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### **DIGITAL TRANSFORMATION AND CROSS-ORGANIZATIONAL INTEROPERABILITY IN ELECTRONIC-BASED GOVERNMENT SYSTEMS**

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#### **ABSTRACT**

Digital transformation in government is reshaping the way public institutions deliver services, manage data, and interact with citizens. In Indonesia, the push toward an integrated electronic government system has been hindered by fragmented institutional behaviors and limited interoperability across ministries. This study addresses the gap by analyzing how organizational structures and interministerial dynamics affect system integration within Indonesia's national digital governance framework. This research employs a mixed-methods approach, combining qualitative and quantitative strategies. Qualitative data were collected through in-depth interviews and document analysis to explore institutional behaviors and coordination mechanisms. Quantitatively, interoperability maturity was measured across four dimensions: technical, semantic, organizational, and legal, using network analysis mapping to visualize interministerial relationships and data exchange structures. The study focuses on three key ministries: The Ministry of Home Affairs, the Ministry of Bureaucratic Reform, and the Ministry of Communication and Information Technology. Findings reveal asymmetries in the maturity of interoperability among ministries. While legal and organizational dimensions show moderate alignment, semantic and technical interoperability remain underdeveloped. The Ministry of Communication and Information leads in technical and semantic areas, whereas the Ministry of Home Affairs demonstrates weaker integration. These disparities reflect autopoeitic tendencies where ministries operate through self-referential logic, hindering systemic coordination. Interview data support the presence of loose coupling, symbolic compliance, and institutional path dependency that obstruct integration efforts. The research integrates systems theory and institutional theory to argue that digital transformation requires structural coupling between autonomous government systems. Without shared standards, semantic alignment, and cross-sectoral governance mechanisms, integration efforts risk being superficial. The study proposes the establishment of a National Interoperability Council to

facilitate coordinated digital governance, mediate inter-agency challenges, and foster accountability. These findings offer both theoretical contributions and policy recommendations for building a more responsive and integrated digital government in Indonesia.

**Keywords:** Digital transformation; cross-organizational; interoperability, e-government.

## INTRODUCTION

Digital transformation has become a global phenomenon that reshapes the way businesses, governments, and societies operate. (Nugraha et al., 2022). In the context of public administration, digital transformation has introduced new paradigms in how governments provide services, manage processes, and interact with citizens. Fueled by the rapid advancement of information and communication technologies (ICT), this transformation offers vast opportunities for enhancing public sector performance, promoting transparency, and fostering participatory governance. (Sakir et al., 2023). However, achieving these outcomes requires more than merely deploying digital tools. It necessitates structural changes within government institutions, especially in terms of system integration and interoperability (Endrodi-Kovács & Stukovszky, 2022; Hidayat & Musari, 2022).

Since the turn of the 21<sup>st</sup> century, Indonesia has made significant strides in adopting Information and Communication Technology (ICT) within its governance. Nevertheless, challenges remain, particularly in ensuring that various government systems across institutions can communicate effectively with one another. (Darusalam et al., 2024; Livson et al., 2021). This challenge of interoperability is fundamental in realizing the full benefits of digital government. Interoperability, defined as the ability of different systems and organizations to exchange, interpret, and use data coherently, is central to the success of digital governance (Gao et al., 2023; Rakhman et al., 2019). It is particularly essential in the implementation of integrated public services. As digital transformation reshapes the culture of interaction between governments and citizens through open data, real-time services, and digital platforms, interoperability becomes the backbone that enables seamless data exchange and operational efficiency across different layers of government. Despite the proliferation of digital tools in Indonesia's public sector, institutional silos and fragmented data architectures continue to hinder efficient service delivery (de Seta, 2023; Kristensen & Andersen, 2023). Ministries often develop their systems independently, leading to duplication of efforts, inconsistencies in data quality, and missed opportunities for coordinated decision-making. To overcome this, there is an urgent need for institutional restructuring and cross-sectoral collaboration supported by interoperable digital infrastructures. According to Aichholzer and Schmutzer (2000), the two critical components of digital transformation in government are the restructuring of administrative functions and processes, as well as the establishment of robust coordination across agencies.

In this context, the Indonesian government has implemented several policies to promote digital integration, reflecting its efforts to implement digitalization. It reflects a commitment to creating a more integrated and interoperable public administration (Mutiarin & Lawelai, 2023; Othman et al., 2023). Ministries such as the Ministry of Administrative and Bureaucratic Reform, the Ministry of Home Affairs, and the Ministry of Communication and Information play vital roles in the endeavor. Their collaboration is vital in designing unified digital platforms that facilitate data sharing and service integration. Furthermore, the concept of interoperability in digital governance encompasses several dimensions: technical, semantic, organizational, and legal. It is not enough for systems to be technically compatible; they also need to share their common data, aligned administrative processes, and a legal

framework that governs data usage and privacy. According to Clark et al (2018), a mature interoperability framework enables governments to deliver high-quality public services that are transparent, reliable, and citizen-centered (Ferreira & Janssen, 2023; Shaharudin et al., 2025).

Moreover, the adoption of cloud computing, open data policies, and shared standards across agencies has further emphasized the need for a secure and efficient data exchange mechanism. Data privacy, cybersecurity, and compliance with national ICT standards must be ensured to protect citizens' rights while enabling innovation and responsiveness.

Importantly, developing human resources who understand the principles and practices of digital governance is equally crucial. In line with these developments, this research aims to investigate the level of interoperability and integration in Indonesia's digital government, with a specific focus on the implementation of electronic government systems in three key ministries. The study aims to answer critical questions, such as how digital transformation alters the structure and function of government institutions. This research will provide a comprehensive understanding of the current state of interoperability in Indonesia's digital transformation. The findings are expected to make theoretical contributions to the field of digital governance and provide practical insights for policymakers seeking to enhance service integration and institutional coordination. This research argues that digital transformation cannot be successful without robust interoperability. It is the connective tissue that links the data, processes, and policies across government systems. By uncovering the current challenges and providing evidence-based recommendations, this research contributes to the broader agenda of creating a responsive and integrated digital government in Indonesia, one that not only adopts technology but also reforms its institutional architecture to embrace the digital age fully.

## **LITERATURE REVIEW**

### **Digital Government Transformation**

Digital transformation in government refers to the comprehensive integration of digital technologies across public sector domains to enhance service delivery, administrative efficiency, and citizen engagement (Janssen & Estevez, 2013). However, as Mergel et al. (2019) emphasize, digital transformation is not merely about digitizing existing procedures; it necessitates a fundamental rethinking of governance models, institutional capacities, and policy ecosystems. The shift from analog to digital processes demands more than technological upgrades, requires the public sector to redesign its structures, adopt new performance logic, and cultivate a data-driven, citizen-centric culture. Within the context of e-government, digital transformation aspires to create institutions that are transparent, accountable, proactive, and responsive to the evolving needs of the population (Gil-Garcia et al., 2018).

Globally, leading countries such as Estonia and South Korea exemplify the transformative potential of integrated digital governance. These nations have adopted whole-of-government digital strategies, where interoperability, secure digital identity frameworks, and cross-agency coordination form the backbone of digital public services (United Nations Department of Economic and Social Affairs [UNDESA], 2022). Their experiences demonstrate that successful digital transformation is less about technology alone and more about institutional coherence, legal frameworks, and political commitment. The theoretical underpinnings of digital transformation are grounded in public value theory (Moore, 1995), which emphasizes the creation of broader public benefits such as trust, equity, and inclusion, and

digital era governance (Dunleavy et al., 2006), which advocates for reintegration, holistic service delivery, and innovation-driven administrative reform.

In developing countries, particularly Indonesia, the path toward digital transformation remains fraught with challenges. Infrastructure limitations, low digital literacy, fragmented governance systems, and inadequate performance indicators hinder the realization of transformational outcomes (Janowski, 2015; Roengtam et al., 2017). Many digital government efforts in these contexts remain focused on front-end service automation without addressing the underlying institutional dynamics required for sustainable transformation. Crucially, while existing literature has explored digital tools and service adoption, a significant gap remains in understanding how digital transformation catalyzes structural and functional changes within government organizations, particularly in terms of interagency coordination, administrative behavior, and governance innovation. To address this transformation gap, this study examines how digital transformation affects institutional behavior in Indonesia, focusing on three key ministries: The Ministry of Home Affairs, the Ministry of Administrative and Bureaucratic Reform, and the Ministry of Communication and Informatics. These ministries form the backbone of Indonesia's national digital ecosystem and are crucial to understanding how digital governance operates at a systemic level. By examining the interplay between digital initiatives and bureaucratic structures, the research contributes to both theoretical development and policy discourse on digital government transformation in the Global South.

### **Interoperability in Digital Government**

Interoperability is widely understood as the ability of different systems and organizations to communicate, exchange, and utilize information effectively (Clark et al., 2018). As digital governance expands, interoperability has become a cornerstone for enabling integrated services, data-driven decision-making, and cross-agency collaboration. It not only enhances efficiency by reducing redundant data entry and manual processes but also facilitates a “once-only” principle in citizen engagement, whereby information provided to one agency is accessible and reusable by others (Zaoui et al., 2019). In the public sector, interoperability enables seamless data flow across agencies and sectors, facilitating integrated decision-making and more comprehensive public services (Misuraca et al., 2011; Zaoui et al., 2019).

From a conceptual perspective, the European Interoperability Framework (EIF) provides a comprehensive and layered model for understanding how interoperability operates across technical, semantic, organizational, and legal domains. The framework not only addresses data and system alignment but also emphasizes institutional harmonization and policy coherence (European Commission, 2017). While technical interoperability, concerned with IT infrastructure and standard protocols, is widely studied, organizational and institutional interoperability remains less theorized, particularly in the context of bureaucratic behavior, inter-agency routines, and rule-making systems. To address this, Luhmann's systems theory (1995) offers an insightful sociological lens, suggesting that organizations operate as self-referential systems that maintain stability and reproduce meaning through internal communication patterns, rather than relying solely on external coordination (Gerontas, 2020). This theoretical integration positions interoperability not merely as a technical capability but as an institutional condition shaped by organizational norms, interpretive codes, and policy logic.

In Indonesia, efforts to institutionalize interoperability within national electronic government (e-government) platforms remain fragmented. Despite initiatives such as SPBE (Sistem Pemerintahan Berbasis Elektronik), empirical research on how interoperability is embedded within ministerial

practices and cross-sectoral governance is scarce. Most studies focus on technological readiness or platform deployment without critically examining how interoperability is enacted—or inhibited—by interagency dynamics, bureaucratic culture, or legal misalignment. The challenge lies not only in connecting systems but in aligning organizational incentives, legal mandates, and policy cycles to foster trust-based data sharing and mutual accountability. This study addresses the conceptual and empirical void by integrating the EIF framework with Luhmann's systems theory to assess interoperability not only as a technical construct but as a deeply institutional phenomenon. By examining how interoperability is operationalized within three strategic ministries in Indonesia—namely, the Ministry of Home Affairs, the Ministry of Administrative and Bureaucratic Reform, and the Ministry of Communication and Informatics this research seeks to understand how institutional structures, normative constraints, and governance cultures mediate information flows. The goal is to assess the maturity of interoperability as both a technical infrastructure and a governance mechanism that reflects the complexity of state transformation in the digital era.

### **Cross-Organizational Interoperability**

Cross-organizational interoperability is particularly relevant for complex government ecosystems. It requires harmonized workflows, joint governance mechanisms, and shared digital infrastructures across multiple institutions (Blanc-Serrier et al., 2018; Van Staden & Mbale, 2012). The maturity model by Clark et al. (2018) identifies five levels of interoperability, ranging from ad hoc and fragmented systems to unified and fully integrated platforms. Digital maturity in interoperability is associated with enhanced scalability, responsiveness, and reliability of e-government platforms (El Benary & El Beqqali, 2017). However, achieving this maturity often confronts institutional barriers, such as legacy systems, a lack of data standards, and bureaucratic resistance (Scholl et al., 2012). Cross-organizational interoperability is rooted in institutional isomorphism (DiMaggio & Powell, 1983), where government agencies mimic or align their structures due to coercive (policy-driven), normative (professional), and mimetic (benchmarking) pressures. Clark et al. (2018) provides a mature model, transitioning from Ad hoc to Unified, which helps diagnose institutional capacity. There is a lack of empirical models that measure interoperability maturity across ministries in Indonesia, using rigorous frameworks. Studies tend to treat ministries as isolated units, ignoring the dynamic inter-agency relational structures that are central to digital integration (Margariti et al., 2020; Kanagwa et al., 2018).

### **Institutional Theory and System Integration**

Institutional theory explains how organizations adopt structures and processes in response to their environments and external pressures (DiMaggio & Powell, 1983). Isomorphic pressures – coercive, mimetic, and normative can influence ministries to align their digital strategies (Tolbert & Zucker, 1996). Systems theory, particularly Luhmann's (1995) concept of autopoiesis, emphasizes the self-referential nature of organizations. For integration to occur, external coupling (structural or operational) must be enabled through shared protocols and communicative mechanisms. The electronic national government aims to integrate diverse systems under a unified governance framework, but success depends on harmonizing institutional behaviors and fostering inter-ministerial cooperation. This study synthesizes institutional theory (Scott, 2001) with autopoiesis (Luhmann, 2003), arguing that organizations are self-producing systems with selective openness to environmental demands. Interoperability requires structural coupling, where systems retain autonomy while aligning through shared protocols. Most studies on institutional reform in digital government focus on policy instruments and regulatory tools. Very few connect institutional dynamics (rules, routines, and norms) with system integration and digital coupling, especially in the implementation of e-government at the national level.

By framing interoperability as a case of institutional structural coupling. This research addresses the theoretical gaps between systems theory and digital public management, particularly in analyzing why fragmentation persists despite integration policies.

## **METHODOLOGY**

This research employs a mixed-methods approach, integrating both qualitative and quantitative strategies to provide a comprehensive understanding of interoperability and digital transformation within Indonesia's national electronic government system. The qualitative component explores institutional behaviors, coordination mechanisms, and inter-organizational dynamics through in-depth interviews and document analysis. Meanwhile, the quantitative component aims to measure the maturity level of interoperability and assess the relationships among key constructs using data analysis through network analysis mapping, which visualizes the structure in interministerial relationship data flow and institutional integration patterns related to digital governance. This approach is used to uncover how ministries are interconnected or fragmented and to what extent interoperability is realized through actual institutional linkage and data exchanges. The study focuses on three key central ministries: The Ministry of Home Affairs, the Ministry of Bureaucratic Reform, and the Ministry of Communication and Information Technology, all of which hold critical mandates at the national level of electronic governance. Each ministry represents different pillars of the national digital transformation effort. The Ministry of Home Affairs focuses on local governance and civil registry data, the Ministry of Bureaucracy Reform focuses on public service reform and institutional performance, and the Ministry of Communication and Technology focuses on infrastructure and information systems. These institutions are selected purposefully due to their regulatory and operational roles in shaping Indonesia's digital government agenda.

Triangulation is used by comparing insights from interviews, documents, and network maps to ensure analytical depth and coherence. Ethical considerations, including informed consent, confidentiality, and adherence to research ethics approval, are maintained throughout the research process. This methodology enables the researcher to transcend normative or policy-based assessments by empirically mapping the interactions between Indonesia's central ministries in their pursuit of digital government integration and interoperability, providing both theoretical insights and actionable recommendations for advancing electronic government at the national level.

## **RESULT AND DISCUSSION**

The evolution of digital government in Indonesia has been marked by structural ambitions for transformation but constrained by enduring institutional fragmentation. While the government has enacted Presidential Regulation No 95/2018 to mandate integration through the electronic government system, the actual behavior of ministries reflects persistence of siloed logic, bureaucratic autonomy, and selective engagement. This phenomenon invites a layered analysis using both systems theory and institutional theory, which together provide a framework to understand why integration fails despite formal coordination mechanisms and digital infrastructure development. Interoperability in digital government as framed in the European Interoperability Framework (EIF) comprises technical, semantic, organizational, and legal dimensions. While Indonesia has achieved modest progress in the technical domain such as through the development of cloud infrastructure and population data platforms, semantic and organizational layers remain underdeveloped (Zaoui et al., 2019; Misuraca et

al., 2011). The perception reflects what Luhmann (1995) describes as operational closure, where in systems construct and maintain meaning through internally referenced codes and reject or reinterpret external stimuli that do not conform to their structure.

**Figure 1**

*Interoperability and Partial Integration across Ministries*

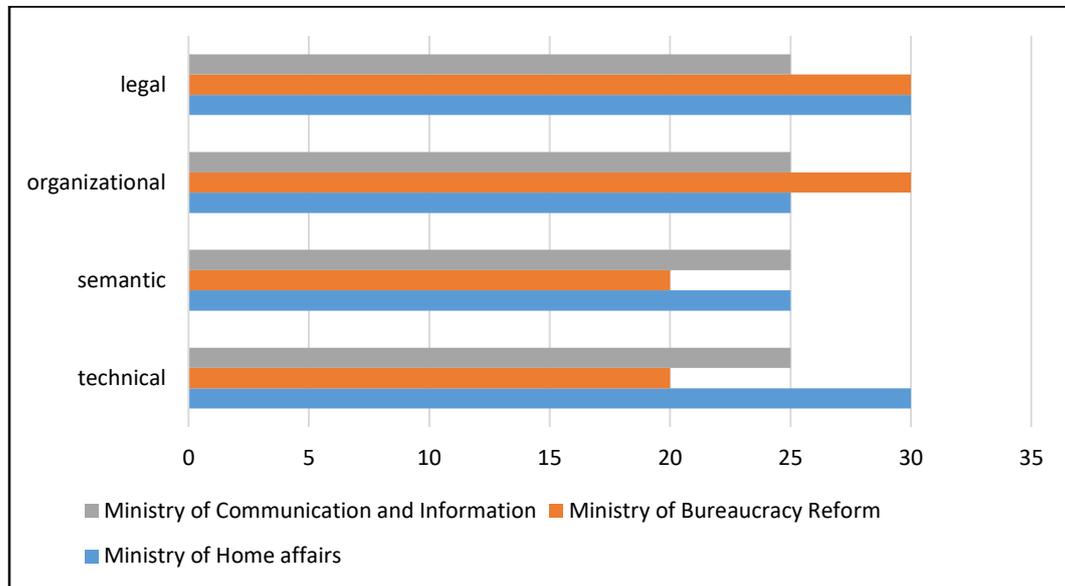


Figure 1 illustrates the comparative maturity levels across four interoperability dimensions — legal, organizational, semantic, and technical for three key ministries involved in Indonesia’s digital government implementation: The Ministry of Communication and Information, the Ministry of Bureaucracy Reform, and the Ministry of Home Affairs. Figure 1 illustrates that all three ministries demonstrate relatively high maturity in both the legal and organizational dimensions, indicating the presence of regulatory frameworks and effective institutional coordination mechanisms. However, disparities become apparent in the semantic and technical dimensions. The Ministry of Communication and Information demonstrates higher levels of maturity in these areas, suggesting more advanced capabilities in ensuring data meaning consistency and technological compatibility. In contrast, the Ministry of Home Affairs lags slightly, particularly in terms of semantic interoperability, which highlights challenges in aligning data standards and shared vocabularies. This variation highlights the fragmented nature of interoperability practices, where each ministry operates at varying levels of digital integration. These findings align with Niklas Luhmann’s theory of autopoiesis, which posits that organizations operate as self-referential systems, prioritizing internal coherence over systemic harmony. As such, each ministry, while producing outputs aligned with its mandates, may not fully integrate with cross-ministerial digital ecosystems.

Niklas Luhmann’s theory of autopoiesis positions organizations as self-referential systems that reproduce their elements and operations in response to internal logic rather than environmental demands (Luhmann, 2003). In the context of e-government, each ministry functions as an autopoietic unit producing digital outputs that align with its mandates but not necessarily with system-wide interoperability goals. For instance, the Ministry of Home Affairs maintains the database but engages in bilateral API sharing on a discretionary basis, rather than as a systemic obligation. This reveals the

absence of semantic operability, in which shared meaning and interpretation of data are prerequisites for integration. This autonomy aligns with structural coupling, a condition where systems engage with their environment while maintaining internal integrity. However, in Indonesia's case, coupling remains superficial. Ministries attend inter-agency coordination meetings but revert to self-reinforcing behaviors afterward. A member of the national e-government system team admitted that.

*"We hold meetings, but implementation returns to each ministry. There's no obligation to follow up unless it's a presidential priority".* (Interview National e-government system Task Force, 2023).

This illustrates loose coupling, which Luhmann describes as interaction without systemic adaptation. Where systems theory explains internal logic, institutional theory offers insight into how external pressures shape organizational behavior. DiMaggio and Powell's (1983) concept of isomorphism describes three mechanisms of institutional alignment: coercive (regulatory pressure), mimetic (imitation of others), and normative (adherence to professional standards). In the implementation of national e-government systems, coercive pressure is present through national regulations, but mimetic and normative alignment are weak. Ministries often appear to comply but do so through superficial mimicry. A policy lead from the Ministry of Bureaucracy Reform reflected:

*"Each institution believes they are already digital. The challenge is making them see the need to be digital together".* (Interviewed by Ministry of Bureaucracy Reform, 2023).

This comment exemplifies symbolic conformity, in which institutions adopt the language and structures of reform without changing underlying practices, also known as decoupling (Meyer & Rowan, 1977). Furthermore, path dependence plays a significant role in Indonesia's fragmented digital governance. Ministries have historically developed their IT systems and protocols, often in partnership with external vendors. This legacy infrastructure creates institutional lock-in, where prior investments constrain future options for convergence (Mahoney, 2000). Thus, even when integration frameworks are introduced, ministries face high transaction costs, technical, political, and organizational, to adopt.

The best international practice is that successful digital government transformation requires both technical design and institutional orchestration. Estonia's X-Road platform integrates over 1000 institutions through a secure and standardized data exchange layer governed by a centralized data authority. The critical success factor is not just the API infrastructure but the legal and semantic governance protocols that ensure consistency and compliance (Kalvet, 2012). Similarly, South Korea's Government 3.0 initiative established inter-ministerial digital task forces and introduced performance-based incentives to facilitate integration. Agencies that contributed to shared data services received higher budgetary allocations and public recognition. The UK's cross-agency teams are to embed digital practices within legacy departments (Margetts & Naumann, 2017). These cases contrast with Indonesia, where ministries remain self-authorizing. Without an empowered digital governance body and cross-sectoral incentive structures, interoperability remains aspirational.

One of the less visible but critical barriers to interoperability in Indonesia is semantic incoherence. Ministries define and structure data differently, even when referring to the same objects. A civil servant in one directorate noted:

*“Even basic definitions, like what counts as a ‘resident’ vary between systems. That’s why we often run into mismatched records when integrating data”.* (Interview by the Ministry of Home Affairs, 2023).

Such inconsistencies are symptoms of metadata anarchy, which is characterized by the absence of a centralized metadata repository or ontology. Without agreed-upon vocabularies and data dictionaries, even technically connected systems cannot “understand” each other. This violates the principle of semantic interoperability, which is necessary for effective service integration (Clark et al., 2018; Janssen et al., 2020). EIF recommends the development of national semantic registries, which are yet to be institutionalized. The absence of a meta-governing institution for interoperability contributes to the disconnect between policy and practice. The Ministry of Communication and Information leads infrastructure development, the Ministry of Home Affairs supervises reform outcomes, and the Ministry of Home Affairs controls foundational data. However, no single body oversees semantic and organizational alignment. As Scott (2001) explains, institutional change requires not only regulative legitimacy but also normative and cognitive alignment, a shared belief system, and rationale across actors. Indonesia’s e-government system lacks this normative infrastructure. There is no professional cadre of data stewards, no interoperability audit, and no cross-sectoral digital leadership program. The current system prioritizes institutional sovereignty over systemic interdependence. This is evident in procurement patterns, where ministries select vendors and architectures without adhering to national interoperability guidelines, thereby deepening fragmentation. To resolve this, the integration must be reframed as a process of structural coupling, not centralization. Structural coupling in systems theory enables different systems to remain autonomous yet interoperable through shared interfaces and reflexive adaptation (Luhmann, 2003). This requires the development of interoperable governance standards, cross-functional performance metrics, and institutional learning mechanisms. One possibility is to establish a National Interoperability Council, comprised of representatives from ministries, technical experts, and civil society actors, that functions as a boundary-spanning institution. This council could govern semantic rules, mediate inter-ministerial conflicts, and ensure accountability. It would replace the current ad hoc coordination with a formal structure for sustained engagement.

**Figure 2**

*Mapping Interoperability between Ministries*

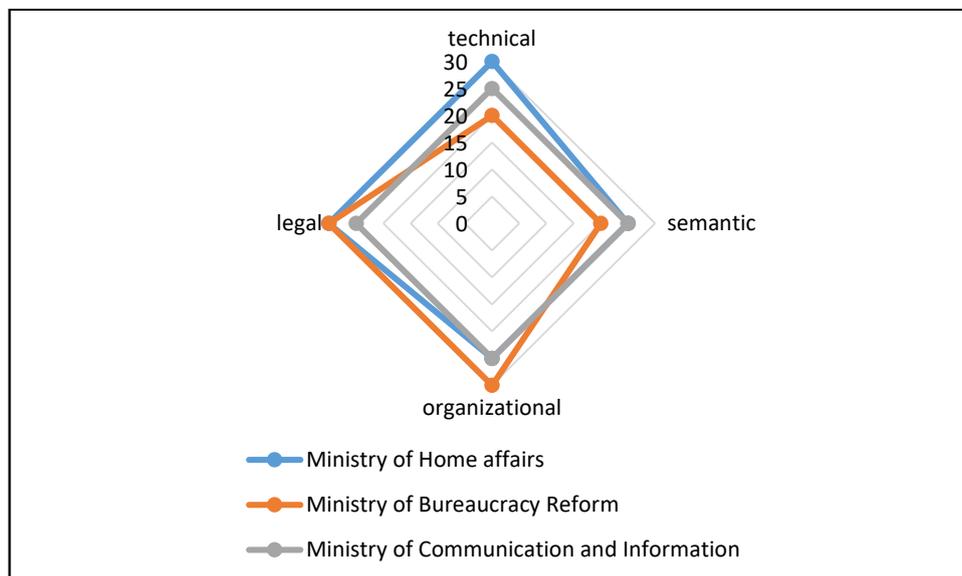


Figure 2 presents a comparative, multidimensional view of how each ministry performs in relation to the others across various aspects of interoperability. Figure 2 shows that the Ministry of Communication and Information leads in the technical and semantic dimensions, indicating more advanced capabilities in system integration and data harmonization. The Ministry of Bureaucracy Reform demonstrates a balanced performance across all dimensions, reflecting its coordinating role. Meanwhile, the Ministry of Home Affairs shows relatively lower scores in the semantic and technical domains but remains comparable in the legal and organizational dimensions. This mapping reinforces the notion of fragmented interoperability maturity among ministries. It aligns with the autopoietic system theory, which suggests that each organization develops internal capacities based on its logic and mandates, leading to limited systemic coordination unless structural coupling mechanisms are enforced.

The broader implication of this study is that interoperability is not a technical project but an institutional revolution. It challenges the very foundations of bureaucratic identity, where control over data equates to authority. For national e-government to succeed, the government must transition from a sovereignty-centric model to an interdependence-based model of governance. This involves not just the integration of platforms but the transformation of power relations, incentives, and accountability structures. As public value theorists argue (Moore, 1995), the legitimacy of public institutions increasingly depends on their ability to co-create outcomes, not just deliver services. Digital governance must be judged by its ability to synchronize actors across silos to address complex, intersectoral challenges such as disaster management, poverty alleviation, and urban planning. The Indonesian case demonstrates that the failure of interoperability is not due to a lack of effort or infrastructure, but due to a misalignment between systemic logic and institutional behavior. Ministries function as autopoietic systems, maintaining operational closure despite formal coordination. Institutional reforms have emphasized compliance over convergence, leading to symbolic integration rather than substantive interoperability, by synthesizing systems theory and institutional theory. This article argues that interoperability must be embedded, not enforced. This means designing institutions, incentives, and interfaces that enable structural coupling and shared meaning. Only by doing so can the national e-government realize its promise of a unified.

## CONCLUSION

This study concludes that achieving effective digital government in Indonesia is critically dependent on the realization of robust interoperability across ministries. While the regulatory framework and technical infrastructure have been partially established, the persistent fragmentation among government institutions, driven by autopoietic organizational behavior and weak institutional alignment, remains a central barrier to integration. The analysis reveals that interoperability must be understood not merely as a technical challenge, but as a complex institutional process that involves legal, semantic, organizational, and technical dimensions. The Ministry of Communication and Information leads in technological and semantic readiness. At the same time, the Ministry of Bureaucratic Reform demonstrates balanced involvement, and the Ministry of Home Affairs faces notable semantic and technical gaps. These disparities indicate that ministries continue to operate in silos, often responding to internal logic rather than collective systems goals. Drawing on systems theory and institutional theory, the research emphasizes that digital transformation necessitates structural coupling: mechanisms that enable autonomous institutions to interact meaningfully through shared standards, reflexive adaptation, and aligned incentives. Without such coupling, integration efforts risk becoming symbolic rather than substantive. Therefore, establishing a dedicated interoperability governance body, such as a national interoperability council, is crucial to coordinate standards, mediate institutional conflicts, and ensure accountability. In conclusion, digital government transformation in Indonesia will only succeed

if institutional behavior, policy coherence, and technological infrastructure are harmonized under a shared vision of interdependence and public value creation.

### **CONFLICT OF INTEREST**

The authors declare no potential conflict of interest. All authors contribute equally to this article.

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