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Policy Learning of One Data Indonesia for Supporting Data-Driven Policy

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Abstract-

The One Data Indonesia policy, established through Presidential Regulation No. 39 of 2019, is a strategic initiative to support evidence-based decision-making through integrated and accessible data governance. This article explores policy learning in its implementation as a foundation for data-driven policymaking in Indonesia. This research uses a post-positivist paradigm where post-positivism uses theory as a guideline for research and acknowledges that values influence the interpretation of qualitative data. A descriptive qualitative method is used to explore the implementation dynamics of the policy in depth. An event or phenomenon of implementing the One Data Indonesia policy with policy learning theory as an analytical framework through semi-structured interviews and literature studies. The results show that the implementation of One Data Indonesia reflects three forms of policy learning (Howlett et al., 2017): cognitive-technical (improving data quality and interoperability), socio-political (cross-agency coordination), and institutional (strengthening regulations and data-based organisational culture). However, challenges such as sectoral ego, data fragmentation, and capacity constraints remain significant. In conclusion, strengthening the legal framework, data literacy, and interoperability is needed to optimise data-based policies in Indonesia. With an in-depth understanding of the policy learning process, this research provides strategic insights for policymakers in optimising the potential of data as a national strategic asset. Specifically, this study contributes by mapping concrete patterns of policy learning that can be replicated or adapted in future national data governance reforms. Effective implementation is expected to support more targeted and efficient development planning.

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INTRODUCTION

The digital era has brought significant changes to the public policy-making process. The use of big data, which includes analysing social, historical, and predictive future data, enables governments to make more targeted and effective policies. In recent decades, the use of big data in policy decision-making has become a global trend to improve accuracy, efficiency, and transparency in governance. Big data enables more precise and adaptive decision-making while accelerating the shift towards digital and smart governance (Hossin et al., 2023). Developed countries have adopted the concept of a data-driven public sector as an integral part of public policy-making. The digital and data-driven transformation has systemically changed the architecture of modern government, including the challenges and best models from various countries (Giest et al., 2025). However, the implementation of data-driven policies in various countries is not without challenges. Common obstacles include data quality and relevance, inter-agency interoperability, technical skills of human resources, and ethical and privacy issues (van Ooijen et al., 2019). These challenges are more complex in developing countries with limited digital infrastructure and low institutional capacity.

Similar challenges exist in Indonesian public data governance. Data is still scattered across various ministries and agencies with different standards, which causes inconsistencies and difficulties in data integration to support public policy. Data problems in Indonesia have long been in the spotlight. Data produced by various government agencies related to the same thing are often different, based on differences in methodology, collection objectives, and standardisation, causing low public confidence in the quality of public data (Katharina et al., 2021).

The open data movement also began in Indonesia with government support for publishing public data by institutions through the One Data Initiative. the implementation of open data in Indonesia is still in its early stages; One Data Indonesia implementation still faces many challenges. Each component of One Data Indonesia implementation (data planning, data entry, data checking, and data distribution) has several problems (Suryahadi, 2022). Weak coordination concerns sectoral egos in the organisation of data and data platforms, as well as data stored individually so that data is scattered, reluctance to share data between agencies and difficulty in obtaining data. Therefore, data quality reform in Indonesia is a must. The need for integrated

information systems makes One Data Indonesia fulfil the need for accurate and accountable data and information in policy-making to improve the quality of development and support the achievement of Golden Indonesia 2045, a national vision aiming for a just, advanced, and globally competitive Indonesia by its centennial independence. Its main objectives include improving the quality of human resources, equitable development, sustainable economic growth, and strengthening governance.

In response to these challenges, the Government of Indonesia issued the One Data Indonesia policy through Presidential Regulation No. 39 of 2019. This policy aims to provide a reference for government data governance, create integrated data integration between government agencies at the center and regions, and encourage transparency and openness in data use. The One Data Indonesia policy emphasises the importance of data governance principles, including data standards, standardised metadata, interoperability, and a single reference code (Sekretariat SDI, 2024) . One Data Indonesia is similar to open government data in that it provides quality data. Although it has been implemented, the implementation of One Data Indonesia still faces various operational barriers, such as the absence of an effective monitoring mechanism, lack of technical capacity and understanding at the local level, which hinders the optimisation of One Data Indonesia, so continuous training and coaching is needed (Firmansyah & Susanto, 2023).

Within this framework, data-driven policy becomes relevant to One Data Indonesia. One Data Indonesia implementation significantly supports evidence-based decision-making through data accessibility, operational efficiency, and bias reduction. Integrated data through One Data Indonesia helps reduce bias in decision-making by shifting from subjective judgments to a more objective, evidence-based approach. Data integration allows policymakers access to more holistic information, which can improve public policy quality. Data integration enables the realisation of "collective rationality" that expands the boundaries of individual rationality in the decision-making process (Nanni & Napolitano, 2024). One Data Indonesia has improved the transparency and accuracy of data to support policy planning and evaluation. A concrete example is using One Data Indonesia data to support the achievement of SDGs and RPJMN. However, technical capacity and coordination gaps remain a major challenge. This is reinforced by the finding that data-driven policy can increase efficiency if data is widely available and can be used by various actors.

The data-driven policy prioritises using data as the main foundation in public policy planning, implementation and evaluation (Höchtel et al., 2016). This concept aligns with the One Data Indonesia policy objective to ensure that accurate, up-to-date, and integrated data support every policy decision. The existence of One Data Indonesia is expected to produce integrated development planning, implementation, evaluation and control supported by data so that it can be carried out effectively. In line with the trend of big data utilisation in the government sector, in Indonesia, the One Data Indonesia policy is a national big data platform on the data.go.id portal as a source of data in decision-making. Making one data policy has been in place for approximately 5 years. Monitoring is required to determine the consequences of the implementation process. This evaluation not only focuses on the final results achieved but also investigates all aspects of implementation; the main purpose of this evaluation is to gain valuable lessons to improve the effectiveness of future government programmes (Howlett et al., 2020).

Policy learning is an important approach to understanding the implementation of policies such as One Data Indonesia, which includes three main types of learning: cognitive/technical, social/political, and institutional (Howlett et al., 2017). Cognitive learning focuses on technical understanding of the problem, cause-and-effect relationships, and the policy tools' effectiveness. In contrast, social/political learning involves the strategies of actors in the network to collaborate and navigate the political process to achieve policy objectives. On the other hand, institutional learning emphasises establishing shared norms, procedures and values that support interaction and collaboration between policy actors. These three concepts form the basis for evaluating One Data Indonesia policy, aiming to draw lessons from the results of policy implementation and provide recommendations that can improve the programme in technical, social and institutional terms and address wider systemic impacts.

To understand the dynamics of One Data Indonesia policy implementation as a basis for data-driven policymaking, this research raises the question: What successes and lessons have the One Data Indonesia Policy learned in supporting data-driven policies? What recommendations can be given to strengthen the implementation of One Data Indonesia? While previous studies have discussed the importance of data governance and public data disclosure initiatives in Indonesia, there is still a gap in studies that specifically

evaluate the policy learning in implementing One Data Indonesia as the foundation of data-driven policy. Most studies tend to focus on technical and normative aspects, such as data interoperability and digital infrastructure, but not many have systematically explored how technical, socio-political and institutional learning occurs during the One Data Indonesia implementation process. This research aims to identify the extent to which technical, social, and institutional learning has taken place in the One Data Indonesia implementation framework and provide strategic recommendations to strengthen One Data Indonesia policies in supporting data-driven development planning.

The urgency of this research lies in the pressing need to improve the efficiency and effectiveness of data-driven decision-making in Indonesia, which is critical amidst the complexity of development challenges. By understanding the policy learning behind One Data Indonesia implementation, this research can provide insights for policymakers to overcome technical, social and institutional barriers and maximise the potential of data as a national strategic asset. This research is academically relevant and has significant practical contributions to Indonesia's sustainability of data governance reform. However, implementing One Data Indonesia (SDI) has faced various policy-level challenges and criticisms from national stakeholders. For example, the National Research and Innovation Agency (BRIN) highlights that the top-down approach in SDI implementation often sidelines local government data governance, leading to fragmentation and limited inter-agency data interoperability (BRIN, 2023). Furthermore, identifies key implementation issues, including regulatory inconsistencies, bureaucratic resistance, and limited human resource capacity, all hindering the ideal vision of integrated and transparent data sharing across institutions (Umasugi, 2025)

METHOD

This research uses the post-positivism paradigm, where post-positivism uses theory as a research guideline and values influence when researchers interpret data. researchers begin to structure and conduct their research with a theory as a foundation for collecting relevant data and conducting analyses (Creswell, 2018), namely with policy learning theory to identify the extent to which technical, social, and institutional learning has been carried out within the One Data Indonesia implementation framework. This research uses a qualitative method with a descriptive research type because it

describes in detail an event or phenomenon of the One Data Indonesia policy implementation. Qualitative data collection is primary data and secondary data. Primary data was obtained through semi-structured interviews using open-ended questions to allow flexible but focused exploration of the learning aspects of the policy with informants of actors directly involved in making One Data Indonesia policies, One Data Indonesia Secretariat Officials, One Data Indonesia Secretariat Data Analytics and Utilisation staff and Walidata Ministry of PPN / Bappenas who were selected by snowball sampling research informants developing and rolling following the information or data needed from previously interviewed informants. Secondary data were obtained from literature studies, official documents, performance reports, scientific articles, and media analyses.

Data analysis used the illustrative method (Neuman, 2014), which links theoretical concepts with empirical evidence from the field. The illustrative method used is case clarification and matching. This method allows researchers to ground Howlett et al., (2017) policy learning theories of cognitive/technical learning, social/political learning, and institutional learning into the context of One Data Indonesia's implementation in the field. Thus, the conceptual framework used is a theoretical analysis tool that is empirically informed and relevant to policy dynamics.

RESULT AND DISCUSSION

Policy learning is evaluated as a promising analytical framework in the policy process (Dunlop & Radaelli, 2018). In One Data Indonesia, learning occurs when policy actors at the central and local levels realize that successful data integration depends on technical aspects, institutional alignment, and collaboration across actors. One Data Indonesia shows the potential for reactive and proactive learning in response to external pressures, such as demands for transparency, public service efficiency, and the need for data-driven policies. Reactive, when One Data Indonesia policies adapt to the failure of previous sectoral data systems that are closed and overlapping; and proactive, when policy actors encourage the strengthening of One Data Indonesia through innovations such as the development of metadata, data standards, and the development of one national data portal. Policy learning is an integral part of the public policy-making process.

Indonesia's One Data Indonesia regulation has been slower than other countries

because it focuses on technical aspects without being supported by a strong institutional strategy and effective cross-sector coordination. Institutional resistance is also a significant obstacle, where government agencies tend to maintain sectoral egos and are reluctant to share data due to fears of losing control. As a result, the effectiveness of existing regulations is still low in solving data governance issues, as they have not been able to encourage system integration, build trust between agencies, or create sufficient incentives for data collaboration.

Implementing the One Data Indonesia Policy stipulated in Presidential Regulation No. 39/2019 faces significant challenges, especially in regulatory development, interoperability, and data utilization. The main obstacles are the lack of coordination between government agencies and a clear mechanism to prepare and supervise One Data Indonesia action plans (Firmansyah & Susanto, 2023). These delays risk causing Indonesia to lose momentum in utilizing data as the basis for accurate and transparent policy-making, so accelerated regulatory development and institutional capacity building are needed to ensure the successful implementation of One Data Indonesia.

The two main perspectives on policy learning are: first, as a normal part of the policy process where policymakers learn from previous policy successes and failures; second, as a response to changes in the external environment that force policy adaptation (Howlett et al., 2017). In practice, this learning can be seen when local governments implement the principles of one data and integrate their sectoral data into the national system. However, many challenges remain, such as gaps in human resource capacity and technological infrastructure. Policy learning can be triggered by problems or proactive efforts to improve existing policies. The outcome of policy learning can be tangible policy change or improved understanding of a problem. Three learnings are concerned with which include:

- **Cognitive/technical learning**

The One Data Indonesia policy is a government data governance policy that integrates all central and local government data in one system that is easily accessible, up-to-date, integrated, accurate, and accountable to be shared by the central and local governments. The existence of One Data Indonesia is expected to produce integrated development planning, implementation, evaluation, and control supported by data so that they can be carried out effectively. In line with the trend of big data utilization in the government sector, in Indonesia, the One Data Indonesia policy is a national big data platform on the

data.go.id portal.

Sourced from the One Data Indonesia Central portal in March 2025, government data integration at the Central Agency level, 70 out of 101 Ministries / Agencies have been integrated with the One Data Indonesia Portal, equivalent to 69% of the total targeted agencies. Meanwhile, at the Regional Agency level, integration with the One Data Indonesia Portal has covered 31 out of 38 Provinces, with a percentage of 82%. For Districts/Cities, the number that have been connected reached 267 out of 514 Districts/Cities, or about 51% of the targeted total. In addition, the number of datasets that have been curated and checked by the Data Warden at the Central Agency and Regional Agencies so that they are suitable for sharing reaches 429,461 datasets, and this number continues to grow and decrease along with the development of data integration and curation systems to meet quality standards. Integration continues to be carried out, although there is still a need to strengthen coordination and improve data quality consistency to ensure the sustainability and optimization of the benefits of this policy.

Implementing the One Data Indonesia policy is the government's strategic step in realising integrated and quality data governance. However, this effort faces various technical challenges, especially in overcoming data fragmentation between agencies and establishing effective interoperability standards. Data fragmentation occurs due to different data formats, standards, and agency collection methods. These differences hinder optimal data integration and utilisation.

The quality of data published through the One Data Indonesia portal still varies, indicating the need for uniform data standards. Despite technical regulations mandating standardised formats, metadata, and reference codes, differences in data quality, consistency, and completeness remain a concern across institutions (Maulidya & Rozikin, 2022; Soegiono, 2018). Efforts to fulfil the principles of One Data Indonesia continue to be made, as stated by the One Data Indonesia Secretariat; data on the data.go.id portal continues to be updated and improved to fulfil the four core principles—data standards, metadata, interoperability, and reference codes. However, implementing these principles still faces structural and political obstacles, such as siloed data management, legacy systems, and fragmented institutional capacities (Adinegoro et al., 2025)

Furthermore, implementing One Data Indonesia at the local level is influenced not only

by institutional readiness but also by the strategic behaviour of agents and their reflexivity toward new data governance structures. Sectoral egos and the reluctance to share data remain critical issues, often rooted in power imbalances and competition over resource control (Irawan & Handayani, 2025). These dynamics underscore how agency, in terms of actors' strategies and adaptive capacities, plays a decisive role in shaping whether integrated and data-driven governance reform agenda can be realized effectively.

Many agencies use different technology platforms without effective communication, hindering data exchange. This limitation is exacerbated by inadequate technological infrastructure in some areas, leading to disparities in One Data Indonesia implementation. The ego sector and complex bureaucracy are significant barriers to One Data Indonesia's implementation. Each agency tends to maintain autonomy over its data, making inter-agency coordination and collaboration difficult. This results in data duplication and inefficiencies in information management. According to the Open Government Partnership report, implementation challenges in One Data Indonesia include institutional issues, sectoral egos, and coordination between the center and regions.

To address data fragmentation, the Indonesian government has initiated the development of a Temporary National Data Centre (PDNS) that allows each Ministry/Institution (M/L) and Local Government (LG) to integrate their data through a harvesting process. This process allows the data catalog and metadata from the agencies' local servers to be synchronized with the central server, facilitating national data management and dissemination. In addition, the development of the National Data Catalogue System (SKDN) aims to support the integration of geospatial and statistical data, enabling connection and harmonisation between data managed at the central and local levels. SKDN is equipped with features that allow Walidata to perform quality checks on data collected by various Data Producers, ensuring the fulfilment of One Data Indonesia principles in the process.

From a cognitive and technical learning perspective, it is necessary to increase the capacity of human resources to understand the importance of quality data and how to manage it. Training and education on data management, analysis, and information technology utilization are essential to ensure that government officials can operate the One Data Indonesia system effectively. Indonesia's one-data policy requires adequate

skills and support from all civil servants. This includes those who work directly with data and employees at managerial and operational levels. Data literacy, communication, and management skills are key in processing and interpreting the available data. This is important to ensure policies are based on accurate and relevant data. It is also important not to assume that effective use of data is the exclusive responsibility of those with "data-related" titles, such as data analysts or data scientists. Data-driven public sector implementation will have a broader impact if it is supported by systemic thinking and cross-government collaboration in setting policy direction. Therefore, countries should ensure that all public servants possess basic skills to understand the potential of data and be aware of the challenges in managing it (Grunke et al., 2018)

Adaptive and risk-based governance mechanisms are needed to balance transparency and security. One approach that can be used is the Privacy Impact Assessment (PIA), a privacy risk assessment method conducted before a data system or policy is enacted. In addition, involving the public and independent experts in the policy evaluation process and establishing an independent oversight body for data protection can increase public trust in the One Data Indonesia system. One Data Indonesia policies must also continue to adapt to international standards, such as the General Data Protection Regulation (GDPR) from the European Union, in order to be able to build a globally competitive digital ecosystem and guarantee citizens' digital rights.

- **Social/political learning**

Social or political learning in the context of the One Data Indonesia (SDI) policy reflects the adaptation process of policy actors to coordination challenges, differences in interests between agencies, and alignment of norms and values in public data management. The key to this learning lies in building collaboration between stakeholders at the central and regional levels to realise open, accurate and accountable data governance. The implementation of SDI requires government agencies to learn to share data and harmonise their understanding of metadata, interoperability standards, and a clear division of roles between data warehouses and data producers. Indonesia's One Data Policy in the context of open government data still faces serious challenges, especially related to the low level of public involvement in the process of compiling and utilising datasets (Prabujaya et al., 2024)

In comparison, a case study from Estonia, a pioneer country in the digital transformation of government, shows that strong political engagement and cross-

agency awareness of the importance of data integration were the main foundations for the success of their national data system. Estonia developed the X-Road platform as the backbone of secure and efficient inter-agency data exchange, which relies not only on advanced technology but also the result of long social learning between the public and private sectors. Meanwhile, in the UK, the implementation of open data through data.gov.uk shows how civil society's involvement in determining the type of data that should be opened is the key to the portal's success. This form of socio-political learning involves the community setting the open data agenda.

In Indonesia, social learning practices are seen in regional capacity building through One Data Indonesia forums. This forum aims to strengthen the role of Walidata in maintaining data security, improving interoperability, and becoming a space for sharing good practices between Ministries/Institutions and Regions. Social learning practices are seen in regional capacity building through One Data Indonesia forums, where local governments have begun to actively adopt One Data Indonesia principles in preparing the Regional Government Work Plan (RKPD). As noted in the One Data Indonesia Semester II 2024 Performance Report, assistance in drafting regulations and integrating data portals has been provided to various regions. This reflects a shift in bureaucratic culture towards data-based information disclosure that requires social and institutional adaptation.

- **Institutional learning**

Implementing the One Data Indonesia policy since 2019 aims to create standardised, integrated and accountable data governance to support data-driven policymaking. Institutional learning, which includes the development of arrangements, procedures, rules, norms, values and shared beliefs, is crucial in reducing the risks and costs of interactions and supporting negotiations and collaboration between institutions. However, based on the SDI performance report for semester 2 of 2024, only 43 or 39.6% of ministries/agencies at the central level have supporting regulations for SDI, while 63 or 60.4% of the 101 ministries/agencies currently have not developed similar regulations. This condition shows that half of the central agencies are not fully prepared in terms of regulations to support SDI implementation, which is a big challenge considering the important role of central agencies in data governance in supporting national policy making.

At the regional level, achieving One Data Indonesia regulations shows better results

than those at the central level. A total of 33 out of 38 provinces (75.11%) have SDI regulations, while 5 provinces (24.89%) have yet to adopt similar regulations. However, at the district/city level, the percentage of regulations that have been implemented is lower, with only 353 out of 514 districts/cities (68.68%) having SDI regulations. This figure shows that the challenges in drafting regulations are still quite large at the local level, especially in areas with limited resources or different development priorities. Differences in interests between actors in the data-sharing process can create barriers that can slow the establishment of data spaces and data-sharing activities. Therefore, it is important to manage these differences of interest well and build effective collaboration mechanisms to ensure the data-sharing process can run smoothly and benefit all parties (Bernot et al., 2024)

Institutional learning in the context of One Data Indonesia also demands a change in organisational culture towards a data-centric orientation. A data-oriented culture is characterised by decision-making based on testing and experimentation, where data has a more dominant role than opinion, and failure is seen as part of the learning process. Organisations that adopt this approach have greater potential to improve their performance. Clear policies and strategies, strong organisational arrangements, and high public support are important factors for successful policy implementation; the UK, with its policy-centric approach and Open Government Data organisation, is rated as the best-performing country (Safarov, 2019). Data In the context of One Data Indonesia, building an organisational culture that places data as a central element in every decision-making process is essential. In addition, data integration that continues to be developed is expected to reduce the sectoral ego that often occurs and encourage closer collaboration between public sector institutions.

Table 1. One Data Indonesia Regulatory and Institution Issue

Problems Regulation and Institutionalisation			Strengthening Regulation Organising One Data Indonesia	
1.	Overlapping authority between ministries/institutions		1.	Strengthening the one data Indonesia authority in cross-sector coordination
2.	Regulations do not yet regulate non-government involvement		2.	Expanding the scope of regulation to include non-government actors
3.	Limited human resources in the field of data and digitalisation		3.	Comprehensive human resource training and development
4.	Lack of understanding and commitment from some agencies		4.	Socialization and incentives for active copper participation

Source: Processed By Researchers From Secondary Data

Implementing One Data Indonesia has been ongoing for five years, but it still faces various challenges related to regulatory and institutional aspects that need to be addressed. Strengthening regulations and institutions in data governance is very important to overcome these obstacles. With more effective, efficient, and accurate government and non-government data management, implementing One Data Indonesia can be more optimal in encouraging the creation of data-driven policymaking. Various regulatory and institutional issues that arise emphasize the urgency of strengthening these aspects for the successful implementation of One Data Indonesia

Opportunities and Challenges Towards a Sustainable Data Ecosystem

Data has increasingly become a strategic resource, comparable to other key economic assets such as energy and natural resources (OECD, 2022; World Bank, 2021). Data governance policies reflect national priorities and demonstrate a country's institutional readiness to manage digital assets in the face of rapid global digital transformation. Data policy has become a central focus in many countries to unlock data's social and economic potential. How a government designs and implements data policy signals its long-term public policy direction and readiness to address future digital challenges. Most countries now recognise data as a critical foundation for product innovation, improved public service delivery, and evidence-based decision-making (Diebold, 2023). While national policy approaches vary depending on technological advancements, political transitions, and shifting strategic goals, there are clear common patterns, particularly in regulating personal data protection, enabling data sharing among stakeholders, and ensuring transparent and secure data access. Indonesia has shown notable progress through implementing the One Data Indonesia initiative and enacting the Personal Data Protection Law (UU PDP No. 27 of 2022). Nevertheless, significant challenges remain in building an inclusive, interoperable, and sustainable national data ecosystem.

In terms of main regulations, Indonesia has two policy pillars, namely Presidential Regulation No. 39/2019 concerning One Data Indonesia and Law No. 27/2022 concerning Personal Data Protection. On the other hand, the European Union, with GDPR and Data Act, displays a strict but pro-innovation human rights-based approach. China emphasizes state control over data as a national security tool, while Singapore and the UK tend to balance business innovation and user protection through an

adaptive and trust-based data governance framework. This is as illustrated in the following table

Tabel 2. Comparison of data governance policies of Indonesia and other countries

Indonesia	Key Regulation: Presidential Reg. No. 32/2019 (One Data Indonesia), PDP Law No. 27/2022 General Strategy: Government data transparency & personal data protection Personal Data: GDPR-like: consent, access, correction, deletion rights Data Sharing: Interoperability between government agencies Data Access: Integration via national portal (data.go.id) Data Production: No clear policy yet; focus on harmonization and public data disclosure
China	Key Regulation: Data Security Law, Cybersecurity Law, PIPL General Strategy: Maximize data for economic growth & social control Personal Data: Strict for private use, flexible for government use Data Sharing: One-way: private to government Data Access: Data localization and export restrictions Data Production: Data seen as a national production factor
India	Key Regulation: PDP Bill (2023), Non-personal Data Framework General Strategy: Digital modernization, privacy, innovation Personal Data: Purpose-based protection, data minimization (Bill not yet passed) Data Sharing: Encouraged across sectors and governments Data Access: Locality preferred, export to "trusted" countries allowed Data Production: Promotes "high-value datasets" (e.g. health, transport)
Singapore	Key Regulation: PDPA, Trusted Data Sharing Framework General Strategy: Data for business & innovation, flexible privacy Personal Data: Allows business use while protecting privacy Data Sharing: B2B sharing through Trusted Framework Data Access: Supports international data flows Data Production: No specific policy
United Kingdom	Key Regulation: UK GDPR, Data Protection Act, Digital Economy Act General Strategy: Pro-privacy, pro-innovation Personal Data: UK-style GDPR: balance privacy and innovation Data Sharing: Public & financial sector sharing (e.g. Open Banking) Data Access: Liberal international data flow Data Production: Not explicitly encouraged
European Union	Key Regulation: GDPR, Data Act, Data Governance Act General Strategy: Rights-based digital transformation Personal Data: Strict, complex GDPR model Data Sharing: Public data sharing via European Data Spaces Data Access: Only GDPR-equivalent countries can access EU data Data Production: Focus on interoperability, not explicit on high-value data

Source: Processed By Researchers From Secondary Data

Data governance policies in Indonesia have shown progress through the One Data Indonesia initiative and the enactment of the Personal Data Protection Law (Law No. 27/2022). However, based on the Data Governance Maturity Model, Indonesia is still in the early stages of building a holistic and sustainable data ecosystem. This model usually consists of several levels of maturity that reflect the developmental stages in data governance practices, ranging from ad-hoc processes to fully integrated frameworks (Schmuck, 2024). Research by (Saputra et al., 2018) shows that the level of data governance maturity at the National Archives of the Republic of Indonesia (ANRI)

is at the initial level, with an average score of 1.35, indicating that data governance practices are still ad-hoc and not well structured.

Unlike the European Union, which adopts a human rights-based approach through GDPR, or India, which encourages the use of non-personal data for economic development through the DEPA (Data Empowerment and Protection Architecture) architecture, Indonesia tends to focus more on administrative regulations than on strengthening the economic and social value of data. Best practices from countries such as Singapore show that pro-innovation data policies, with flexibility in using personal data for business purposes while still upholding the principles of transparency and user consent, can accelerate the growth of the digital economy. In addition, India's initiative in building a DEPA architecture offers a collaborative approach through consent managers that allow users to share their data securely according to the provisions set (NITI Aayog, 2020)

Indonesia can adopt this approach to bridge public and private interests in the data ecosystem. Indonesia also needs to develop policies that explicitly encourage the production of high-value data, especially in strategic sectors such as health, education, and transportation, so that data becomes both an object of regulation and an economic resource. Finally, strengthening interoperability mechanisms and data sharing between institutions is essential, taking lessons from the Open Banking approach in the UK and the Data Sharing Framework in Singapore. Indonesia can build adaptive, competitive, and people-oriented data governance by combining strong data protection, open access to public data, risk-based policies, and innovation incentives.

One Data Indonesia Supports Data-Driven Policy: An Analysis of Development Policymaking

One Data Indonesia is a strategic initiative of the Indonesian government that aims to create integrated, accurate, and widely accessible data governance. With the foundation of Presidential Regulation No. 39/2019, One Data Indonesia is present to reduce data fragmentation and encourage more effective and efficient evidence-based decision-making. This aligns with the public sector's digital transformation and data revolution, which has been proven to increase transparency, efficiency, and public trust in government (Hwang et al., 2021). Implementation of One Data Indonesia has shown positive impacts in several aspects. For example, as the One Data Indonesia coordinator, the Ministry of National Development Planning/Bappenas has successfully integrated

data across ministries and agencies to support preparing strategic policies such as the RPJMN and SDGs through the One Data Indonesia Secretariat. By implementing evidence-based practices, encouraging collaboration, and harnessing the potential of advanced technologies, governments are poised to achieve a future characterized by more informed, efficient, and accountable governance (Potok, 2024).

In 2022-2024, the initial target of the program was to implement one use case for each of these approaches. This implementation began to show concrete results in Semester I of 2023 when an analytical dashboard for the Domestic Production Usage Improvement Programme (P3DN) use case was successfully developed. Furthermore, in Semester II of 2023, the development continued by creating seven thematic dashboards covering strategic issues such as poverty, stunting, education, investment, infrastructure, environment, and food security. This step represents a technical achievement and illustrates how data can be integrated and utilized thematically to support cross-sectoral policies. With the implementation of One Data Indonesia, the control of development planning becomes more effective and efficient. This is due to better data consolidation with a single data producer, improved access and transparency among ministries, institutions, and regions (M / I / RGs), and more optimal cross-sector integration and coordination. Duplication of program budgets and activities is reduced, program implementation becomes more targeted, and the overall use of resources becomes more efficient.

Figure 1. Growth of Priority Data in One Data Indonesia (2022–2024)



Source: Processed by authors from secondary data provided by the Secretariat of One Data Indonesia (2024)

Figure 1 shows that the achievement of the One Data Indonesia (SDI) policy from 2022 to 2024 has significantly supported data-based planning and development. The increase in the number of priority data for development programs and the president, from 639 in 2022 to 1,689 in 2023 and 1,879 in 2024, reflects the government's success in

strengthening coordination across ministries/institutions and regions. This achievement also shows the effectiveness of policy implementation in meeting data needs for national strategic programs. However, the trend in data availability to support the Sustainable Development Goals (SDGs) shows a more complex dynamic, with a decrease from 125 datasets in 2022 to 104 in 2023 before jumping drastically to 368 in 2024. This fluctuation can be interpreted as part of the data quality evaluation process and adjustment of the collection methodology. In the context of policy learning, this achievement shows that SDI policy is beginning to show early maturity in the data governance maturity model, where the institutional learning process is seen from the improvement in the quality of coordination, data harmonisation, and adaptive response to global policy needs.

This policy learning model, as explained, reflects reflexive learning, which is when policymakers not only adjust policies based on evaluation results but also build internal capacity to improve data governance processes in a sustainable and structured manner (Dunlop & Radaelli, 2018) . This is an important foundation in strengthening data governance that supports evidence-based policy, while also marking a transition from an administrative approach to a more strategic and platform-based approach. In 2024, the One Data Indonesia program entered an important stage by implementing a pilot project for Data Interoperability and Utilisation, which became a concrete step in the follow-up of the Basic One Data Indonesia Principle Fulfilment Assistance completed in the previous three phases. The pilot project tests and proves One Data Indonesia's ability to improve data interoperability between agencies and optimize data utilization in data-driven policymaking.

There are two main use cases in this pilot project. The first is SDGs Data Interoperability, which focuses on integrating data to support achieving sustainable development goals. The second is the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration (Kemedesa PDTT) Data Interoperability and Utilisation, which aims to strengthen data management across sectors to support village development programs. The success of these two use cases is expected to be the basis for escalating the application of data interoperability to 10 other ministries/institutions (M/I) through the Advanced Assistance program. This Advanced Assistance is designed to expand the scope of implementation of One Data Indonesia principles to encourage more intensive utilization of data in planning, monitoring, evaluating, and controlling national

development. As such, the program aims to improve the quality of data governance and strengthen evidence-based decision-making practices at the government level, thereby supporting more targeted and effective development.

The pilot project started in July 2024 has shown significant progress, with a completion status of more than 50%. Although not fully completed, the project provides an important initial benchmark for identifying technical and operational challenges. Meanwhile, for the 10 M/I mentoring program, the kick off meeting was held in November 2024, marking the program's start, which will last until 2025. This gradual and structured approach demonstrates One Data Indonesia's commitment to building an integrated, transparent, and reliable data ecosystem. This program is expected to establish a data governance model that enhances government performance and promotes inclusive public policy outcomes.

Despite ongoing efforts to fulfill priority data for development planning, major implementation challenges remain—particularly in coordination among institutions. In 2024, as many as 1,279 priority datasets have not yet been agreed upon, leaving numerous development indicators unsupported. The root of this problem lies in the asymmetric authority between data producers and users: producers retain full control over data production processes—including the timing, spatial coverage, and specifications—which are often determined unilaterally. As revealed in interviews with the Head of Pusdatinrenbang Bappenas, this has led to relatively low satisfaction levels (40–60%) among Bappenas work units, as their data needs must adapt to inflexible formats and schedules set by producers. This highlights a fundamental issue in governance design, where coordination mechanisms are weak and incentives for alignment are lacking.

Although Presidential Regulation No. 39/2019 provides a foundation for One Data Indonesia, it falls short in enforcing binding obligations and clear accountability among data producers, coordinators, and users. Unlike Singapore's SNDGO, Estonia's X-Road, or South Korea's Government 24 and CDO model, Indonesia lacks strong institutional mechanisms and infrastructure to ensure interoperability and cross-agency responsiveness. To close this gap, Indonesia must empower data coordinators with legal authority, enforce service-level agreements (SLAs), and institutionalize co-design between data producers and users. Without these enforceable and well-resourced

structures, One Data Indonesia risks remaining a compliance exercise rather than evolving into a strategic driver of data-driven governance.

Strategic Recommendation: Optimising One Data Indonesia for Data-Driven Policy

1. Strengthening the Legal and Policy Framework for Data Management

The formulation of a comprehensive Data Governance Law is crucial to strengthening compliance mechanisms and harmonising data management practices across public and private sectors. While Law No. 27/2022 on Personal Data Protection (PDP) addresses individual privacy, it falls short in governing institutional data practices. A dedicated legal framework is therefore needed to regulate data classification, accessibility, and interoperability to fully operationalise the principles of One Data Indonesia. that applies to all public and private sectors. Draft a policy framework harmonising regulations on managing public, personal, and commercial data to support *data-driven policies*. In the context of national data governance, which is complex and involves public access rights and data protection, a special law that comprehensively regulates it is needed. The law ideally outlines the level of data accessibility: which data is open to the public, limited, and exempted.

This is similar to the practice in other countries, such as Europe, which already has a main legal umbrella on public data. In Indonesia, the development of data-related regulations started from sectoral approaches such as the Presidential Regulation on One Map and then the realisation of One Data Indonesia, until finally the birth of Law No. 27 of 2022 on Personal Data Protection (PDP Law). However, the PDP Law focuses more on the privacy aspect of individuals and has not touched on the governance aspect of government data as a whole. Therefore, the need for a special law on data governance is becoming increasingly urgent so that the principles of One Data Indonesia can be truly implemented consistently and have binding legal certainty for all parties.

Despite the significant achievement of One Data Indonesia, the Semester II 2024 performance report shows that only 39.6% of 101 ministries/institutions have regulations implementing One Data Indonesia, and only 66.3% of districts/cities have similar regulations. This shows the need to accelerate central-regional regulatory harmonisation. The government must require all ministries/institutions and local governments to have a Regional Head Regulation or Decree of the head of the institution

on implementing One Data Indonesia, accompanied by budget integration in the RKPD and Renstra. India's approach through the Ministry of Electronics and Information Technology (MEITY), which mandates the Data Empowerment Protection Architecture (DEPA), represents a centralised and secure data exchange model. This regulatory model offers relevant insights for Indonesia's fragmented data ecosystem.

2. Optimisation of Data Clearance and SPBE Expenditure as Efficiency Instruments

The SPBE expenditure clearance programme has effectively prevented overlapping data collection between agencies. The recommendation is to make the SPBE clearance process a mandatory pre-requisite in submitting budgets for data collection activities in all ministries and regions, and develop a cross-sector automatic notification system based on reference codes. UK Through the Digital Economy Act and Open Banking Regulation, the UK requires agencies and financial institutions to conduct data-sharing agreement clearance that facilitates efficiency and avoids data duplication.

3. Real-Time Utilisation of Priority Data through the National Analytical Dashboard

By the end of 2024, the One Data Indonesia Portal recorded 278,593 datasets—down from 369,529 in the previous period—highlighting data quality and timeliness issues. One of the strategic achievements of the 2019–2024 One Data Indonesia Policy is identifying and categorising 1,879 types of Priority Data, including key indicators from the RPJMN, RKP, and SDGs. This milestone marks a significant step in transforming national data governance by providing clear references for government institutions in planning, managing, and evaluating development programs. However, the central challenge remains: how to optimise the utilisation of this Priority Data in real-time to support data-driven policy. To overcome this, it is recommended that Indonesia develop a National Analytical Dashboard linked directly to Priority Data, equipped with real-time updates, big data analytics, and machine learning capabilities for predictive policy analysis. A relevant model is Singapore's Trusted Data Sharing Framework developed by the Infocom Media Development Authority (IMDA), which focuses on inter-agency data interoperability and incorporates an analytics service layer that supports evidence-based policymaking in critical sectors such as health and transportation. This framework offers a valuable reference for Indonesia in enhancing the impact and utility of its national data infrastructure.

4. Standardisation and Interoperability

One Data Indonesia needs to strengthen standardisation and interoperability across agencies to ensure effective data governance by improving the existing technical guidelines. One of the strategic steps to be taken is to revise and expand the One Data Indonesia technical guidelines to align with Singapore's Trusted Data Sharing Framework principles. The framework provides comprehensive guidance on the data-sharing process, including legal, technical, and security aspects, which has been proven to encourage openness while maintaining trust between stakeholders. In addition, the Indonesian government must implement standardised Data Sharing Agreements (DSAs) between agencies as a legal reference in data sharing to ensure equality, accountability and legal certainty in public sector data exchange.

Technically, using open but secure national Application Programming Interfaces (APIs) is crucial to ensure reliable integration between central and local systems and third parties such as research partners and the private sector. Best practices from Singapore demonstrate the successful implementation of legal contract templates and national interoperability standards in strengthening a data ecosystem that is not only collaborative but also innovative and solution-orientated. This approach can serve as a model for Indonesia to build a cross-agency data exchange system that is technically effective but also inclusive and sustainable in supporting data-driven policies.

5. Data Literacy and Participation Campaign

To build an inclusive and democratic data culture, the government needs to launch a national campaign titled "Data for Public Good" that educates the public about the importance of data, the right to personal data, and the role of data in public policy. This recommendation presents a novelty by combining data literacy, public education, and citizen participation in one integrated approach through a citizen-generated data platform. This initiative expands the data policy framework in Indonesia from an administrative to a participatory approach and introduces the concept of data as a collective resource. Compared to previous studies that emphasise the regulatory aspect, this approach adds an educational and deliberative dimension, in line with the concepts of data justice and collaborative governance, and refers to the European Union's practice in Digital Rights and Data Altruism. Thus, this campaign can potentially strengthen data governance based on social inclusion and citizen empowerment.

CONCLLUSION

The study results show that implementing the One Data Indonesia policy reflects three forms of policy learning: cognitive-technical learning through improving data quality and interoperability, socio-political learning through strengthening inter-agency coordination and public engagement, and institutional learning in developing data-based regulations and organizational culture. Although there has been significant progress, the main challenges still centre on data fragmentation, sectoral resistance, capacity gaps, and weak regulatory frameworks. These findings emphasize that the success of the SDI policy is not only determined by technical aspects but also highly dependent on alignment between actors and institutional readiness in adopting new values and procedures in data governance.

Based on these findings, the recommended future strategies include: first, the preparation of a National Data Law that integrates government, personal, and private data regulations as a whole. Second, increasing interoperability through implementing data-sharing agreements between institutions and using open and secure national APIs. Third, developing a real-time National Analytical Dashboard that is connected to priority data to support predictive policies. Fourth, public data literacy and participatory campaigns such as citizen-generated data should be expanded to increase accountability and community engagement. By adopting best practices from countries such as Estonia, the UK and Singapore, as well as strengthening synergies between stakeholders, One Data Indonesia has the potential to become a key pillar in an inclusive and sustainable national digital transformation towards the Golden Indonesia Vision 2045.

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