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Bridging the data divide: Integrating social assistance systems in Jakarta during Covid-19

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Abstract

This study examines the challenges and strategies of social welfare data integration in Indonesia, particularly in DKI Jakarta. It highlights the importance of reliable data for effective policy-making and service delivery in the public sector, emphasizing the role of master data management (MDM) in ensuring data quality and coherence. The research identifies significant obstacles such as data fragmentation, lack of standardization, inadequate technological infrastructure, and poor inter-agency coordination, which hinder efficient poverty alleviation efforts. The Jakarta Smart City initiative and applications like Jaki and CRM are explored as innovative approaches to improve data integration and community engagement. The study advocates for a comprehensive strategy that incorporates grassroots data collection, collaboration among stakeholders, and the adoption of best practices from other regions to enhance the effectiveness and equity of social welfare programs in alignment with the Sustainable Development Goals.

Keywords

Data integration, Interoperability, Jakarta smart city, Pusdatin

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Introduction

The increasing demand for reliable data in day-to-day operations sparks a big challenge in data integration implementation in many domains, including the public sector. A successful data integration implementation provides trustable, non-duplicate data to stakeholders. The public sector relies on creating value through services to stakeholders, and reliable data is crucial for the purpose [1]. Policy predictions [2], [3], smart cities [4], [5], and social security programs [6] are gaining popularity. The government can use master data management (MDM) with integrated data to ensure

adequate data quality, speed, variety, openness, and interoperability for policy making [7]. is certainly encourages the command's perspective in making policies by expanding data sources using appropriate cross-institutional data and more predictive analytics [8]. The government is creating new opportunities in the democratic process, the economy, and other sectors. Public services and innovations have demonstrated efficiency [8], [9], [10]. On the other hand, data often refers to the ability of transformation, where the government must be able to read the results of the analysis used. The use of data in social welfare efforts can have both positive and negative effects on public services [11]. We then utilize the social data to prevent the impoverished from sinking deeper into poverty. In public administration, social equality refers to justice in public service government policies [12], [13], [14]. In the development of the study as the study progresses, one of the implications of data-based public services for social welfare is the emergence of fragmented and ambiguous relationships [11]. This ambiguity can lead to issues such as awareness of social justice in policy making and the evaluation of government policies [15], [16]. The public sector has witnessed the development of data integration research [7], [17] particularly in the areas of social justice and welfare studies. Research reveals that data-driven public services for social justice significantly impact policy outcomes [18].

The government implements social justice and welfare policies in developing countries where there are still impoverished individuals or those living below the set standards. Indonesia was one of the countries with a high poverty rate of 25.90 million people in March 2023 [19] (see Figure 1). Data poverty is a major issue that affects social justice data integration efforts, especially One Data on Poverty in Indonesia. Ardiansyah et al. [20] found that inconsistent poverty definitions and interpretations across ministries have led to fragmented and outdated data, which has hindered targeted poverty alleviation programs. Due to data governance inconsistencies, poverty reduction efforts are inefficient and inaccurate, affecting resource distribution and support for the needy. This approach supports the Sustainable Development Goals (SDGs) to end poverty and hunger, which emphasize data integration as a key to social justice. This study shows that data quality and coherence can improve poverty alleviation targeting and effectiveness, promoting a more just and equitable society.

Data management in DKI Jakarta faces several challenges [21] including limited availability of accurate, consistent, and accessible data for planning, lack of guaranteed data protection, and weak coordination among agencies and sectors. This silo mentality, prevalent within and across government and non-government institutions, hampers effective policy-making. In response, the Covid-19 pandemic prompted the DKI Jakarta Provincial Government to adapt its data collection and integration processes by leveraging ICT advancements. The Jakarta Smart City (JSC), an agile core unit, has played a pivotal role in fostering collaboration among stakeholders. JSC established online and offline complaint channels, such as the Jaki (Jakarta Kini) application, to collect feedback from residents. Offline data is integrated into the CRM (Cepat Respon

Masyarakat) system, ensuring that complaints, including those related to social assistance, are directed to the Social Service Data and Information Center (Pusdatin Dinsos) for factual verification. This enhanced data integration process ensures that social assistance reaches residents efficiently. Moreover, the pandemic has driven a cultural shift in the bureaucracy, promoting digital governance and collaborative workflows. These changes underline the importance of streamlined business processes in improving service delivery and policy-making.

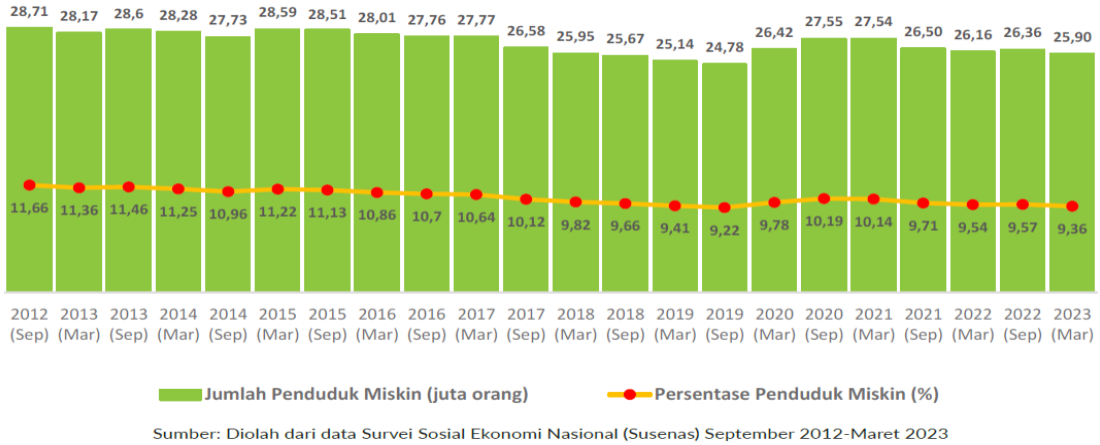

Figure 1. Number and Percentage of Poor Population, September 2012–March 2023

The ongoing business processes encourage OPDs (Regional Apparatus Organizations) to collaborate and integrate data effectively. This study examines the business processes used to integrate data between JSC (Jakarta Smart City) and Pusdatin Dinsos (Social Service Data and Information Center) until the assistance reaches the community. Previously, all stages of data management for identifying poor households—starting from data collection, factual verification, to finalizing recipient data—were conducted internally by the Social Service. This research is significant as it highlights the DKI Jakarta Provincial Government's efforts in streamlining the social assistance program flow through integrated business processes among OPDs and leveraging digital governance.

The success of Open Government Data implementation relies on ensuring that open data meets the diverse needs of its users. This involves adhering to the eight principles of Open Government Data: completeness, primacy, availability, accessibility, machine-processability, non-discrimination, open formats, and absence of licensing restrictions [22], [23]. Practical steps to achieve open data include providing non-personal data and addressing potential costs associated with data release, such as those related to location disclosures and obtaining publishing permissions [24]. Open Government emphasizes transparency, accountability, and collaboration to establish a participatory governance system. It aims to generate public value by prioritizing accessibility, openness, and community involvement. However, achieving open government requires active community support and collaboration alongside government efforts [25].

There is concern that increasing data-based dependence in public services will have an impact on social justice, especially socio-economic disparities [18]. This highlights the vulnerability of segmenting problems that arise from the use of data in public service practices [26]. According to Cepiku & Mastrodascio [16], social justice primarily refers to the equitable access and utilization of public services, including both goods and services. We interpret social equality as a process that prioritizes the delivery of specific services. Understanding the various aspects of equity from a structural perspective is crucial [15], [18]. Services and policies that measure social justice have a multi-sector impact on the services they provide. This study examines the data present in social welfare at different stages of the public service delivery process. The ongoing data business process uses an evaluation framework in the organization [27], [28]. According to Löfgren & Webster [28], the model concentrates on four key areas: data collection, data storage, analysis and modeling, and the utilization of results (see Table 1).

Table 1. Value chain in big data use [29]

Activities	Data Collection	Storage	Analysis	Usage
Technologies (examples) Social	Social media, IoT, Sensors/cameras, 'Smart devices', Existing data sets (e.g., census) Distributed	Distributed databases 'Clouds' Variances	Data mining Machine learning Algorithms Social network analysis Visualization Data	Business analytical methods, Citizen profiling Predictions Open data
Variances	Voluntary, observed, inferred and coercive (legally binding)	Inhouse data storage Outsourced data storage	Data analysis Business analysis	Business analysis Direct use
Smart city (Examples)	CCTV and other cameras, mobile device use, sensors, smart cards in mass transit, etc.	Collected and aggregated raw and unstructured data from many sources	Analytics of data from various sources	Transport management systems, Business predictions, targeting certain groups of citizens
Actors	Public sector agencies, IPs/phone companies, Social networks, Private retailers, Data vendors	Search engine providers, Social networks, Data brokers, 'clouds'	Search engine providers, Analytics companies, Government research agencies	Governments, contractors, Social Networks, Business interests, Service users, Citizens

The operational process that takes place in the integration of organizational data becomes systematic [30]. In this study, we will focus on the components that need to be taken into account when integrating data in big data [18]. The study involves several stages to ensure data in social welfare, which include:

1. ensuring fairness in reporting procedures, also known as procedural fairness;
2. ensuring fair processes, also known as process equity.
3. The study also covers the stages of data collection, analysis, and storage.

This study will employ the methodology of Ruijer et al. [18]. The ongoing data process undoubtedly involves a series of steps from the beginning to the emergence of outcomes, specifically the receipt of social assistance. of social assistance).

Method

This study uses Yin's [31] perspective on positioning theory as a research guide. Case study research entails investigating a case in its natural context, comprehensively, and in depth using multiple data sources [34]. The case study research method allows researchers to capture multiple realities that are difficult to measure. This approach distinguishes itself from other methods by adopting a comprehensive approach to collecting information in a real-life setting and using purposive sampling techniques [33].

The selection of sampling techniques based on key informant consultations follows the purposive sampling method described by Patton [34], which focuses on identifying individuals or groups with extensive knowledge and experience relevant to the research topic. Key informants were chosen systematically, targeting those directly involved in the governance and management of social welfare data within Jakarta Smart City (JSC) and Pusdatin Dinsos of DKI Jakarta Province. Their credibility was established based on their expertise, roles, and direct involvement in the data integration processes under study. To ensure representativeness, the consultations included a diverse range of stakeholders, such as senior officials, data analysts, and operational staff, providing varied perspectives and reducing potential bias. Triangulation was employed to enhance the validity and reliability of the findings, combining data source triangulation, methodological triangulation, and investigator triangulation. Data source triangulation compared information from in-depth interviews, official documents, reports, and secondary sources, while methodological triangulation integrated interviews, document analysis, and field observations to corroborate findings. Additionally, investigator triangulation involved collaboration with other researchers or experts to cross-verify interpretations, minimizing individual biases. This comprehensive validation process ensures that the research findings are grounded in multiple lines of evidence, enhancing their transparency.

Results and Discussion

Challenges and barriers to the integration of welfare data in Indonesia

The integration of social welfare data in Indonesia encounters a variety of significant obstacles that impact the efficacy and efficiency of welfare initiatives from the government. There are numerous primary obstacles, such as: (1) Diversity of Data Sources. Social welfare data sources are diverse and include the Ministry of Social Affairs, the Central Statistics Agency, local governments, and non-governmental organizations. The presence of diverse formats, standards, and data collection methods

hinders the process of integration. (2) Non-standardization. The lack of consistent standards in data collection, storage, and processing creates challenges in merging data from different sources. Standardization is necessary to ensure data compatibility and facilitate seamless integration. (3) Limited Technology Infrastructure. Insufficient Technological Infrastructure: Numerous regions in Indonesia, particularly remote areas, continue to face a shortage of information technology infrastructure. This impedes the process of gathering and incorporating data in a digital format. (4) Data Security. and Privacy Ensuring data security and privacy is crucial when integrating social welfare data containing personal information. A robust security system is necessary to safeguard the data from any unauthorized access, misuse, or leakage. Data privacy concerns pose a significant challenge when it comes to implementing data integration. (5) Inter-Agency Coordination. Effective inter-agency coordination is critical for successful data integration, as it entails the collaboration and cooperation of multiple government agencies and other relevant stakeholders. Frequently, this lack of coordination leads to data duplication or the presence of unsynchronized data. (6) Human Resource Capacity. The availability of skilled and experienced human resources in data management and information technology is still limited. Sufficient training and capacity development are necessary to guarantee the quality and uniformity of the integrated data. (7) Funding. The process of integrating data necessitates substantial funding for technological infrastructure, human resource training, and system development. Limited financial resources frequently hinder the successful execution of plans. (8) Real-Time Data Availability. The reliance on manual data collection methods limits the availability of current data, leading to delays in data processing and consequently outdated information. In order to accurately depict social welfare conditions, data integration necessitates the presence of real-time or nearly real-time data. (9) Bureaucratic Complexity. Elaborate bureaucratic frameworks and protracted administrative procedures can impede the efficiency of the data integration process. To expedite data integration implementation, the bureaucracy must be streamlined.

Public concerns about social welfare data are complex, frequently focusing on inaccuracies, lack of transparency, inequality, ineffective communication, and challenges in data integration. A multitude of individuals contend that the collected data fails to represent current conditions owing to obsolete records, flawed collection methodologies, or administrative inaccuracies. Outdated datasets have resulted in the misallocation of benefits in social assistance distribution, causing dissatisfaction. Although initiatives like regular updates and digital record-keeping have been implemented to mitigate these problems, their efficacy remains uncertain. Moreover, the absence of transparency and accessibility in data collection and utilization engenders distrust among the populace. Despite the implementation of online dashboards and public information campaigns in certain regions, their effectiveness in enhancing public trust has not been sufficiently assessed.

People often complain about inequality and discrimination, especially the unequal distribution of benefits. These issues often result from poor data collection or biased eligibility standards. The process standardization proposal addresses these issues, but the lack of systematic monitoring casts doubt on its discrimination-reduction effectiveness. Poor communication and socialization hinder public awareness of welfare programs, leading to confusion about benefits and participation. We have launched media campaigns and community outreach, but their long-term impact on citizen engagement remains unclear. Health, education, and employment systems make welfare analysis difficult due to data integration issues. Integrated data platforms have potential, but they face implementation challenges like data security, inter-agency collaboration, and technical interoperability. While proposals for solutions exist for each challenge, their implementation necessitates further consideration and planning. Assessing previous methods and anticipating new solution challenges is necessary to solve these problems. Real-time digital data collection systems may improve accuracy, but they require staff training, significant funding, and strict data privacy protocols. Accessible welfare data platforms could improve transparency, but digital literacy and language must be addressed. Standardized data collection methods and impartial algorithms can reduce discrimination, but they require strict oversight to avoid biases in automated systems. Programs for community engagement can enhance communication and awareness, but their long-term impact requires continuous evaluation. Comprehensive data integration necessitates collaboration among governmental entities, the private sector, and civil society. This approach must address challenges including stakeholder commitment, ensuring interoperability, and protecting data security. By emphasizing evidence-based strategies and utilizing technological advancements, policymakers can improve social welfare data systems. Simultaneously, they must confront socio-cultural and administrative obstacles to guarantee effective and equitable execution. An integrated strategy that assesses previous initiatives alongside proactive planning will result in more effective policy development and enhanced outcomes for beneficiaries.

Data integration between regional device organizations (OPD)

The DKI Jakarta Provincial Government then combines the information from the top-down Ministry of Social Affairs with its own social welfare data. The Jaki and CRM applications are the means by which community members can submit new submissions and voice objections to data. The JSC of the DKI Jakarta Provincial Communication, Informatics, and Statistics Office manages both of these services. We carry out integration in conjunction with the DKI Jakarta Provincial Social Service Center to ensure smooth operations.

Furthermore, in addition to possibly receiving data improvements through JAKI or the DKI Jakarta provincial government's CRM, we also receive data improvements from the village deliberation process. This results in the fact that there are indeed some data inputs for the cleansing process. As a result of the village deliberation, the village begins

to play the role, followed by the cadres, and finally the heads or administrators of RT/RW because they have a better understanding of the conditions that their residents are living in. As an example, the village deliberation is one of the ways that we update data regarding social assistance. For the purpose of the data updating process, there are, in fact, some inputs beginning with JAKI, followed by CRM, and also the village deliberation process in the village. In this manner, we simply integrated the separated data with validation. (MG, Head of TU Pusdatin Dinsos DKI Jakarta). The data process to be integrated through the stages illustrated in Figure 2.

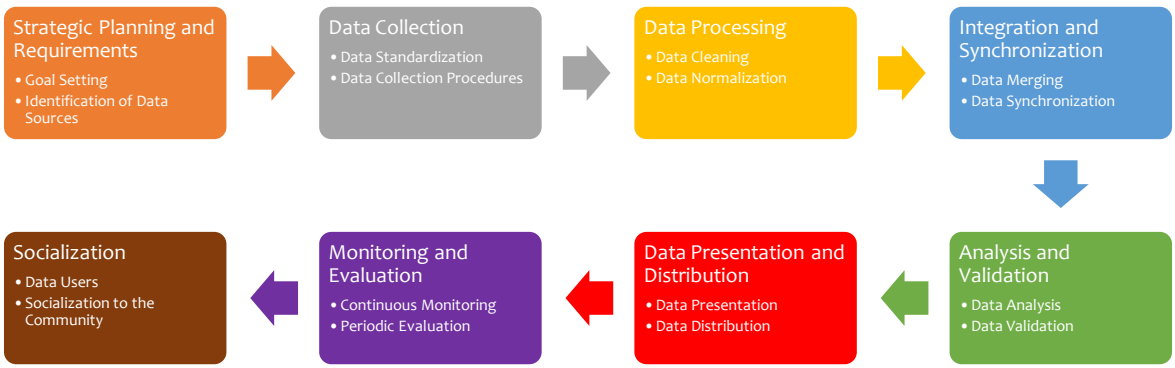

Figure 2. The general stages of the data integration process

In the process that takes place through the Jaki and CRM applications (see Figure 3), JSC has carried out the following with the data center:

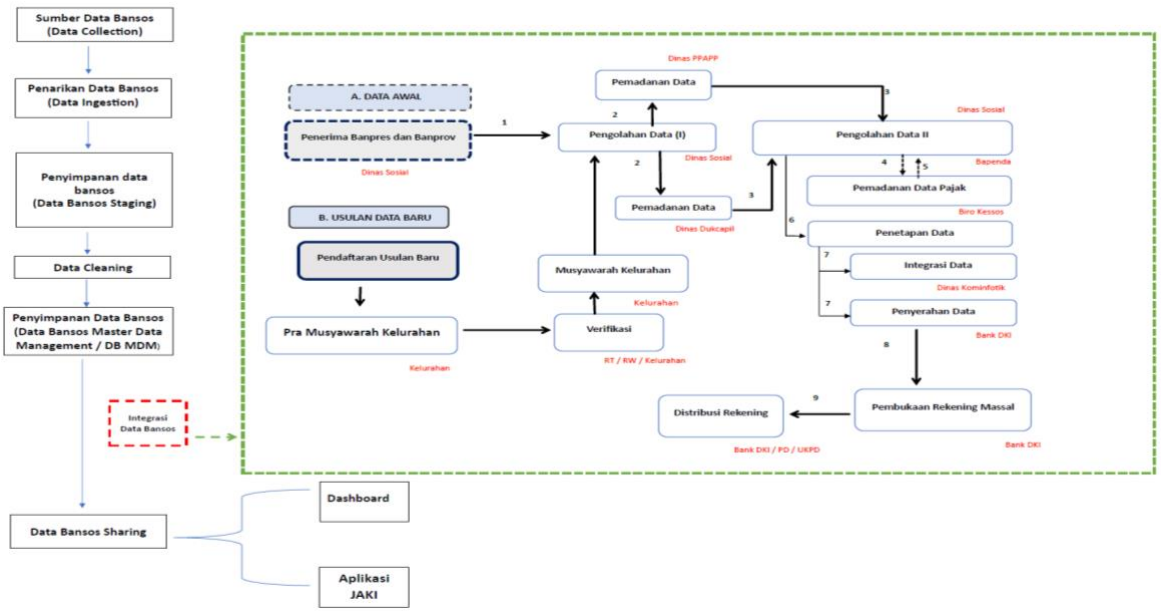

Figure 3. Flow of Social Welfare Data Integration Stages for Social Assistance Through the JAKI and CRM Applications

In response to widespread implementation complaints, the DKI Jakarta Provincial Government has substantially integrated social welfare data. This integration combines Ministry of Social Affairs top-down data with locally collected data to better understand beneficiaries. Community members can submit new data or objects to existing data using innovative platforms like Jaki and CRM. To ensure operational efficiency, the Jakarta Smart City (JSC) team under the Provincial Communication, Informatics, and

Statistics Office manages these services with the DKI Jakarta Provincial Social Service Center. DKI Jakarta's approach is commendable, but studying other regions' efforts reveals lessons and areas for improvement. West Java uses the PIKOBAR platform to combine social welfare, health, and economic data. West Java uses village officials to collect data locally, unlike Jakarta, to ensure accuracy. This grassroots approach has improved trust and reduced errors, addressing DKI Jakarta's data issues. The Central Java provincial government uses Sistem Informasi Kesejahteraan Sosial Next Generation to promote transparency and accessibility. Citizens and government officials can view and update their data on this platform. Central Java reduced welfare program mistrust by integrating local inputs with Ministry of Social Affairs data. While innovative, DKI Jakarta's use of Jaki and CRM still struggles to reach marginalized groups without digital literacy or smartphones, a problem Central Java has solved with offline community-based outreach programs.

East Java's social welfare data integration with private sector organizations is another intriguing model. East Java collaborates with local businesses and NGOs to make social programs data-driven and supported by additional resources and expertise. Our collaborative model contrasts with DKI Jakarta's centralized approach, which could benefit from external stakeholder involvement to address resource constraints and improve system sustainability. Poor data interoperability and lack of coordination between local governments and the Ministry of Social Affairs persist despite regional differences. While DKI Jakarta's integration efforts are commendable, addressing structural issues is necessary for national representation. The Ministry of Social Affairs could enhance provincial data collection and integration standards to ensure consistency while allowing for local adaptations. Comparing these models shows that DKI Jakarta's approach teaches data integration using technology. Best practices from other provinces, such as grassroots verification in West Java, offline outreach in Central Java, and cross-sector collaboration in East Java, could improve the system's inclusivity, accuracy, and sustainability. A nationally representative social welfare data integration strategy must adapt these regional innovations to each province's needs and capacities. Provinces can collaborate and share knowledge to create a more robust and equitable social welfare data system in Indonesia. This will improve social program delivery nationwide, helping those in need.

Conclusion

In summary, the incorporation of social welfare data in Indonesia, especially in DKI Jakarta, encounters various obstacles that impede effective policy formulation and service provision. Notwithstanding progress via platforms like Jakarta Smart City (JSC) and applications such as Jaki and CRM, challenges including data fragmentation, absence of standardization, insufficient technological infrastructure, and inadequate inter-agency coordination endure. These impediments lead to inefficiencies in poverty alleviation initiatives and may intensify socio-economic inequalities. The study

emphasizes the necessity of implementing a holistic strategy that incorporates grassroots data collection, community involvement, and collaboration with diverse stakeholders to improve data precision and availability. By emulating successful models from other provinces and rectifying structural deficiencies, Indonesia can formulate a more efficient and equitable strategy for social welfare data integration, thereby enhancing service delivery to those in need and aligning with the Sustainable Development Goals.

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