

Implementation Challenges of the Regional Government Information System (SIPD): Comparative Evidence from Three Indonesian Local Governments

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Abstract

The implementation of the Regional Government Information System (SIPD) represents a strategic initiative by the Indonesian government to achieve effective, transparent, and accountable governance. However, SIPD implementation faces various challenges that hinder the achievement of these objectives. Objective: This study aims to analyze the challenges of SIPD implementation in three Indonesian local governments and identify factors influencing its successful implementation. Method: This research employs a comparative descriptive qualitative approach with case studies in Nganjuk Regency, Nias Regency, and Medan City. Data were collected through in-depth interviews with 29 informants, direct observation, and document review. Data analysis used the Miles and Huberman interactive model with Van Meter and Van Horn's policy implementation theory framework. Results: The study identified three main categories of challenges: (1) Technical challenges including system instability, incomplete features, and integration issues; (2) Human resource challenges encompassing capacity deficiencies, change resistance, and training limitations; (3) Policy coordination challenges involving weak central-local communication and unclear standardization. All three regions showed similar challenge patterns despite varying intensities. Conclusion: SIPD implementation requires a holistic approach integrating technical system improvements, human resource capacity building, and strengthened policy coordination. Implementation success depends on leadership commitment, infrastructure readiness, and sustained support from the central government.

Keywords: Regional Government Information System (SIPD), Policy Implementation, Regional Financial Management, E-Government, Government Digitalization

I. INTRODUCTION

A. Background of the Study

Digital transformation in government has become a global agenda aimed at enhancing the quality of public service delivery, as well as improving transparency and accountability in public administration (Noviani et al., 2024). In Indonesia, efforts to digitalize government operations have been institutionalized through various e-government initiatives, one of which is the Regional Government Information System (Sistem Informasi Pemerintahan Daerah—SIPD) (Sembiring et al., 2023). The Regional Government Information System (Sistem Informasi Pemerintahan Daerah—SIPD) is an integrated digital platform developed by the Ministry of Home Affairs to manage regional planning and financial data in a unified and real-time manner (Siregar & Irawan, 2021).

The implementation of the Regional Government Information System (Sistem Informasi Pemerintahan Daerah—SIPD) is mandated by Regulation of the Minister of Home Affairs of the Republic of Indonesia Number 90 of 2019 on the classification

and codification of regional planning and public finance. SIPD replaces fragmented legacy systems, including SIMDA and various locally developed applications, with an integrated platform that standardizes government data management (Nasution et al., 2023). The system aims to improve efficiency in planning and budgeting processes, enhance financial transparency and accountability, and strengthen monitoring and performance evaluation in local governments (Handoko et al., 2024).

However, the implementation of SIPD across local governments has encountered significant challenges. A report by the Ministry of Home Affairs (2020) indicates that, out of 542 local governments in Indonesia, only 67% successfully completed the planning and budgeting processes using SIPD during the first year of implementation. Various technical, organizational, and managerial issues have been reported to constrain the system's effectiveness (Kuncoro et al., 2024).

The public sector information systems literature consistently emphasizes that technological success is shaped by the interaction of technical, human, organizational, and contextual factors (DeLone &

McLean, 2016;. Accordingly, examining implementation challenges in the SIPD context is critical for informing effective improvement strategies (Purba, 2019; Umar et al., 2020).

B. Research Questions

Based on the background outlined above, this study formulates the following research questions:

1. What challenges constrain the effective implementation of the Regional Government Information System (Sistem Informasi Pemerintahan Daerah—SIPD) in local governments?
2. How do implementation challenges vary across different local government contexts.
3. What factors are critical to the successful implementation of SIPD?

C. Research Objectives

The objectives of this study are to:

1. Identify and analyze the challenges of implementing the Regional Government Information System (Sistem Informasi Pemerintahan Daerah—SIPD) in three local governments.
2. Compare patterns of SIPD implementation challenges across different local government contexts.
3. Identify the key factors influencing the successful implementation of SIPD.

D. Significance of the Study

Theoretical Significance

1. This study contributes to the literature on e-government and public sector reform by extending empirical evidence from developing country contexts.
2. It advances the application of Van Meter and Van Horn's policy implementation theory by examining its relevance in the digital governance setting.

Practical Significance

- a) The study provides actionable recommendations for central government authorities to enhance the effectiveness of the SIPD system.
- b) It offers practical insights for local governments in optimizing SIPD implementation.
- c) The findings inform policymakers in designing and refining strategies for the implementation of government information systems.

II. LITERATURE REVIEW

A. E-Government and Government Digitalization

E-government is commonly defined as the use of information and communication technologies to enhance the efficiency, effectiveness, transparency, and accountability of government. The concept has evolved from an initial emphasis on automating administrative processes toward a more comprehensive transformation of how governments interact with citizens, businesses, and other governmental entities .

The e-government maturity model proposed by the United Nations (2020) conceptualizes the evolution of digital government through four progressive stages. The first stage, *emerging presence*, is characterized by the provision of basic governmental information through online platforms, primarily aimed at establishing an initial digital footprint. The second stage, *enhanced presence*, involves the delivery of more comprehensive, regularly updated, and interactive information, allowing users to engage more actively with government websites. The third stage, *transactional presence*, enables two-way digital interactions, including online transactions and the electronic submission of forms and documents. The final stage, *connected presence*, represents the highest level of e-government maturity, in which government services are fully integrated and interoperable across agencies, facilitating seamless service delivery, data sharing, and coordinated governance (Haes et al., n.d.; Prafitri et al., 2018; Umar et al., 2019).

As a regional government information system, SIPD can be positioned at the transitional stage between *transactional* and *connected presence* within the e-government maturity framework . The system extends beyond the mere provision of information by enabling two-way digital interactions and facilitating integrated regional planning and budgeting processes across government units. Through this level of integration, SIPD supports data interoperability and coordination among local government agencies, thereby reflecting a movement toward more connected and collaborative digital governance.

B. Van Meter and Van Horn's Policy Implementation Theory

Van Meter and Van Horn (1975) propose a seminal framework for analyzing policy implementation, emphasizing that policy outcomes are shaped by multiple interrelated variables rather than by policy design alone. Their model identifies six key variables that influence the performance and effectiveness of policy implementation:

1. Policy Standards and Objectives
The clarity and consistency of policy standards and objectives determine the direction and effectiveness of implementation. Ambiguous standards or unrealistic objectives can create uncertainty among implementers and hinder effective policy execution.

2. Resources
Policy implementation requires adequate resources, including financial support, skilled personnel, facilities, and relevant information. Resource constraints are frequently identified as a major barrier to successful policy implementation.
 3. Interorganizational Communication and Enforcement
Activities
Effective communication and coordination among implementing organizations are critical to policy success. Miscommunication, information distortion, or weak coordination mechanisms can undermine implementation efforts.
 4. Characteristics of Implementing Agencies
Organizational structure, norms, and patterns of interaction influence how policies are implemented in practice. Agencies with rigid hierarchical structures often face greater difficulties in adapting to policy changes and complex implementation environments.
 5. Disposition of Implementers
The attitudes, commitment, and level of support of policy implementers significantly affect implementation outcomes. Resistance, limited understanding, or lack of commitment among implementers may impede the achievement of policy objectives.
 6. Economic, Social, and Political Environment
External environmental conditions shape the implementation process. Political support, economic capacity, and social dynamics can either facilitate or constrain policy implementation.
- This model is particularly relevant for analyzing SIPD implementation, as it comprehensively captures technical, organizational, and contextual dimensions that shape policy implementation outcomes.
- C. Regional Government Information System (Sistem Informasi Pemerintahan Daerah—SIPD).**
- The Regional Government Information System (Sistem Informasi Pemerintahan Daerah—SIPD) is an integrated information system developed by Indonesia's Ministry of Home Affairs to manage regional planning and public financial data in a unified and coordinated manner. The system is structured into several core functional modules, each designed to support specific stages of the regional governance and public financial management cycle:
1. Planning Module
 - a) The planning module supports the preparation and integration of key regional planning documents, including the Regional Medium-Term Development Plan (Rencana Pembangunan Jangka Menengah Daerah—RPJMD).
 - b) The Regional Government Work Plan (Rencana Kerja Pemerintah Daerah—RKPD).
 - c) The Work Plan and Budget (Rencana Kerja dan Anggaran—RKA).This module ensures alignment between strategic development priorities and annual planning and budgeting processes.
 2. Budgeting Module
 - a) The budgeting module facilitates the formulation and management of the *Regional Revenue and Expenditure Budget* (Anggaran Pendapatan dan Belanja Daerah—APBD).
 - b) including budget revisions (*Revised APBD*) and the issuance of *Budget Implementation Documents* (Dokumen Pelaksanaan Anggaran—DPA).
 - c) This module supports fiscal discipline, budget consistency, and effective linkage between planning and budget execution.
 3. Financial Administration Module
 - a) The financial administration module supports budget execution and cash management through key administrative instruments, including *Letters of Fund Provision* (Surat Penyediaan Dana—SPD)
 - b) Payment Request Letters (Surat Permintaan Pembayaran—SPP).
 - c) Payment Orders (Surat Perintah Membayar—SPM). This module enhances expenditure control, procedural compliance, and the traceability of financial transactions.
 4. Accounting and Reporting Module
 - a) The accounting and reporting module generates key financial and performance reports.
 - b) Including the Budget Realization Report.
 - c) The Regional Balance Sheet, and Performance Reports. This module supports compliance with public sector accounting standards, enhances financial transparency, and strengthens performance-based accountability in local government administration.
- The implementation of SIPD is guided by a roadmap issued by the Ministry of Home Affairs, which outlines sequential stages including policy socialization, user training, data migration from legacy systems, and the full operational deployment of the platform.
- D. Prior Studies on Government Information System Implementation.**
- Several prior studies have examined the implementation of information systems in the public sector:
1. Heeks (2003) provides a seminal analysis of e-government implementation outcomes,

revealing that a significant proportion of such initiatives experience failure. Specifically, approximately 35% of e-government projects are reported to fail completely, while an additional 50% encounter partial failure, leaving only 15% classified as fully successful. Heeks argues that the predominant cause of these failures is the *design–reality gap*, defined as the misalignment between the assumptions embedded in system design and the actual organizational, institutional, and socio-political conditions within which the systems are implemented. When information systems are designed without adequate consideration of local capacities, administrative practices, and contextual constraints, implementation outcomes are likely to fall short of intended objectives.

2. Gil-García and Pardo (2005) identify multiple categories of barriers to e-government implementation, encompassing technical, organizational, and institutional dimensions. Technical barriers include challenges related to system interoperability and information security. Organizational barriers involve resistance to change and limitations in human resource capacity, while institutional barriers relate to regulatory frameworks and the coordination mechanisms among government agencies. Together, these factors highlight the multidimensional and interdependent nature of e-government implementation challenges.
3. Luna-Reyes and Gil-García (2014) emphasize the importance of a multi-level approach to e-government implementation, which simultaneously considers individual, organizational, and external environmental factors. They argue that e-government initiatives cannot be effectively understood or implemented by focusing on a single level of analysis, as interactions across levels play a critical role in shaping implementation processes and outcomes. This perspective highlights the need for integrated analytical frameworks when examining complex digital government reforms.

In the Indonesian context, several studies have examined the implementation of information systems in local governments.:

Wahyudi (2017), for instance, analyzes the implementation of the Regional Management Information System (SIMDA) and finds that implementation success is strongly influenced by leadership commitment, human resource capacity, and the quality of technical assistance provided to implementing agencies.

Nugroho (2019) examines e-government adoption in local governments and identifies organizational culture and political support as critical

determinants of successful implementation. The study highlights that beyond technical readiness, institutional values and sustained political commitment play a decisive role in shaping e-government outcomes.

However, empirical studies specifically examining SIPD implementation using a comparative approach across multiple local governments remain limited. This study seeks to address this gap by providing an in-depth analysis of SIPD implementation challenges in three local governments with differing institutional and contextual characteristics.

E. Conceptual Framework

Based on the literature reviewed above, this study adopts Van Meter and Van Horn's policy implementation framework to analyze the implementation of the Regional Government Information System (Sistem Informasi Pemerintahan Daerah—SIPD). The study's conceptual framework is illustrated as follows:

1. Inputs
 - a) SIPD Policy Framework, particularly the Regulation of the Minister of Home Affairs (Permendagri) No. 90/2019.
 - b) SIPD System and Supporting Infrastructure, including hardware, software, and network connectivity.
 - c) Local Government Resources, encompassing human, financial, and institutional capacities.
2. Implementation Process (Van Meter and Van Horn's Variables).
 - a) Policy Standards and Objectives, referring to the clarity and consistency of SIPD goals and implementation guidelines.
 - b) Resources, including human resources, budgetary allocation, and technological infrastructure.
 - c) Interorganizational Communication, reflecting coordination and information exchange among implementing agencies.
 - d) Characteristics of Implementing Organizations, such as organizational structure, norms, and internal coordination mechanisms.
 - e) Disposition of Implementers, indicating the attitudes, commitment, and responsiveness of policy implementers.
 - f) Social, Political, and Economic Environment, representing external contextual factors influencing implementation.
3. Implementation Challenges

- a) Technical Challenges, such as system interoperability, data integration, and system reliability.
 - b) Human Resource Challenges, including limited technical skills, resistance to change, and uneven capacity among users.
 - c) Policy Coordination Challenges, particularly inter-agency coordination and alignment between central and local government policies.
4. Outputs
- a) Effectiveness of SIPD Implementation, measured by system utilization, process integration, and compliance with regulations.
 - b) Quality of Local Government Financial Management, reflected in accuracy, timeliness, and reliability of financial information.
 - c) Transparency and Accountability, demonstrated through improved public access to information and strengthened financial oversight.

III. RESEARCH METHODOLOGY

A. Research Approach

This study employs a descriptive qualitative approach with a comparative case study design. The qualitative approach was chosen to obtain an in-depth understanding of SIPD implementation within its natural context (Creswell, 2014). The comparative case study design enables the identification of patterns and differences in implementation challenges across multiple local governments with distinct institutional and contextual characteristics.

B. Research Sites and Study Period

1. The study was conducted in three locations.
 - a) The first site is Nganjuk Regency, East Java.
 - b) which has a medium level of regional development.
 - c) The focus of the study in this location was the Regional Financial and Asset Management Agency (BPKAD).
 - d) The period of SIPD implementation examined in this site spans 2024–2025.
2. The second location is Nias Regency, North Sumatra.
 - a) The second location is Nias Regency, North Sumatra, characterized as a less-developed regency with limited infrastructure.

- b) The focus of the study was the Regional Financial and Revenue Management Agency (BPKPD).
 - c) Examining the implementation of SIPD during 2024–2025.
3. The third location is Medan City, North Sumatra
- a) Is a large urban area with relatively adequate infrastructure.
 - b) The focus of the study was the Regional Financial and Asset Management Agency (BPKAD).
 - c) With an emphasis on SIPD implementation during 2024–2025.

These three locations were purposively selected to capture variations in regional characteristics, including administrative type (regency versus city) and level of development (developed versus underdeveloped), thereby enabling a comprehensive comparative analysis of the challenges encountered in SIPD implementation.

The study was conducted from January to August 2025.

C. Research Informants

Research informants were selected using purposive sampling based on the following criteria: (1) direct involvement in SIPD implementation, (2) possessing knowledge and experience related to the system, and (3) willingness to provide information openly. A total of 29 informants participated in the study, distributed as follows:

1. Nganjuk Regency (6 informants):
 - a) Head of the Regional Financial and Asset Management Agency (BPKAD).
 - b) Secretary of BPKAD.
 - c) Head of the Budget Division.
 - d) Head of the Accounting Division.
 - e) SIPD Technical Staff (2 persons)
2. Nias Regency (17 informants):
 - a) Head of the Regional Financial and Revenue Management Agency (BPKPD).
 - b) Secretary of BPKPD.
 - c) Head of the Budget Division.
 - d) Head of the Treasury Division
 - e) Head of the Accounting Division
 - f) Head of the Planning Subdivision.
 - g) SIPD Technical Staff (11 persons)
3. Medan City (6 informants):
 - a) Head of the Regional Financial and Asset Management Agency (BPKAD)
 - b) Secretary of BPKAD
 - c) Head of the Budget Division
 - d) Head of the Accounting Division
 - e) SIPD Technical Staff (2 persons)

D. Data Collection Techniques

Data for this study were collected using three complementary methods:

1. Semi-structured Interviews
Semi-structured interviews were conducted using an interview guide covering the following themes:
 - a) SIPD implementation processes
 - b) Challenges encountered during implementation.
 - c) Strategies employed to overcome challenges.
 - d) Evaluation of system effectivenessEach interview lasted 45–90 minutes per informant, resulting in a total of 29 interview sessions.
2. Direct Observation
Observations were carried out to capture:
 - a) The process of using the SIPD application.
 - b) User interactions with the system.
 - c) Work dynamics within the BPKAD/BPKPD offices.
 - d) Observations were conducted for 5–7 days per location.
3. Document Analysis
Relevant documents were reviewed, including:
 - a) Minister of Home Affairs regulations related to SIPD.
 - b) Regional regulations concerning the APBD.
 - c) Planning documents (RPJMD, RKPD).
 - d) Regional financial reports.
 - e) Technical documentation of SIPD.
 - f) Meeting minutes and correspondence related to SIPD implementation

E. Data Analysis Techniques

Data were analyzed using Miles and Huberman's (2014) interactive model, which comprises three stages:

1. Data Reduction
 - a) Selecting and focusing on relevant data
 - b) Simplifying and abstracting raw data
 - c) Transforming raw data into meaningful information.
 - d) Coding data according to research times
2. Data Display
 - a) Organizing information systematically.
 - b) Presenting data in tables, matrices, and narrative form.
 - c) Grouping data according to categories of challenges.
3. Conclusion Drawing and Verification
 - a) Interpreting data to answer research questions.
 - b) Verifying conclusions through triangulation of sources and methods.
 - c) Comparing findings across the three study sites.

F. Data Validity

To ensure data validity, the study employed multiple triangulation techniques:

1. Source Triangulation – comparing information from various informants, including leadership, technical staff, and system users.
2. Method Triangulation – cross-checking data obtained from interviews, observations, and document analysis.
3. Time Triangulation – conducting interviews and observations at different times to verify the consistency of information.
4. Member Checking – confirming analysis results with key informants to ensure the accuracy of interpretations.

IV. RESULTS AND DISCUSSION

A. SIPD Implementation Profile in the Three Local Governments

1. Nganjuk Regency

Nganjuk Regency, East Java, began implementing SIPD in 2020 in accordance with directives from the Ministry of Home Affairs. The Regional Financial and Asset Management Agency (BPKAD) acted as the leading sector responsible for overseeing the system's implementation. Prior to SIPD, the regency relied on the Regional Management Information System (SIMDA), which had been operational for over ten years.

The implementation process commenced with a socialization program for all Regional Work Units (SKPD) in January 2020. Technical training was conducted progressively for SIPD operators within each SKPD. Data migration from SIMDA to SIPD took place between February and March 2020, and full operationalization began with the preparation of the Regional Government Work Plan (RKPD) for 2021. This structured approach allowed Nganjuk Regency to transition from a legacy system to an integrated digital platform, although challenges related to technical adaptation and human resource capacity influenced the speed and effectiveness of full SIPD adoption.

2. Infrastructure and Human Resources

- a) Internet Connection: Dedicated 50 Mbps line
- b) Computer Equipment: 125 units distributed across 45 Regional Work Units (SKPD)
- c) Local Server: Available for data backup

3. Human Resources:

- a) Total SIPD Operators: 125 personnel
- b) Operators with IT Background: 15%
- c) Training Received: 2-day technical workshop

3. Nias Regency

Nias Regency, North Sumatra, encountered considerable challenges in implementing the Regional Government Information System (SIPD) due to its status as a less-developed region with limited infrastructure. Implementation began in mid-

2020, supported intensively by the North Sumatra Provincial Government. The Regional Financial and Revenue Management Agency (BPKPD) adopted a phased implementation approach, retaining the legacy system, MAKUDA, as a backup. The data migration process faced difficulties arising from inconsistencies in data formats and nomenclature, which delayed full operationalization.

Infrastructure:

- a) Internet Connectivity: 20 Mbps shared line
- b) Computer Equipment: 78 units distributed across 35 Regional Work Units (SKPD).
- c) Local Server: Not available.

Human Resources:

- a) Total SIPD Operators: 78 personnel
- b) Operators with IT Background: 8%
- c) Training Received: 1-day workshop supplemented with online mentoring

The combination of limited technological infrastructure and a low proportion of IT-skilled operators significantly constrained the pace and effectiveness of SIPD adoption, highlighting the contextual challenges of implementing e-government systems in underdeveloped regions.

4. Medan City

Medan City, as a major metropolitan area and the capital of North Sumatra Province, benefits from relatively well-developed infrastructure. Nevertheless, the city faces significant challenges due to organizational complexity and the large volume of financial transactions. The Regional Financial and Asset Management Agency (BPKAD) of Medan City initiated the implementation of the Regional Government Information System (SIPD) in early 2020. The process was supported by a relatively strong internal IT team, which facilitated the adaptation and integration of the SIPD system into existing financial management workflows. Despite the infrastructural advantages, ensuring data accuracy, coordination across multiple departments, and system scalability remained critical challenges during the early phases of implementation.

To ensure continuity in budgeting processes, Medan City adopted a parallel implementation strategy, whereby the SIPD system operated simultaneously with the legacy system. This approach allowed for systematic monitoring and minimized operational disruptions. Monthly evaluations were conducted to identify issues and implement corrective measures, thereby facilitating a smoother transition and enhancing the overall effectiveness of the financial management system.

B. Infrastructure and Human Resources

Medan City has relatively advanced infrastructure to support the implementation of the

Regional Government Information System (SIPD). The city is equipped with a dedicated 100 Mbps internet connection with a backup to ensure system reliability. A total of 250 computer units are distributed across 68 local government agencies (SKPD), supported by local servers with adequate capacity to handle the system's data requirements.

Regarding human resources, Medan City has 250 SIPD operators, with 25% having an IT background. Capacity-building initiatives include three-day workshops combined with intensive mentoring, aimed at enhancing operator competencies and ensuring effective system utilization across all departments.

1. Challenges in SIPD Implementation

Based on the analysis of data from the three research locations, the challenges in implementing the Regional Government Information System (SIPD) can be categorized into three main groups: technical challenges, human resource challenges, and policy coordination challenges.

2. Technical Challenges

- a) System Instability A consistent issue reported across all three study locations was the instability of the SIPD system. The central server, managed by the Ministry of Home Affairs, frequently experienced disruptions, particularly during peak usage periods such as the deadlines for budget document preparation.
- b) Incomplete Features The implemented SIPD system is still under development, with many features either incomplete or malfunctioning. Certain menus were inaccessible, some automated calculation functions did not operate correctly, and generated reports often did not conform to the required formats.
- c) Integration Issues SIPD is designed as an integrated system connecting planning, budgeting, treasury, and reporting processes. However, in practice, module integration has not been fully optimized. Data from one module does not automatically synchronize with other modules, necessitating repeated manual input.
- d) Complex Nomenclature Changes A fundamental change in SIPD involves the adoption of new nomenclature based on Permendagri No. 90 of 2019, including revised codes for programs, activities, and accounts. These changes differ significantly from the previous system, adding complexity to the transition and requiring additional adjustments by the operators.

3. Human Resource Challenges

- a) **Limited Capacity and Understanding**
The majority of SIPD operators in the three study locations have limited educational and professional backgrounds in information technology. Most are employees from administrative, financial, or planning departments who must adapt to a complex new system, often without prior experience in IT-based financial management.
- b) **Insufficient Training and Mentoring**
Training provided to SIPD operators is generally limited in both duration and quality. In Nganjuk and Nias Regency, training lasted only 1–2 days and primarily involved workshops focused on system familiarization rather than hands-on practice. In Medan City, although the training was more intensive (three days) and accompanied by mentoring, it was still considered inadequate for mastering the complexities of the SIPD system.
- c) **Resistance to Change**
Employees often exhibit resistance to transitioning from familiar legacy systems to the new SIPD platform. This resistance is influenced by uncertainty about new procedures, fear of making errors, and perceived increases in workload, which can slow down adoption and reduce overall system efficiency.
- d) **Dual Workload**
Due to the suboptimal functionality of the SIPD system, employees are required to operate both the SIPD system for fulfilling central reporting obligations and the legacy system for internal purposes. This dual workload increases employee burden and leads to inefficiencies in daily operations, further complicating the adoption of the new system.

4. Policy Coordination Challenges

- a) **Weak Central–Regional Communication**
Coordination between the Ministry of Home Affairs, as the system developer, and regional governments, as users, remains weak. Communication is largely top-down, with limited opportunities for feedback from local authorities.
- b) **Ambiguity in Standardization**
Although SIPD is designed to establish standardization, many aspects remain unclear or open to varying interpretations across regions. Existing technical guidelines are considered insufficiently detailed and are often issued

belatedly, creating inconsistencies in implementation.

- c) **Lack of Ongoing Technical Support**
After the initial implementation phase, technical support from the Ministry of Home Affairs decreases significantly. There is no sustained mentoring to ensure the system operates effectively and to address emerging problems, leaving regions to manage challenges independently.

5. Factors Affecting the Success of SIPD Implementation.

Based on comparative analysis, this study identifies key factors influencing the successful implementation of SIPD.

a) Enabling Factors

- 1) **Leadership Commitment**
In all three regions, the commitment of leaders (Regents/Mayors and Heads of BPKAD/BPKPD) is a critical factor in driving implementation. Committed leadership provides resource support, motivates staff, and mitigates resistance to change.
- 2) **Infrastructure Readiness**
Adequate infrastructure, including stable internet connections, sufficient hardware, and local servers for backup, reduces the impact of technical system issues. Medan City, with the most advanced infrastructure, is better able to handle central server disruptions.
- 3) **Human Resource Capacity**
Regions with a higher proportion of IT-trained operators (Medan City: 25%) experience a faster learning curve compared to regions with limited human resource capacity (Nias Regency: 8%).
- 4) **Gradual Implementation Strategy**
The parallel implementation approach, where SIPD operates alongside the legacy system, effectively reduces operational risks. Medan City and Nganjuk Regency, which adopted this strategy, experienced fewer disruptions than Nias Regency, which implemented SIPD fully from the start.
- 5) **Inter-Regional Learning**
Informal forums among SIPD operators from different regions facilitate knowledge sharing and dissemination of best practices. Regions that implemented SIPD earlier often serve as references for others.

b) Inhibiting Factors

- 1) **Immature System Quality** The primary hindrance is the SIPD system itself, which is not yet fully matured. System instability, incomplete features, and integration issues are systemic problems that cannot be resolved solely by the regions.
- 2) **Limited Training** Short and superficial training prevents operators from mastering the system. The absence of follow-up training and ongoing mentoring exacerbates the situation.
- 3) **Sudden Changes** SIPD implementation occurred with a short preparation period. Regions had to transition to the new system within less than six months, without sufficient transition time.
- 4) **Minimal Central Support** Weak communication and limited technical support from the Ministry of Home Affairs leave regions feeling “left alone” in addressing implementation challenges.
- 5) **Organizational Culture Resistance** An organizational culture accustomed to traditional workflows and lacking adaptability becomes a barrier, particularly in regions with a majority of senior staff.

B. Discussion

1. SIPD Implementation from the Perspective of Van Meter and Van Horn’s Policy Implementation Theory

The implementation of the Regional Government Information System (SIPD) was analyzed using the six variables of the policy implementation model proposed by Van Meter and Van Horn. This theoretical framework provides a comprehensive lens for examining how policy objectives are translated into operational practices and how various contextual factors influence implementation outcomes:

- a) **Policy Standards and Objectives**
The policy standards governing the implementation of the Regional Government Information System (SIPD) are clearly stipulated in Minister of Home Affairs Regulation No. 90 of 2019, complemented by a series of technical guidelines. The policy objectives are likewise explicit, aiming to establish an integrated system for the management of regional planning and financial data.
- b) **Resource limitations** constitute a significant barrier to SIPD implementation, particularly in underdeveloped regions such as Nias Regency:

- 1) These constraints encompass several dimensions, including the availability of human resources with adequate information technology competencies
- 2) The adequacy of technological infrastructure (internet connectivity and hardware)
- 3) The allocation of budgets for training and technical assistance
- 4) The availability of sufficient time for adaptation and learning.

b) Inter-organizational Communication

Communication between the Ministry of Home Affairs and local governments remains weak and is predominantly instructive in nature, characterized by a top-down approach with limited effective feedback mechanisms. This one-way communication constrains the ability of local governments to convey implementation challenges and system-related issues to the central authority.

2. Patterns of Challenges in E-Government Implementation.

The findings of this study are consistent with the literature on e-government implementation challenges in developing countries. Heeks (2003) identifies the *design–reality gap* as a primary cause of e-government failure, referring to the mismatch between system design and organizational realities. In the case of the Regional Government Information System (SIPD), this gap is clearly evident, as the system’s conceptual design does not fully align with the institutional, organizational, and technical conditions encountered during implementation at the local government level.

From a design perspective, SIPD is conceptualized as an integrated, user-friendly, and efficient information system intended to streamline regional planning and financial management processes. However, the empirical reality reveals a system that remains insufficiently mature, highly complex, and demanding substantial organizational and technical adaptation. This mismatch illustrates a clear *design–reality gap*, as conceptual expectations are not fully supported by operational conditions.

In addition, Gil-García and Pardo (2005) classify e-government barriers into three interrelated dimensions: technical, organizational, and institutional. The findings of this study reveal a similar pattern. Technical barriers include system instability, incomplete features, and weak module integration. Organizational barriers are reflected in limited human resource capacity, resistance to change, and rigid organizational cultures. Institutional barriers manifest in weak central–local coordination, unclear standardization, and regulatory ambiguities that further complicate implementation.

3. Lessons Learned from Government Information System Implementation

This study offers several important lessons regarding the implementation of government information systems, particularly in the context of developing countries.

- a) System readiness is a critical prerequisite.
- b) Information system implementation should not be enforced before the system is fully prepared. In the case of SIPD, implementation occurred while the system was still under development, resulting in numerous technical issues that could have been avoided with a more mature system.
- c) Second, the importance of a phased implementation approach. A “big-bang” implementation strategy—simultaneously applied across all regions without an adequate transition period—creates significant pressure and increases the risk of failure. A phased approach, beginning with pilot projects in selected regions, would likely be more effective in identifying system weaknesses and refining implementation strategies before nationwide rollout.
- d) Investment in human resources is as important as investment in technology. Successful implementation depends not only on technological infrastructure but also on the competencies of system users. Investment in training, mentoring, and human resource capacity building should therefore be prioritized alongside technological development.
- e) Two-way communication is essential. Effective communication mechanisms between system developers at the central level and system users at the local level are crucial for timely identification and resolution of implementation problems. A predominantly top-down approach with limited feedback channels has proven insufficient in supporting effective system adoption.
- f) Finalocal context must be taken into account.

A one-size-fits-all implementation strategy is not suitable for Indonesia, given the significant diversity in regional characteristics. Greater flexibility is required to accommodate varying levels of institutional capacity, infrastructure readiness, and human resource availability across regions.

4. Policy Implications

Based on the findings of this study, several policy implications can be formulated to improve the

implementation of the Regional Government Information System (SIPD).

- a) Implications for the Central Government (Ministry of Home Affairs):
 - 1) The central government should ensure that the SIPD platform reaches an adequate level of technical maturity before mandating full-scale implementation across all regions. System stabilization, feature completeness, and module integration should be prioritized to reduce implementation risks at the local level.
 - 2) a phased and differentiated implementation strategy should be adopted. Rather than enforcing a uniform nationwide rollout, the Ministry of Home Affairs should consider pilot implementations in selected regions with varying capacity levels to test system readiness and refine technical and administrative guidelines.
 - 3) Continuous technical support and structured communication channels must be strengthened. Establishing formal feedback mechanisms—such as dedicated help desks, regular coordination forums, and rapid response teams—would enable local governments to report issues and receive timely assistance.
 - 4) Clearer and more detailed technical guidelines should be issued in a timely manner to minimize ambiguity and ensure consistent interpretation across regions. Standardization efforts should be accompanied by practical operational manuals that reflect actual implementation conditions.

V. CONCLUSION AND RECOMMENDATIONS

A. Conclusions

Based on the research findings and discussion, several conclusions can be drawn.

1. Challenges in SIPD Implementation

The implementation of the Regional Government Information System (SIPD) in the three local governments—Nganjuk Regency, Nias Regency, and Medan City—encounters three main categories of challenges.

a) Technical Challenges

Technical challenges include system instability, incomplete features, weak integration across modules, and the complexity arising from changes in nomenclature. These challenges are systemic in nature and cannot be adequately

addressed by local governments independently, as they are closely linked to the design, development, and management of the system at the central level.

- b) **Human Resource Challenges**
Human resource–related challenges include limited operator capacity and understanding of the system, insufficient training and mentoring, resistance to change—particularly among senior staff—and the emergence of dual workloads resulting from the suboptimal functionality of the SIPD system. These factors collectively hinder effective system adoption and reduce operational efficiency at the local government level.
- c) **Policy Coordination Challenges**
Policy coordination challenges are reflected in weak communication between the central and local governments, ambiguity in implementation standardization, and the lack of sustained technical support from the central government. These issues undermine coordination effectiveness and constrain local governments' capacity to address implementation problems in a timely and systematic manner.

2. Inter-Regional Comparison

Although similar patterns of challenges are observed across the three local governments, the intensity and impact of these challenges vary considerably among regions. Differences in infrastructure readiness, human resource capacity, leadership commitment, and implementation strategies result in divergent implementation outcomes across Nganjuk Regency, Nias Regency, and Medan City.

3. Success Factors

The success of SIPD implementation is influenced by both enabling and inhibiting factors.

- a) **Enabling Factors**
Key enabling factors include leadership commitment, infrastructure readiness, human resource capacity, the adoption of a phased implementation strategy, and inter-regional learning through knowledge sharing and best practices.
- b) **Inhibiting Factors**
In contrast, inhibiting factors encompass the immature quality of the SIPD system, limited and insufficient training, sudden implementation without an adequate transition period, minimal support from the central government, and resistance rooted in organizational culture.

4. Theoretical Perspective

The analysis based on Van Meter and Van Horn's policy implementation theory demonstrates that all six variables—policy standards and objectives,

resources, inter-organizational communication, characteristics of implementing agencies, implementer disposition, and the external environment—significantly influence SIPD implementation. The most pronounced gaps are observed in the resource variable and inter-organizational communication, which emerge as critical constraints on effective implementation.

5. Implementation Effectiveness

During the first year of implementation, SIPD had not yet achieved its intended objectives. The system was unable to significantly enhance efficiency, transparency, or accountability in regional financial management. Instead, implementation initially generated inefficiencies, particularly due to dual workloads and a temporary decline in the quality of planning documents.

B. Recommendations

Based on the conclusions above, this study proposes the following recommendations to enhance the implementation of the Regional Government Information System (SIPD):

1. Recommendations for the Ministry of Home Affairs

a) Comprehensive System Improvement

- 1) Priority should be given to improving server stability and strengthening backend infrastructure to ensure system reliability, particularly during peak usage periods.
- 2) All promised system features must be fully completed and rigorously tested to ensure proper functionality and compliance with regulatory requirements.
- 3) Integration across SIPD modules should be enhanced to enable seamless data synchronization and eliminate redundant manual data entry.
- 4) The user interface should be further developed to become more intuitive and user-friendly, thereby reducing the learning burden on operators with limited IT backgrounds.
- 5) Comprehensive, clear, and easily accessible technical documentation should be provided to support system operation, troubleshooting, and capacity building at the local government level.

b) Strengthening Support Systems

A dedicated help desk should be established with clearly defined service level agreements (SLAs), ensuring a maximum response time of 24 hours. In addition, specialized technical assistance teams should be deployed to support underdeveloped regions with limited implementation capacity.

Furthermore, a centralized ticketing system should be developed to systematically track reported issues and corresponding solutions,

enabling better monitoring and continuous system improvement. An online knowledge base accessible to all local governments should also be created to facilitate self-learning and dissemination of technical guidance. Finally, formal inter-regional communication forums should be facilitated to encourage the sharing of experiences, best practices, and lessons learned among local governments implementing SIPD.

c). Improving Training Quality

Training programs should be extended to a minimum duration of five days, with at least 70 percent of the sessions devoted to hands-on practice. A tiered training structure—comprising basic, intermediate, and advanced levels—should be implemented to accommodate varying levels of operator competence.

In addition, refresher training should be conducted every six months to reinforce skills and address system updates. The development of an e-learning platform is also recommended to support self-directed learning and broaden access to training materials. Finally, a formal certification scheme for SIPD operators should be introduced to ensure competency, standardize skill levels, and promote professionalism.

d). Improving Communication and Coordination

A formal feedback mechanism should be established to enable systematic communication from local governments to the central authority. Regular evaluation meetings involving representatives from local governments are necessary to assess implementation progress and identify emerging challenges. In addition, periodic newsletters or bulletins should be issued to disseminate system updates, policy changes, and best practices. The establishment of a dedicated monitoring and evaluation team that actively conducts field visits to local governments is also recommended to ensure continuous support and oversight.

e) Enhancing Implementation Flexibility

Adequate transition periods—of at least one year—should be granted to regions with lower levels of readiness. A phased implementation approach based on regional classification and capacity should be considered to reduce implementation risks. During the transition phase, the use of parallel systems should be permitted to maintain data continuity and operational stability. Furthermore, implementation timelines should be adjusted to reflect the specific institutional and infrastructural conditions of each region.

2. Recommendations for Local Governments

a) Infrastructure Investment

Local governments should increase internet bandwidth capacity to a minimum of 50 Mbps dedicated connections to support stable system

performance. Backup connectivity should also be provided to mitigate potential network disruptions.

In addition, adequate hardware should be supplied for all SIPD operators to ensure smooth system operation. The establishment of local servers for data backup is recommended to reduce dependence on central servers and enhance data security. Furthermore, local governments should ensure a conducive working environment equipped with appropriate supporting facilities to improve operator productivity and system utilization.

b) Human Resource Capacity Development

Local governments should recruit or assign personnel with information technology backgrounds to serve as SIPD administrators. Regular internal training programs should be conducted at least every three months to continuously enhance operator competencies.

In addition, internal IT teams should be established to provide troubleshooting support and on-site assistance for SIPD operators. High-performing operators should be encouraged to participate in advanced training programs to strengthen institutional capacity. Finally, solutions to frequently encountered problems should be systematically documented and compiled as internal references to support knowledge retention and continuous improvement.

c) Change Management

Intensive socialization programs should be conducted to communicate the benefits and objectives of SIPD to all government employees, thereby fostering shared understanding and acceptance of the system. Employee involvement throughout the implementation process is essential to reduce resistance to change and to strengthen a sense of ownership among users.

To motivate performance and sustain commitment, incentives or rewards should be provided to operators demonstrating high levels of competence and adaptability. In addition, *change agents* should be identified and empowered from among enthusiastic and capable staff to promote positive attitudes toward the system and to support peer learning. Transparent communication regarding implementation progress, achievements, and challenges is also critical to maintaining trust and organizational alignment.

d) Adaptive Implementation Strategy

Local governments should adopt a parallel system approach by operating SIPD alongside legacy systems during the transition period to minimize operational risks. Regular evaluations—conducted at least on a monthly basis—are necessary to assess implementation progress and to allow timely strategic adjustments.

Furthermore, a dedicated task force should be established to oversee SIPD implementation, coordinate across organizational units, and resolve

emerging issues promptly. Local governments are also encouraged to learn from the experiences and best practices of regions that have demonstrated more successful implementation outcomes, thereby facilitating institutional learning and continuous improvement.

e) Internal Coordination

Effective internal coordination is essential to ensure data consistency and the smooth operation of SIPD across organizational units. Local governments should establish cross-departmental coordination teams involving multiple *Regional Work Units* (SKPDs) to synchronize data inputs and operational procedures.

Regular coordination meetings should be institutionalized to identify implementation issues, share solutions, and monitor progress collectively. Clear and standardized *Standard Operating Procedures* (SOPs) for SIPD usage must be developed and enforced to reduce ambiguity and operational discrepancies among units.

In addition, a systematic quality control mechanism should be implemented to verify data accuracy, completeness, and consistency before submission. Facilitating structured communication among SIPD operators—through formal forums or internal communication platforms—can further promote peer support, knowledge sharing, and rapid problem resolution.

3. Research Limitations

This study has several limitations that should be considered when interpreting its findings:

- a) The geographical scope of the research is limited to three local governments, which constrains the generalizability of the results to other regions in Indonesia with different administrative capacities and socio-economic conditions.
- b) The research period covers only the first year of SIPD implementation, thereby limiting the ability to capture long-term impacts, system maturation processes, and subsequent institutional adjustments.
- c) The study primarily focuses on technical and organizational aspects of SIPD implementation, while broader political dynamics and macroeconomic factors that may influence policy execution were not examined in depth.
- d) Data accessibility constraints restricted full access to sensitive information related to budgetary processes and financial performance, potentially limiting the comprehensiveness of the analysis.
- e) The subjectivity of informants represents an inherent limitation of qualitative research, as interview data may reflect individual perceptions and experiences. Although triangulation techniques were applied to

enhance validity, some degree of interpretive bias may remain.

Despite these limitations, the study makes a significant contribution to the literature by providing empirical insights into the challenges of e-government system implementation in Indonesia and by offering practical, evidence-based policy recommendations for improving SIPD implementation at both central and local government levels.

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