, participatory and accountable decision-making must complement technical and cultural readiness.

Policy Implications for National Digital Governance

The results of this study also have direct implications for Indonesia's national digital governance framework. First, in relation to the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik - SPBE) as regulated in *Presidential Regulation No. 95/2018*, the weaknesses identified in organizational structure and managerial competence reveal that higher education institutions still face difficulties in meeting SPBE standards of interoperability, integration, and accountability (Sabani et al., 2019; Willia Gusman, 2024).

Second, the findings align with the agenda of the digital bureaucracy reform initiated by the Ministry of Administrative and Bureaucratic Reform (KemenPAN-RB), which emphasizes digitalization as a pathway to achieving efficient, transparent, and accountable governance (Faedlulloh et al., 2021). Fragmented authority and insufficient managerial capacity, as highlighted in this study, mirror the broader challenges faced by public institutions in Indonesia in implementing digital reforms.

Third, in the context of regional autonomy, as outlined in *Law No. 23/2014 on Regional Government*, universities located in diverse socio-cultural environments, such as Gorontalo State University, must adapt digital governance models to local needs and conditions accountability (Sabani et al., 2019; Willia Gusman, 2024). This reinforces the necessity of contextualized governance frameworks that bridge national policy directives with local institutional realities.

Thus, the study not only contributes to academic discourse but also offers policy-relevant recommendations: strengthening ICT governance structures in universities is

part of Indonesia's broader efforts to implement SPBE, accelerate digital bureaucracy reform, and reinforce regional autonomy in digital service delivery.

DISCUSSION

These findings confirm that ICT governance in higher education cannot rely solely on technical competence or infrastructure but requires integration with organizational and cultural contexts. Previous studies (Gkrimpizi et al., 2023; Ali et al., 2020) identified infrastructure and funding as primary obstacles; however, this study reveals that governance weaknesses—particularly in managerial competence and organizational structure—are equally significant barriers.

The relatively strong performance in institutional culture indicates growing digital acceptance, suggesting readiness for broader transformation. Nevertheless, without adequate managerial frameworks and structural reforms, ICT governance remains vulnerable to inefficiency and fragmented coordination. This reflects broader governance challenges within Indonesian universities, where digital transformation is often policy-driven but not sufficiently institutionalized (HAMIDU, 2025)

Anchored in governance theory, these results emphasize the need for a contextualized model that blends public administration principles (accountability, efficiency, stakeholder orientation) with ICT governance frameworks (strategic alignment, risk management, decision rights). The proposed governance model can strengthen decision-making processes, improve resource utilization, and foster sustainable digital services in higher education.

Reflective Discussion

The governance of ICT at UPA TIK demonstrates that structural and cultural dynamics are as decisive as technical capacity. From an administrative standpoint, fragmented decision-making and limited managerial competence suggest that ICT governance in universities cannot be reduced to technology deployment alone. Instead, it requires a governance framework that integrates strategic leadership, organizational flexibility, and participatory decision-making.

Practically, this implies that universities must establish clearer governance structures, with well-defined decision rights and accountability mechanisms for ICT development. The lack of measurable performance indicators for ICT strategies reflects a gap in aligning digital initiatives with institutional missions. Therefore, leadership must not only invest in infrastructure but also cultivate managerial skills and governance literacy among ICT staff.

From a policy perspective, the findings highlight the need for universities to adopt governance models that reflect the dual identity of higher education institutions: as service providers for internal stakeholders (students, lecturers, administrators) and as public institutions accountable to the state and society. This dual role requires ICT governance to balance efficiency and inclusivity, ensuring both operational effectiveness and democratic participation in decision-making.

Cultural Reflexivity

From an ethnographic perspective, the case of Gorontalo State University illustrates how institutional culture and local norms influence ICT governance outcomes. While the acceptance of ICT among students and lecturers shows a gradual cultural shift toward digitalization, resistance among certain administrative staff reflects deeper organizational traditions rooted in hierarchical and paper-based practices.

In the Indonesian context, cultural values of collectivism, respect for authority, and consensus-building shape governance interactions. These cultural norms can be both enablers and barriers: on the one hand, they support collaborative work and shared responsibility; on the other, they may slow decision-making and perpetuate dependency on higher authorities. Thus, digital governance reforms in Indonesian universities cannot simply import Western governance models but must be adapted to local cultural logics.

From this cultural lens, ICT governance becomes not merely a technical or managerial challenge but also a cultural negotiation, where digital practices must harmonize with institutional identities, local values, and community expectations. Strengthening digital literacy and fostering cultural readiness for digital transformation is therefore as important as building infrastructure.

Diagram: Practical and Theoretical Implications

A two-layer diagram can be visualized:

- Layer 1 (Practical Implications):
 - Clear governance structure → Faster ICT decision-making
 - Managerial competence → Effective ICT policy integration
 - Resource alignment → Sustainable digital services
- Layer 2 (Cultural Implications):
 - Digital literacy → Wider adoption of ICT services
 - Cultural readiness → Reduced resistance to change
 - Local adaptation → Contextualized governance model

The overlap represents the “Contextual ICT Governance Model for Indonesian Higher Education” balancing global governance principles with local cultural dynamics.

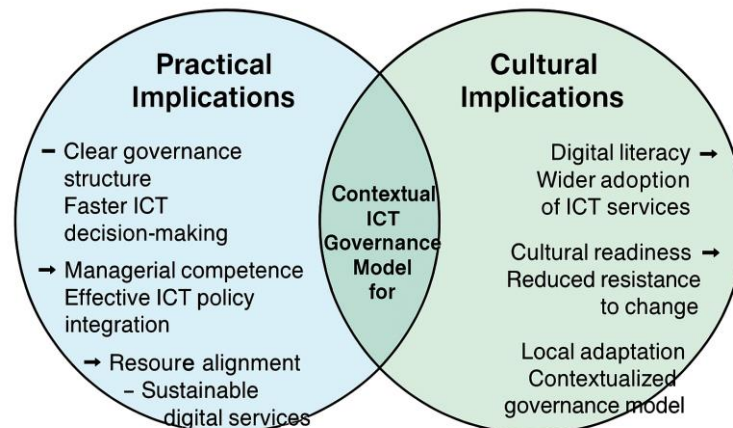


Figure 1. Venn Diagram of Practical and Cultural Implications in ICT Governance for Indonesian Higher Education

Figure 1 visualizes the convergence between practical and cultural implications in ICT governance. The overlap area demonstrates that a contextual ICT governance model for Indonesian higher education emerges when managerial competence, resource alignment, and strategic structures intersect with digital literacy, cultural readiness, and local adaptation. This conceptual integration implies that governance effectiveness in higher education must balance efficiency-driven principles from global ICT frameworks (e.g., COBIT, ITIL) with the values and organizational cultures embedded in Indonesian institutions. Such a balance ensures that ICT governance is not only technically sound but also socially sustainable (Rusman et al., 2022).

CONCLUSION

This study concludes that the governance of information and communication technology (ICT) at UPA TIK, Gorontalo State University, is shaped by five critical dimensions: strategic alignment, organizational structure, managerial competence, resource allocation, and institutional culture. While institutional culture and stakeholder acceptance have demonstrated positive progress, governance weaknesses remain evident in managerial competence, fragmented decision-making, and insufficient resource allocation.

From a theoretical standpoint, the research contributes to the literature on public administration and digital governance by demonstrating that ICT governance in higher education requires a contextualized governance model that integrates organizational theories with ICT frameworks. The findings highlight that governance effectiveness is not only determined by infrastructure and technology but also by cultural readiness and institutional dynamics, thereby extending the scope of digital governance studies into a non-Western higher education context.

In terms of policy implications, the study emphasizes the importance of developing clear governance structures, measurable ICT performance indicators, and capacity-building programs for managerial staff. Strengthening stakeholder participation and fostering digital literacy are also critical to overcoming cultural barriers and enhancing ICT adoption. These insights provide practical guidance for university leaders and policy makers in formulating more integrated and adaptive digital governance policies.

Nevertheless, the study is not without limitations. The research is confined to a single institutional case, which may limit the generalizability of its findings. Furthermore, the qualitative approach provides depth but not statistical representativeness. Future research could adopt comparative multi-institutional studies or mixed-method approaches to validate and expand the proposed governance model. Such studies would enrich the empirical basis for formulating digital governance policies in Indonesian higher education and beyond.

In conclusion, the findings underscore that digital governance in universities must be seen as a socio-technical system—where strategic, structural, managerial, and cultural factors converge. By addressing these interlinked dimensions, higher education institutions can better harness ICT for academic excellence, institutional accountability, and public service improvement.

Despite its contributions, this study has several limitations. First, it is confined to a single case study at Gorontalo State University, which limits the generalizability of the findings to other higher education institutions. The contextual nature of ICT governance means that institutional variations, particularly between large metropolitan universities and smaller regional institutions, may yield different governance dynamics.

Second, the reliance on qualitative methods provided rich insights but did not allow for statistical validation of governance dimensions. Future studies could adopt mixed-methods approaches by integrating surveys or quantitative performance metrics to complement qualitative findings and strengthen empirical robustness.

Third, this study focused primarily on internal institutional governance, while external factors—such as national funding policies, regional disparities in digital infrastructure, and regulatory enforcement under the SPBE framework—were not examined in depth. Future research could therefore expand the scope by incorporating

comparative multi-institutional analyses across regions or by evaluating the interplay between national digital policies and local institutional practices.

Finally, there is an opportunity for future research to explore longitudinal **designs**, tracking governance reforms over time to capture how managerial competence, organizational culture, and policy alignment evolve in response to digital transformation pressures. Such studies would enrich both theoretical discourse in digital governance and practical strategies for sustaining higher education reform.

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