Agile Governance and Innovation Measurement Journal

Vol 1, No 1 (2024): Page no: 35-43

Inventing the Future: Yogyakarta City Government's Policy in Actualizing Smart City

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Article Info

Check for updates

Article History;
Received:
2024-02-20
Revised:
2024-03-25
Accepted:
2024-03-26

Abstract: Yogyakarta is a notable tourist destination in Indonesia, known for its abundant cultural legacy, historical significance, and natural splendor. Yogyakarta may improve the experience of travelers by adopting smart city initiatives, which involve the implementation of advanced technology to offer improved information and services. This includes efficient management of transportation, interactive tourist applications, and the development of tourism-friendly infrastructure. Smart technology in a smart city can enhance the citizens' quality of life. In response to these difficulties, the government has implemented several initiatives, one of which involves transforming Yogyakarta into a smart city, or, in other words, a technologically advanced urban area. The government has established an internet and intranet network in Yogyakarta, effectively connecting the city and transforming it into a smart city. The application of the smart city idea in Yogyakarta Municipality yields a wide range of benefits. An example of such a policy is the e-Health policy, which brings about advantages for patients and MCH service users. These benefits include faster and more convenient services, as well as more accurate patient data. The JSS (Jogja Smart Service) application is a significant advancement in the sphere of public services, serving as the first implementation of Smart City and e-government in Yogyakarta.

Keywords: *Smart City; e-government; e-Health Policy.*

INTRODUCTION

The city of Yogyakarta continues to improve and develop its tourism sector after being recognized as one of the ten best destinations in Indonesia according to the Traveler's Choice Award 2017. The city government, seeing great potential in sectors such as education, tourism, technology, and the active participation of the local community, is working with the central government to develop Yogyakarta into a smart city. Yogyakarta is one of Indonesia's famous tourist destinations, with a rich cultural heritage, history, and natural beauty. By becoming a smart city, Yogyakarta can enhance the traveler's experience with the use of smart technology to provide better information and services, such as efficient transport management, interactive tourism applications, and tourism-enabled infrastructure. In a smart city, smart technology can be used to improve the quality of life of residents. For example, the use of technology to manage and monitor air quality, efficient waste management, energy savings, and better traffic regulation can have a positive impact on people's lives. As a smart city, Yogyakarta can become a center of technological innovation that drives economic development. Encouraging digital entrepreneurship and supporting the tech startup ecosystem can create new jobs, improve economic competitiveness, and drive the growth of the tech sector in the region. By turning

Yogyakarta into a smart city, it can increase tourism, improve quality of life, and foster innovation and economic development (Faidat & Khozin, 2018).

The concept known as a smart city is a concept that emphasizes a smart city order, which aims to facilitate the community in obtaining information quickly and accurately. There are important issues that must be managed by government policies in the development of the city of Yogyakarta into a smart city. Yogyakarta is a city with a high level of tourists, so it is also densely populated. To overcome the problem of the difficulty of tourists and the people of Yogyakarta itself who find it difficult to access the city tour, the development of the city into a smart city is an effective solution. It requires a strong information and communication technology (ICT) infrastructure, including applications that can make it easier for tourists, a fast, affordable, and reliable internet network that covers the entire city area, as well as the use of sensors and smart technology to manage traffic and improve drainage systems (Ramadhani et al., 2020).

With the issue of these problems, the government has made various policies, one of which is making Jogjakarta a smart city, or in other words, a sophisticated city. By making Yogyakarta a smart city, the government has built an internet and intranet network in Yogyakarta and has been well connected. All Regional Apparatus Organizations and Work Units in the City Hall complex and in 126 locations outside the City Hall complex. 126 locations outside the City Hall complex have been connected to the internet/intranet network. The details are as follows: 1) Kelurahan: 45, 2) Sub-districts: 14, 3) Puskesmas: 18, 4) Sub-Community Health Centres: 10, 5) Regional Apparatus Organizations/Work Units outside the City Hall complex:39, and the Yogyakarta government has created the JSS (Jogja Smart Service) application, which is useful for: Tourist Information, Booking and Reservation, Navigation and Directions, and Complaints and Assistance Services (Sah & Suhartono, 2018).

The benefits obtained from the implementation of the smart city concept in Yogyakarta City are diverse. One of them is the e-Health policy, where the benefits are felt by patients and users of MCH services, specifically services become faster and easier, and patient data becomes more accurate (Saharuddin, 2018). Then in the field of public services, there is the JSS (Jogja Smart Service) application, where the application is a concrete first step in realizing a smart city and e-government in Yogyakarta (Auralia et al., 2022). In addition to the JSS application, the application of the Citizen Charter in public service policies has brought positive changes where public service delivery is increasingly accountable, responsive, and transparent, and the community as service users is starting to realize their rights and dare to control the delivery of services carried out by the government bureaucracy slowly (Rohmah, 2020).

Although there are benefits and successes in implementing smart cities in the city of Yogyakarta, there are still some shortcomings in the implementation of policies in implementing smart cities. The Government has the readiness to build the city of Yogyakarta into a smart city, but the community is not ready (Sah & Suhartono, 2018b). Then, in the implementation of smart cities in Yogyakarta City, it has not fully achieved suitability in adopting the dimensions of sustainable economy and smart governance (Ferza et al., 2022). In the one data policy, data management by SKPD Information and publications related to e-KTP, NIK, population databases, and other related aspects have been found, but the utilization of population databases in district and city governments is still minimal (Hastuti, 2020).

RESEARCH METHOD

Research methods refer to the systematic procedures employed by researchers to acquire data or information. The research approach encompasses a comprehensive outline of the research design, which includes the methodologies, data sources, data types, and data analysis

techniques employed. Research methods are typically categorized into three types: quantitative, qualitative, and mixed methods. For this investigation, we employed qualitative research methodologies. The qualitative method is a research approach that does not rely on statistical methods or calculations to achieve results. Instead, it focuses on understanding and interpreting the significance of human behavior and interaction events in specific contexts, from the researcher's perspective. Qualitative approaches aim to comprehend and interpret the significance of the interplay of events in human behavior within specific contexts, as perceived by the researchers themselves. This qualitative research aims to gain a comprehensive understanding of the conditions within a specific context by providing a full and thorough description of the current state of affairs in a natural setting. This involves examining the real occurrences and phenomena within the subject of study (Olsson, 2008). Qualitative research is a form of research that generates discoveries that cannot be obtained using statistical procedures or other quantitative methods. A type of research that can be employed to study various aspects of community life, history, behavior, functional organizations, social movements, or kinship relationships. Also, it is a method of research that generates descriptive data by seeing and analyzing the speech, writing, and behavior of individuals. This qualitative investigation enables the acquisition of a comprehension of reality through an inductive cognitive process.

RESULTS AND DISCUSSION

Public Service Reform and the Foundation for Smart City Implementation

It is known that the implementation of smart city-based public services in Yogyakarta began in 2003, starting with public service reform by implementing citizen charter or contract-based services. A citizen charter or service contract is a form of participatory service management aimed at encouraging each stakeholder (citizens as stakeholders, service providers, and the private sector) to jointly agree on how public services should be carried out as well as possible. This agreement then becomes a binding contract between the service providers and users. The public can use the service contract overseeing service providers and service users with the help of the contract as a guideline in providing services. Initially, the citizen charter was applied to birth certificate services in 2003 and ID card-making in 2005 (Rohmah, 2020). In addition to the citizen charter, public complaint services began in the same year.

Yogyakarta is a densely populated city and many tourists come to Yogyakarta. So, becoming a smart city is one way to overcome these problems. A smart city requires a strong information and communication technology (ICT) infrastructure. It requires a fast, affordable, and reliable internet network that covers the entire city. In 2015, the Yogyakarta City Government issued Mayor Regulation No. 15/2015 on E-government as one of the foundations for implementing the smart city concept. The regulation contains steps in the development of e-government in Yogyakarta, including (1) improving network infrastructure, (2) strengthening information system infrastructure, (3) integration and development of application data, (4) data warehouse, (5) smart city policies. Following these regulations and following the development of technology and information that is increasingly complex, with the need for services that are mobile and simple, in October 2018, the Yogyakarta City Government launched a public service application, called Jogja Smart Service (JSS). The application contains services that have been connected to all OPDs (Regional Apparatus Organizations), such as general services, data and information services, city government partners, information and complaints, and emergencies.

The Effectiveness of Smart City-Based Public Services in Yogyakarta Municipality

In assessing the effectiveness of smart city-based public services in Yogyakarta City, it is necessary to know the six elements contained in the smart city concept. The six elements are

(Ferza et al., 2022; Yogyakarta et al., 2022); Smart Governance (SG) emphasizes transparency, a sense of responsibility, and the willingness of the government to perform its duties competitively. Smart Mobility (SM) emphasizes the ability to advance transformation and development as urban infrastructure improves. Smart Economy (SE) emphasizes the quality to innovate and compete. Smart Living (SL) emphasizes the importance of ensuring an adequate quality of life for people. Smart Environment (SE) emphasizes the importance of sustainable, comfortable, and community-friendly environmental management.

Smart Governance

With the launch of the JSS Application by the Yogyakarta City government, the community showed its readiness and enthusiasm for the realization of Yogyakarta City as a smart city. This is indicated by the participation and involvement of the people of Yogyakarta city, who have an important collaborative relationship in smart governance by maximizing the service system contained in the Yogyakarta city government (Kencono, 2021). Although there are still shortcomings, such as not including a vital element of public policy formulation, namely the absorption of public aspirations as the substance of public policy (Ferza et al., 2022). The Yogyakarta City Government's policy for building a smart city can be effectively elaborated with the concept of smart governance. Smart governance plays a crucial role in the implementation of smart city initiatives, ensuring efficient and effective delivery of services to citizens (Anand & Navío-Marco, 2018). In the context of smart cities, governance is a key factor that influences the success of such initiatives. Smart governance involves aspects such as transparency, accountability, and effective decision-making processes (Mukhlis et al., 2021). It is essential to address spatial inequalities and ensure that smart city development contributes to the overall well-being of all residents (Mukhlis et al., 2021). Furthermore, the integration of smart governance principles can help promote inclusive development and enhance the local economy within a smart city framework (Vujković et al., 2022).

The concept of smart public governance (SPG) is gaining attention globally, emphasizing the importance of modernizing public administration through emerging technologies at both local (smart city) and national (smart government) levels (Ngo & Le, 2021). Effective governance is essential for the successful implementation of smart city projects, ensuring that they align with the needs and priorities of the community (Sukmadiansyah & Noviaristanti, 2022). Cities in Indonesia, such as Semarang and Bandung, have embarked on smart city development initiatives driven by the central government's encouragement to enhance public services through ICT (Lumbanraja, 2021). To accelerate sustainable development, the urgency of smart city regulations in Indonesia has been emphasized, highlighting the role of smart city concepts in addressing urban challenges and promoting sustainable urbanization. By leveraging smart governance practices, cities like Yogyakarta can enhance their regulatory frameworks and governance structures to support the transition towards smart city development.

Smart Mobility

The Yogyakarta city government is working on the integration of public vehicles and development that supports community activities in traveling, one of which is the Transjogja program as a means of public transportation. Yogyakarta's focus on smart mobility is in line with its broader vision of creating a more sustainable urban environment with reduced environmental impact and enhanced quality of life for its residents (Benevolo et al., 2015). Through coordinated actions to enhance transportation efficiency, effectiveness, and environmental sustainability, Yogyakarta Municipality aims to optimize travel time, reduce road congestion, accidents, and harmful emissions (Angelevska & Atanasova, 2021). Moreover, the integration of smart mobility

concepts into Yogyakarta's smart city framework contributes to sustainable urban development. By utilizing information and communication technologies, the city can optimize travel time, reduce space usage, and enhance overall transportation efficiency (Angelevska & Atanasova, 2021). This approach not only enhances mobility within the city but also fosters a more environmentally conscious and livable urban environment. Yogyakarta's emphasis on smart mobility indicators highlights its dedication to developing a more connected, efficient, and sustainable urban transportation system. By prioritizing smart mobility initiatives, Yogyakarta is taking significant strides toward achieving its smart city objectives and improving the overall quality of life for its residents.

Furthermore, the incorporation of Information and Communication Technologies (ICT) in conjunction with Intelligent Transportation Systems (ITS) is essential for optimizing the utilization of current transportation infrastructure, thereby enhancing safety, security, mobility, and environmental sustainability in urban regions such as Yogyakarta. The use of mobile applications, such as the "Jogja Pass," has played a crucial role in facilitating the execution of smart city initiatives in Yogyakarta, specifically in addressing the difficulties brought about by the COVID-19 epidemic (Kusmawati & Rachmawati, 2022). The implementation of intelligent transportation systems in cities such as Yogyakarta is intricately connected to the city's transformation into a smart city. The objective is to offer user-friendly services and improve the efficiency of urban transportation (Marchesani, 2023). Yogyakarta aims to develop a transportation system that is more efficient, sustainable, and citizen-centric by prioritizing smart mobility metrics. This initiative is in line with the city's smart city objectives (Nooringsih & Susanti, 2022).

Smart Economy

The Governor of Yogyakarta encourages a smart economy to be one of the requirements of a smart city by increasing investment and expanding the field of commercial and guaranteed e-commerce services for SMEs. Even Yogyakarta's digital economy is favored in the regional scope. Although the COVID-19 pandemic shows shortcomings in the implementation of SE, one of which is that there is no advanced sectoral planning of the overall digitalization activities of MSMEs (Ferza et al., 2022). The development of the smart city in Yogyakarta, particularly focusing on the smart economy, is centered on promoting innovation, entrepreneurship, and economic competitiveness within the city. Through the utilization of Information and Communication Technologies (ICT) and innovative solutions, Yogyakarta aims to establish a thriving economic ecosystem that supports sustainable development and enhances the quality of life for its residents (Pratama, 2018).

Yogyakarta's smart city initiatives in the smart economy sector are in line with the city's vision to empower the community, ensure security, enhance infrastructure, and promote local cultural values (Pratama, 2018). By highlighting aspects such as innovation, entrepreneurship, productivity, and global competitiveness, Yogyakarta is striving to create a dynamic economic environment that integrates with both national and international markets (Pratama, 2018). Moreover, the implementation of smart economy strategies in Yogyakarta is crucial for stimulating economic growth, fostering creativity, and advancing sustainable development. By concentrating on smart economy indicators, the city aims to boost economic competitiveness, generate new business prospects, and enhance the overall economic resilience of the city (Iqbal, 2021). The establishment of a smart city in Yogyakarta with a specific emphasis on a smart economy underscores the city's dedication to utilizing technology and innovation to propel economic growth, entrepreneurship, and competitiveness. By prioritizing smart economy

initiatives, Yogyakarta is laying the foundation for a sustainable and prosperous urban economy that benefits both residents and businesses.

Smart Infrastructure

The development of smart infrastructure in Yogyakarta involves integrating advanced technologies into the city's physical structures to enhance efficiency, sustainability, and quality of life. This includes elements such as 5G connectivity, a cashless economy, automated public transportation, energy-efficient buildings, smart water and waste management systems, and other innovative solutions aimed at improving public safety and enhancing the overall urban environment (Jemat & Kamal, 2021). Efforts to establish smart infrastructure in Yogyakarta are in line with the city's objective of utilizing technology to create a more connected, efficient, and sustainable urban environment. By integrating features like renewable energy, water quality management, smart transportation systems, waste management, smart homes, and public safety measures, Yogyakarta aims to develop a modern and resilient city that caters to the needs of its residents. Moreover, the incorporation of smart infrastructure in Yogyakarta is crucial for optimizing resource utilization, improving service delivery, and promoting environmental sustainability. Through the deployment of technologies such as sensors, IoT devices, and smart grids, the city can effectively monitor and manage critical infrastructure components, leading to enhanced operational efficiency and reduced environmental impact. Implementation of smart infrastructure in Yogyakarta plays a vital role in advancing the city's smart city agenda by integrating technology into urban infrastructure to establish a more efficient, sustainable, and livable urban environment.

Smart Living

The Yogyakarta City Government focuses on improving its culture, community welfare, and security. The development of the smart city in Yogyakarta, particularly focusing on smart living, involves a holistic approach aimed at improving the residents' quality of life by integrating technology and innovative solutions. Yogyakarta's smart city vision encompasses smart living as a core objective, alongside smart tourism and smart culture, achieved through the implementation of various smart service indicators (Iqbal, 2021). The city's commitment to smart living is evident in its mission to empower the community, ensure security and public order, establish integrated spatial arrangements, enhance facilities and infrastructure, and promote environmentally sustainable settlements (Pratama, 2018). By emphasizing smart living indicators, Yogyakarta aims to establish an urban environment that prioritizes the well-being and satisfaction of its residents.

Moreover, the smart living initiatives in Yogyakarta involve utilizing information and communication technologies to enhance urban services, foster community engagement, and elevate the overall quality of life. By integrating smart technologies into housing, utilities and public services, Yogyakarta is striving to develop a more efficient, sustainable, and citizen-centric city. Implementation of the smart city concept in Yogyakarta, with a specific focus on smart living, highlights the city's dedication to leveraging technology and innovation to enhance the residents' quality of life. By giving importance to smart living initiatives and incorporating smart solutions into urban planning, Yogyakarta aims to create a more inclusive, connected, and sustainable urban environment that meets the needs of its inhabitants.

Smart Environment

According to some data, Yogyakarta City has provided internet facilities that make it easy for local people to access. 356 points have been identified as internet access points. With that many access points, the use of JSS (Small Scale Mobile Network) will be more favorable around

the Yogyakarta area. Implementation of the smart city in Yogyakarta in terms of a smart environment involves leveraging technology to enhance environmental conditions, promote sustainability, and optimize resource management. Smart Environment initiatives aim to improve the quality of the urban environment, increase resource efficiency, and create a more sustainable city for residents (Rachmawati et al., 2021).

Yogyakarta's smart city vision includes a focus on a smart environment as one of the key dimensions alongside smart mobility, smart government, smart economy, smart people, smart living, and smart disaster management (Pratama, 2018). By integrating technology to monitor and manage environmental conditions, Yogyakarta aims to create a city that is environmentally friendly, resource-efficient, and resilient to environmental challenges. The implementation of Smart Environment initiatives in Yogyakarta involves utilizing technology to improve environmental monitoring, enhance waste management practices, and promote sustainable urban development. By incorporating smart solutions such as IoT devices, sensors, and data analytics, Yogyakarta can optimize energy consumption, reduce waste generation, and mitigate environmental impacts (Rachmawati et al., 2021). Implementation of the smart city in Yogyakarta in terms of a smart environment underscores the city's commitment to utilizing technology to create a sustainable and environmentally conscious urban environment. By focusing on smart environment initiatives, Yogyakarta aims to enhance environmental quality, promote resource efficiency, and foster a greener and more livable city for its residents.

CONCLUSION

The Yogyakarta administration is currently transforming public services as part of its efforts to develop a smart city. One of the measures they are taking is the implementation of citizen charters or contract-based services. A citizen charter, also known as a service contract, is a kind of participatory service management that seeks to involve all stakeholders, including people, service providers, and the private sector, in order to promote better service delivery. There are five evaluations of the efficiency of smart cities, which are Smart Governance (SG), Smart Mobility (SM), Smart Economy (SE), Smart Living (SL), and Smart Environment (SE). The smart city policy roadmap and smart city policy mapping of the Yogyakarta City Government offer a comprehensive view of the stages and variables that shape the development of a smart city in Yogyakarta. This includes the introduction of the Jogja Istimewa and JSS applications. Furthermore, this study also uncovered some shortcomings, including the inadequate availability of skilled personnel in Yogyakarta to effectively operate ICT systems, as well as the absence of robust legal regulations pertaining to the implementation of the JSS program as a smart city initiative in Yogyakarta. The scarcity of sufficient publications and information regarding the JSS application hinders the public from acquiring comprehensive details about it. All of these vulnerabilities are encompassed in the policy mapping table. Thus, this study offers a concise overview of the deployment of smart city-oriented public services in Yogyakarta and assesses its efficacy in attaining smart city objectives.

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