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Analysis of smart governance applications in Indonesia (Case Study of Smart Province DIY & West Java)

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Abstract: The implementation of smart governance applications in two pilot projects of the Smart Province in Indonesia, the Jogja Istimewa (DIY) and Sapawarga (West Java) applications, follows different approaches to developing smart governance applications. This study focuses on the types of services provided by each application and on the evaluation of user perceptions, obtained through documentation and data scraping. Jogja Istimewa emphasises transparency, cultural preservation, and digital inclusion. Meanwhile, Sapawarga is oriented towards administrative efficiency, cross-sector integration, and the improvement of data-driven public services. Analysis of user review evaluations confirms these differences in orientation through variations in satisfaction levels, temporal trends, relative participation, and perceptions of application performance. These findings confirm that the effectiveness of smart governance implementation depends not only on technological readiness but also on the local government's ability to understand the socio-spatial context, citizens' needs, and the digital divide between rural and urban areas.

***Key Words**: application, digital divide, digital public services, smart city, smart governance, smart province*

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Introduction

The development of information and communication technology (ICT) in the era of globalisation has become part of urban life. Currently, more than half of the world's population lives in urban areas (Djunaedi et al., 2018). By 2045, the urban population in Indonesia is predicted to reach 67% of the total national population (Bappenas, 2018). Rapid urban population growth has increased demand for public services and placed pressure on cities' capacity (Akhirul et al., 2020). These problems can become complex if local governments are unable to address them effectively. The complexity of urban issues can be overcome through the concept of smart cities, which implement information and communication technology support (Djunaedi et al., 2018; Rachmawati et al., 2021). This

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concept emerged as an alternative to the challenges of modern cities, combining principles of sustainable development (Rachmawati, 2019).

The concept of smart cities was then expanded to smart provinces. Smart provinces are efforts to accelerate digital transformation, aiming to provide effective and efficient public services at the provincial level (Sanjaya & Darma, 2023). Smart provinces are a form of provincial government innovation that involves coordinating across cities and regencies to sustainably and efficiently use resources (Nugroho, 2023). In 2023, the provinces of West Java and Yogyakarta were appointed by the Ministry of Communication and Information Technology as smart province pilot projects (Diskominfo Jabar, 2023).

Both provinces are located on Java Island, the island with the highest population density and the centre of Indonesia's economic development. Both were selected as pilot projects because they have successfully transformed around 80% of their cities/districts into smart cities (Nurauliana et al., 2023). West Java Province has 18 districts and 9 cities, with an area of 37,044.86 km² and a population density of 1,359 people/km² (BPS, 2025). The high population density in West Java indicates a great need for digital services (Jayanthi & Dinaseviani, 2022), while also signifying greater challenges in equalising digital access (Setyasih, 2022). On the other hand, the Province of DIY has only 4 regencies and 1 city, covering an area of 3,170.64 km² and with a population density of 1,186 people/km² (BPS, 202). The smaller, more densely populated area allows for more equitable development of digital technology than in West Java (Rilansari et al., 2022). Shin et al. (2021) identify three factors that influence the digital divide: socio-demographic conditions, digital literacy, and community needs. Putri (2023) adds that digital literacy is a factor that influences the digital divide, as it relates to a community's ability to operate and understand digital technology.

Based on Indonesia's 2021 digital literacy index, DIY ranks first with a score of 3.71. In contrast, West Java ranks 23rd with an index score of 3.47. The high digital divide is caused by the imbalance in digital infrastructure between large cities and rural areas (Nasution, 2016). The demographic and geographical conditions of these two provinces have led to disparities in digital development. An area of research, as well as governmental study, is the phenomenon of the digital divide brought on by uneven development. The study of the digital divide is a growing field of research in knowledge and development and continues to expand in scope and breadth (van Dijk, 2006). Wang et al. (2021) explained that limitations in equitable ICT development contribute to this inequity. Oktavianoor et al. (2020) state that there is a greater divide in the digital area, with an emphasis on rural areas. The study noted that urban communities have greater access to ICT than rural communities (Oktavianoor et al., 2020). Although Indonesia is one of the top countries in the world in the area of the use of social communication media, there is a very big problem in digital communication in both rural and urban areas (Jayanthi & Dinaseviani, 2022)

The two provinces were selected as case studies in this research because they have different and interesting characteristics to compare. The comparison is important for understanding variations in the implementation of smart governance policies in Indonesia. One of the main differences lies in the geographical conditions and administrative structure. This difference is important to analyse to see how the region influences the implementation of technology. The implementation of smart governance at the provincial level must also align with that at the city/district level to run optimally. The success of smart governance depends on multi-level government collaboration (Oktavianoor et al., 2020). The Province of DIY is known for its culture-based governance, realised through the integration of technology and local values. This is also reflected in Peraturan Gubernur Daerah Istimewa Yogyakarta Nomor 32 Tahun 2024 (Governor Regulation of the Special Region of Yogyakarta Number 32 of 2024) concerning the 2024–2028 Jogja Smart

Province Master Plan. The vision of the DIY Governor for the 2022–2027 period through the cultural innovation development and ICT utilisation programme forms the basis for the implementation of the smart province in DIY.

In contrast, West Java emphasises the implementation of technology across various sectors with a large-scale, modern approach (Desy & Alkis, 2018). This study was conducted to analyse the various types of smart governance applications in the case studies of smart provinces in DIY and West Java. Furthermore, this study was conducted to analyse user evaluations of smart governance applications in the case studies of smart provinces in DIY and West Java.

Methods

Data Collection

The data used as research material are secondary, with the unit of analysis being the Jogja Istimewa application in the Province of DIY and the Sapawarga application in the Province of West Java. The data in this study were collected through documentation and data scraping. Documentation was carried out by tracing both applications. The documentation includes data on differences in characteristics and service types across the Jogja Istimewa and Sapawarga applications. At the same time, secondary data was also collected using the data scraping/web scraping method. Data scraping was conducted on metadata and user reviews from the Google Play Store (Flores et al., 2020). The data obtained using this method included star ratings, user names, review times, review dates, and review content. The data were selected from the period from the initial launch through 2024. The Jogja Istimewa application has been available on the Google Play Store since September 2015, while Sapawarga was officially launched only on 13 August 2019. The review data was collected using the Google Play Scraper API, implemented in Python. The data collection process began with creating a library for each application, which was then used to initialise the metadata. The next step was to include several parameters, namely the number of reviews, the language of the reviews, and the display order. All metadata collected successfully was stored in CSV format for further processing and analysis.

Data Processing and Data Analysis

This research applies a qualitative method. The variables used are the types of characteristics and service varieties found in the Jogja Istimewa and Sapawarga applications. The classification of service varieties is based on the functions and roles of the services, analysed according to the classification of public services in the National Government Administration Framework and reinforced by the nine national priority services, as defined by the Ministry of Administrative and Bureaucratic Reform. Based on the National Government Administration Framework (LAN, 2004), the categories of public services include government services, development services, utility services, clothing-food-shelter services, and community services. Meanwhile, the national priority services according to the Ministry of Administrative and Bureaucratic Reform include health services, education, social services, police services, population administration, state financial transactions, civil service, data exchange, and the national public service portal.

Meanwhile, data collected through data scraping were analysed using temporal trend analysis, application ratings, user participation proportion analysis, and user review category analysis. Review time data was analysed using temporal trend analysis between the two applications from the initial launch period until 2024. Ratings were used as an initial quantitative indicator of the general public's perception of public satisfaction. The

meaning of each rating score is explained in Table 1. The user rating assessment categories were adapted from Burhan (2024) and Latief & Ayustira (2020), with adjustments to the context of digital public services tailored to applications.

Table 1. Categories and Interpretations of Application User Rating

Rating	Description	Interpretation
5	Very Satisfied	Indicates the highest level of user satisfaction. Generally given by users who feel that the application is very helpful, works well, and meets their expectations.
4	Satisfied	Indicates that users are satisfied with the application, but there may still be minor technical issues or features that are not yet optimal.
3	Somewhat Satisfied	Indicates a mixed user experience. Users may find the application helpful, but they may also encounter obstacles, leaving them unsatisfied.
2	Dissatisfied	Indicates user dissatisfaction with the application's functionality
1	Very Dissatisfied	Indicates the most negative experience. Generally, this is given because the application is inaccessible, technical failures occur, or key features do not work.

Source: Adapted from Burhan (2024); Latief & Ayustira (2020)

In absolute terms, the number of reviews on the Sapawarga app is much greater than on the Jogja Istimewa app. This phenomenon needs to be highlighted because the disparity in numbers between the two apps does not solely reflect the level of direct community involvement. An analysis of user review categories was conducted to understand user engagement and participation in providing reviews more proportionally. The number of reviews during the initial launch period until 2024 was compared with the number of productive-age residents (16-64 years old) in each province. This approach was taken to ensure a proportional comparison, as the two regions have different demographic conditions.

Table 2. Categories and Interpretations of Application User Reviews

Code	Problem Category	Interpretation
A1	Technical problem	Indicates a functional problem with the application that interferes with basic usage
A2	Network & connection problem	Indicates connectivity issues, either due to the application server or the user's network
A3	Feature problem	Implies a deficiency or malfunction in a feature that should be working
A4	Positive feedback & appreciation	Reviews expressing satisfaction, support, or praise for the application
A5	User suggestions & expectations	Contains constructive feedback in the form of criticism, suggestions, and requests for service improvements

Source: Analysis Results 2025

All user review data was analysed manually and categorised into five main codes (Table 2). The code categories were determined based on the dominant themes that emerged in the user reviews. This code categorisation shows that public responses to users are not only negative complaints, but also appreciation and active participation in providing suggestions to the government. This can reveal patterns in public satisfaction and complaints about the application's features and performance.

Results

Classification of smart governance applications in smart province case studies in DIY and West Java Provinces.

The Special Region of Yogyakarta and West Java Provincial Governments have developed integrated public service applications as part of their smart province initiatives to support the realisation of inclusive and responsive digital-based governance. Each province has implemented this through the development of the Jogja Istimewa and Sapawarga applications (Figures 1 & 2).

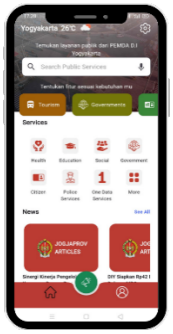

Figure 1. Jogja Istimewa Application

Figure 2. Sapawarga Application

Both applications are designed to expand public access to public services through integrated digital channels. However, the approaches taken and the types of services offered differ in several respects (Table 3).

Table 3. Comparison of the characteristics of the Jogja Istimewa and Sapawarga Applications

Aspect	Jogja Istimewa (DIY)	Sapawarga (West Java)
Navigation Structure	3 main navigation menus: home (providing various types of services), complaints, profile	4 main navigation menus: home, services, information, profile
Service Grouping Basis	National priority services from the Ministry of Administrative and Bureaucratic Reform	Citizen life cycle-based
Main Service Menu	14 main service menus	Life cycle menu (11 sectors) and other service menus (6 sectors)
Service Type	Informative	Transactional
Service Functions	Providing public information	Providing informative services and fulfilling the transactional needs of the community quickly and efficiently
Service Focus	Sectoral public information	User experience
Two-way interaction	Exists but minimal	Exists in some features
Ease of Access to Information	Easy	Easy

Source: Analysis Results 2025

Table 3 shows the differences in characteristics between the two applications. These differences are reflected not only in the interface structure and service grouping, but also in the digital policy philosophy adopted by each local government. The differences in service types were analysed and categorised according to the National Government Administration Framework (LAN, 2004) (Table 4). This classification helps to identify the focus and direction of digital service development in both provinces, while also highlighting the level of service completeness accommodated by each regional digital application.

Table 4. Various Types of Jogja Istimewa and Sapawarga App

Category	Jogja Istimewa (DIY)	Sapawarga (West Java)
Government Services	Samsat, Samsat Corner, E-Posti	Vehicle Tax
	Legal Product, Public Document, Peladen	Permit Services
	WIKI Pemda DIY, Legal Product	Public Information Request
	WIKI Pemda DIY	JDIH
	Jogja Public Services	West Java Hotline
	News	West Java Daily News
	Dataku Bappeda, Indonesia One Data	West Java Info & Data
	Indonesia One Data	West Java Open Data
	E-Lapor	Complaints on Population Data & Broadcasting
	Official Police Contacts	Emergency Numbers
Development Services	Road CCTV	Road CCTV
	-	Road Maintenance Activities
	-	Toponym Mapping
Utility Services	Public Transport (Trans Jogja), Gas Stations, ATMs, Free Internet Zones	-
Clothing, Food, & Housing Services	-	Food Price Info
	Jogja Business (traditional markets, souvenirs)	-
	-	Waste Bank
Community Services	Jogja Belajar, School, Training Schedule	Education Services
	-	Scholarships
	Satu Sehat, Jogja Sehat, Siranap, Clinics, Health Centres, Hospitals	Laboratory Services
	Jogja Sehat, Satu Sehat, Siranap	Health Facility Location Info
	-	Job Vacancies
	-	Community Service (KKN
	Manunggal Raharja, Social Aid Check	Social Aid (Bansos)

Source: Analysis Results 2025

The classification shown in Table 4 indicates that Jogja Istimewa excels at integrating culture, tourism, and urban interaction into its services, while Sapawarga focuses more on administrative aspects and population data systems. Furthermore, Jogja Istimewa tends to offer more interactive, spatially connected services. More specifically, differences in service types are reinforced when compared using the nine national priority services set by the Ministry of Administrative and Bureaucratic Reform (Table 5).

Table 5. Comparison of the Types of Services Offered by the Jogja Istimewa and Sapawarga Applications Based on the National Priority Services of the Ministry of Administrative and Bureaucratic Reform

National Priority Services	Jogja Istimewa (DIY)	Sapawarga (West Java)	Differences
Education Services	Education Menu (*Jogja Belajar* (Interactive Learning Videos), School, Training Schedule)	Education Menu (Higher Education, School, Non-formal Education, Complaints)	Jogja Istimewa only provides a training directory and general information, without direct administrative services. Sapawarga provides administrative services and programmes.
Health Services	Health Menu (*Jogja Sehat* (Health Facility Directory), *SIRANAP* (Hospital Bed Availability Information System), *Satu Sehat* (Health Facility Information System))	Health Menu (Laboratories, Health Facilities, Emergency Numbers, Complaints)	Jogja Istimewa does not yet have a rapid response service like Sapawarga. Sapawarga is more responsive to emergencies.
Social Assistance Services	Social Menu (Social Assistance Check, *Manunggal Raharja* (Social Assistance Information And Verification Service)	The Social & Legal menu only contains Complaints, and the Social Assistance menu is linked to other sectors.	Jogja Istimewa has social assistance (Bansos) checking feature. Sapawarga disseminates information on assistance in several menus, but does not provide a direct channel for checking social assistance.
Police Services	Police Services (National Police and Regional Police)	No direct police services available	There is a specific police services menu on Sapawarga
Employment Services	-	Career menu (Job Vacancies, Training & Certification)	Only available on Sapawarga, supporting the integration of employment services.
Integrated Licensing Transactions	Government Menu (Servers, Legal Products)	Some licensing services, such as permits related to the education sector (e.g., special education schools/*SLB*) and research permits, are available across the Education and Business menus.	Sapawarga has begun to integrate cross-sector licensing services more explicitly.
Population Administration Services	Citizen Menu (Rusunawa) – only related to housing.	Family Menu (Population Administration)	Sapawarga more explicitly supports the integration of Adminduk services.
National Public Service Portal	E-Report Menu	The Complaints feature is available in all menus (except	Sapawarga is more systematic and integrated in each menu.

		JDIH/Legal Documentation and Information Network)	
Data Exchange/One Data Indonesia	One Data Service Menu (*Dataku Bappeda* (regional data platform managed by the Regional Development Planning Agency), Indonesia One Data) – not available (server error)	Other Services Menu (Open Data Jabar)	Both provide open data channels, but Jogja Istimewa is not yet optimal.
Non-Priority Additional Services	Live CCTV, SiBakul Jogja, Teras Malioboro, JITV, Explore Jogja	*Rupa Bumi* (Geospatial Information Service), Food Price Info, Waste Bank, CSR (Corporate Social Responsibility), Interactive Tourism, Public Facility Reservations	Each has its own unique local thematic strengths.

Based on Table 5, both applications have demonstrated fundamental similarities in the services they provide in the education and health sectors, their complaint channels, and their data transparency. This indicates that both DIY and West Java have followed national policies in promoting the digitisation of essential public service sectors. Sapawarga is generally superior in terms of service coverage to meet citizens' life-cycle needs. The approach based on life phases makes it easier for users to explore services that suit their individual contexts, ranging from education and careers to health and emergency response. Meanwhile, Jogja Istimewa places greater emphasis on disseminating information and promoting local culture through channels such as Explore Jogja, JITV, and SiBakul Jogja. The Jogja Istimewa application remains directive and informative, and does not yet offer many administrative services directly connected to transactional public services. Many basic service features on the Jogja Istimewa application are not yet available or cannot be fully accessed. These limitations mean that Jogja Istimewa has not yet fully achieved its target of integrating national priority services.

Analysing user evaluation of smart governance applications in smart province case studies in DIY and West Java Provinces.

Several indicators were used to analyse user evaluations of both applications, namely the number of reviews, the review period, ratings, and review content. An analysis of annual trends in the number of user reviews for both applications was conducted from the initial launch period until 2024. This shows the temporal dynamics of the development of patterns of public interaction with integrated government digital services through applications over time (Figure 3).

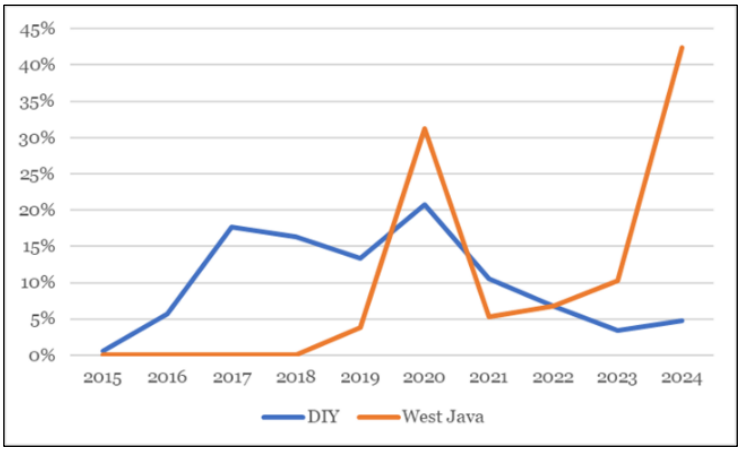

Figure 3. Number of Jogja Istimewa App and Sapawarga App Reviews per Year

Source: Analysis Results 2025

In absolute terms, the number of reviews on the Sapawarga application is much greater than on the Jogja Istimewa application (Figure 3). This phenomenon needs to be highlighted because the disparity in numbers between the two applications does not solely reflect the level of direct citizen engagement. Therefore, this comparative analysis focuses on the proportion and dynamics of annual review trends between the two applications.

Rating distribution as a quantitative indicator is used to assess user perceptions of the quality of digital services provided by the provincial government through integrated applications (Abdillah & Pramesti, 2024). This data provides an initial overview of user acceptance and satisfaction levels. Based on user ratings for the Jogja Istimewa and Sapawarga applications from the initial launch period until 2024 (Figure 4). Both show similar results at first glance, but upon further analysis, they differ significantly (Figure 4). The dynamics of rating on both applications show variations in user satisfaction between the two regions.

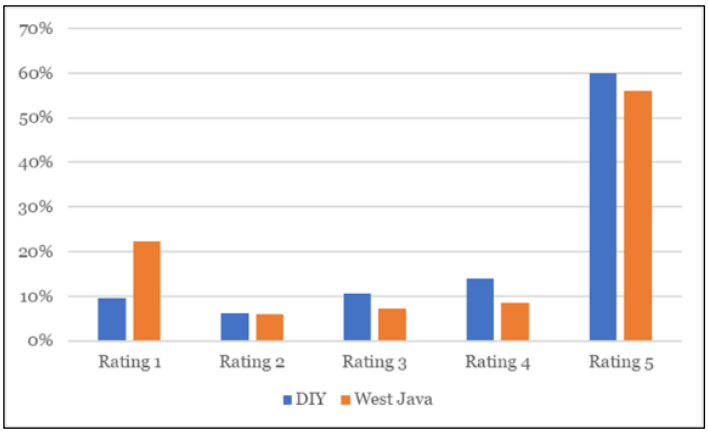

Figure 4. User ratings for the Jogja Istimewa and Sapawarga applications (Initial launch period-2024)

Source: Analysis Results 2025

Overall, both applications, Jogja Istimewa and Sapawarga show a dominance of high ratings (4 and 5), indicating generally positive user perceptions. However, Sapawarga records a higher proportion of low ratings compared to Jogja Istimewa, suggesting more frequent user dissatisfaction in certain aspects of the service. In absolute terms, Sapawarga also has a significantly higher number of reviews and ratings than Jogja Istimewa.

However, the population difference between the two provinces makes an absolute comparison unfair. Therefore, population size is used as a weighting factor in the analysis. This comparison is based on the number of users, the number of reviews, and the proportion of reviews to the population in each province. As explained earlier, the number of reviews between the two applications cannot be directly compared because doing so would introduce bias that would affect the research results. In this context, the absolute number of reviews is insufficient to represent the level of engagement or the success of digital application implementation by local governments. Therefore, the number of reviews needs to be compared with the number of productive-age residents in each province to maintain equality and minimise bias. This approach was chosen to obtain results that are more representative of the age group of potential users of the application. The productive age group in question refers to those aged 15-64, who are generally more digitally literate and more actively involved in accessing public services. This comparative analysis was conducted as an initial indicator of public engagement with integrated digital public services through applications within the smart governance ecosystem.

Table 6. Comparison of Jogja Istimewa and Sapawarga Applications

Aspect	Jogja Istimewa (DIY)	Sapawarga (West Java)
Average Rating	4,08	3,69
Review Time Period	September 23, 2015-2024	August 13, 2019-2024
Total Reviews	787	4.189
Populasi (2024)	3.759,5	50.345,2
Ratio	1	13,39
No. of Working-Age Population	2.583.740	35.406.838
Users per 100,000 Working-Age Population	30	12

Source: Analysis Results 2025

Based on the comparative results, several observations can be drawn. West Java has a population approximately 13.39 times larger than that of the Special Region of Yogyakarta, making population size a critical factor in comparing the two applications. After adjusting for population, the findings indicate that the number of reviews for Jogja Istimewa exceeds those for Sapawarga. This suggests a higher level of user participation in providing reviews for Jogja Istimewa compared with Sapawarga. A similar pattern is observed in average ratings, with Jogja Istimewa receiving higher scores, reflecting greater user satisfaction.

The comparison of user-review categories for Jogja Istimewa and Sapawarga from launch through 2024, shows that user characteristics and experiences with digital services in each region shape distinct perceptions and evaluation patterns. Both applications exhibit a predominance of code A4, which encompasses positive feedback and appreciation for the respective applications (Table 7).

Table 7. Categories and Interpretations of Jogja Istimewa and Sapawarga Applications User Reviews

Code	Description	Jogja Istimewa (DIY)		Sapawarga (West Java)	
		No. of Reviews	%	No. of Reviews	%
A1	Technical & general issues	53	7%	877	21%
A2	Network & connection issues	16	2%	61	1%
A3	Feature issues	148	19%	363	9%
A4	Positive feedback & appreciation	425	54%	2575	61%
A5	User suggestions & expectations	145	18%	313	7%
	Total	787	100%	4189	100%

Source: Analysis Results 2025

The characteristics of user grievances concerning the functionalities of the two applications exhibit significant divergence. Regarding Jogja Istimewa, the functionalities most frequently highlighted by users include CCTV services, a limited set of service features, outdated information, and a lack of interactive capabilities. Conversely, with respect to Sapawarga, users most commonly mentioned functionalities such as inquiries about taxation, payment of motor vehicle taxes, ticket acquisition, and the student admission (PPDB) feature. More specifically, user assessments were classified based on the nature of the technical difficulties encountered and the type of affirmative feedback received. As indicated by the study's results, technical challenges were categorised into five distinct groups, while commendatory reviews were organised into six categories (Table 8 & Table 9).

Table 8. Problems of Jogja Istimewa and Sapawarga Applications

Problems	Jogja Istimewa (DIY)	Sapawarga (West Java)
Bug/Error	Only a few users, and the frequency is not too frequent	Frequent errors occur, especially in transaction services and access to services
Performance	Performance is quite good.	There are often complaints about the speed of access to certain services.
Feature Completeness	Some features that users expect are not yet available	Many features, but not yet maximised
Accessibility & Convenience	-	There are some user reviews about the lack of easy navigation.
Security & Data	-	There are some complaints from users.

Source: Analysis Results 2025

Table 9. Positive Reviews of Jogja Istimewa and Sapawarga Applications

Problems	Jogja Istimewa (DIY)	Sapawarga (West Java)
Ease of Use	Easy to use and simple navigation	Fairly easy to use, some features are less intuitive
Useful Features	Useful but still limited	More varied features
Manager Response	Quite fast	Some users find it less attractive
Display	Design is modern and comfortable	There are some reviews from users about the lack of easy navigation
Information accuracy Information	Information is quite accurate and updated frequently	Information is accurate, but updates are sometimes late

Government Program Support	Support DIY public services	Integrate with government policies

Source: Analysis Results 2025

Both applications have their pros and cons (Table 8 & Table 9). However, Jogja Istimewa is perceived as more stable and easier to use, while Sapawarga offers more features but is less stable and requires ongoing improvements in its functionality and performance to provide a stable, good user experience.

Discussions

The Jogja Istimewa and the Sapawarga apps from Yogyakarta and West Java, respectively, have, in principle, implemented initiatives aligned with national policies that encourage the digitalisation of essential public services. However, there are fundamental discrepancies in the implementation of policies for the digitalisation of public services in the context of smart governance, evident in interface designs, service categorisation, and the philosophies of digital governance policies of the provincial governments.

The Jogja Istimewa application displays attributes of a system developed using a top-down approach. Its service categories align directly with the nine top-priority service categories set by the Ministry of Administrative and Bureaucratic Reform, as there is a strong compliance with the central government. The application informs users who access it about the rules and policies by situating them in context. This implies that Jogja Istimewa emphasises transparency and the accessibility of information as part of open government initiatives.

Rukmaningtyas & Akbar (2024) assert that transparency is achieved when the data provided leads to tangible results. This indicates that data transparency is enhanced when mechanisms that facilitate stakeholder feedback and data visualisation are incorporated (Matheus et al., 2023). Consequently, the Jogja Istimewa application serves as a paradigmatic instance of the utilisation of open government and open data to foster civic engagement and advance local innovation (Wang et al., 2024).

Although the comprehensive range of services at Jogja Istimewa is commendable, the services seem to be in a state of stagnation, leading to a balance that is yet comparatively unchanging in user ratings. The breadth of services is still largely prescriptive, reflecting a limited set of service functionalities that directly support transactional services in the public sector. The deficiencies in the service's functionality, coupled with the paucity of available features, are contributing to a gradual decline in user engagement across the board. The Jogja Istimewa app, created by the Local Government of the Special Region of Yogyakarta, has strong functionality for utility services and development services that are absent on the Sapawarga platform. These services demonstrate the province's efforts toward digital inclusiveness and public safety. An inclusive smart city is defined as a technologically advanced urban development system that promotes ease of access to the services offered and encourages participation (Liang et al., 2021). This shows that Jogja Istimewa has a strong focus on the fusion of offline and online services to address digital disparities, especially for the disadvantaged. Digital disparity has been a dominant issue in the creation of inclusive cities (Kolotouchkina et al., 2022). Aditya et al. (2023) contend that one of the key issues for countries is the digital inequity faced by the rest of the population.

As part of the smart infrastructure of the 'smart' province system, closed-circuit television (CCTV) performs an invaluable role (Djunaedi et al., 2018). CCTV is also part of

the security system of the Intelligent Transport System (ITS) (Huyen & Thai, 2024). Surveillance of urban hotspots promotes urban safety and sustainable mobility. Moreover, it complies with the requisitions of good governance, as it enables the citizenry to access real-time information on the status of the roads and traffic (Prateeppornnarong, 2025)

A considerable proportion of user feedback, which includes both accolades and critiques, within the application predominantly focuses on this specific service. This trend suggests that CCTV functionality is considered the most critical element of the overall system. Nonetheless, despite its pivotal role, CCTV services frequently become points of vulnerability in the event of technical malfunctions, thereby highlighting the imperative for enhanced quality assurance measures and ongoing surveillance to ensure the reliability of digital service provision. The governmental authorities may need to consider integrating the system with more robust intelligent surveillance technologies, in conjunction with automated failure-reporting mechanisms capable of identifying technical anomalies in real time. Intelligent surveillance has emerged as a manifestation of smart city initiatives within public monitoring frameworks, enabling the derivation of more precise data to facilitate automated decision-making (Alkaf & Sutrisno, 2019).

Concurrently, the Sapawarga initiative is advanced through a participatory design-thinking paradigm, in which citizens are perceived as the primary beneficiaries of digital public services. This is illustrated by the life-cycle-focused service model, which categorises services by the pivotal aspects of citizens' lives, thereby enhancing both their importance and accessibility. This exemplifies citizen-centric principles and reflects a comprehensive understanding of residents' needs over time. In contrast to the Jogja Istimewa application, which serves a purely informational purpose, Sapawarga is characterised by its operational and transactional nature, effectively connecting citizens to governmental public service frameworks. User evaluations similarly demonstrate that the functionality and breadth of services embedded in the Sapawarga application positively influence user satisfaction. This reinforces the premise that favourable user responses are shaped not merely by technical performance but by the degree to which digital services align with citizens' practical needs in their daily lives (Shin & Huh, 2016). Nevertheless, the extensive range of features offered by Sapawarga also introduces a set of challenges that are both more complex and more intensive. These challenges arise from its position as a one-stop service platform operating at a substantially larger population scale and across a wider geographical scope (Citarum Harum Juara, 2023). As the platform has evolved, the increasing complexity of its functionalities has produced a more polarised distribution of user ratings, characterised by both highly positive appraisals and more pointed criticisms.

The stated modifications have led to a significant increase in the cumulative number of user evaluations over a given period. During the application's initial stage, Sapawarga predominantly attracted users from specific demographic cohorts. A remarkable escalation in reviews was documented in 2023, which coincided with the West Java Provincial Government's strategic initiatives to expand the user base and diversify digital services. This improved accessibility enhanced the application's usability for a wider demographic, leading to increased evaluative activities.

The discrepancy in user reviews across the two provinces illustrates the need to address public concerns about digital services. Large differences between predicted and actual user experience can lead to poor reviews (Amba et al., 2023). Consequently, governments need to improve the user feedback mechanism and system to create better user experiences (Trisya et al., 2024). In this regard, the Provincial Government of West Java needs to examine further the sources of dissatisfaction to fine-tune services and achieve better user outcomes. At the same time, the Provincial Government of Special Region Yogyakarta can view its consistent rating of integrated public-service applications as an indicator of its

success in maintaining user confidence. In addition, the rating for an application is a valuable resource for assessing it and developing a better plan to address user dissatisfaction. This comparison demonstrates that, within the framework of smart governance, the influence of digital technology is inextricably linked to the socio-political climate and policy direction, and not merely the technology itself (Togala et al., 2025)

The population of West Java is about 13 times larger than that of the Special Region of Yogyakarta, given the two provinces' demographic traits. However, the inhabitants of the Yogyakarta Special Region were more likely to respond to and assess the digital tools made available by their local governments than those in the other provinces. Hence, even though the absolute number of users was higher in West Java, in terms of qualitative digital engagement, the Special Region of Yogyakarta was much better, further aggravated by the province's higher rank in the 2024 Indonesia Digital Society Index (IDSI). The Special Region of Yogyakarta has a score of 47.10 based on its strongest pillars of infrastructure and ecosystem, while West Java has a lower IDSI score of 46.66.

These ratios exhibit two characteristics. The first is that citizens' digital engagement in regional public service systems is not strictly determined by population size or regional geography. The second is that within the Indonesian provinces, the Special Region of Yogyakarta (DIY) is more engaged, albeit qualitatively, in using government digital services. Accordingly, digital participation is more closely tied to the structural and cultural dimensions of digital literacy, trust in domestically developed digital systems, and the efficiency of communication between the government and the people.

As regards the socio-demographic profile of the Special Region of Yogyakarta (DIY), owing to its profile, DIY has an average educational level that is higher than most regions in Indonesia. This is made possible by his above-average HDI (Human Development Index) scores (Prajoko et al., 2024). Indeed, DIY ranks second in the country's HDI ranking, behind only Jakarta (Firhani, 2024). These socio-demographic attributes may be related to residents' ability to utilise digital public services with analytical, evaluative, and critical responsiveness. In addition, the province's small size, both territorial and administrative, allows for more individualised and personalised management and delivery of digital service applications. Along with West Java having the largest population in the country, complexities in engaging citizens in even, fair, and balanced ways arise (Mufrida, 2024). The interplay of regional diversity, digital divides across regions, and differences in digital literacy may strain the capacity of digital feedback tools. Because of this, a high volume of feedback may be more reflective of regions with greater digital access and skills than of a balanced representation of the population. Most Sapawarga users are in urban centres in West Java Province. Further, Supriyatin et al. (2020) indicate that, owing to its position as the provincial capital and its relatively advanced infrastructure, the city of Bandung has been the most developed.

On the other hand, the lowest percentage of Sapawarga users resides in the rural southern regions of West Java. West Java as a whole, and rural areas within peripheral regions, are noticeably different from urban areas. The rural area is far from the provincial administrative centre, and the lack of digital infrastructure is a major challenge for users of the application. The limited use of the application can be attributed to the digital divide theory (Van Dijk, 2006). The digital divide theory postulates that the lack of technological adoption is an outcome of the area's socio-demographic attributes, as well as its digital infrastructure. The area's socio-demographic attributes, along with digital infrastructure, are crucial determinants. The peripheral regions, particularly the southern areas of Java, are in a higher need of development (Nurahmani, 2022). This need is indicated in the Peraturan Gubernur Daerah Istimewa Yogyakarta Nomor 32 Tahun 2024 (Presidential

Regulations No 87 of 2021), which focuses on improving infrastructure and developing other facilities to influence the socio-economic status of the region and the whole country.

Outcomes from this study provide evidence from which implications for the theory of smart governance can be drawn. As Prabowo et al. (2022) point out, the impact of digital public service applications is not a function of user participation. Impact can be assessed by measuring the quality of participation and the extent to which the participation is relevant. Along with creating integrated digital service platforms, governments need to be keen to ensure that citizen participation is inclusive, represents diverse audiences, and is meaningful to the issue at hand (Hidayat, 2025). Local governments need to engage organically and sustainably through digital literacy, enhanced data transparency, and input-output feedback mechanisms that allow citizens to be heard and acknowledged (Ramadhan et al., 2024). More digitally inclusive and participatory service models will likely motivate engagement and participation, and support the retention of intended outcomes (Budiarto et al., 2024).

As such, when analysing such data, one must take into account the contextual data that correlates with the datasets. In the absence of population-level data, one may encounter conclusions drawn from user reviews that may not be entirely accurate. The digital public services user reviews do not take into account community technology engagement, societal structured use of ICT readiness, and digital services access inequity. As digital public services users review, public service success is not determined solely by the volume of users, but by the quality of engagement (Rosidi & Sakuntalawati, 2022). This reinforces the notion that digital public service success is not about how many users there are or how accessible they are, but about the quality of user engagement and participation.

Researching digital governance in Indonesia focuses on the informatics resilience model, which emphasises transparency, and a participatory model, which emphasises service integration. Both models indicate that the success of digital governance is not only about innovation in services but also about the acceptance of socio-spatial contexts, population needs, and governance continuity. Both models allow for integrating public service digitalisation and developing a smart governance system. Active models of public service digitalisation enable the development of an inclusive, responsive, and equitable smart governance system.

Conclusions

The research shows that the smart governance implementation varies across the provinces. Differences are due to specific regional practices shaped by combinations of institutional traits, policy directions, and geographical conditions. The Jogja Istimewa application by the Special Region of Yogyakarta (DIY) aligns with the province's Smart Province vision, emphasising local values and community engagement, with a focus on transparency, cultural identity, and digital inclusion. In comparison, the Sapawarga application by West Java Province focuses on administrative efficiency, the integration of public services, and responsiveness to the public, mirroring the regional government's adaptive, data-driven digital transformation.

The analysis of user reviews further supports the differences. There are certain patterns of satisfaction and complaint that indicate that the presence of specific technologies is not the only factor affecting the outcomes of smart governance. Further analysis of user reviews shifts the study's focus to the need for a citizen-centred approach as a dominant premise for the development of digital government initiatives. Injustice and inequality are most often the driving factors behind the development of digital government initiatives.

Therefore, such initiatives need to be designed in a way that not only fosters public trust and improves relationships between users and the government, but is also elastic enough to adapt to technological advancements. The future of smart province development should shift its focus from the sole development of technologies to the socio-technical sensibility of each region.

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