Research Article

One Data Indonesia: A Retrospective Analysis of Data Interoperability in Declaring Regional Planning and Development

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Abstract.
Regional development in Indonesia is key to improving people's welfare and regional progress. However, many local government applications have not been integrated, leading to fragmented data and suboptimal planning analysis. The purpose of this research is to explore the implementation of the Electronic-Based Government System (EGBS/SPBE), and the challenges faced, as well as its impact on regional development planning. The novelty of this research lies in the in-depth analysis of how the One Data Indonesia regulation facilitates data interoperability and standardization at the regional level. The research methodology uses a qualitative approach through interviews, group discussions, and document analysis. The data analysis technique involved thematic coding to identify patterns and main themes. The results show that these regulations facilitate data interoperability and standardization, although technical and administrative challenges remain. Case studies in Central Java and Jember District show improved integration of sectoral data, such as education. The research concludes that the implementation of Satu Data Indonesia provides a solid foundation for improving the efficiency of public services, strengthening bureaucratic transparency, and supporting more accurate data-driven decision-making that can improve the effectiveness of SPBE and support sustainable and responsive regional development. This research provides important insights into the complexities of data integration in local government, as well as contributing to national efforts to improve data governance and public services.

Keywords: One Data Indonesia, e-government system, data integration, interoperability, regional development planning

1. INTRODUCTION

Regional development is one of the crucial aspects in the effort to improve people's welfare and advance the region. The analysis of regional development planning becomes very important during this process to ensure that the actions taken are targeted and effective. However, the main problem being faced today is the discrepancy between the use of various applications in regional development planning and implementation[1], [2].

Currently, many applications are used by local governments for various purposes, ranging from data collection, analysis, to program monitoring and evaluation. However, these applications have not been integrated with each other, so the data and information produced are often fragmented. This results in regional development planning analysis that cannot be conducted appropriately and comprehensively, as the required data is scattered across various platforms that are not interconnected. This condition creates an urgency to find solutions that can integrate various existing applications, so that data can be managed in an integrated and efficient manner.

The Indonesian government has realized the importance of this data integration, as mandated in several regulations, for example Presidential Regulation No. 95/2018. About Electronic-Based Government System, Presidential Regulation Number 39 of 2019 concerning One Data Indonesia and Presidential Regulation. Number 82 of 2023 on the Acceleration of Digital Transformation and the Integration of National Digital Services. These regulations aim to realize good data governance, improve data quality, and encourage openness and accountability in government. With this, there is a strong legal basis for integrating applications and data in order to support better analysis of regional development planning[3].

Based on data from the Directorate of Government Informatics Application Services of the Ministry of Communication and Information Technology, there are currently 27,400 applications and databases spread across various government agencies. This poses various challenges, such as the need for high interoperability, information security, and efficient use of data centers. Along with the development of information technology, laws and regulations such as UU 11/2008 ITE, PP 71/2019 PSTE, and Perpres 95/2018 on SPBE have regulated the legal basis to support data integration and security in government. The National Data Center (PDN) and Intra-Government Network (JIP) are key infrastructures in supporting SPBE, which aims to connect various data and applications in an integrated manner, thus supporting effectiveness, efficiency, and information

security across government agencies. Therefore, this research aims to explore data integration efforts through interoperability, which is one of the main principles in the implementation of SPBE, to realize One Data Indonesia that is accurate, accessible and reliable [4].

As for efforts in local governments, the Central Java Provincial Government has taken significant steps in supporting this policy through Central Java Governor Regulation No. 52/2016 on Single Data System and Governor Regulation No. 89/2016 on Integrated Information Management System. However, the implementation of data interoperability at the local level still faces serious challenges. Current government data tends to be inconsistent in standards, difficult to share, and has varying metadata for the same data. This suggests the need for clearer data standardization and effective interoperability implementation.

In addition, some regions in Indonesia have started digital platform initiatives to support sectoral data integration. For example, Jember District with My Dispendik application that provides integrated information on education, and Magelang City with DataGo portal for e-filing-based sectoral data management. This research aims to examine how the implementation of Satu Data Indonesia and the Electronic-Based Government System (SPBE) can be optimized to overcome the challenges of separate applications and improve the accuracy and effectiveness of regional development planning analysis. The focus will also include an evaluation of the effectiveness of applications such as My Dispendik and DataGo in supporting the vision of One Data Indonesia in the education sector and across other sectors.

Several researches have actually reviewed data interoperability, including Lazuardi et al. , 2021[5] and Akbar et al. (2022)[6]. Data interoperability is essential in regional development planning, where integration of data from various sources is necessary for comprehensive analysis and decision-making. By ensuring data accessibility, standardization and interoperability, local governments can better address complex challenges and promote sustainable development [7]. An interoperability framework based on international standards and best practices helps overcome data silos and fragmentation, enabling a more holistic approach to planning and development [8], [9].

In addition, the application of interoperable systems and technologies improves coordination between government agencies, streamlines processes, and improves service delivery to citizens [10], [11]. By promoting interoperability, local governments optimize

resource allocation, governance effectiveness, and service quality [12], [13]. Interoperability also supports the integration of digital technologies and services, improving the efficiency and effectiveness of regional development [14], [15]. In addition, data consistency and integration are critical to the success of planning and budgeting processes in local governments [16], [17]. Maintaining consistency in planning documents is important for achieving development goals, public service performance, and local government credibility [16], [18].

This research is not only important in the context of improving the quality of local development planning and implementation, but also contributes to national efforts to build better data governance and a more efficient government that is responsive to community needs. Some of the problems in planning in local government, for example Fragmentation and Separation of Local Government Applications, Lack of Data Consistency and Standardization, Effectiveness of Policy Implementation and Data Infrastructure in regional planning and development will be interesting to review. With the results of this research, it is expected that practical solutions and recommendations can be found that can be widely applied, providing long-term benefits for regional development in Indonesia

2. METHODS

The research on the implementation of One Data Indonesia and the Electronic Based Government System (EBS) in Indonesia will use qualitative methods that focus on understanding the perceptions and experiences of stakeholders [19]. This approach involves in-depth interviews, focus group discussions, and analysis of relevant policy documents and reports. [19]. The research aims to provide insights into the challenges, successes and impacts of data integration in regional development planning [19].

In addition, this research will use thematic analysis techniques to identify common patterns and themes from the qualitative data [19]. By synthesizing these findings, this research aims to offer concrete policy recommendations and practical solutions to improve data integration and enhance the effectiveness of regional development planning in Indonesia. [20], [21].

The use of document analysis to review policies and regulations, such as Presidential Regulation No. 39 of 2019 and Central Java Governor Regulation No. 52 of 2016, will assist in understanding the legal and administrative context governing data integration

at the local level. (Muthmainnah, Arief and Fitriyani, 2022). In addition, secondary data from documentation such as project reports and implementation evaluations of applications such as My Dispendik and DataGo will provide a comprehensive picture of their performance in supporting the vision of One Data Indonesia [22], [23].

In addition, thematic analysis techniques will be used to identify common patterns, themes and challenges emerging from the qualitative data. Using this approach, this research aims to provide concrete policy recommendations and practical solutions to improve data integration and the effectiveness of regional development planning in Indonesia.

3. RESULTS AND DISCUSSION

3.1. Implementation of One Data Indonesia

The implementation of One Data Indonesia and System of Electronic-Based Government (SPBE) in Indonesia is supported by Presidential Regulation No. 39/2019, which emphasizes on data integration between central and local government agencies. This regulation serves as a legal framework that promotes transparency, accountability and efficiency in government data management by highlighting the importance of data standardization, system interoperability and good data governance to improve public services and administrative efficiency. [24]. In addition, the regulation mandates the implementation of an Electronic Based Government System (EBSS) to integrate various government applications and information systems, aiming to streamline operations and improve service delivery at various levels of government [25].

At the regional level, the implementation of Presidential Regulation No. 39/2019 is complemented by gubernatorial regulations such as Central Java Governor Regulation No. 52/2016 on Single Data System and Governor Regulation No. 89/2016 on Integrated Information Management System. These local policies underscore the commitment of local governments to improve data interoperability despite technical and administrative challenges, thus contributing to the overall goal of improving data integration and governance at the local level. [26].

The implementation of One Data regulations in various regions in Indonesia, such as Jember District and Magelang City, through initiatives such as the My Dispendik application and the DataGo portal, shows how the integration of sectoral data can improve the effectiveness of local development planning and management[27]. While
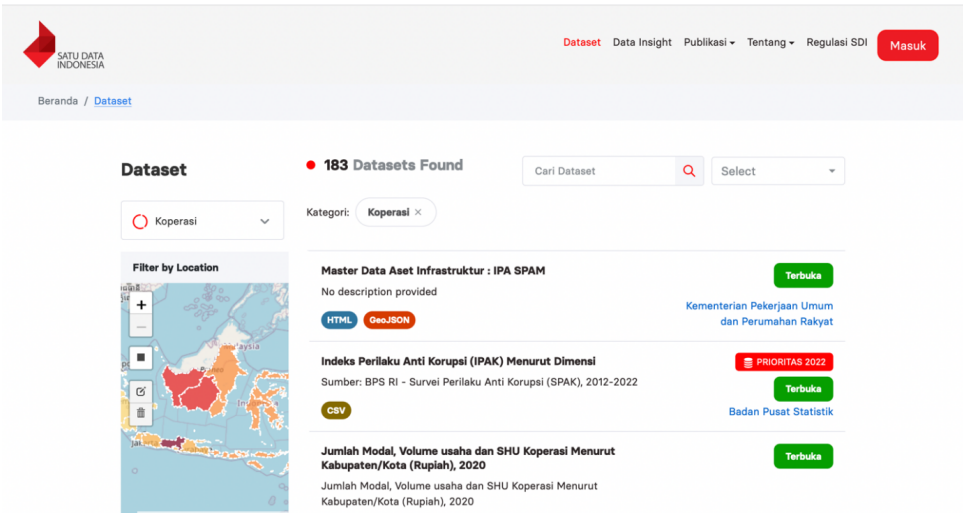
Figure 1: Display of data.go.id.

these efforts signal a positive step towards better data governance, several challenges remain, including issues related to data consistency, system interoperability, and the need to improve data management capacity and skills [28].

Effective coordination between central and local governments is essential to ensure the successful and sustainable implementation of these regulations. [29]. By addressing these challenges and improving coordination mechanisms, data integration through the One Data Indonesia regulation can result in a more responsive, efficient and accountable government in Indonesia, which will ultimately benefit regional development and people's welfare [30].

3.2. Fragmentation and Decoupling of Local Government Applications

3.2.1. Implementation of Single Data System in Central Java

Central Java Regional Regulation Number 11 of 2019 aims to be a guide for Regional and Regency/City Governments in Central Java in implementing the Smart Central Java Province program. This regulation is also intended to facilitate synergy between central government policies and local governments in the implementation of the Smart Central Java Province. In addition, this regulation provides direction to the community and business sector to play an active role in the implementation of the Smart Central Java Province program, which aims to increase the effectiveness of resource management and encourage sustainable innovation in regional development.

The concept of Electronic Systems includes various electronic devices and procedures that facilitate the preparation, collection, processing, analysis, storage, and dissemination of Electronic Information. Electronic-Based Government System (SPBE) is a form of government administration that utilizes information and communication technology to provide services to SPBE users, as outlined in Presidential Regulation Number 95 of 2018[31].

In addition, the definition of different types of data is essential in understanding information systems. Data, in general, refers to records that represent facts or information in various forms such as numbers, letters, symbols, images, or sounds, which reflect real circumstances or convey certain ideas. Statistical Data deals with numerical information describing certain characteristics of a population, obtained through processes such as collection, processing, presentation, and analysis. Geospatial Data, on the other hand, provides information about the geographic location, dimensions, or attributes of natural or man-made objects relative to the earth's surface. Central Level State Financial Data includes information compiled by the Central Government based on the government accounting system, which includes all the rights and obligations of the state that can be valued in money, including various assets and liabilities related to state duties [32].

The current state of government data shows that it lacks consistent standards, is difficult to share and use widely, and often has difficulties in the compilation process. Another problem that often arises is that there are different meta data accompanying the same data, and there are many different definitions for data that should be uniform. On the other hand, the ideal is to have a clear national standard for data, allowing data to be easily shared according to their respective authorities, and easily compiled and processed. Ideally, data should have meta data that is consistent with the data itself, allowing data to be processed into richer and more meaningful dimensions.

Presidential Regulation 95/2018 regulates interoperability, which is the coordination and collaboration between business processes and electronic systems to facilitate the exchange of data, information, or services through the Electronic-Based Government System (SPBE). Data and information interoperability standards are set by the minister responsible for government affairs in the field of communication and informatics, thus ensuring that all systems and processes can operate effectively and integrated.

At the regional level, Central Java Province has taken concrete steps through Governor Regulation (Pergub) No. 52/2016 on *Single Data System*. This system ensures the availability of uniform, complete and valid data to support regional development. In

addition, Regional Regulation No. 11 of 2019 on the Implementation of Smart Central Java Province provides a legal basis for innovation and integration of solutions to improve the quality of public services.

Figure 2: Integration to External Applications. Source: Communication and Informatics Office of Central Java Province (2019).

The following is the application of interoperability in Central Java in the context of regional financial data:

This integration includes various applications such as SiRUP LKPP and Bank Jateng to manage procurement general plan data through the e-Project Planning application. In addition, non-cash transactions are also implemented through SINERGI DJPK from Dispermadesdukcapil, including financial and tax report data integrated with applications from the Director General of Taxes. Tax deduction data is managed through the e-Finance Administration application, as well as population NIK data which is in the process of integration. BKD also uses personnel data as the basis for system user identification. Open Data implementation in Central Java includes open data visit statistics that record 2,000 visits per day. This data is connected to 35 districts/cities, with a total of 52,857 datasheets, consisting of 18,766 from the Provincial SKPD and 34,091 from districts/cities.

The implementation of the *Single Data System* in Central Java includes various types of data from various agencies. The data managed includes information on employees such as class, education, and gender, as well as monthly expenditures managed by BKD, BPKAD, and DISDIKBUD. In addition, data on schools, educators, and infrastructure is also an important part of the system, with contributions from the BPS SKPD and Social Services. Infrastructure-related data such as reservoirs and dams are managed by DPU SDA TARU, while socio-economic indicators such as NTP, poverty, HDI, and social centers are also integrated in this system. The types of data managed by various
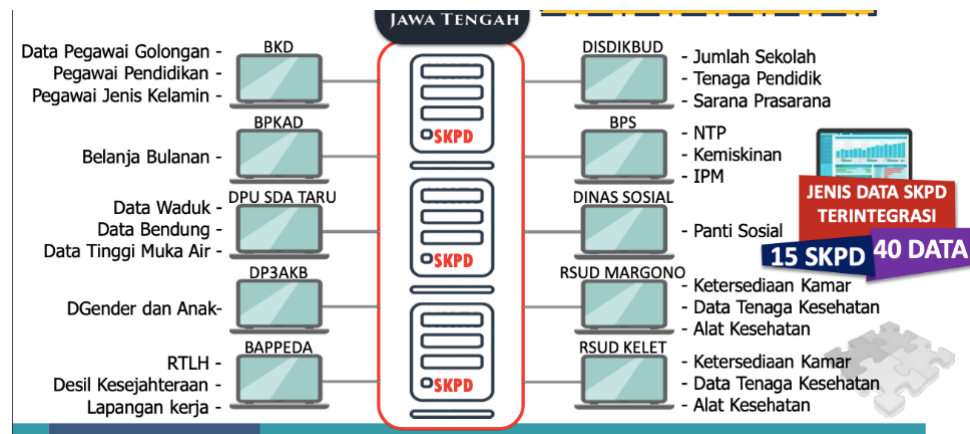
Figure 3: Implementation of Single Data System in Central Java. Source: Communication and Informatics Office of Central Java Province (2019).

SKPDs include 40 different types of data, including data on water levels, gender and children, RTLH, welfare deciles, and employment, which are managed by DP3AKB, BAPPEDA, and RSUD Margono and 15 other SKPDs.

The phases planned for the future include several important steps. First, data collection from various sources will take place. Second, the collected data will be processed and organized. Third, the information generated from the data processing will be presented. Finally, the information that has been presented will be used for various purposes.

The data analysis process involves several key activities. Firstly, standardization of data forms was carried out to homogenize various data formats into a single type to facilitate and speed up processing. Second, aggregation of data from various sources was done to eliminate redundancy and minimize ambiguity. Third, data filtration based on prioritization is applied to determine the level of urgency of the information according to the problem to be solved, thus accelerating the decision-making process.

This analysis aims to provide an overview to the leadership of potential threats from various sources that can threaten the security and sovereignty of the Republic of Indonesia. The results of this analysis are expected to be input for the leadership in determining further policies to maintain the security and sovereignty of the country. The scope of this analysis includes an evaluation of potential threats from various sources to the security of state sovereignty within a certain predetermined period.

The results of the analysis that has been carried out will be represented in the form of data visualization to assist in decision making. Decision-making and necessary actions

are the responsibility of the Central Java Provincial Government, taking into account the data obtained from the Integrated System based on the Big Data Platform.

The implementation of this regulation has seen significant progress in Central Java, with data integration into various external applications and improvements in interoperability between applications. These measures not only improve the efficiency of public administration but also strengthen inter-agency cooperation in achieving sustainable development goals.

Overall, this regulation underlines the importance of standardized and interoperable data management to support fast and precise decision-making, in accordance with the demands of the industrial era 4.0. In this context, data integration and integrated human resource thinking are also key to achieving maximum benefits from the potential of *Big Data Analytics* in supporting sustainable development in Central Java Province**.**

3.2.2. One Data Indonesia Regulation and its Implementation in Jember District with My-Dispendik Education Office

The government is increasingly prioritizing the role of data in the process of planning, implementing, evaluating, and controlling development, with the One Data Indonesia (SDI) Program as a key strategy to improve data governance. To support this program, the Jember District Government launched the My Dispendik application, a digital platform developed through collaboration between the Communication and Information Office (Diskominfo) and the Jember Education Office (Dispendik). This application aims to produce accurate, up-to-date, integrated, and accountable data on education in Jember.

My Dispendik facilitates the digitization of an integrated education map, making it easier for teachers and the public to access various education models in Jember. The app displays complete information about education services, including the number of teachers and students, school facilities, and student and teacher achievements. School data can also be entered independently by each school. In addition, My Dispendik is connected to the Basic Education Data (Dapodik) platform from the Ministry of Education, Culture, Research and Technology, which is expected to accelerate access to and dissemination of education information in Jember.

The district has launched the "Jember Satu Data" portal, which aims to integrate data from all Regional Apparatus Organizations (OPDs) within the Jember district government. The portal, which is managed by the Jember Communication and Informatics

Figure 4: My-Dispendik of Jember District Education Office. Source: Jember Regency Government (2023).

Office (Diskominfo), is a step towards bureaucratic transparency and is connected to the East Java Provincial Government's Information and Documentation Management Officer (PPID). The portal is designed to unify data from 38 OPDs and 1,053 meta data with statistical recommendations from the Central Statistics Agency (BPS). This is expected to facilitate the public in accessing applicable and informative services and help decision-making by top-level management. According to Hendy, public information disclosure is an obligation that must be continuously updated to create better changes. The importance of accurate data is to ensure that decisions are made based on the correct data. The "Jember Satu Data" portal is expected to become a benchmark in decision-making and continue to improve. The public can access data through the portal-data.jemberkab.go.id page, and OPDs are required to continue updating data according to community needs.

3.2.3. One Data Indonesia Regulation and its Implementation in Magelang City with DataGo portal

One Data Indonesia regulation is a strategic step implemented in Magelang city through DataGO system. DataGO is an innovation in web-based data management managed by the Communication Information and Statistics Office of Magelang City. Launched on October 30, 2014, this application has changed the paradigm of regional data management to be more structured, efficient, and reliable.

As an effort to improve the quality of data management, DataGO presents an integrated database that not only provides high-quality data and statistics, but is also updated continuously. Through a PHP-based platform, DataGO allows all SKPDs and vertical agencies that own strategic data in Magelang City to manage data online. Each SKPD has a Person in Charge who is responsible for the validity and availability of data according to the period and data group they handle.

The success of DataGO is also reflected in its ability to provide easy and transparent access to statistical information of Magelang City to the wider community. DataGO is not only a tool for data publication, but also a platform for communication and collaboration between SKPDs through DataGO Forum. Regular coordination between DataGO administrators and managers every month is an integral part in improving the effectiveness of sectoral data management.

Legally, the existence of DataGO is supported by various regulations such as Law No. 16 of 1997 concerning Statistics, Law No. 14 of 2008 concerning Public Information Disclosure, as well as Mayor Regulation No. 25 of 2015 which establishes DataGO as an Integrated Regional Data Information System Center. Thus, DataGO not only functions as an instrument for local data management, but also as a contributor to the concept of One Data Indonesia.

The history of DataGO formation reflects the commitment of Magelang City Government in overcoming various challenges related to previous data management. With the existence of DataGO, there is a significant change in data management in SKPD, from manual management that is sometimes not well compiled to structured and well-coordinated management through a digital platform. This not only improves efficiency, but also the accuracy and quality of the data presented.

With the continuous development of features and modules in DataGO, as well as integration with CKAN-based open data portals, DataGO continues to adapt to increasingly complex regional data needs. This not only expands access to statistical information

for the public, but also supports the vision of Satu Data Indonesia, which encourages openness and integration of data at all levels of government.

Figure 5: DataGo Portal of Magelang City. Source: Magelang City Government (2024).

Thus, the existence of DataGO is not just a local innovation, but also a significant contribution in realizing transparency, efficiency, and accountability in regional data management in accordance with the principle of One Data Indonesia.

DataGO is a city-scale database platform that now has more comprehensive features and content. This includes active participation of DataGO Managers in online data contribution and verification and validation process before data is published. Nevertheless, to improve efficiency and effectiveness in managing sectoral data in Magelang City, the Office of Communication Information and Statistics plans to integrate DataGO with open data portals in the future.

3.2.4. SIPD HUB as Data Interoperability Model in Declaring Regional Planning and Development

The figure above explains the flowchart or concept map that describes the One Data System for Domestic Government in Indonesia. This system is a major initiative that aims to integrate and manage data from various domestic government systems and applications, with the aim of providing up-to-date, accurate, and accountable data. At its center is SIPD HUB, an acronym for Local Government Information System, which serves as a data integration center that collects and manages information from various local governments, including provinces, districts, and cities.
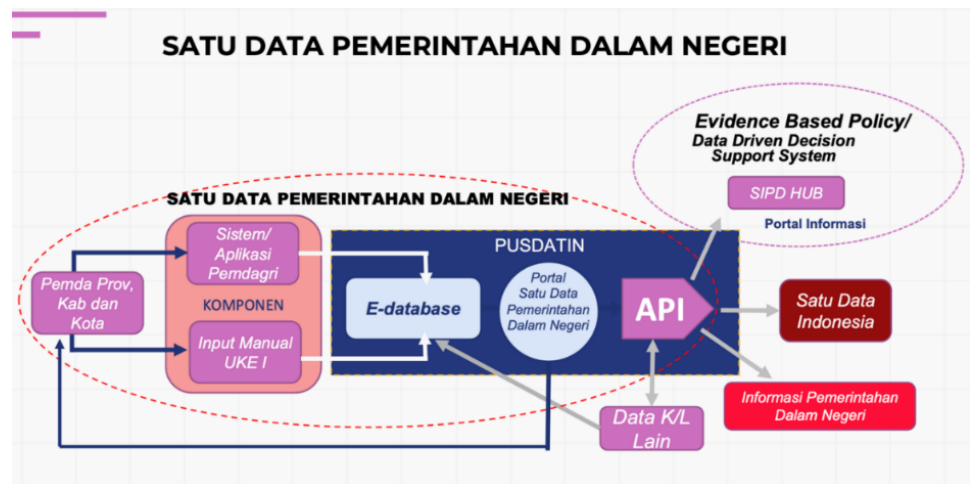
Figure 6: One Home Government Data.

The Prov Kab and Kota Local Government Information Portal is a place for local governments to access and share information integrated through SIPD HUB. In addition, the system supports data-driven policymaking and decisions based on accurate and relevant data analysis, known as Evidence Based Policy or Data Driven Decision Support System. The E-database component refers to an electronic database that is the foundation for data storage and management.

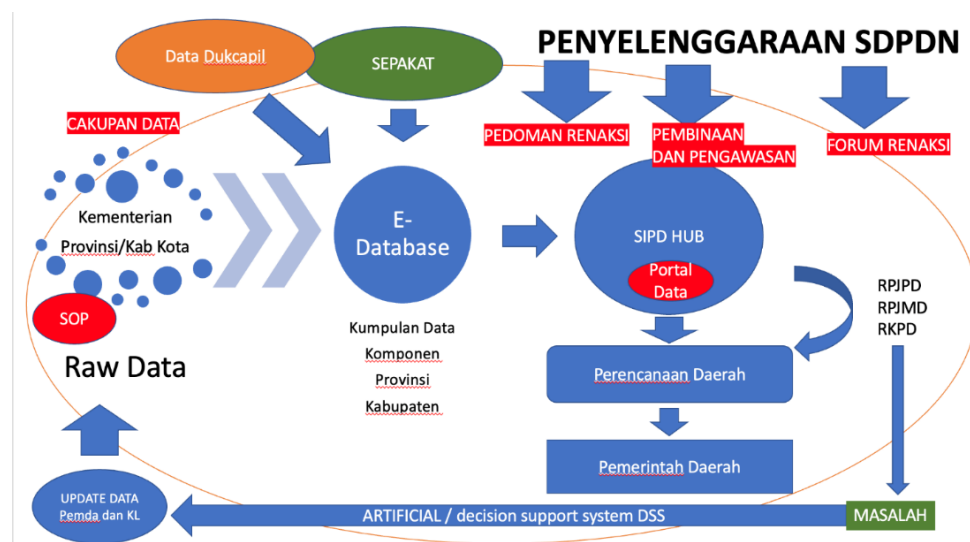To provide a clearer picture of the SIPD-HUB workflow, here is a flowchart of the process:

Figure 7: SIPD-HUB flow.

The data collection process begins with data obtained from various ministries and agencies, the Ministry of Home Affairs (MoHA), and local governments. This data is then

entered into the e-database after going through a verification and agreement process by the Socio-Economic Registry (Regsosek).

The data in the e-database will be updated regularly to ensure that the information available is always accurate and relevant. These regular updates include various types of data that are relevant for local government and development purposes.

The data that has been collected in the e-database will be analyzed using an artificial intelligence-based decision support system (DSS). This analysis is based on planning documents such as the Regional Medium-Term Development Plan (RPJMD), Regional Long-Term Development Plan (RPJPD), and Regional Government Work Plan (RKPD). Through the DSS, key problems are identified, issues are prioritized, and appropriate policy recommendations are developed to support more effective decision-making.

Data on the realization of the Regional Budget (APBD) will be displayed transparently in the form of action plan guidelines (renactions) based on RPJMD, RPJPD, and RKPD documents. This will enable monitoring of conformity between planning and budget realization. Furthermore, the monitoring and evaluation system will ensure that the planning and implementation of regional development programs are on track. This process includes periodic evaluation and reporting, which helps in identifying areas that require improvement or intervention, thereby supporting the achievement of sustainable development goals oriented towards improving community welfare.

The data in the e-database will be updated regularly to include the latest information from ministries/agencies, the Ministry of Home Affairs (MoHA), and local governments. This update includes various types of data, such as population data, regional finance, development, health, education, and other relevant data. This periodic update process is important to ensure that the available data is always accurate and up-to-date, so that it can be used for effective analysis and decision-making. By regularly updating the data, the e-database will become a reliable and constantly evolving source of information, allowing the government to respond to changes and new needs more quickly and appropriately. It also helps in minimizing errors and data inconsistencies that can hinder the process of planning and evaluating regional development programs.

SIPD-HUB will provide comprehensive monitoring and evaluation features to ensure that the planning and implementation of regional development programs are in accordance with the planning documents. This system is designed to facilitate local governments in conducting periodic evaluations of various programs and projects that are being implemented.

With the monitoring and evaluation features available, local governments can easily identify areas that require improvement or intervention. The system enables a thorough and systematic evaluation of the implementation of development programs, including whether the targets set in the RPJMD, RPJPD, and RKPD documents have been achieved. In addition, SIPD-HUB provides analytical tools that assist local governments in assessing the effectiveness and efficiency of these programs, as well as in identifying the main causes of any deviations or constraints that arise. As such, local governments can take timely and result-oriented corrective actions, ensuring that local development goals are achieved in a sustainable manner and have a positive impact on people's welfare.

SIPD-HUB will use an artificial intelligence-based Decision Support System (DSS) to analyze problems in the district or city. Decision Support Systems (DSS) are information systems designed to assist decision-making in organizations. DSS utilizes information technology and data analysis to process information and provide useful recommendations for decision makers.

This DSS is designed to process and analyze data from important documents such as the Regional Medium-Term Development Plan (RPJMD), Regional Long-Term Development Plan (RPJPD), and Regional Government Work Plan (RKPD). By utilizing artificial intelligence, the DSS is able to identify the main problems faced by the region, prioritize issues that require immediate attention, and provide appropriate policy recommendations.

The analysis conducted by DSS not only helps in understanding the conditions and needs of the region in greater depth, but also provides data-driven guidance for more effective decision-making. This will ensure that resources are allocated wisely and planned interventions can have maximum positive impact. In addition, DSS will speed up the analysis process and improve accuracy in planning, thereby supporting the achievement of sustainable and responsive regional development goals.

4. CONCLUSION

Data integration is crucial in improving the efficiency and effectiveness of regional development planning in Indonesia. Currently, there are many applications and systems used by local governments, but the lack of integration between these systems causes data to be fragmented and difficult to manage in a unified manner. Regulations such

as Presidential Regulation No. 39/2019 on Satu Data Indonesia and Electronic-Based Government System (SPBE) have become an important legal foundation in the effort to integrate various government applications. It aims to create good data governance, improve data quality, and ensure openness and accountability in government.

Case studies in Central Java Province, Jember District and Magelang City show concrete steps in implementing data integration through digital platforms such as My Dispendik, the "Jember Satu Data" portal and DataGO. These steps not only improve the efficiency of public administration, but also strengthen bureaucratic transparency and support more accurate data-based decision-making. On the other hand, the Ministry of Home Affairs' implementation of SIPD HUB as a central information portal demonstrates the importance of data integration to support planning and budgeting across administrative regions. SIPD HUB facilitates efficient data exchange between government units and agencies, ensuring consistency of information from planning to local financial reporting.

Overall, standardized and interoperable data integration and information management are key in harnessing the potential of information technology to support sustainable development in Indonesia. This not only creates a more efficient administrative environment, but also enables the government to better respond to the needs of society and development challenges in today's digital era.

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