SCIENTIFIC CULTURE
www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 4, (2026), pp. 7991-8004
Open Access. Online & Print

DOI: 10.5281/zenodo.12426797

THE LEGAL FRAMEWORK AND FISCAL-ECONOMIC DIMENSIONS OF INDONESIA'S ONE DATA POLICY: A CRITIQUE OF NORM HIERARCHY, SECTORAL REGULATORY DISHARMONY, IMPLEMENTATION CHALLENGES, AND STATE REVENUE ENHANCEMENT POTENTIAL

Jaka Santos Adiwijaya[1]*, Nurwati[2], Ismail Sugardo[3], Cyrilla Milana Santos[4]

[1]Master of Law Program, Universitas Djuanda. Email: jaka.santos@unida.ac.id
[2]Faculty of Law, Universitas Djuanda. Email: nurwati@unida.ac.id
[3]Master of Law Program, Universitas Gadjah Mada. Email: ismailsugardo@mail.ugm.ac.id
[4]PWP Law Firm. Email: cyrilla.milana@students.mq.edu.au

Received: 03/12/2025
Accepted: 13/04/2026

Corresponding Author: Jaka Santos Adiwijaya (jaka.santos@unida.ac.id)

ABSTRACT

Indonesia's One Data Indonesia (SDI) policy, established through Presidential Regulation Number 39 of 2019, aims to realize government data governance that is accurate, current, integrated, and shareable across institutions. This study analyzes three critical dimensions: (1) the weaknesses of the legal foundation of Presidential Regulation 39/2019 examined through Hans Kelsen's theory of normative hierarchy and Article 7 in conjunction with Article 13 of Law Number 12 of 2011, as well as its disharmony with the Statistics Law, the Geospatial Information Law, the State Finance Law, the Public Information Disclosure Law, and the Personal Data Protection Law; (2) the technical challenges of implementation, encompassing system interoperability, central-regional synchronization, and the integration of digital platforms for public services; (3) the economic and fiscal potential of integrated data as an instrument for augmenting state revenue, including improvements in tax collection, efficiency in social protection expenditure, optimization of infrastructure investment, and data utilization by state-owned enterprises including the Daya Anagata Nusantara Investment Management Agency (Danantara) through the integration of statistical and geospatial data that have hitherto remained suboptimally utilized. The research employs a juridical-normative methodology with statutory, conceptual, and comparative approaches. The study further examines practices in Australia, China, and Denmark. The findings indicate that, beyond its hierarchical and technical deficiencies, ODI holds considerable fiscal potential if implemented optimally. This research recommends elevating the regulatory level to a One Data Indonesia Act through an omnibus law approach, accompanied by the development of adequate national data infrastructure and an institutional framework capable of optimizing the economic value of government data.

KEYWORDS: One Data Indonesia; Normative Hierarchy; Omnibus Law; Fiscal Potential; Danantara; Data Interoperability; Government Data Governance.

1. INTRODUCTION

The availability of accurate, current, integrated, and cross-institutionally accessible government data is a fundamental prerequisite for evidence-based development planning and policymaking. Within this framework, the Indonesian Government established the Satu Data Indonesia (One Data Indonesia) policy through Presidential Regulation Number 39 of 2019 on Satu Data Indonesia (Presidential Regulation Number 39/2019).

The regulation defines SDI as a government data governance policy designed to produce data that is accurate, current, integrated, and accountable, as well as easily accessible and shareable across central and regional government institutions through compliance with Data Standards, Metadata, Data Interoperability, and the use of Reference Codes and Master Data. This provision simultaneously establishes four core principles of data governance, namely the application of Data Standards, the provision of Metadata, adherence to Data Interoperability rules, and the use of Reference Codes and Master Data [1].

Institutionally, the regulation establishes a governance structure consisting of a Steering Council, data stewards, data custodians, and data producers at both the central and regional levels [1]. As a strategic initiative, SDI was designed to address the long-standing problem of data silos across government agencies [2]. Overlapping data on spatial planning, land area, and mining permits exemplify the absence of a unified national data reference. The SDI policy is intended to serve as that common reference, coordinated by Bappenas in its role as the national-level data steward [1].

Despite its progressive objectives, this study identifies three problem dimensions that have yet to receive comprehensive and simultaneous scholarly attention [3]. First, from a juridical standpoint, Presidential Regulation Number 39/2019 rests on a weak legal foundation, as its scope touches on subject matter that should properly be regulated at the statutory level [4]. The regulation encompasses geospatial and statistical data that are already governed by separate laws, which is inconsistent with the principle of legislative hierarchy [5].

Second, from a technical standpoint, SDI implementation faces significant challenges stemming from the absence of implementing rules on system interoperability and cross-agency data sharing mechanisms [6]. Data synchronization between central and regional governments remains suboptimal due to disparities in data infrastructure capacity and bureaucratic cultural resistance [1].

Third, from an angle that has received limited academic attention, government data integrated under the SDI framework carries substantial economic and fiscal potential as an instrument for increasing state revenue [7]. Reliable and trustworthy integrated data serves as the foundation for development planning, enabling more targeted presidential decision-making. It can also be leveraged by Danantara, the government's sovereign investment vehicle, to reduce investment uncertainty, lower investment costs, and enhance the return potential from asset utilization and the production of goods and services by state-owned enterprises. Beyond the public sector, this data can benefit private enterprises through data-sharing arrangements involving outputs produced by ministries, agencies, and regional governments, channeled through Danantara.

Building on these considerations, this study examines three principal aspects. The first concerns a juridical review of the regulatory strength of Presidential Regulation Number 39/2019, its disharmony with various sectoral laws, and the urgency of elevating its regulatory level. The second involves a technical review of SDI implementation. The third addresses an analysis of the economic and fiscal potential of SDI-integrated data as a catalyst for increased state revenue and a foundation for enterprise investment. The study also incorporates a comparative analysis of national data governance practices in Australia, China, and Denmark.

2. LITERATURE REVIEW

A. The Hierarchy of Legislation and the Graduated Norm Theory

Hans Kelsen's theory of graduated legal norms, known as the *Stufenbau des Rechts*, provides the foundational framework for assessing the level and binding force of any legal instrument [3]. In the Indonesian context, this concept is codified in Law Number 12 of 2011, which arranges the hierarchy of regulations in the following order: the 1945 Constitution, MPR Decrees, Laws and Government Regulations in Lieu of Law, Government Regulations, Presidential Regulations, and Regional Regulations. Article 13 of Law 12/2011 stipulates that Presidential Regulations may only contain matters expressly mandated by a law or matters necessary to carry out the exercise of governmental authority [8].

Harahap (2025) found that the potential for overlap between Presidential Regulations and higher-level regulations remains a recurring problem in Indonesian constitutional practice [9]. When a substantive arrangement lacks a clear mandate or

delegation from a statute, a Presidential Regulation risks violating the hierarchy of norms and the principle of delegated authority. Nawiasky further developed a typology of norms into four layers, placing Presidential Regulations within the category of *Formell Gesetz*, which should govern technical and operational matters rather than foundational substance such as the establishment of permanent institutions, regulation of public information access rights, or personal data protection [10].

B. The Satu Data Indonesia Policy and Its Legal Framework

Presidential Regulation Number 39/2019 designates Bappenas as the Chair of the SDI Steering Council, supported by cross-ministerial members including BPS and BIG [1]. The SDI domain covers statistical, geospatial, and state financial data, and the regulation simultaneously integrates the One Map policy as a component of One Data. There are four areas of desynchronization within the regulation worth examining.

The first concerns Law Number 16 of 1997 on Statistics, which governs the confidentiality of micro-data and statistical coordination forums through BPS. This potentially conflicts with the One Data Forum established under Presidential Regulation SDI. The Statistics Law is widely regarded as outdated and has been undergoing revision, though the process has stalled partly because both the Statistics Law and the Geospatial Information Law occupy the same hierarchical level [11]. The second area involves Law Number 4 of 2011 on Geospatial Information, which designates BIG as the sole administrator of the National Geospatial Information Network, creating friction with the SDI regulation's authority over geospatial data coordination [12]. Third, the State Finance Law and the Public Information Disclosure Law contain mechanisms that have yet to be connected to the SDI framework. Fourth, Law Number 27 of 2022 on Personal Data Protection creates a critical normative gap, as Presidential Regulation SDI contains no provisions on personal data protection [13]. Without a statutory foundation, SDI implementation risks being undermined by agencies adhering to their respective sectoral mandates. For this reason, many academics and members of the legislature have advocated for SDI to be elevated into a comprehensive statute.

C. The Economic and Fiscal Dimensions of Integrated Data: A Conceptual Framework

In the digital economy literature, integrated government data is regarded as a strategic national asset carrying layered economic value. Mayer-Schönberger and Cukier describe data as "the new oil," in the sense that raw data holds limited value on its own, but once processed and integrated, its value multiplies substantially [14]. This analogy is relevant for understanding why the SDI policy is more than an administrative reform; it constitutes an investment in national information infrastructure that generates long-term economic returns.

From the standpoint of public policy theory, Stiglitz and Greenwald (2014) argue that information asymmetry is the primary source of market inefficiency and government failure [15]. Integrated and trustworthy government data directly reduces such asymmetry, both across government agencies and between the government and business actors. This reduction in information asymmetry improves the quality of policy decisions while simultaneously lowering transaction costs for private and state-owned enterprise investment.

In the fiscal domain, the OECD (2023) documented that countries implementing automatic data exchange between tax authorities and integrated information systems experienced an average increase in the tax ratio of 1.5 to 2 percentage points over five years of implementation [16]. These findings suggest that SDI carries significant fiscal impact potential if implemented optimally.

D. Data Integration for State-Owned Enterprises within the Danantara Framework

Danantara, established under Government Regulation Number 10 of 2025, is an investment management body responsible for overseeing the assets of all state-owned enterprises [17], with initial assets under management estimated at USD 900 billion. Its mandate is to optimize the value of state assets through investments that generate high returns while delivering developmental impact. To fulfill this mandate effectively, Danantara requires an accurate, integrated, and trustworthy data foundation as the basis for large-scale investment decisions.

From an investment theory perspective, information uncertainty is a primary risk factor influencing returns and capital allocation decisions. Spatial planning data, land ownership data, forest area data, natural resource potential data, and regional economic data, when integrated into a single platform as envisioned by SDI, directly reduce that uncertainty and enable faster, more accurate, and more cost-efficient investment decision-making.

E. The Omnibus Law Approach in Data Regulatory Reform

The omnibus law concept has emerged as a deregulation solution in Indonesia. The government applied this approach in the Job Creation Law of 2020, and its framework was reinforced by Law Number 13 of 2022, which explicitly accommodates the omnibus method. Yuliandri (2020) describes the omnibus approach as an integrative strategy for constructing unified regulatory frameworks for digital government governance [18]. The legislature has already included a draft Satu Data Indonesia Law in the National Legislation Program for 2025 to 2029.

F. Comparative Study of National Data Governance

Australia enacted the Data Availability and Transparency Act 2022, which establishes a controlled public sector data-sharing scheme and creates the National Data Commissioner as an independent regulator. China enacted the Data Security Law 2021, which classifies data according to its sensitivity to national security. Denmark, through its Basic Data Programme launched in 2012, consolidated public registers and introduced the tell-us-once principle, generating significant annual economic benefits [19][20].

G. Conceptual Framework of Interoperability and Government Digital Platforms

Interoperability encompasses both technical dimensions, such as formats, protocols, and IT standards, and semantic dimensions, such as uniformity of definitions, codes, and references. SDI is viewed as complementing the Government Electronic System (SPBE), where SDI provides the content in the form of data, while SPBE provides the container in the form of a service integration platform. Grindle (1980) categorizes policy benefits as distributive, redistributive, and regulative [21]. The SDI policy contains all three types of benefits, with the greatest distributive value found in the efficiency gains it offers to the national economic system as a whole [22].

3. RESEARCH METHOD

This study employs a normative legal research method combining a statute approach, a conceptual approach, and a comparative approach [23]. The analysis centers on the positive legal framework governing the Satu Data Indonesia policy, with Presidential Regulation Number 39/2019 and its related regulations as the primary legal objects, supplemented by comparative review of international practices and economic-fiscal analysis.

The statute approach involves a systematic examination of Presidential Regulation Number 39/2019 and its legal implications within the regulatory hierarchy as defined by Hans Kelsen's graduated norm theory and Law Number 12 of 2011. The conceptual approach connects the SDI policy to legal theory, particularly norm hierarchy and the omnibus law concept, as well as economic theory, including information asymmetry and the economic value of public data. The comparative approach draws on national data governance practices in Australia, China, and Denmark to provide external reference points for evaluating Indonesia's regulatory design.

Primary legal materials consist of statutory and regulatory documents, as well as official publications issued by ministries, agencies, and regional governments. Secondary legal materials comprise academic literature, including legal journals, legal theory texts, and policy reports from government institutions and international organizations. These materials were collected through systematic library research, encompassing searches of academic journal databases and official government publications.

The analysis proceeds through descriptive-analytical interpretation, applying systematic reading of legal provisions against theoretical standards. Four analytical steps structure the inquiry. First, the juridical weaknesses of Presidential Regulation Number 39/2019 are examined against the norm hierarchy theory and the principles of legislative drafting. Second, regulatory disharmony is assessed by comparing the substantive content of the Presidential Regulation with relevant statutes. Third, a framework for regulatory upgrading is proposed, including the omnibus law option, drawing on precedents established by Law Number 13 of 2022. Fourth, technical implementation findings are identified through case studies from regional SDI implementation reports and SPBE literature, followed by a discussion of remedial measures.

It should be noted that this study is doctrinal in nature and does not involve primary data collection through interviews or surveys. Nonetheless, select empirical facts drawn from prior studies and official reports are cited to provide implementation context. Analytical validity is maintained through source triangulation, whereby each issue is examined from the perspectives of regulation, expert opinion, and comparative state practice. The study's limitations lie in the dynamic nature of the policies under review, particularly the SDI draft law, which remains under

deliberation, and Danantara, which was only recently established. The analysis therefore relies on the best available secondary data through the end of 2025.

4. RESULTS AND DISCUSSION

A. The Hierarchical Weakness of Presidential Regulation Number 39/2019 and the Urgency of Statutory Elevation

A juridical review reveals that regulating SDI through Presidential Regulation Number 39/2019 carries a fundamental weakness when assessed against the theory of regulatory hierarchy. The substantive scope of the regulation encroaches upon matters already governed by sectoral statutes. This creates a constitutional problem, as a Presidential Regulation, being an executive product that bypasses the legislative process in the parliament, nonetheless governs cross-sectoral matters with far-reaching consequences. According to Hans Kelsen, the validity of a Presidential Regulation depends on whether a mandate or delegation exists from a higher norm [24]. In the case of SDI, no enacted statute explicitly instructs the President to regulate "Satu Data Indonesia." Presidential Regulation Number 39/2019 cites only Article 4(1) of the 1945 Constitution as its legal basis, without referencing any sectoral law.[3] While Article 13 of Law 12/2011 formally permits this, the question of whether establishing national data standards and cross-agency integration across Indonesia can be regarded merely as the "exercise of governmental authority," or whether it more properly warrants statutory-level regulation, remains substantively open to challenge.

The principal critique concerns legitimacy and binding force. A statute carries stronger political legitimacy because its formulation involves the legislature and it occupies a higher position in the hierarchy, making its provisions binding on all parties with greater force. A Presidential Regulation, by contrast, is more susceptible to being disregarded when it overlaps with other legislation [25]. Presidential Regulation Number 39/2019, for instance, mandates ministries, agencies, and regional governments to open data access through the Satu Data Portal without requiring memoranda of understanding or inter-agency cooperation agreements. Yet many agencies remain reluctant to share data they produce, invoking confidentiality obligations or specific procedural and operational standards prescribed by their own sectoral laws. These agencies can credibly argue that their sectoral statutes rank higher than the Presidential Regulation and therefore take precedence.

A further weakness lies in the complete absence of legal sanctions for non-compliant agencies. Presidential Regulation Number 39/2019 is largely coordinative in character and relies on the voluntary commitment of each ministry, agency, and regional government. Without enforceable consequences for non-compliance, adherence to the regulation remains essentially discretionary. Elevating the SDI policy from a Presidential Regulation to a statute would allow the inclusion of sanction provisions, for example, administrative penalties for public officials who obstruct data access.

The urgency of statutory elevation has also been voiced from within the legislature. The parliament, through its relevant committees, has proposed upgrading the SDI policy to the statutory level. As early as 2021, proposals emerged to incorporate provisions on the National Data Center into the SDI draft law, with the aim of strengthening the overall Electronic Government System policy. The parliament has since invited public participation on its website regarding the SDI bill and published its own analysis concluding that the current Presidential Regulation form is inadequate, framing the legislative process as a timely opportunity to bring the National Data Center into statutory law within the SDI bill [26].

Elevating the SDI policy to the level of a statute would yield several concrete benefits. First, top-down legal harmonization would become achievable through the revision or repeal of conflicting provisions in existing sectoral laws. Second, the SDI institutional framework could be reinforced with a more permanent mandate. Third, policy continuity across successive governments would be more robustly guaranteed. Fourth, public participation mechanisms could be more meaningfully accommodated, including channels for complaints about data quality and the recognition of public data access as an information right under Article 28F of the 1945 Constitution [27].

B. The Desynchronization of Presidential Regulation Number 39/2019 with Sectoral Laws: Analysis and Harmonization Solutions

1. Conflict Between the Statistics Law and Presidential Regulation SDI

Law Number 16 of 1997 on Statistics designates BPS as the coordinator of national statistics, requiring sectoral agencies to adhere to established standards while maintaining the confidentiality of micro-level data [28]. Presidential Regulation Number SDI, on the other hand, establishes the Satu Data Forum to agree on development priority data[1] and designates

BPS as the Data Steward for Statistics and the central-level statistical data custodian. This arrangement raises a practical tension: does the Satu Data Forum clash with the existing statistical coordination forum? The question becomes particularly acute in cases such as poverty data collected by individual name, which the Statistics Law prohibits from being disclosed at the individual level, yet which the Ministry of Social Affairs requires for the targeted distribution of social assistance.

The harmonization required here is clear. A future SDI Law must explicitly recognize the principle of statistical confidentiality, ensuring that individual micro-data remains protected while aggregate data can be shared broadly. One viable path forward is to revise the 1997 Statistics Law concurrently with the enactment of the SDI Law, so that BPS's statistical recommendation mechanism aligns with the data custodian verification process under the SDI framework.

2. Conflict Between the Geospatial Information Law and Presidential Regulation SDI

Law Number 4 of 2011 on Geospatial Information recognizes BIG as the sole administrator of foundational geospatial information and mandates the operation of the National Geospatial Information Network [12]. Presidential Regulation Number SDI, however, establishes a Steering Council in which BIG serves as only one member under Bappenas's coordination. Institutional friction may arise when Bappenas, through the Satu Data Forum, seeks to integrate thematic maps from various ministries, while BIG asserts its equivalent coordinating mandate under the Geospatial Information Law.

The appropriate solution lies in the omnibus law approach. A future SDI Law could revoke or amend the coordination provisions of the Geospatial Information Law to bring geospatial data governance within the One Data framework. At a minimum, the SDI Law could stipulate that geospatial matters continue to follow the Geospatial Information Law, except for cross-thematic integration matters that are coordinated through the SDI mechanism.

3. Conflict Between the State Finance Law and the Public Information Disclosure Law with Presidential Regulation SDI

Presidential Regulation SDI includes state financial data as a primary category without synchronizing it with the confidentiality protocols governed by Ministry of Finance regulations, including provisions on taxpayer confidentiality under the General Tax Provisions Law. Harmonization can be achieved by inserting an exception clause in the future SDI Law, clarifying that data whose confidentiality is protected by other statutes is not automatically subject to disclosure under the SDI framework [29].

At the same time, Presidential Regulation SDI does not provide a mechanism aligned with the Public Information Disclosure Law regarding the public's right to access or correct erroneous data. The future SDI Law could address this by establishing that the Satu Data Portal constitutes part of public information disclosure implementation, and that rejected data requests may be appealed through the relevant agency's Information and Documentation Management Officer in accordance with the Public Information Disclosure Law. Integration of financial data has already been partially initiated through the Regional Development Information System managed by the Ministry of Home Affairs, and this initiative warrants explicit recognition in the future SDI Law [30].

4. Conflict Between the Personal Data Protection Law and Presidential Regulation SDI

This is the most critical and unambiguous area of conflict. Law Number 27 of 2022 on Personal Data Protection, as a newer and higher-profile instrument, effectively supersedes Presidential Regulation SDI in matters of data protection. Every data integration activity is now required to comply with the principles of the Personal Data Protection Law, including lawfulness, fairness, purpose limitation, and data minimization. Given that SDI involves substantial volumes of personal data such as national identification numbers and public service records, the absence of synchronization creates a real risk that SDI implementation could be deemed a privacy violation whenever detailed personal data is exchanged without a clear legal basis.

A future SDI Law must therefore refer to and adopt the principles of the Personal Data Protection Law. Another harmonization pathway involves integrating the role of Data Protection Officers, already mandated by the Personal Data Protection Law, into the SDI data custodian process. Before any data is shared through the Satu Data Portal, the Data Protection Officer of the relevant agency should be required to verify that no personal data is exposed without appropriate anonymization.

C. The Prospects of an Omnibus Law Approach for Reforming the Satu Data Indonesia Policy

Law Number 13 of 2022 has formally opened the door to the omnibus method in legislative drafting.

This creates a legal pathway for the Government and the legislature to position the SDI draft law as an omnibus bill that simultaneously addresses multiple sectoral statutes governing data. The political momentum is already present, as the parliament included the SDI bill in its medium-term National Legislation Program for 2025 to 2029.

Beyond legal harmonization, the omnibus approach offers the practical advantage of legislative efficiency. A single drafting process can amend multiple statutes at once, which compares favorably to revising each sectoral law individually, whether the Statistics Law, the Geospatial Information Law, or others, a sequential approach that would consume considerably more time and carry a higher risk of producing incoherent results. The primary challenge of the omnibus method, however, lies in its inherently broad scope, which demands intensive inter-agency coordination. A process lacking transparency risks procedural defects, as was experienced with the Job Creation Law.

Several elements are critical for the SDI omnibus bill to address adequately. The first concerns clear definitions and scope, including a categorical classification of government data covering administrative, statistical, geospatial, and financial data, as well as explicit carve-outs for classified data such as intelligence, defense, and certain categories of personal data. The second involves strengthening the institutional structure by clarifying the roles of the Steering Council, data stewards, data custodians, and data producers, and by considering the establishment of a permanent national data oversight body. The third pertains to mandatory agency obligations, requiring every ministry, agency, and regional government to comply with the core SDI principles of standards, metadata, interoperability, and reference codes.

The fourth element addresses public rights over data, stipulating that data published on the national portal is freely accessible to the public except for explicitly exempted categories, in line with the Public Information Disclosure Law. The fifth concerns data commercialization as a pathway for increasing non-tax state revenue through measured, secure, efficient, and trustworthy business schemes channeled through Danantara. The sixth involves full adoption of the Personal Data Protection Law principles into SDI governance, including Data Protection Officer obligations and minimum cybersecurity standards across all agencies. The seventh element covers enforcement and incentive mechanisms, including administrative sanctions for non-compliant agencies and performance incentives for regional governments that demonstrate strong SDI implementation. The eighth and final element addresses the omnibus amendment provisions themselves, through which the bill would revoke or modify inconsistent provisions in the Statistics Law, the Geospatial Information Law, the Public Information Disclosure Law, the Personal Data Protection Law, and other relevant statutes.

D. The Economic and Fiscal Potential of Satu Data Indonesia as a Catalyst for Increased State Revenue

The economic and fiscal dimension is a critical aspect that has received insufficient attention in existing SDI scholarship. Analysis reveals that government data integrated within the SDI framework holds significant potential for generating economic and fiscal value through four principal channels.

1. Improving the Tax Database and Increasing the Tax Ratio

This channel represents the most direct and potentially largest source of fiscal gain. Indonesia's tax ratio in 2023 stood at only 10.21 percent of GDP, far below the average of developing countries at 15 percent and OECD members at 34 percent. The Directorate General of Taxation estimates that the untapped revenue potential, commonly referred to as the tax gap, reaches 3.7 percent of GDP. The persistence of this gap is partly sustained by fragmented data, which prevents tax authorities from conducting automatic and efficient cross-verification.

With a fully integrated SDI, linking population data from Dukcapil, tax data from DGT, asset ownership data from BPN/ATR, business registration data from OSS/AHU, and banking account data from Bank Indonesia would allow tax authorities to conduct automatic cross-matching. This would enable detection of unregistered taxpayers with significant assets, discrepancies between reported income and observed ownership and consumption patterns, and business entities operating with inadequate tax compliance.

OECD countries that have implemented automatic data exchange systems between tax agencies experienced an average tax ratio increase of 1.5 to 2 percentage points over five years. For Indonesia, a one-percentage-point increase in the tax ratio alone would translate into additional revenue of approximately IDR 220 to 240 trillion per year, based on the 2024 GDP estimate of around IDR 22,000 trillion. Accounting for implementation complexity,

SDI data integration could realistically contribute a 0.3 to 0.5 percentage point increase in the tax ratio over five years, equivalent to IDR 70 to 120 trillion in additional annual tax revenue. This makes SDI one of the highest-return regulatory investments available to the government.

2. Improving the Efficiency of Social Protection Spending through Targeting Accuracy

Program duplication and mistargeting have long persisted due to unsynchronized beneficiary data across agencies. The total social protection budget in the 2024 State Budget reached IDR 496.8 trillion, yet findings from the Supreme Audit Agency and the World Bank indicate that 15 to 20 percent of social assistance recipients do not actually qualify as intended beneficiaries.

With integrated SDI, the Integrated Social Welfare Database could be automatically cross-validated against population registration data from Dukcapil, electricity consumption data from PLN as a welfare proxy, financial account and balance data from OJK, and land and property ownership data from BPN. This would enable systematic removal of ineligible recipients while simultaneously identifying vulnerable citizens not yet reached by existing programs.

The estimated efficiency gain from improved social protection targeting is IDR 50 to 75 trillion per year, funds that could be redirected to expand coverage or improve program quality for those genuinely in need. The dual benefit is fiscal efficiency combined with greater effectiveness in poverty reduction programs.

3. Optimizing Data-Driven Infrastructure Spending Allocation

Infrastructure investment decisions concerning roads, irrigation, ports, and energy that are based on inaccurate data tend to produce misallocated projects. Bappenas has documented a number of National Strategic Projects that encountered utilization constraints attributable to planning data inaccuracies. With SDI integration, infrastructure development priorities can be determined based on actual needs by combining traffic count data from the Ministry of Public Works, regional economic data from BPS, trade data from the Ministry of Trade, and connectivity data from the Ministry of Transportation to produce an objective and measurable infrastructure needs map.

Efficiency gains from improved planning quality are estimated at IDR 40 to 60 trillion per year from the total infrastructure budget. Equally important, higher-quality data for infrastructure development planning increases private investment attractiveness by reducing uncertainty around project feasibility.

4. The Potential for Public Data Monetization

Several countries have developed data marketplace models in which anonymized government data is sold or licensed to the private sector. South Korea, through the National Information Society Agency, operates a Public Data Portal that enables structured commercialization of public data and generates significant annual economic value. Indonesia can develop a similar model within the SDI framework, where anonymized and aggregated datasets produced by ministries, agencies, and regional governments are made available through Danantara as a coordinating vehicle for data-based economic partnerships with private enterprises.

For Indonesia, high-value data categories for the private sector include geospatial data from BIG, which has already been partially commercialized through government cooperation with business entities such as Google Maps; village-level weather and climate data from BMKG for agricultural insurance companies and the agribusiness sector; mobility and traffic data from regional transportation agencies for logistics and e-commerce companies; energy consumption data by zone from PLN and the Ministry of Energy for industrial estate developers; and aggregate sociodemographic data from BPS for market research and product development. In the medium term, monetization of anonymized public data has the potential to generate IDR 5 to 15 trillion per year once the SDI infrastructure is fully established.

Data commercialization should, however, be centralized rather than fragmented across individual ministries and agencies, to ensure data security, transparency, and the consolidation of revenue. Danantara, as the investment management body overseeing strategic state-owned enterprise assets valued at over USD 900 billion, is well positioned to serve as this centralized vehicle. Its mandate for large-scale investment decision-making requires precisely the kind of accurate, integrated, and trustworthy data that a fully implemented SDI would provide, directly reducing information risk across its investment portfolio.

1. Spatial Planning and Industrial Estate Data

This is the most concrete and urgent application. Conflicts frequently arise between regional spatial planning documents and data held by BIG,

BPN/ATR, the Ministry of Environment and Forestry, and the Ministry of Energy and Mineral Resources, where a single parcel of land may carry different and contradictory claims from four separate agencies. As a result, private enterprises or state-owned companies seeking to develop industrial estates must conduct independent land due diligence that takes years and costs hundreds of billions of rupiah.

With integrated SDI, spatial planning data, land title data from BPN/ATR, forest area data from the Ministry of Environment and Forestry, mining license data from the Ministry of Energy, and environmental permit data would form a single legally authoritative integrated map. The practical benefits for Danantara's data commercialization operations are substantial, including the ability to identify potential industrial estate locations within days rather than months, reduced dispute risk because land status would already be cross-verified across agencies, more accurate land valuation through integration of property market data with official assessed values, and more efficient negotiations with regional governments through a single agreed data reference.

The cost of land due diligence for a large-scale industrial estate currently ranges from IDR 50 to 200 billion and takes two to three years. With integrated SDI data, this process could be compressed to three to six months at one-tenth of the cost. For Danantara, which plans to develop dozens of industrial estates and National Strategic Projects, transaction cost savings alone could reach IDR 5 to 10 trillion in aggregate, excluding the additional benefits from reduced uncertainty that would enhance the attractiveness of co-investment from domestic and foreign private partners.

2. Renewable Energy

Danantara manages investments in PLN, Pertamina, and PT Pertamina Geothermal Energy, all of which carry renewable energy expansion agendas aligned with the 2060 net-zero emissions target. Poor site selection for solar or wind power plants due to inaccurate data can result in wasted investments worth trillions of rupiah. Integrating solar radiation data by district from BMKG, wind speed data, geothermal potential data from the Geological Agency, PLN transmission network data, and electricity load density data within SDI would enable systematic mapping of optimal renewable energy plant locations. Indonesia's solar energy potential of 3,294 GWp remains only approximately 0.3 percent utilized, indicating that data-driven investment decisions could significantly accelerate its exploitation.

3. Agriculture and Food Security

State-owned enterprises within the Danantara ecosystem, including Pupuk Indonesia, BULOG, and ID FOOD, require precise agricultural data to optimize their operations. Integrating actual paddy field data from BPN, BIG, and the Ministry of Agriculture, productivity data per land unit, rainfall data from BMKG, and commodity price data from BPS and the Ministry of Trade would produce a precision agriculture map enabling optimal placement of food buffer warehouses, targeted subsidized fertilizer distribution planning, and identification of land suitable for food security programs.

4. Required Institutional Mechanisms

Realizing this potential requires an institutional architecture that formally connects SDI with Danantara. First, a legal basis for institutional data access between the Satu Data Portal and Danantara must be established, ideally through the future SDI Law. Second, an analytical layer above raw SDI data is necessary, as raw data alone is insufficient; Danantara requires data processed into investment intelligence. This creates an opportunity to establish an Indonesia Data Analytics Center dedicated to transforming SDI data into high-value analytical products. Third, a feedback loop mechanism is needed so that Danantara's investment realization data, covering jobs created, production output, and taxes paid, feeds back into SDI as actual data that updates development planning. This creates a mutually reinforcing data cycle between government and business entities.

5. Risks and Critical Notes

This study must be candid about the risks accompanying the substantial potential described above. The first is initial data quality risk. The principle of garbage in, garbage out applies fully: if the data being integrated is of poor quality, Danantara's data-driven investment decisions could produce worse outcomes than making decisions without data at all. A data quality certification mechanism must be established before integrated data is used for major investment decisions.

The second risk concerns information asymmetry and unfair competition. If Danantara receives preferential access to SDI data compared to private sector actors, this creates an asymmetry that could violate fair competition principles under Law

Number 5 of 1999. Data access mechanisms must be fair, transparent, and equally available to all qualifying business actors.

The third risk involves data security and sovereignty. Consolidated data containing strategic national information becomes an extremely high-value target for cyberattacks. BSSN security standards must be rigorously applied, and past government data breach incidents involving national identity cards, BPJS, and ministerial data must serve as reminders that integration without layered security is itself a source of danger.

The fourth risk is bureaucratic resistance. Ministries, agencies, and regional governments that have long monopolized sectoral data may be unwilling to share it, as doing so diminishes their information power. This political-bureaucratic obstacle frequently emerges as the primary implementation challenge for SDI and requires firm political commitment from the highest level of leadership.

E. International Comparative Study: Implications for SDI Policy

The comparative review yields several lessons that Indonesia can draw upon from other countries' national data governance experiences. The first concerns the need for a statutory legal foundation. Both Australia with its Data Availability and Transparency Act 2022 and China with its Data Security Law 2021 demonstrate that governments have found it necessary to enact dedicated legislation to govern data management. Indonesia needs an SDI Law that is hybrid in character, accommodating both openness and data security in a balanced framework.

The second lesson involves the establishment of a dedicated data oversight institution. Australia's appointment of the National Data Commissioner as an independent implementation regulator raises the question of whether Indonesia's current Steering Council arrangement is sufficient, or whether a permanent institution with a clear statutory mandate is necessary. One alternative worth considering is expanding the mandates of BPS or Bappenas as national data stewards through explicit statutory authorization.

The third lesson pertains to personal data protection. The European Union's GDPR requires all open data initiatives to comply with privacy rules, as does China's Personal Information Protection Law. The key takeaway is that Indonesia must deepen the integration between SDI and the Personal Data Protection Law, including guidelines on data anonymization and the obligation to conduct Data Protection Impact Assessments before any new integration system is launched.

The fourth lesson concerns shared technical infrastructure and standards. Denmark's experience demonstrates the importance of a single platform and national Master Data standards. Indonesia needs to establish several core master datasets, including a Population Master Data using the National Identity Number as the primary key, a Territory Master Data using village codes and coordinates, a Legal Entity Master Data using the Business Identification Number, and a Development Program Master Data using Bappenas's standard program codes.

The fifth lesson is the value of a phased approach. Full data integration takes considerable time, as demonstrated by Denmark's Basic Data Programme, which required nearly eight years to implement. Indonesia needs a clear roadmap with measurable milestones, for example integrating data between specific agencies in the first year, extending to all central ministries and agencies in the second year, reaching all provincial governments in the third year, and covering all district and city governments in the fourth year.

F. Technical Challenges in SDI Implementation

1. Data Interoperability

Presidential Regulation SDI has established the principle of interoperability, but its implementation requires detailed technical specifications that currently remain absent, including standardized data exchange formats, API protocols, metadata integration schemes, and semantic consistency. The absence of implementing regulations in this area is widely recognized as a constraint. The short-term solution lies in adopting international standards such as DCAT, SDMX, and ISO 19115, while the long-term solution involves ensuring that the future SDI Law mandates a dedicated Government Regulation specifically governing national interoperability standards and protocols.

2. Central-Regional Synchronization

Bappenas's review findings reveal a trust gap in data sources, where data produced by the central government tends to be regarded as more accurate while regional data is frequently disregarded. What is needed is formalization of synchronization within the Satu Data Forum, led by the Ministry of National Development Planning or a ministry that may be established specifically to administer the SDI, along with a two-way synchronization mechanism that gives regional data appropriate standing.

3. Data Quality and Regular Updates

Technical integration holds little value if the data being integrated is of poor quality or outdated. The future SDI Law must place explicit emphasis on data accuracy and currency. The implementing Government Regulation mandated by that law should specify update frequencies for each priority data category, for example real-time updates for population data by Dukcapil, annual updates for poverty data, and quarterly updates for regional budget data by regional governments. Without clarity on update frequency, the data portal risks being populated with stale and unusable records.

Beyond update frequency, reference codes and master data deserve attention as they form the foundation of interoperability. The central SDI Forum is responsible for agreeing on these reference codes. Ideally, Indonesia would establish a National Reference Data Catalogue containing all agreed classification standards and codes, covering territorial codes, business sector classifications, education classifications, and others, with every agency system required to use these codes consistently. The National Standardization Agency could be involved in establishing National Standards in the data domain to give this framework additional technical credibility.

5. CONCLUSION

Based on the analysis presented throughout this study, six conclusions can be drawn.

The first concerns the legislative hierarchy dimension. Presidential Regulation 39/2019 carries fundamental weaknesses in both hierarchical standing and legitimacy. A cross-sectoral national policy touching upon the domains of statistics, geospatial information, public finance, and data transparency should properly be governed by statute, consistent with Hans Kelsen's theory of graduated norms. Presidential Regulation SDI remains out of sync with the Statistics Law, the Geospatial Information Law, the State Finance Law, and the Public Information Disclosure Law, and it makes no provision for personal data protection as now required by the Personal Data Protection Law.

The second conclusion is that regulatory disharmony between Presidential Regulation SDI and various sectoral statutes creates genuine normative gaps and real risks of jurisdictional conflict. The omnibus law approach is highly relevant as a comprehensive solution to this disharmony.The third conclusion, drawn from the international comparative study, is that countries that have successfully integrated government data have invariably supported that integration with statutory-level regulation. Australia, China, and Denmark all demonstrate that regulatory investment in data governance generates economic benefits that far exceed its costs.

The fourth conclusion addresses the economic and fiscal dimension. Integrated data within the SDI framework carries substantial potential as a catalyst for increased state revenue through four principal channels. Improved tax revenue through cross-agency data matching could add IDR 70 to 120 trillion per year. Efficiency gains in social protection spending through better targeting could save IDR 50 to 75 trillion per year. Optimized infrastructure spending allocation based on accurate data could save IDR 40 to 60 trillion per year. Public data monetization could generate IDR 5 to 15 trillion per year in the medium term. In aggregate, the fiscal potential of SDI ranges from IDR 165 to 270 trillion per year under optimal conditions, a figure that fully justifies the investment required to build SDI infrastructure and enact comprehensive SDI regulation.

The fifth conclusion is that the utilization of SDI data by Danantara and other state-owned enterprises represents a strategic dimension requiring dedicated regulatory attention. Integrated spatial planning and industrial estate data directly reduces transaction costs, investment risk, and legal uncertainty that have long constituted the primary obstacles to large-scale investment. Establishing a formal, fair, and transparent institutional data access mechanism between the Satu Data Portal and business entities, both state-owned and private, is an essential component that the future SDI Law must accommodate.

The sixth conclusion is that the technical challenges of implementation, covering interoperability, central-regional synchronization, and data quality, must be addressed systematically through a combination of detailed implementing regulations, reliable National Data Center infrastructure development, and sustained human resource capacity building programs.

On the basis of these six conclusions, this study puts forward the following recommendations. First, the deliberation and enactment of the SDI draft law through the omnibus approach should be accelerated. Second, the economic and fiscal dimensions should be explicitly integrated into the academic paper accompanying the SDI bill, including mechanisms for data utilization by business entities such as Danantara. Third, implementing regulations governing technical

interoperability standards should be issued promptly following the enactment of the SDI Law. Fourth, a dedicated ministry for Satu Data Indonesia should be appointed or established under the SDI Law's mandate. Fifth, an Indonesia Data Analytics Center should be developed to transform SDI data into high-value investment and policy intelligence products.

The SDI policy represents a progressive step toward improving government data governance, yet it currently faces weaknesses in both its legal foundation and technical implementation. SDI is an investment in national information infrastructure that, when backed by strong regulation, reliable technical systems, and effective institutional arrangements, has the potential to become one of the largest contributors to increased state revenue, public spending efficiency, and investment attractiveness in Indonesia over the coming decade. SDI functions as a national GPS for government decision-making and investment. A GPS does not generate revenue directly, but without it, logistics costs rise, decisions deteriorate, and efficiency falls. The economic value of SDI is pervasive and multiplies across every sector. Accelerating SDI implementation, including its elevation to the statutory level, is therefore among the highest-return regulatory investments Indonesia can make today.

REFERENCES

[1] Republic of Indonesia, *Presidential Regulation Number 39 of 2019 on Satu Data Indonesia. State Gazette of the Republic of Indonesia Year 2019 Number 112*. 2019.

[2] Bappenas, "Roadmap Satu Data Indonesia," Jakarta, 2024.

[3] H. Kelsen, *Pure Theory of Law*. Berkeley: University of California Press, 1967.

[4] Reja Reja, Faris Widiyatmoko, Hesti Rosdiana, and Jerry Indrawan, "Membangun Keamanan Data dalam Kebijakan Satu Data Indonesia," *Jurnal Riset Rumpun Ilmu Sosial, Politik dan Humaniora*, vol. 4, no. 4, pp. 464–474, Aug. 2025, doi: 10.55606/jurrish.v4i4.6569.

[5] M. F. Indrati, *Ilmu Perundang-undangan*. Yogyakarta: Kanisius, 2007.

[6] Bappenas, "Evaluasi Implementasi Satu Data Indonesia Tahun 2022," Jakarta, 2022.

[7] V. C. K. Mayer-Schonberger, *Big Data: A Revolution That will Transform How We Live, Work and Think*. New York: Houghton Mifflin Harcourt Publishing Company, 2013.

[8] Republic of Indonesia, *Law Number 12 of 2011 on the Formation of Legislation, as amended by Law Number 15 of 2019 and Law Number 13 of 2022*. 2011.

[9] P. K. Harahap, "Kedudukan Peraturan Presiden Dalam Hierarki Peraturan Perundang-Undangan Indonesia," *Asas Wa Tandhim: Jurnal Hukum, Pendidikan Dan Sosial Keagamaan*, vol. 4, no. 2, pp. 233–248, Jun. 2025, doi: 10.47200/awtjhpsa.v4i2.2868.

[10] H. Nawiasky, *Allgemeine Rechtslehre als System der rechtlichen Grundbegriffe*. Einsiedeln: Benziger, 1948.

[11] P. M. Hadjon, *Pengantar Hukum Administrasi Indonesia*. Yogyakarta: Gadjah Mada University Press, 2015.

[12] Republic of Indonesia, *Law Number 4 of 2011 on Geospatial Information*, no. 4. Jakarta: State Secretariat of the Republic of Indonesia, 2011.

[13] Republic of Indonesia, *Law Number 27 of 2022 on Personal Data Protection*, no. 27. Jakarta: State Secretariat of the Republic of Indonesia, 2022.

[14] V. Mayer-Schönberger and K. Cukier, *Big Data: A Revolution That Will Transform How We Live, Work, and Think*. New York: Houghton Mifflin Harcourt, 2013.

[15] J. E. Stiglitz and B. C. Greenwald, *Creating a Learning Society: A New Approach to Growth, Development, and Social Progress*. New York: Columbia University Press, 2014.

[16] OECD, "Tax Administration 2023: Comparative Information on OECD and Other Advanced and Emerging Economies," Paris, 2023.

[17] Republic of Indonesia, *Government Regulation Number 10 of 2025 on the Daya Anagata Nusantara Investment Management Agency (Danantara)*, no. 10. Jakarta: State Secretariat of the Republic of Indonesia, 2025.

[18] Yuliandri, *Asas-asas Pembentukan Peraturan Perundang-undangan yang Baik: Gagasan Pembentukan Undang-undang Berkelanjutan*, 3rd ed. Jakarta: RajaGrafindo Persada, 2020.

[19] Danish Agency for Digitisation, "The Basic Data Programme: Strategy and Implementation Plan," Copenhagen, 2012.

[20] Ramboll Management Consulting, "Socioeconomic Analysis of the Basic Data Programme," Copenhagen, 2017.

[21] M. S. Grindle, *Politics and Policy Implementation in the Third World*. New Jersey: Princeton University Press, 1980.
[22] R. Pollock, "The Value of the Public Domain," London, 2006.
[23] A. I. Hamzani, T. V. Widyastuti, N. Khasanah, and M. H. Mohd Rusli, "Implementation approach in legal research," *International Journal of Advances in Applied Sciences*, vol. 13, no. 2, p. 380, Jun. 2024, doi: 10.11591/ijaas.v13.i2.pp380-388.
[24] H. Kelsen, *Pure Theory of Law*, 2nd ed. Berkeley: University of California Press, 1967.
[25] W. Widodo and M. Barthos, "Conflict of Norms for Plantation Transfer by the Government in the Labour Creation Law and Presidential Regulation Number 5 of 2025," *International Journal of Social Service and Research*, vol. 5, no. 6, pp. 537–546, Jun. 2025, doi: 10.46799/ijssr.v5i6.1248.
[26] A. Bernot *et al.*, "Institutional Dimensions in Open Government Data: A Deep Dive Into Indonesia's *Satu Data* Initiative and Its Implications for Developing Countries," *Public Performance & Management Review*, vol. 47, no. 6, pp. 1399–1429, Nov. 2024, doi: 10.1080/15309576.2024.2377609.
[27] Republic of Indonesia, *Undang-Undang Dasar Negara Republik Indonesia Tahun 1945*. Indonesia, 1945.
[28] Republic of Indonesia, *Law Number 16 of 1997 on Statistics*, no. 16. Jakarta: State Secretariat of the Republic of Indonesia, 1997.
[29] R. Haryandu, B. Azheri, and R. Rembrandt, "Legal protection of customer data in implementing the financial information access law for tax purposes," *Gema Wiralodra*, vol. 14, no. 2, pp. 912–920, Aug. 2023, doi: 10.31943/gw.v14i2.509.
[30] L. Judijanto, "IS THERE ANY PERSONAL DATA PROTECTION IN THE CORE TAX ADMINISTRATION SYSTEM?," *Journal of Law and Sustainable Development*, vol. 13, no. 4, p. e04396, Apr. 2025, doi: 10.55908/sdgs.v13i4.4396.