

Cross-Ministerial Data Integration for Evidence-Based Policymaking: Toward Data-Driven Governance in Indonesia

Mardani Malemi [ORCID: 0009-0008-5878-2355]¹, M. Shiddiq Al-Ghifari²

^{1,2}Universitas Islam Negeri Ar-Raniry Banda Aceh, Indonesia

Corresponding author. E-mail: mardani.malemi@ar-raniry.ac.id

Co-author. E-mail: mhmdshiddiq20@gmail.com

Abstract

Cross-ministerial data integration is widely recognized as a prerequisite for evidence-based policymaking and effective digital government. Despite substantial investments in digital infrastructure, persistent data fragmentation continues to impede integrated governance in many developing countries, including Indonesia. Existing research has primarily examined technical, organizational, or policy-related barriers in isolation, leaving the governance mechanisms through which these challenges interact insufficiently understood. This study synthesizes the existing evidence to explain how governance conditions shape cross-ministerial data integration in Indonesia. A qualitative systematic literature review was conducted following the PRISMA 2020 guidelines. Twenty-three empirical studies published between 2015 and 2026 were identified through a systematic search of five academic databases and analyzed using abductive thematic analysis. The synthesis revealed four recurring patterns: systemic data fragmentation across levels of government, persistent decoupling between formal policy adoption and implementation, multidimensional deficits in administrative capacity, and limited utilization of technical infrastructure despite its availability. These findings suggest that data integration is constrained by mutually reinforcing governance conditions rather than by technological limitations alone. Accordingly, the study develops an Integrated Data Governance Framework that conceptualizes political commitment, institutional governance, administrative capacity, technical infrastructure, and data resources as interdependent components shaping cross-ministerial data integration, thereby extending existing explanations of data governance beyond a predominantly technology-centered perspective.

Keywords: Cross-ministerial data integration; Integrated Data Governance Framework; data governance; digital government; One Data Indonesia; systematic literature review.

CONTACT AARAV Social Policy Journal  E-mail: dariacehcom@gmail.com

 Supplemental information for this article can be accessed online at:
<https://journal.dariaceh.com/aarav-spi/article/view/cross-ministerial-data-integration>

© 2026 The Author(s). Published by Atjeh Publishing, Aceh, Indonesia

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

1 Introduction

The digital transformation of government has fundamentally reshaped the relationship between public administration and data. Governments worldwide now generate unprecedented volumes of administrative data, ranging from population registries and health records to taxation systems, social services, and welfare programs. Once regarded merely as a by-product of administrative processes, data has evolved into a strategic public asset (Sirello & Tissot, 2026). As evidence-based policymaking increasingly depends on timely, reliable, and integrated data, cross-sectoral data integration has become more than a technical aspiration; it is now a fundamental requirement for effective public governance (Wang et al., 2026; Ruijter, 2021).

International organizations, including the OECD, emphasize that governments capable of effectively leveraging data are better positioned to design targeted public policies and improve the quality of public service delivery (OECD, 2020). Nevertheless, research on governmental big data ecosystems indicates that, despite the considerable potential of data-driven policymaking, the field still lacks a robust conceptual framework capable of systematically explaining how data governance supports evidence-based policy ecosystems (Zhang et al., 2024, as cited in Yanto et al., 2026). This challenge is further compounded by the fact that governments face not only technical constraints but also intertwined institutional, regulatory, and organizational-cultural barriers that collectively hinder effective data integration (Wirtz et al., 2022).

Indonesia presents a particularly compelling case for examining public-sector data governance. Since 2019, the Indonesian government has introduced several major digital governance reforms, including Presidential Regulation No. 39 of 2019 on One Data Indonesia (Satu Data Indonesia), the mandatory implementation of the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik; SPBE), and the development of the Government Service Integration Platform (Sistem Penghubung Layanan Pemerintah; SPLP) as the technical backbone for inter-agency data exchange (Lukman & Fiulaiizi, 2026). Collectively, these initiatives constitute strategic instruments for advancing a more open, collaborative, and evidence-oriented model of public governance. The One Data Indonesia initiative is founded on four core pillars—data standards, metadata standards, interoperability, and reference codes with master data—all of which are conceptually intended to overcome long-standing fragmentation across government institutions (Lukman & Fiulaiizi, 2026).

From an implementation perspective, measurable progress has been achieved. By 2025, the One Data Indonesia portal had incorporated 413 national and subnational data-producing institutions—including ministries, government agencies, provincial governments, and district or municipal governments—with a total of 457,536 datasets curated and verified by designated data stewards (Lukman & Fiulaiizi, 2026). Despite these achievements, however, a substantial gap remains between policy ambition and implementation reality. As noted by Hasnita and Salomo (2025), government agencies frequently produce conflicting datasets on identical policy issues because they employ different methodologies, collection objectives, and standardization procedures. Such inconsistencies undermine public confidence in the quality and credibility of government data.

This condition reflects a pattern of institutional decoupling, whereby the existence of formal policy frameworks does not automatically translate into substantive implementation. Institutional constraints, weak inter-agency coordination, and divergent methodological practices continue to impede the realization of integrated data governance.

This dynamic can be summarized as follows:

Formal policy adoption → partial implementation → methodological and standard inconsistencies across agencies → inconsistent data → declining public trust → weakened legitimacy of evidence-based policymaking.

Consequently, Indonesia faces a challenge that extends well beyond technical interoperability. Although the institutional framework for data integration has been formally established, operational data management practices have not undergone corresponding substantive transformation. This disconnect constitutes the central puzzle addressed in the present study.

Empirical evidence from a growing body of research demonstrates that cross-government data fragmentation in Indonesia is neither an isolated nor a marginal issue; rather, it represents a pervasive and systemic challenge affecting multiple levels of government. At the national level, only 43 of 101 ministries and government agencies (39.6%) had established supporting regulations for the One Data Indonesia initiative, whereas the remaining 63 institutions (60.4%) had yet to develop comparable regulatory frameworks (Hasnita & Salomo, 2025). By 2024, agreement had not been reached on 1,279 priority datasets, leaving numerous national development indicators without adequate data support (Hasnita & Salomo, 2025).

The underlying cause extends beyond the absence of technical infrastructure and is rooted in the asymmetric distribution of authority between data producers and data users. Data-producing agencies retain exclusive control over the entire data production process—including collection schedules, spatial coverage, methodological specifications, and publication timelines—which are frequently determined unilaterally. In contrast, data users must adapt their analytical needs to the formats, standards, and schedules established by data producers. This institutional imbalance has contributed to relatively low user satisfaction, with satisfaction levels among planning units within the National Development Planning Agency (Bappenas) ranging from only 40% to 60% (Hasnita & Salomo, 2025).

Comparable patterns have also been documented at the subnational level. A study conducted in Papua Province identified six interrelated dimensions that constrain data integration: fragmented information systems and incompatible data standards; disparities in digital infrastructure between central government and remote regions; insufficient civil servant capacity in data literacy and data governance; complex institutional coordination coupled with weak regulatory harmonization; organizational resistance and persistent sectoral mentalities; and concerns regarding data sensitivity and security within Papua's distinctive socio-political context (Muchsin, 2025). Collectively, these findings suggest that the challenges of data integration in Indonesia are inherently multidimensional, encompassing technical, institutional, human resource, and socio-political dimensions that reinforce one another and generate persistent systemic barriers.

Similar implementation challenges have been observed in West Sumatra Province, where efforts to establish interoperable data services continue to be constrained by limited technical capacity, the absence of consistent data exchange standards, weak inter-agency commitment, and the underutilization of the Government Service Integration Platform (SPLP) (Hapsari & Permana, 2025). Of the fifteen applications and websites deployed through the SPLP platform for West Sumatra, only two—the regional development dashboard and the West Sumatra data portal—remain actively utilized (Hapsari & Permana, 2025). This limited adoption reflects a broader governance problem: many digital

applications were developed without clearly identifying their intended users or policy objectives, while other government agencies perceived little practical need to utilize the available applications or datasets.

A review of the existing literature reveals that research on cross-ministerial data integration has evolved along largely disconnected disciplinary trajectories. On one hand, studies of open government data (OGD) and interoperability have been dominated by computer science and information systems research, emphasizing technical issues such as metadata standards, Application Programming Interface (API) architectures, data quality, and the technological infrastructure required for data exchange (Wirtz et al., 2022; Schwoerer, 2026). As Wirtz et al. (2022) observe, research on OGD has been predominantly situated within public administration and public management, while receiving comparatively limited attention from the information systems and digital business communities.

On the other hand, scholarship on collaborative governance and policy integration has developed primarily within public administration and political science. This body of research emphasizes institutional coordination, stakeholder interactions, administrative capacity, and the political dynamics shaping policy implementation (Sarti, 2023; Domorenok et al., 2021). Domorenok et al. (2021) argue that existing studies have implicitly acknowledged the importance of administrative capacity for integrated policy design without explicitly theorizing or empirically examining the relationship between the two. Likewise, Sarti's (2023) bibliometric analysis of 413 policy integration studies demonstrates that concepts such as policy instruments, policy goals, and policy design dominate the literature, whereas analytical frameworks including the Advocacy Coalition Framework, Punctuated Equilibrium Theory, and Veto Player Theory appear in only approximately 1% of published studies.

This disciplinary divide has produced a fragmented understanding of data integration. Technical research rarely considers the institutional and political dynamics that shape implementation in practice, whereas institutional studies often overlook the technical constraints and data quality issues that fundamentally influence policy choices. Consequently, existing scholarship remains insufficient to explain why data integration initiatives succeed in some contexts yet fail in others.

Building upon this synthesis of the international literature and empirical evidence from Indonesia, the present study identifies three interrelated research gaps that provide the foundation for its theoretical contribution.

Drawing on the preceding synthesis of the literature and empirical evidence from the Indonesian context, this study identifies three interrelated research gaps that collectively underpin its theoretical contribution. First, existing research has largely treated technical interoperability and institutional governance as distinct and independent domains. Studies on interoperability predominantly concentrate on technical standards, system architecture, and digital infrastructure (Kasiwi et al., 2025; Taduka, 2025), whereas research on collaborative governance emphasizes organizational arrangements, institutional coordination, and inter-agency collaboration (Ruijter, 2021; Bartolomucci et al., 2026). Despite their complementary nature, these two strands of scholarship have rarely been integrated into a coherent analytical framework capable of explaining how technical and institutional factors interact to shape data integration outcomes in practice.

Second, the existing literature has devoted considerably more attention to how data integration should be implemented than to why integration initiatives consistently fail to produce substantive organizational change. This limitation is particularly evident in developing countries, where formal digital government reforms frequently coexist with persistent implementation failures. Evidence from Indonesia—including studies conducted

at the national level as well as in Papua and West Sumatra—suggests that a substantial gap remains between policy design and implementation capacity (Muchsin, 2025; Hapsari & Permana, 2025; Hasnita & Salomo, 2025). This recurring pattern reflects a broader phenomenon of institutional decoupling, in which formally adopted policies fail to generate corresponding changes in organizational practices. Although this phenomenon has been widely observed, its underlying mechanisms remain insufficiently theorized within the literature on digital government and data governance.

Third, and most importantly, no existing theoretical framework comprehensively explains the causal relationships among institutional arrangements, administrative capacity, data governance mechanisms, interoperability outcomes, and evidence-based policymaking within a single analytical model. This gap echoes the concern raised by Domorenok et al. (2021), who argue that the relationship between administrative capacity and integrated policy design remains insufficiently articulated. Likewise, Wirtz et al. (2022) identify a persistent lack of integration between technical and institutional perspectives within the open government data (OGD) literature.

Taken together, these three research gaps reinforce one another. Without an integrative framework that simultaneously incorporates institutional, administrative, and technical dimensions, existing scholarship remains unable to explain why governments possessing formal regulatory frameworks and digital infrastructure continue to experience persistent failures in achieving substantive cross-government data integration. Evidence from Indonesia indicates that these failures are systemic rather than isolated, emerging from the dynamic interaction among institutional arrangements, administrative capacity, and technical interoperability rather than from deficiencies in any single dimension.

This cyclical governance problem may be conceptualized as follows:

Formal policy framework (Presidential Regulation No. 39/2019) → partial implementation due to institutional barriers → persistent data fragmentation → weak evidence-based policymaking → limited pressure for institutional reform → continued institutional barriers.

The self-reinforcing nature of this cycle suggests that improvements in technical infrastructure alone are unlikely to resolve the underlying governance challenges. Instead, sustainable progress requires a governance perspective that recognizes the interdependence of institutional structures, organizational capacity, and technological systems in shaping the effectiveness of cross-government data integration.

The principal novelty of this study lies in the development of an Integrated Data Governance Framework that explains cross-ministerial data integration through the interaction of institutional, administrative, and technical layers. Unlike previous studies, which have generally examined either the technical dimensions of interoperability or the institutional dimensions of governance in isolation, this study advances a holistic analytical perspective that conceptualizes the interaction among these three layers as the primary mechanism determining the success or failure of cross-government data integration.

Rather than treating data governance as merely a technological challenge or solely an issue of organizational coordination, the proposed framework positions successful data integration as an emergent outcome of mutually reinforcing institutional arrangements, administrative capabilities, and interoperable technical infrastructures. In doing so, the study offers a more comprehensive theoretical explanation for why evidence-based policymaking remains difficult to achieve despite extensive digital government reforms.

Building upon the research gaps identified above, this study pursues three interrelated

objectives. First, it seeks to examine why cross-ministerial data integration remains fragmented despite the implementation of extensive digital government reforms in Indonesia. Second, it aims to explain how institutional, technical, and administrative capacities interact to shape evidence-based policymaking. Third, the study develops an integrated governance framework capable of explaining the conditions under which cross-ministerial data integration succeeds or fails within the Indonesian public sector.

To achieve these objectives, the study addresses the following research questions: RQ1. Why does cross-ministerial data integration remain fragmented despite extensive digital government reforms in Indonesia? RQ2. How do institutional, technical, and administrative capacities interact to shape evidence-based policymaking in the public sector? RQ3. What governance framework best explains the success and failure of cross-ministerial data integration in Indonesia?.

2 Research Design, Case Selection, dan Methods

This study adopted a qualitative research approach employing a systematic literature review (SLR) design guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. This design was selected because it enables the systematic identification, critical appraisal, and synthesis of fragmented evidence drawn from multiple disciplinary domains—including computer science, public administration, and political science—into a coherent analytical framework. The review was designed as an exploratory qualitative evidence synthesis, reflecting the emerging nature of cross-ministerial data integration as a research topic that has received limited comprehensive scholarly attention. The review protocol was developed prior to the literature search but was not formally registered in a public protocol registry.

2.1 Literature Search Strategy

The literature search was conducted mid-2026 across five academic sources: Scopus, Web of Science, ScienceDirect, Google Scholar, and nationally accredited Indonesian journals indexed in SINTA 1–2. The search covered publications published between 2015 and 2026. This time frame was determined on two grounds. First, the issuance of Presidential Regulation No. 39 of 2019 on One Data Indonesia marked a major policy milestone in Indonesia's data integration agenda. Second, scholarly interest in public-sector data integration has expanded substantially since 2015.

The search strategy employed Boolean operators to combine keywords across four conceptual domains: objects ("data integration," "interoperability," "metadata"), subjects ("government," "public sector," "interagency"), context ("Indonesia," "developing countries"), and related concepts ("data governance," "evidence-based policy," "administrative capacity"). The complete Boolean search strings used for each database and source are provided in Appendix A. Searches were restricted to journal articles published in either English or Indonesian and available in full text. The initial search yielded 1,082 records.

2.2 Study Selection

Study selection followed the four-stage PRISMA 2020 process. During the identification stage, 1,082 records were retrieved from the selected databases and sources. After 185 duplicate records were removed using Mendeley, 897 unique records remained for screening.

During the screening stage, two reviewers independently assessed the titles and abstracts. A total of 712 records were excluded because they did not address public-sector data integration, were not relevant to Indonesia or other developing-country contexts, or did not constitute peer-reviewed journal articles. Consequently, 185 records advanced to the full-text assessment stage.

The eligibility stage involved full-text assessment of the remaining 185 records. Studies were included if they: (1) were published between 2015 and 2026; (2) were written in English or Indonesian; (3) examined data integration, interoperability, or data governance within the public sector; (4) focused on Indonesia or other developing-country contexts; and (5) were available in full text. Studies were excluded if they focused exclusively on the private sector, examined only developed-country settings, consisted solely of opinion or conceptual papers without empirical evidence, or lacked full-text accessibility.

Following full-text assessment, 141 articles were excluded. To maintain analytical focus, an additional 21 studies were removed because they addressed only technical aspects of interoperability without considering institutional or policy dimensions. The final review corpus comprised 23 articles. The complete PRISMA 2020 flow diagram is presented in Figure 1, while detailed reasons for exclusion are provided in Appendix B.

2.3 Quality Appraisal

The methodological quality of the included studies was assessed using an appraisal instrument adapted from previous systematic review research. The screening stage was conducted independently by two reviewers through title and abstract assessment. Disagreements between the two reviewers were resolved through discussion and consensus. Five criteria were evaluated: topic relevance, clarity of research objectives, clarity of findings, quality of interpretation, and strength of conclusions. Each criterion was scored on a three-point scale ranging from 0 to 2, producing a maximum possible score of 10. Studies scoring below 5 were excluded from the review. The complete quality appraisal instrument is presented in Appendix C.

2.4 Data Extraction

Data from each included study were extracted using a structured extraction matrix comprising bibliographic information, research objectives, study context, principal findings, verbatim quotations with corresponding page numbers, and preliminary thematic codes. This extraction procedure ensured that analytical claims could be traced directly to their original sources, thereby supporting the transparency, traceability, and auditability of the review process.

2.5 Data Analysis

The extracted data were analyzed using thematic analysis informed by an abductive approach (Braun & Clarke, 2019). Abductive analysis integrates deductive and inductive reasoning, enabling the identification of underlying causal mechanisms through evidence synthesis. The analytical process consisted of six sequential stages: (1) data familiarization; (2) initial coding, resulting in 147 initial codes; (3) development of analytical categories, producing 24 analytical categories; (4) development and identification of overarching themes, leading to six overarching themes; (5) theme review and refinement; and (6) conceptual synthesis.

Coding was conducted by the principal researcher. Rather than employing formal inter-coder reliability measures, methodological rigor was enhanced through four complementary strategies: (1) iterative coding conducted in two rounds separated by a two-week interval; (2) maintenance of a comprehensive audit trail documenting all coding decisions; (3) peer debriefing with two academics specializing in public administration and information systems; and (4) continuous reflexive memo writing throughout the analytical process. The complete coding framework is presented in Appendix D.

2.6 Trustworthiness and Validation

The credibility of the findings was established through source triangulation and expert review. Source triangulation involved comparing evidence derived from three categories of materials: (1) peer-reviewed journal articles ($n = 23$); (2) policy documents, including Presidential Regulation No. 39 of 2019 and Minister of Communication and Informatics Regulation No. 1 of 2023; and (3) official government reports, particularly the One Data Indonesia Performance Report. Policy documents and official reports were used exclusively to triangulate and validate the interpretation of findings and were not included as part of the systematic review corpus.

Expert validation was undertaken through consultation and discussion with two scholars specializing in public administration and information systems, who reviewed the analytical framework and thematic interpretations to strengthen the credibility of the findings.

3 Results

3.1 Data Fragmentation Patterns Across Governmental Levels

The reviewed studies consistently reveal a recurring empirical pattern: data fragmentation across Indonesian government institutions occurs systematically at multiple governance levels.

At the national level, Hasnita and Salomo (2025) report that only 43 out of 101 ministries and agencies (39.6%) have issued supporting regulations for Satu Data Indonesia. The same study documents that 1,279 priority datasets remained unagreed upon as of 2024, leaving many development indicators without adequate data support. Furthermore, satisfaction rates among planning units in Bappenas are reported between only 40% and 60%, with data users required to conform to formats and schedules unilaterally set by data producers.

A similar pattern emerges at the provincial level. Muchsin (2025) identifies six empirical challenges in Papua: information system fragmentation and data standard incompatibility; digital infrastructure gaps; insufficient civil service capacity in data literacy and governance; complex institutional coordination and weak regulatory synchronization; organizational resistance and sectoral mindsets; and data sensitivity issues within Papua's unique socio-political context.

In West Sumatra, Hapsari and Permana (2025) report that among fifteen applications uploaded to the Government Service Interconnection System (SPLP), only two are utilized effectively—a development dashboard and the provincial data portal. The same study identifies constraints including limited technical capacity, inconsistent data exchange standards, low inter-agency commitment, and sub-optimal SPLP utilization.

Aggregated evidence indicates that this fragmentation pattern surfaces consistently at national, provincial, and local levels, signaling a systemic rather than localized phenomenon.

3.2 Policy-Implementation Gap Patterns

A second recurring empirical pattern across studies is the persistent gap between formal policy adoption and substantive implementation.

Kasiwi et al. (2025) document that ministries attend inter-agency coordination meetings but revert to self-reinforcing behavior afterward. A member of the national e-government system team stated:

"We hold meetings, but implementation goes back to each ministry. There is no obligation to follow up unless it is a presidential priority." (Kasiwi et al., 2025)

An official from the Ministry of PANRB similarly reported:

"Every institution believes they are already digital. The challenge is making them see the need to be digital together." (Kasiwi et al., 2025)

At the operational level, semantic fragmentation exacerbates this pattern. A civil servant noted:

"Even basic definitions, such as what constitutes a 'resident', vary across systems. That is why we frequently encounter record mismatches when integrating data." (Kasiwi et al., 2025)

Evidence consistently indicates that institutions adopt the language of reform—attending meetings, drafting reports, forming committees—while maintaining autonomous data practices with incompatible standards.

3.3 Limited Administrative Capacity Patterns

A third empirical pattern involves administrative capacity across three dimensions: systems/tools, organizational structures, and human resources.

Domorenok et al. (2021) identify three levels of administrative capacity for integrated policy design: (1) systems and tools (comprehensive policy frameworks, thematic templates, interoperable systems); (2) organizational structures (vertical and horizontal coordination mechanisms); and (3) human resources (qualified staff with cross-sectoral skills).

In Indonesia, studies consistently document gaps across all three dimensions. Regarding systems and tools, Hasnita and Salomo (2025) report regulatory adoption at only 39.6% among central ministries and 68.68% in regencies/cities. On organizational structures, Hapsari and Permana (2025, p. 4) document weak coordination, reflected in only 2 of 15 SPLP applications being effectively used. Regarding human resources, Muchsin (2025) reports "insufficient civil service capacity in data literacy and governance" in Papua, while Hapsari and Permana (2025) identify "limited human resource technical capacity" in West Sumatra.

Synthesis indicates that gaps across these three dimensions occur concurrently across government levels, demonstrating systemic rather than isolated deficiencies.

3.4 Technology Utilization Patterns

A fourth empirical pattern concerns technology utilization. Across the reviewed studies, infrastructure availability does not consistently correlate with effective usage.

Schwoerer (2026) reports that identical platforms (Socrata) yield widely varying usage levels depending on how metadata are managed by individual publishers. Variations in metadata practices—rather than platform differences—account for variations in data usage outcomes.

A similar pattern surfaces in Indonesia. Hapsari and Permana (2025) document that while SPLP is available as technical infrastructure, only 2 out of 15 applications are effectively utilized. Nationally, Lukman and Fiulaiizi (2026) report that although 413 agencies are integrated into the Satu Data portal with 457,536 datasets, fragmentation persists due to inconsistent metadata standards. Hasnita and Salomo (2025) document that 1,279 priority datasets remain unavailable due to asymmetric authority between data producers and users.

Evidence consistently demonstrates that while technical capacity for data exchange exists, governance capacity to ensure data usability is lacking.

The empirical patterns identified above—fragmentation across governance levels, policy-implementation gaps, three-dimensional administrative capacity deficits, and limited technology utilization despite available infrastructure—demonstrate recurring regularities across studies and government levels. These patterns consistently point to a gap between formal policy adoption and substantive implementation. The following Discussion section explores potential explanations for why these patterns emerge and what they indicate regarding cross-ministerial data integration in Indonesia.

4 Discussion

4.1 Explaining Fragmentation Patterns: A Self-Reinforcing Cycle

The synthesized evidence leads to a consistent pattern: data fragmentation in Indonesia recurs across government levels. This pattern is not merely a collection of isolated barriers, but points to mutually reinforcing mechanisms.

Low regulatory adoption (under 40% of ministries) and weak coordination (only 2 of 15 SPLP applications effective) indicate that institutional fragmentation is not a marginal phenomenon. This pattern logically precedes the emergence of data silos—unavailable priority datasets, inconsistent standards—which subsequently diminish interoperability. Low interoperability weakens evidence-based policymaking (reflected in satisfaction rates of only 40–60%). Weak policy output generates no pressure for institutional reform. The absence of reform pressure allows institutional fragmentation to endure. Each element in this chain strengthens the next, establishing a self-reinforcing cycle.

This synthesis collectively suggests a mechanism conceptualized as a self-reinforcing vicious cycle. Each component reinforces the others, creating an institutional lock-in resistant to partial interventions. This is not a set of isolated hurdles, but a systemic pattern. The cycle perpetuates itself because weak evidence cannot justify institutional change, and weak institutions cannot produce robust evidence. This explains why formal policy (Pres.

Reg. 39/2019) coexists with ongoing fragmentation—the institutional environment demands compliance, but organizational self-interest requires autonomy, and the cycle perpetuates both without resolving either.

Three sub-mechanisms reinforce this cycle. First, decoupling and symbolic compliance emerge as adaptive responses. Kasiwi et al. (2025) document that institutions adopt the rhetoric of reform—attending meetings, generating reports—without altering underlying practices. This reconciles external pressure for integration with internal desires to preserve autonomy. Second, asymmetric authority between data producers and users acts as a structural barrier. Producers unilaterally control production; users must adapt (Hasnita & Salomo, 2025). This power imbalance prevents the alignment required for integration. Third, administrative capacity deficits across three dimensions—systems/tools, organizational structures, human resources—demonstrate circular interdependence (Domorenok et al., 2021). Weak systems mean no operational guidance; weak structures mean no coordination; weak HR capacity means no execution. Each deficiency reinforces the others.

This interpretation aligns with Meyer and Rowan's (1977) institutional decoupling theory, where organizations adopt formal structures to satisfy external expectations while maintaining substantive autonomy. The synthesis extends this concept to data governance by showing how decoupling operates specifically through semantic fragmentation, asymmetric authority, and circular capacity deficits.

4.2 Comparison with Previous Literature

Positioning the findings within the existing body of scholarship is essential for clarifying the contribution of the present study. Accordingly, the synthesized evidence is compared with previous research on data governance, integrated policymaking, and digital government to identify both shared insights and points of departure. This comparison demonstrates that the present synthesis does not merely confirm earlier findings; rather, it integrates and extends existing explanations by proposing a more comprehensive account of the institutional and governance mechanisms that shape cross-ministerial data integration.

Previous Study	Primary Focus	Key Findings	Limitations of Previous Studies	Contribution of the Present Study
Wirtz et al. (2022)	Open government data	Technical barriers are the principal obstacles to data integration and open government initiatives.	Emphasizes technical interoperability while giving limited attention to institutional dynamics in developing countries.	Demonstrates that institutional and behavioral mechanisms—particularly institutional decoupling, asymmetric authority, and administrative capacity deficits—are more influential than technical barriers in explaining cross-ministerial data integration in Indonesia.
Domorenok et al. (2021)	Integrated policy design	Administrative capacity is a prerequisite for integrated policymaking.	Treats administrative capacity primarily as	Shows that administrative capacity is itself constrained by a self-

			an enabling condition rather than an outcome of broader institutional dynamics.	reinforcing governance cycle, preventing capacity accumulation over time.
Schwoerer (2026)	Open data platforms	Metadata management influences the effectiveness of identical technological platforms.	Focuses on technological implementation without explicitly examining institutional governance mechanisms.	Demonstrates that technology creates interoperability potential, whereas governance determines whether that potential is translated into effective organizational practice.
Present Study	Cross-ministerial data integration in Indonesia	Develops an Integrated Data Governance Framework (IDGF) explaining how political commitment, institutional governance, administrative capacity, technical infrastructure, and data resources interact to shape integration outcomes.	—	Introduces a multi-layer explanatory framework and identifies institutional decoupling as the principal mechanism sustaining fragmented data governance.

Table 1. Comparison Between Previous Studies and the Present Synthesis (2026).

This synthesis extends prior understanding in two key respects. First, whereas Wirtz et al. (2022) identify technical barriers as central to open government data challenges, the reviewed evidence suggests institutional and behavioral factors—decoupling, asymmetric authority, and circular capacity deficits—may be more decisive in the Indonesian context. This distinction likely reflects contextual conditions: in developing nations with weak enforcement mechanisms and strong institutional autonomy, institutional barriers outweigh technical constraints.

Second, Domorenok et al. (2021) found administrative capacity to be key for integrated policy design. This synthesis confirms that insight while extending it: in Indonesia, capacity fails to develop because the self-reinforcing cycle systematically prevents capacity accumulation. While leadership turnover triggered capacity development in Veneto, leadership changes in Indonesia do not automatically alter capacity due to rigid bureaucratic structures and deeply entrenched institutional autonomy.

The synthesis also refines understanding regarding the technology-governance relationship. Schworer (2026) showed that identical platforms yield varying outcomes depending on metadata practices. Evidence from Indonesia indicates this is not an exception but reflects a general pattern: technology creates possibilities, but governance determines whether those possibilities are realized.

4.3 Conceptual Framework: Integrated Data Governance

Building upon the preceding synthesis, this study proposes an Integrated Data Governance Framework to explain the conditions under which cross-ministerial data integration succeeds or fails. The framework conceptualizes data integration as a multilayered governance process in which political, institutional, administrative, technical, and data-related dimensions interact to determine implementation outcomes.

The five layers are presented as an analytical progression derived from the reviewed evidence rather than as a normative hierarchy or universally applicable model. Their ordering reflects the sequence through which the empirical findings are most coherently interpreted.

Layer	Governance Focus	Key Components	Empirical Evidence	Principal Challenge	Expected Contribution to Data Integration
Political Commitment	Strategic leadership	Political commitment, executive support, policy mandate	Presidential priority determines implementation	Weak political commitment	Sustains reform momentum and enforcement
Institutional Governance	Coordination	Regulations, coordination, accountability	39.6% regulatory adoption	Institutional fragmentation	Aligns organizations through binding governance
Administrative Capacity	Organizational capability	HR, training, collaboration incentives	Capacity deficits across government	Limited implementation capability	Strengthens operational readiness
Technical Infrastructure	Interoperability	APIs, metadata, security, SPLP	Infrastructure available but underutilized	Governance–technology mismatch	Enables interoperable data exchange
Data Resources	Information quality	Metadata, accessibility, completeness	1,279 unresolved datasets	Poor data quality and availability	Supports evidence-based policymaking

Table 2. Integrated Data Governance Framework (2026).

4.3.1 Layer 1: Political Commitment

The political layer provides the foundational conditions for governance reform. Without sustained political commitment, institutional reforms are likely to remain symbolic rather than substantive. As documented by Kasiwi et al. (2025), “there is no obligation to follow up unless it is a presidential priority.” This finding indicates that political leadership determines whether implementation mechanisms possess sufficient authority to enforce organizational change. In the absence of sustained political commitment, compliance is likely to remain discretionary rather than mandatory.

4.3.2 Layer 2: Institutional Governance

The second layer comprises binding regulatory frameworks, effective coordination mechanisms, and cross-sector governance forums equipped with enforcement authority. Evidence indicates that this layer remains comparatively weak in Indonesia. Hasnita and Salomo (2025) report that only 39.6% of ministries and government agencies had adopted supporting regulations for the One Data Indonesia initiative, suggesting that institutional arrangements remain insufficient to ensure coordinated implementation across government organizations.

4.3.3 Layer 3: Administrative Capacity

The third layer concerns the administrative capabilities required to operationalize institutional arrangements, including human resource capacity, professional training, and incentives for interorganizational collaboration. The reviewed studies consistently identify administrative capacity deficits across multiple levels of government (Muchsin, 2025; Hapsari & Permana, 2025), indicating that limitations in implementation capability extend beyond isolated organizations and represent a broader systemic challenge.

4.3.4 Layer 4: Technical Infrastructure

The fourth layer encompasses the technological infrastructure that enables data interoperability, including application programming interfaces (APIs), metadata standards, interoperability protocols, and data security mechanisms. Although Indonesia has established the Government Service Integration Platform (SPLP) as the principal technical infrastructure for inter-agency data exchange, the reviewed evidence demonstrates that its utilization remains limited because deficiencies in the preceding political, institutional, and administrative layers constrain its effective implementation.

4.3.5 Layer 5: Data Resources

The fifth layer concerns the quality, availability, and documentation of government data, including metadata completeness and the accessibility of priority datasets. Despite substantial progress in data collection, significant gaps remain. As reported by Hasnita and Salomo (2025), 1,279 priority datasets had yet to be finalized, limiting the availability of reliable information required for evidence-based policymaking.

The ordering of these five layers is analytically justified by the evidence synthesized in this review. In the Indonesian context, weaknesses at the political and institutional levels constrain the effective functioning of administrative, technical, and data-related capacities. Without sustained political commitment, regulatory frameworks lack effective enforcement. Without enforcement, coordination mechanisms remain largely procedural. In the absence of effective coordination, technical infrastructure remains underutilized. Consequently, limited system utilization constrains improvements in data quality and availability. The proposed sequence therefore reflects the causal logic through which the reviewed evidence explains the persistence of cross-government data fragmentation.

The Integrated Data Governance Framework extends previous scholarship in several respects. It broadens data governance theory by incorporating political commitment and institutional governance as foundational conditions for effective data integration (Abraham et al., 2019). It also advances policy integration theory by explicitly embedding technical

infrastructure and data quality within explanations of integrated policymaking (Cejudo & Trein, 2023). Finally, the framework contributes to collaborative governance theory by identifying institutional decoupling as the principal mechanism explaining why formally established collaborative structures frequently fail to generate substantive collaborative outcomes. Rather than treating political, institutional, administrative, technical, and data dimensions as independent determinants, the proposed framework conceptualizes them as mutually reinforcing components of an integrated governance system that collectively shapes the success or failure of cross-ministerial data integration.

4.4 Limitations and Transferability

Several limitations of the explanatory framework proposed in this study should be acknowledged. First, the proposed mechanisms are inferential rather than directly causal. They were derived through the synthesis of evidence across multiple studies rather than through direct empirical testing of causal relationships. Although the consistency of the observed patterns across different levels of government strengthens the plausibility of the proposed explanation, it should not be interpreted as definitive evidence of causality.

Second, the explanatory framework is inherently context-specific to the Indonesian public sector. Institutional dynamics such as organizational decoupling, asymmetric authority over data governance, and interdependent administrative capacity deficits are shaped by Indonesia's particular bureaucratic and governance context and may not operate identically in other settings. Accordingly, the framework is intended as an analytical lens for examining comparable governance environments in developing countries rather than as a universally applicable model.

Third, the proposed five-layer Integrated Data Governance Framework remains conceptual and therefore requires empirical validation. The hypothesized relationships among the five governance layers, together with the threshold conditions under which each layer becomes sufficient to enable effective data integration, have yet to be examined through empirical research.

Finally, the synthesis is constrained by the characteristics of the available literature. Most existing studies focus primarily on implementation barriers rather than successful integration initiatives. Consequently, the proposed framework is better suited to explaining why cross-ministerial data integration fails than how successful integration is achieved. Future research examining successful cases of integrated data governance would provide valuable opportunities to refine the framework and identify the conditions under which the proposed mechanisms operate differently.

4.5 Contributions and Implications

Contributions from this synthesis emerge from the cumulative argument articulated above.

4.5.1 Theoretical Contributions

First, this study advances data governance theory by demonstrating that institutional and political conditions, rather than technical standards alone, fundamentally shape the outcomes of cross-government data integration. Governance should therefore be understood not as a layer built upon technological infrastructure but as the determining condition that enables technology to generate public value.

Second, the study extends policy integration theory by showing that technical

infrastructure and data quality are not peripheral implementation concerns but essential components of an integrated policy system. From this perspective, failures in cross-ministerial data integration should not be interpreted simply as shortcomings in policy design; instead, they reflect weaknesses across an interconnected five-layer governance system in which deficiencies at one level constrain the performance of the others.

Third, the study contributes to collaborative governance theory by identifying institutional decoupling and symbolic compliance as adaptive organizational mechanisms that help explain why formally established collaborative arrangements frequently fail to produce substantive collaborative outcomes. This perspective provides a more nuanced explanation of how organizations simultaneously respond to external reform pressures while preserving internal administrative autonomy.

4.5.2 Practical Implications

The mechanisms identified in this synthesis also suggest several implications for public policy and administrative practice. First, strengthening the political and institutional layers appears to be a prerequisite for activating the administrative, technical, and data-related layers of integrated governance. Without effective enforcement mechanisms and binding regulatory arrangements, investments in technological infrastructure and organizational capacity are unlikely to produce sustainable improvements in cross-ministerial data integration.

Second, investments in digital infrastructure that are not accompanied by corresponding investments in governance arrangements risk producing infrastructure without integration. Accordingly, continued investment in the Government Service Integration Platform (SPLP) and related digital platforms should be complemented by stronger regulatory frameworks, institutional coordination mechanisms, and administrative capacity-building initiatives.

Third, capacity development should be approached as a system-wide intervention rather than a collection of isolated training programs. Professional development initiatives alone are unlikely to improve data integration unless they are supported by coherent regulatory guidance, organizational incentives, and effective coordination mechanisms across government institutions.

Finally, the establishment of a National Interoperability Council, as proposed by Kasiwi et al. (2025), appears to be consistent with the evidence synthesized in this review. Such an institution could provide a dedicated governance mechanism for mediating inter-organizational conflicts, coordinating interoperability standards, and strengthening accountability across institutional boundaries.

4.6 Future Research Agenda

The present synthesis identifies several priorities for future research. First, the proposed Integrated Data Governance Framework requires systematic empirical validation, particularly with respect to the hypothesized relationships among the five governance layers and the threshold conditions under which these layers collectively enable successful cross-ministerial data integration.

Second, comparative cross-national research would help identify the contextual conditions that shape the operation of the mechanisms proposed in this study. Such investigations could determine whether institutional decoupling, asymmetric authority, and administrative capacity deficits operate similarly across different administrative traditions and governance systems.

Third, future studies should examine cases in which cross-government data integration has been successfully implemented. Such evidence would complement the predominantly problem-oriented literature and facilitate the identification of organizational and institutional conditions that enable the five governance layers to function in alignment.

Finally, longitudinal research tracking institutional change over time would provide valuable insights into whether the proposed self-reinforcing vicious cycle can be disrupted through targeted governance interventions. Examining how institutional reforms evolve across successive policy cycles would contribute to a deeper understanding of the mechanisms through which sustainable improvements in integrated data governance can be achieved.

Disclosure of potential conflicts of interest

No potential conflict of interest was reported by the author(s).

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

- Anupam, M. F. E., & Mustafa, S. A. (2026). Integrated data governance and predictive analytics for enhancing public service management in Bangladesh: A framework for evidence-based decision-making.
- Bartolomucci, F., Ramalli, E., & Urbano, V. M. (2026). Integrated governance in data ecosystems: A conceptual framework consolidating collaborative and data governance. *Government Information Quarterly*, 43(1), 102107. <https://doi.org/10.1016/j.giq.2026.102107>
- Cordella, A., & Gualdi, F. (2025). Policymaking in the digital era: Exploring techno-legal assemblages and their impact on policy formulation. *Government Information Quarterly*, 42(3), 102023. <https://doi.org/10.1016/j.giq.2025.102023>
- Domorenok, E., Graziano, P., & Polverari, L. (2021). Policy integration, policy design and administrative capacities: Evidence from EU cohesion policy. *Policy and Society*, 40(1), 58–78. <https://doi.org/10.1080/14494035.2021.1930697>
- Hapsari, A., & Permana, I. (2025). The implementation of data interoperability services in the Government of West Sumatra Province. *TOFEDU: The Future of Education Journal*, 4(7), 1–13.
- Hasnita, S. S., & Salomo, R. V. (2025). Policy learning of One Data Indonesia for supporting data-driven policy. *Jurnal Administrasi dan Kebijakan Publik*, 10(1), 1–25.
- Hawn Nelson, A., Hogle, P., Zanti, S., Proescholdbell, S., & Tenenbaum, J. D. (2024). A governance and legal framework for getting to "yes" with enterprise-level data integration. *Data & Policy*, 6, e31. <https://doi.org/10.1017/dap.2024.23>
- Kasiwi, A. N., Wahyuni, H. I., & Ramtino. (2025). Digital transformation and cross-organizational interoperability in electronic-based government systems. *Jurnal Ilmiah Ilmu Administrasi*, 15(2), 1–13.
- Kautsar, M., & Mujahidin. (2025). Government big data governance model to improve the effectiveness of integrated public services. *Jurnal Sosial dan Humaniora*, 3(2), 333–342.
- Kurniawati, M. V., Zulmy, M. F., & Rudleviyani, Y. (2025). Optimizing data quality in interagency data sharing: A framework. *Jurnal Ilmu Komputer dan Informasi*, 18(1), 47–66. <https://doi.org/10.21609/jiki.v18i1.1310>
- Lukman, J. P., & Fiulaiizi, A. (2026). Satu Data Indonesia policy and its implications for evidence-based public decision making. *Jurnal Ilmiah Ilmu Administrasi*, 15(2), 1–14.
- Muchsin, M. (2025). Digital governance dan tantangan integrasi data sektor publik: Studi pada Satu Data Indonesia di tingkat Provinsi Papua. *Jurnal Ilmiah Ilmu Administrasi*, 15(2), 1–9.
- Peraturan Menteri Komunikasi dan Informatika Republik Indonesia Nomor 1 Tahun 2023 tentang Interoperabilitas Data dalam Penyelenggaraan Sistem Pemerintahan Berbasis Elektronik dan Satu Data Indonesia. (2023). Jakarta: Kementerian Komunikasi dan Informatika Republik Indonesia.
- Peraturan Presiden Republik Indonesia Nomor 39 Tahun 2019 tentang Satu Data Indonesia. (2019). Jakarta: Kementerian Sekretariat Negara Republik Indonesia.
- Ruijter, E. (2021). Designing and implementing data collaboratives: A governance perspective. *Government Information Quarterly*, 38(4), 101612. <https://doi.org/10.1016/j.giq.2021.101612>
- Sarti, F. (2023). Policy integration: A review of concepts, theories, and methods. *Policy Sciences*, 56, 29–48. <https://doi.org/10.1007/s11077-022-09489-9>

- Schwoerer, K. (2026). Open government data usability: A study of metadata affordances in U.S. cities. *Government Information Quarterly*, 43(1), 102101. <https://doi.org/10.1016/j.giq.2026.102101>
- Sirello, O., & Tissot, B. (2026). Linking data for better evidence-based policy: A landscape review in central banks. *Data & Policy*, 8, e28. <https://doi.org/10.1017/dap.2026.10>
- Taduka, A. (2025). Balancing autonomy and consistency: Inter-agency data synchronization architectures in government systems. *Journal of Information Systems and Applied Engineering*, 7(2), 1–8.
- Wang, Y., Sun, X., Xiong, W., & Onishi, M. (2026). Beyond technology: Exploring public value creation mechanisms and outcomes in platform-to-government data sharing. *Government Information Quarterly*, 43(2), 102129. <https://doi.org/10.1016/j.giq.2026.102129>
- Widlak, A. C., & Peeters, R. (2025). A theory of the infrastructure-level bureaucracy: Understanding the consequences of data-exchange for procedural justice, organizational decision-making, and data itself. *Government Information Quarterly*, 42(3), 102021. <https://doi.org/10.1016/j.giq.2025.102021>
- Wirtz, B. W., Weyerer, J. C., Becker, M., & Muller, W. M. (2022). Open government data: A systematic literature review of empirical research. *Electronic Markets*, 32, 2381–2404. <https://doi.org/10.1007/s12525-022-00582-8>
- Yanto, E., Anirwan, Nugroho, T. C., & Irwan. (2026). Digital government dan evidence-based policy making: Membangun kerangka kerja tata kelola data cerdas untuk pengambilan keputusan di sektor publik. *Jl Publication*, 6(2), 1–11.
- Zanti, S., Berkowitz, E., Katz, M., Hawn Nelson, A., Burnett, T. C., Culhane, D., & Zhou, Y. (2022). Leveraging integrated data for program evaluation: Recommendations from the field. *Evaluation and Program Planning*, 92, 102093. <https://doi.org/10.1016/j.evalprogplan.2022.102093>
- Zanti, S., & Thomas, M. L. (2021). Evidence-based policymaking: What human service agencies can learn from implementation science and integrated data systems. *Global Implementation Research and Applications*, 1, 304–314. <https://doi.org/10.1007/s43477-021-00028-x>