

Systematic Literature Review On Mapping Policies, Institutional Challenges, and Local Readiness for SIPD-RI

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ARTICLE INFO

Article History:

received: 2025-11-19

revised: 2026-05-15

accepted: 2026-06=30

Keywords:

digital governance; Local Government information system; SIPD-RI; interoperability; organizational readiness

DOI: 10.33701/jiapd.v18i1.5713

ABSTRACT

The transformation of the Local Government Information System (SIPD) into SIPD-RI is a strategic agenda for digitalizing Local governance in Indonesia. Although the regulatory framework is comprehensive, studies specifically examining this transformation from the perspectives of regulation, system architecture, and governance implications remain scarce—even though the change carries strategic consequences for data interoperability and central–Local coordination. This study maps the development of SIPD research and policy from 2020 to 2024, identifies implementation challenges and opportunities, and analyzes the implications of the transition toward SIPD-RI. Using a PRISMA 2020-guided systematic literature review, 12 journal articles and 6 policy documents were analyzed through thematic synthesis. The synthesis reveals three clusters of findings: (1) SIPD improves the consistency of planning–budgeting documents and the traceability of financial reports, yet these benefits are uneven and highly dependent on data readiness, internal standard operating procedures, and inter-agency collaboration; (2) the dominant barriers are institutional—human resource capacity, inter-agency coordination, and organizational readiness—rather than purely technical; and (3) the transition to SIPD-RI demands data interoperability, business-process standardization, and institutional readiness that remain uneven across regions. The main contribution of this review is a comprehensive map of the 2020–2024 SIPD literature and an analytical framework linking system transformation to the concepts of interoperability, organizational readiness, and institutional capacity. Its policy implication is that the success of SIPD-RI cannot be achieved through technological refinement alone; it requires differentiated capacity-building programs across regions, explicit data-migration guidelines, and institutionalized central–Local coordination mechanisms.

INTRODUCTION

The Local Government Information System SIPD, launched by Indonesia's Ministry of Home Affairs, is a strategic policy. It aims to integrate all local development planning data, local fiscal management data, and other local government affairs information onto a single unified platform, eliminating the need to retrieve data back and forth across scattered systems. This mandatory requirement originates from Article 6 of Ministry of Home Affairs Regulation 70 of 2019 (Permendagri Number 70/2019), a regulation specifically formulated for the Local Government Information System, which mandates all Local Governments to build their systems and migrate their data in accordance with these requirements.

This 2019 Ministry of Home Affairs Regulation Number 70 does not only set out the construction requirements for SIPD; it also serves as a tool to implement higher-level legal requirements, specifically Article 391 of Law Number 23 of 2014 on Local Government. That law long required all Local Governments to provide government affairs information in electronic form, abandoning the circulation of paper materials, and Regulation 70 establishes concrete implementation measures for this legal requirement. In addition, Regulation 70 explicitly adds a provision: SIPD must not become isolated "information silos" built by individual regions. It must be interconnected and integrated with the architecture of the national-level Electronic-Based Government System SPBE, linking local data into the national government affairs network to ensure that data from all regions can be managed consistently in accordance with unified national standards, preventing mismatched local data standards that would make cross-Local data retrieval impossible.

At the specific implementation level, these framework requirements alone are insufficient. This management framework is supported by two official documents that clarify details such as how data should be classified and coded. One is Ministry of Home Affairs Regulation 90 of 2019, which covers the classification, coding, and Nomenclature of Development Planning and Local Finance, establishing unified "identity rules" for all data to be entered into SIPD. The other is Minister of Home Affairs Decree Number 050-3708 of 2020 (Kepmendagri 050-3708/2020), which presents the Verification and Validation Results of the updated classification, coding, and nomenclature rules for development planning and Local finance, formally confirming the updated rules that all regions must follow to organize their data. Together, these two documents truly lay the foundation for the standardization of Local Government data. This set of standards fully aligns with the requirements of the national "One Data Indonesia" agenda, which was launched pursuant to Presidential Regulation Number 39 of 2019. Its core principles include unified data standards, metadata, system interoperability, and unique reference codes for all government-held datasets, unifying national government affairs data standards at the national level.

Keeping pace with the development of government affairs technology, Indonesia's central government launched SIPD-RI as an upgraded version of the older SIPD system. This new version is more centralized than the original SIPD and better aligns with the national unified advancement direction. Official descriptions of the SIPD-RI modules state that the new system was introduced to achieve data interoperability across regions and align all local business processes with central government policies (Ministry of Home Affairs, 2024).

The first modules to be prioritized for rollout are the Administration and Accounting modules. These modules are designed to strengthen budget management and promote the unification and standardization of local financial reports. On 13 September 2024, the Ministry of Home Affairs issued a specific letter urging progress on the implementation of these modules, with reference number B/5629, requiring all Local Governments to complete the activation of the modules by November 2024 to achieve the goal of the full nationwide deployment of SIPD-RI (Ministry of Home Affairs, 2024).

Even though the rules related to this system have been formulated in detail, multiple existing empirical studies show that regions still encountered various problems when implementing the older version of SIPD. These past implementation barriers have also created hidden risks for the smooth advancement of the new SIPD-RI system.

Research in Ogan Komering Ilir Regency found that local implementation of SIPD faced several obstacles: the staff responsible for operating the system lacked sufficient capacity to support its daily operation; servers frequently malfunctioned, failing to provide stable support for work; and

coordination between various local government departments was poor, leading to numerous gaps in collaboration (Permata Sari & Karyadin, 2023). A study in Yogyakarta City also noted that while SIPD did improve the efficiency of local financial reporting, unsolved issues such as inadequate supporting infrastructure and incomplete built-in system functions remained persistent bottlenecks for implementation (Puspitasari & Manurung, 2025).

The assessment results from Bulukumba Regency differed from those of the two previous locations: SIPD implementation there had become very smooth and mature, with the only shortcoming being that inter-agency cooperation and communication needed further strengthening to address this final gap (Rezkiaty, 2023). These widely varying research findings indicate that SIPD implementation outcomes across different regions are completely inconsistent, and a more systematic analysis is required to explain why such uneven conditions have emerged.

A review of prior studies on SIPD reveals that research in this field has expanded rapidly, yielding an increasing number of outputs since 2020. However, most of these studies suffer from two distinct limitations: they either merely describe the observed phenomena without conducting in-depth analysis, or they focus on isolated single cases, thereby precluding cross-case comparisons or broader, macro-level conclusions.

Several papers specifically examine the practical implementation of SIPD in Local development planning, with studies focusing on Wonosobo Regency (Afifah, Subarno, & Akbarini, 2023), Asmat Regency (David & Ohoiwutun, 2022), and East Kutai Regency (Sari, 2022). Another group of studies concentrates on financial management and reporting aspects associated with SIPD; research of this type covers Cimahi City (Paat & Saleh, 2023), Semarang City (Tumija, Hendra, & Sinurat, 2023), Nias Regency (Laoli, Ndraha, & Telaumbanua, 2022), and Bulukumba Regency (Rezkiaty, 2023). Only a small number of recent studies have begun to address public service aspects (Hardiansyah & Jaffisa, 2024) or focus on the transition from the old SIPD version to the new SIPD-RI version—including a study on transition preparations by the Local Finance Agency in Karanganyar Regency (Arif & Firmansyah, 2024). Despite this body of scattered research, no study to date has specifically integrated the three dimensions—regulatory provisions, system technical architecture, and impacts on Local governance—to comprehensively analyze the entire transition process from SIPD to SIPD-RI.

This unaddressed research gap represents a significant academic opportunity within the current field of study. It is important to note that the transition from SIPD to SIPD-RI is not merely a simple technical update—akin to a mobile app version upgrade—but rather a fundamental shift in the logic of data governance. This transformation will have strategic, long-term implications for three key areas: first, the extent to which data can be seamlessly interconnected and shared across various systems; second, the clarity with which accountability in financial processes can be traced; and third, the changes occurring in the collaborative relationship between central and Local governments.

Currently, very few domestic studies have managed to systematically map the research context in this field, integrate research conclusions from various regions, or combine empirical findings with theoretical frameworks regarding data interoperability and organizational readiness. This study's innovation lies in three aspects: first, it is the first to apply a Systematic Literature Review (SLR) process adhering to PRISMA 2020 standards to research on SIPD/SIPD-RI; second, it combines empirical research evidence from journal articles with published official policy documents for analysis; and third, it constructs an analytical framework linking the system transition process with academic concepts of data interoperability, organizational readiness, institutional capacity, and digital governance.

Precisely because of these gaps in prior research, this study focuses on examining the development and evolution of academic research and policy documents concerning SIPD between 2020 and 2024. It aims to elucidate the obstacles regions faced during SIPD implementation, the development opportunities they successfully leveraged, the key conclusions drawn by existing studies, and the impact the transition from the initial SIPD to SIPD-RI will have on Local governance and related policies.

METHODS

This research methodology employs a Systematic Literature Review (SLR) process adhering to the PRISMA 2020 guidelines (Page et al., 2021). The SLR method was selected because it provides

a transparent mechanism for identifying, selecting, assessing, and synthesizing evidence in a replicable manner (Kitchenham 2004; Snyder 2019). Reporting for this study complies with PRISMA 2020 minimum requirements, covering eligibility criteria, information sources, search strategies (study registration), selection processes, quality assessment, and synthesis of results. Literature searches were conducted across five sources: Google Scholar, Garuda/Garba Rujukan Digital (Ministry of Education, Culture, Research, and Technology), the SINTA portal, Semantic Scholar, and Scopus. The keywords and Boolean strings used were ("SIPD" OR "Sistem Informasi Pemerintahan Daerah" OR "SIPD-RI") AND ("implementasi" OR "transformasi" OR "perencanaan" OR "keuangan daerah" OR "interoperabilitas" OR "tata kelola digital"). Although the data coverage period spans 2020–2024, significant related policy documents from preceding years were also included. The search strategy adhered to systematic search principles, prioritizing transparency and traceability (Boell & Cecez-Kecmanovic 2015; Booth et al.).

Inclusion criteria comprised: (1) peer-reviewed journal articles published between 2020 and 2025; (2) studies specifically addressing SIPD, SIPD-RI, Local SPBE (Electronic-Based Government System) implementation, or the digital transformation of local government governance; and (3) official government policy documents—such as regulatory decrees, manuals, and circular letters—that are relevant to the study objectives and included in this scoping review. Exclusion criteria included: (1) publications that did not describe the local government context; (2) articles lacking empirical data or adequate policy analysis; and (3) articles that did not sufficiently address SIPD/SIPD-RI. These criteria were established to align with the document selection protocol for a Systematic Literature Review (SLR), which requires a focus on relevance to the research question and consistency (Kitchenham 2004).

A four-stage selection process (identification, title/abstract screening, and full-text eligibility assessment) was employed to process all relevant studies prior to their inclusion in the review. The initial search yielded 172 records from databases, supplemented by 9 records from policy documents and manual searches. After removing duplicates (33 records), 148 records remained. A total of 106 records were excluded following the title and abstract screening stage. A full-text eligibility assessment was conducted on 42 articles; of these, 24 were excluded for failing to meet inclusion criteria (e.g., topics outside the scope of SIPD, lack of empirical data, or contexts outside the local government setting). The final synthesis comprised 18 studies, consisting of 12 journal articles and six policy documents. Table 1 illustrates the selection stage:

Table 1. Study Selection Flow Diagram (PRISMA 2020)

Stage	Description	Amount
Identification	Records identified from databases (Google Scholar, Garuda, SINTA, Semantic Scholar, Scopus)	172
Identification	Additional records from other sources (policy documents, manual searches)	9
Identification	Records after duplicates removed	148
Screening	Records screened (title and abstract)	148
Screening	Records excluded (irrelevant)	106
Eligibility	Full-text articles assessed for eligibility	42
Eligibility	Articles excluded (did not meet inclusion criteria)	24
Inclusion	Studies included in synthesis	18
Inclusion	– Journal articles	12
Inclusion	– Policy documents	6

When assessing the quality of all included studies, we utilized an assessment form divided into four dimensions, with each item scored individually before being aggregated into a total score. The scoring criteria for these four dimensions were as follows: the first dimension assessed the clarity of the study's objective (score range: 0–2); the second evaluated the appropriateness of the study methods and the extent to which the collected data supported the research (score range: 0–2); the third assessed the alignment between the study content and the primary research question (score range: 0–

2); and the final dimension evaluated the utility of the evidence presented in the study (score range: 0–2). Based on the sum of scores across these four dimensions, the minimum possible total score was 0 and the maximum was 8. We categorized all studies into quality levels based on their total scores: studies scoring 7–8 were classified as high quality; those scoring 5–6 as medium quality; and those scoring below 5 as low quality. Studies assessed as low quality were not immediately excluded; rather, they were all retained for the final meta-analysis. We assigned less weight to the conclusions of these studies, deliberately controlled for their influence during the interpretation phase, and specifically flagged these low-quality studies in the data extraction table to ensure they could be easily distinguished. All quality assessments were conducted independently by each participating author, without any joint discussion during the scoring process. In instances where different authors assigned different scores to the same study, the authors convened to discuss the discrepancies until differing views were reconciled and a consistent assessment result was achieved.

For each included study, we extracted specific, predefined categories of information and compiled them in a standardized format within the data extraction table. This information includes: the study's authors and publication year; the specific location and context of the study; the methods employed; key conclusions; the quality score we assigned; and the thematic codes we applied. The full content of the aforementioned data extraction table, along with the basic characteristics of all included studies, is presented in Table 2 for direct reference.

To integrate the conclusions from all studies in this research, we employed the thematic synthesis method (Thomas & Harden, 2008). This method comprises three core steps: first, open coding, which involves breaking down the content of all studies into small fragments and assigning basic labels; second, aggregating the labeled content and extracting descriptive themes that reflect the content itself; and third, further extracting analytical themes to analyze core issues. Our coding process strictly adhered to thematic analysis protocols—drawing on the work of Braun & Clarke (2006)—to avoid arbitrary labeling. The resulting high-level analytical themes were not arbitrarily created but were extracted incrementally by combining actual cross-study findings with established core concepts: interoperability, organizational readiness, institutional capacity, and digital governance.

In addition to empirical academic research articles, we included several policy documents—specifically “Permendagri” 70/2019, “Permendagri” 90/2019, “Kepmendagri” 050-3708/2020, and “Perpres” 39/2019, as well as SIPD-RI modules and relevant circular letters. We categorized these policy documents as normative background evidence, serving to clarify the regulatory foundation of the research and the current policy orientation. These policy documents were not analyzed alongside the previously mentioned empirical academic articles; instead, they were analyzed separately. Their role was solely to cross-verify—or triangulate—the conclusions of the academic studies; the content of these policy documents was never incorporated into the conclusions drawn from the empirical research. In this meta-analysis, the policy documents served only to complement the empirical evidence derived from academic journals, an approach fully consistent with standard practices for systematic literature reviews in the field of public policy.

RESULT AND DISCUSSION

Characteristics of Included Studies

A total of 12 journal articles and 6 policy documents were included in the synthesis. The included articles spanned various regions of Indonesia—Sumatra, Java, Kalimantan, Sulawesi, and Papua—with a predominance of qualitative methods (10 studies) and a small proportion of quantitative ones (2 studies). The data extraction matrix and study characteristics are presented in Table 2.

Table 2. Data Extraction Matrix and Study Characteristics

No	Author (Year)	Location	Method	Key Findings	Quality
1	Afifah, Subarno, & Akbarini (2023)	Wonosobo Regency, Central Java	Descriptive qualitative	SIPD supports development planning through the planning, socialization, data entry and evaluation stages.	High

2	David & Ohoiwutun (2022)	Asmat Regency, Papua	Qualitative (policy implementation)	Implementation of SIPD in planning faces human resource and infrastructure constraints	Medium
3	Paat & Saleh (2023)	Cimahi City, West Java	Quantitative (regression)	The implementation of SIPD has a positive impact on the quality of financial reports.	High
4	Tumija, Hendra, & Sinurat (2023)	Semarang City, Central Java	Qualitative	SIPD is implemented, but the resource dimension (human resources and infrastructure) is still problematic	Medium
5	Rezkiaty (2023)	Bulukumba Regency, South Sulawesi	Qualitative evaluative	The implementation of SIPD is considered very optimal; cooperation and communication need to be strengthened.	Medium
6	Hardiansyah & Jaffisa (2024)	Medan City, North Sumatra	Qualitative (case study)	SIPD increases transparency and access to public service information	High
7	Sari (2022)	East Kutai Regency, East Kalimantan	Qualitative	The success of SIPD at Bappeda is still limited; data and SOP readiness are needed.	Medium
8	Laoli, Ndraha, & Telaumbanua (2022)	Nias Regency, North Sumatra	Qualitative	The implementation of SIPD in financial management faces various operational obstacles.	Medium
9	Arif & Firmansyah (2024)	Karanganyar Regency, Central Java	Qualitative	The Local Personnel Agency (BKD) has not yet used SIPD-RI; preparation for accounting and reporting for the 2024 fiscal year is needed.	High
10	Permata Sari & Karyadin (2023)	Ogan Komering Ilir Regency, South Sumatra	Qualitative	Obstacles: HR competency, server instability, weak coordination between OPDs	Medium
11	Puspitasari & Manurung (2025)	Yogyakarta City, Special Region of Yogyakarta	Qualitative	SIPD improves financial reporting efficiency; infrastructure and features are still limited	Medium
12	Cahyanti (2024)	Local financial reports	Qualitative	The implementation of SIPD supports financial report reconciliation services.	Medium

Based on the 12 included articles, the development of SIPD publications shows an upward trend since 2022, peaking in 2023, and continuing through 2024–2025 (Table 3). Dominant themes include development planning, Local financial management, financial reporting quality, public services, and—starting in 2024—readiness for the transition to SIPD-RI. The shift in focus from “SIPD implementation” to “SIPD-RI transition” indicates that the research agenda is following the dynamics of national policy.

Table 3. Publication Trends and Dominant Themes 2020–2024

Year	Number of Studies	Dominant Theme
2022	3	Development planning; Local financial management
2023	5	Planning; quality of financial reports; implementation evaluation
2024	3	Public services; SIPD-RI transition readiness; financial report reconciliation
2025	1	Implementation of SIPD at BPKAD (reporting efficiency)
Total	12	Shifting focus from SIPD implementation to SIPD-RI transition

Thematic Synthesis Results

This section presents the results of the thematic synthesis by clearly separating the empirical findings derived from the articles reviewed from the authors' interpretations. A summary of the synthesis is presented in Table 4.

Table 4. Summary of Thematic Synthesis

Theme	Empirical Findings (from the article)	Author's Interpretation	Policy Implications
Regulation and policy direction	A strong normative framework (Minister of Home Affairs Regulation 70/2019, 90/2019, Minister of Home Affairs Decree 050-3708/2020, SIPD-RI module) is a driver for adoption	Regulations have not addressed the Local capacity gap	Technical implementation guidelines adapted to the Local context
Planning and budgeting	SIPD improves document consistency and accelerates verification (Wonosobo, East Kutai)	Benefits are conditional on data and SOP readiness	Strengthening SOPs and primary data readiness
Financial accountability	Financial reporting quality improved (Cimahi); reporting efficiency improved (Yogyakarta)	Administration module is a priority for SIPD-RI	Prioritize administration and accounting modules
Human resources and bureaucracy	Consistent human resource limitations (Asmat, Nias, Semarang); Bulukumba is considered optimal	Variations reflect organizational and leadership readiness.	Differentiated capacity building and task clarification
Infrastructure and technical	Server, connectivity, device issues (OKI, Yogyakarta, Semarang)	Technical barriers have structural impacts in remote areas	Hosting, backup/failover, connectivity enhancements
SIPD-RI interoperability and transition	Karanganyar not yet ready for SIPD-RI; data migration challenges	Organizational interoperability is not yet established	Explicit data migration standards and technical assistance

Regulations and Policy Direction

Document analysis shows that the central government has established a robust normative framework for data integration in planning, budgeting, and reporting, ranging from Minister of Home Affairs Regulation 70/2019, Minister of Home Affairs Regulation 90/2019, Minister of Home Affairs Decree 050-3708/2020, to the SIPD-RI 2024 technical module. Regulations are the dominant institutional driver for SIPD adoption in the regions. However, regulations have not fully addressed

Local capacity gaps; effective implementation depends heavily on each region's ability to adapt its internal processes. This finding aligns with the argument that a centralized policy framework requires local capacity to translate into an operational context (Heeks, 2001).

Studies in Wonosobo Regency (Afifah, Subarno, & Akbarini, 2023), East Kutai Regency (Sari, 2022), Cimahi City (Paat & Saleh, 2023), and Yogyakarta City (Puspitasari & Manurung, 2025) show that SIPD improves the consistency of planning and budgeting documents, accelerates verification between Local Government agencies (OPDs), enhances the traceability of budget data, and improves the quality of financial reports. However, these benefits are not uniform; effectiveness is strongly influenced by the availability of primary data, internal standard operating procedures (SOPs), and the quality of collaboration between Local agencies. This variation confirms that the benefits of technology are conditional on the organizational context.

Based on these data, technical obstacles were reported in almost all studies, including server disruptions, unstable internet connectivity, and limited devices, for example in Ogan Komering Ilir Regency (Permata Sari & Karyadin, 2023), Yogyakarta City (Puspitasari & Manurung, 2025), and Semarang City (Tumija, Hendra, & Sinurat, 2023). However, the intensity and impact varied between regions. Urban areas with better infrastructure tend to experience technical barriers as operational disruptions, while remote areas such as Asmat Regency (David & Ohoiwutun, 2022) and Nias Regency (Laoli, Ndraha, & Telaumbanua, 2022) face them as structural barriers that hinder the Local budget (APBD) preparation process. Complete reliance on a central server without backup or failover mechanisms poses high risks, especially during the crucial period of APBD preparation. These differences demonstrate that technical barriers cannot be understood uniformly without considering the geographic context and Local infrastructure capacity.

Human resource capacity constraints consistently emerge, such as a lack of trained operators, unclear task allocation, and a lack of data management units, which are common in Asmat Regency (David & Ohoiwutun, 2022), Nias Regency (Laoli, Ndraha, & Telaumbanua, 2022), and Semarang City (Tumija, Hendra, & Sinurat, 2023). However, there is a contradiction between studies: an evaluation in Bulukumba Regency assessed SIPD implementation as "very optimal" (Rezkiaty, 2023), while studies in other regions reported significant obstacles. This contradiction likely reflects differences in organizational readiness and Local leadership quality, not solely technological differences. This confirms that successful implementation depends not only on technology, but also on institutional capacity to manage business process changes and ensure the involvement of all Local officials (Apleni & Smuts, 2020; Signore, Chesi, & Pallotti, 2005).

Another obstacle identified in studies on SIPD-RI remains limited. A study in Karanganyar Regency showed that the Local Finance Agency had not yet adopted SIPD-RI in its accounting and financial reporting processes and needed to prepare for Fiscal Year 2024 (Arif & Firmansyah, 2024). Identified migration challenges included data format incompatibilities, duplication, and the potential loss of audit trails. These interoperability issues stemmed from limited API documentation and technical migration guidelines that were not yet fully understood by local governments. Data integration is not only a technical issue but also related to inadequate data governance—in line with organizational interoperability frameworks (Gottschalk & Solli-Sæther, 2009; Sulehat & Taib, 2016).

Discussion

After aggregating all research findings, it can be confirmed that the upgrade from SIPD to SIPD-RI is essentially to build a cross-government data interconnection system nationwide. Simply put, this is not just an ordinary system update, but an initiative to enable the data held by governments at all levels across the country to be seamlessly connected and put into use across departments and regions. Based on the analytical framework proposed by Gottschalk and Solli- (2009), the promotion of SIPD-RI must go through three sequential, progressive stages. The first is the most basic technical-level interconnection: first achieve the most basic cross-subject data sharing, so that data can be transmitted from one department to another. The second is semantic-level interconnection: ensure that all participants have completely consistent definitions and interpretations of the same set of data, eliminating the situation where the same data is understood differently across departments and cannot be used universally. The final stage is organizational-level interconnection: unify and coordinate the business processes of different departments, so that all parties can cooperate to complete relevant work in accordance with unified rules.

At present, many obstacles have been encountered in the promotion of SIPD-RI across regions. Three core problems have been sorted out: the data storage formats of different regions are incompatible and cannot be directly connected; various local departments repeatedly collect the same set of data, resulting in massive redundancy; and there is an extreme lack of supporting documentation for the APIs that connect different systems, making it impossible for other departments to smoothly call the interfaces. All these problems point to a harsh reality: most regions are still stuck in the early stage of technical interconnection, failing to even cross the most basic first threshold, yet national-level policies have already required all regions to sprint toward full organizational-level interconnection. This mismatch between actual progress and policy requirements has also turned the link of smoothly migrating all data from old systems to new systems into the riskiest and most core turning point in the entire SIPD-RI upgrade process. Whether this hurdle can be overcome directly determines the success or failure of the entire upgrade.

The implementation effects of the promotion across regions are uneven: some regions operate the new system smoothly, while others struggle to make progress. The core influencing factor is organizational readiness, that is, whether local governments have made all necessary organizational preparations to take on the new system. Most regions with high organizational readiness meet three clear conditions: their leadership truly attaches importance to the project and is willing to invest resources to support its implementation; they have a clear data management architecture, with clear rules on who manages data and how to manage data; and they have complete standard operating procedures, so that all personnel act in accordance with unified rules. These regions often reap more benefits from the upgrade, and Bulukumba Regency, studied by Rezkiaty (2023), is a typical case of this type. Conversely, regions with low organizational readiness encounter various blockages and difficulties in the promotion process. This conclusion is fully consistent with the findings of previous studies in the e-government field, which all regard organizational readiness as a core factor for the success of digital transformation in the public sector, a view shared by the studies of Apleni & Smuts (2020; Signore, Chesi, & Pallotti, 2005).

Analyzed from the perspective of Local institutional capacity, the study also finds that digitalization will not automatically transform the original office habits of the government. Simply installing a new system will not lead to the independent update and adaptation of old work processes and outdated operating logics. If targeted capacity building, training and support are not provided for relevant staff to help them keep up with the requirements of the new system, the new system will instead increase the administrative burden on local government teams, with more and more complex tasks to complete than before. This conclusion aligns with the core viewpoint of the "design-reality gap" framework proposed by Heeks (2001): this framework states that the more severe the disconnect between the design requirements of a centralized system and the actual operation of local departments, the higher the probability that the system will fail to be implemented. Therefore, the SIPD-RI upgrade must not be treated merely as an ordinary technical project; it is essentially an institutional-level transformation. To achieve successful implementation, continuous data governance must be carried out, and long-term investment must be made to improve various organizational readiness conditions.

We compared the system readiness of various regions, and the results show that the implementation progress across regions varies drastically: cities with sufficient fiscal resources and adequate professional personnel—that is, Yogyakarta City, Semarang City, and Cimahi City—have consistently maintained more thorough preparation work; while the remote and underdeveloped Asmat Regency and Nias Regency have been struggling with various deep-seated structural obstacles, and are simply unable to keep up with the progress of the aforementioned cities. If this gap is ignored, and only a unified SIPD-RI acceleration policy is promoted without providing differentiated and targeted supporting assistance measures for each region, the pre-existing Local digital divide will only be widened further, allowing better-resourced regions to advance with increasing smoothness, while underdeveloped regions fall further and further behind in meeting the requirements of the digital system.

From a theoretical perspective, these findings of uneven progress across regions confirm a core judgment: SIPD-RI is far more than an ordinary information system for storing and processing information; it is a tool to unify Local data authority and streamline the collaborative relationship between the central and local governments. After the central government unifies all data standards,

account codes, and core business processes, it can take full control of the right to define and circulate all local development data. The central government uniformly governs which data count as relevant to local development and how such data is transmitted between government agencies at different levels. This unified framework can improve national-level data quality, but it requires all local governments to act in line with the central government's logic. This logic, formulated at the national level, often fails to accommodate the unique practical operational scenarios of each region, and does not function smoothly when implemented in some localities. This conflict between unified national standards and local autonomy is a long-standing governance challenge that must be addressed carefully and in line with each region's actual circumstances; it cannot be resolved through a one-size-fits-all mandate.

In terms of policy implementation, this comprehensive study puts forward three actionable adjustment directions: (1) Strengthen core infrastructure, establish redundant backup and failover mechanisms to prevent problems during the critical period when local governments formulate budgets, ensuring that if the main system fails, the backup system can activate promptly without delaying core local work; (2) Formulate clear data migration guidelines and launch targeted technical support adapted to the existing administrative capacity of each region, so that regions with weaker capacity do not struggle to navigate a unified set of guidelines; (3) Launch organizational capacity building projects, abandon generic, one-size-fits-all training content, and instead customize content based on each region's specific level of readiness to address identified gaps. To sustainably maintain stable data quality and integrity, it is necessary to continuously streamline business processes between various departments of local governments (OPDs) to avoid situations where inter-departmental processes are misaligned and data cannot be transmitted. Regular supervision and inspections must also be carried out to promptly identify emerging problems..

CONCLUSION

This study shows that upgrading SIPD to SIPD-RI is a critical step in the digitalization of local governance. However, whether this upgrade can truly deliver its efficacy is not determined by the upgrade action itself; to a large extent, it relies on three underlying preconditions: whether the relevant local organizations participating in the implementation are prepared for the transformation, whether the institutions hosting the system have sufficient implementation capacity, and whether the quality of regional-level data management work is solid enough. First, the original SIPD does generate tangible benefits: it can align work plans with supporting budgets, eliminating mismatches where planned initiatives lack funding or approved budget items are not included in plans. Second, the core issues that hinder SIPD from functioning properly all stem from the institutional level—specifically, insufficient human capacity, stalled cross-OPD collaboration, and organizations that are not prepared to adopt the system. Third, to complete the transition to SIPD-RI, two basic requirements must first be met: data from different systems must be interconnected and shareable, avoiding information silos where data from one system cannot be imported into another, and all business processes must have unified implementation standards so that all stakeholders follow the same rules.

This study also puts forward clear guidance for policy formulation: to ensure the successful implementation and long-term smooth operation of SIPD-RI, stakeholders must not focus on a single task in isolation. Instead, three efforts must be integrated and advanced simultaneously: first, consolidate foundational infrastructure such as the hardware and networks that support system operation; second, formulate clear, universally applicable data migration standards; and third, carry out targeted capacity building tailored to the existing capacity of different regions, rather than imposing a uniform set of improvement requirements on all localities. In addition, a key misconception must be corrected: SIPD-RI should not be viewed merely as a routine technical upgrade of the old system. It must be recognized as a tool to standardize data management authority and streamline the collaboration process between the central and local governments, as its role extends far beyond simply updating technology. Finally, the study identifies three priority areas for future related research: first, evaluate the actual performance of the SIPD-RI management module nationwide; second, conduct comparative studies by selecting regions with varying capacity levels; third, analyze the impacts of SIPD-RI on local financial accountability mechanisms and on central-local relations.

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