Journal of Management and Administration Provision
Vol. 5, Issue 3, 2025
Page 461-470
DOI: https://doi.org/10.55885/jmap.v5i3.688

Implementation of Smart City in Palembang City

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Abstract. *This study aims to examine the role of the Department of Communication and Informatics of Palembang City in developing a Smart City. According to a 2022 report from the Central Bureau of Statistics (BPS), approximately 50% of Palembang City residents have access to information regarding public services. This research uses a qualitative method with a descriptive approach. The author chose this approach to gain a deeper understanding of Smart City development in Palembang. The findings indicate that the roles of regulator, dynamizer, facilitator, innovator, and catalyst as outlined in the theory have been partially fulfilled. In addition, the Smart City indicators proposed by Mircea and Lucian namely technology, human resources, and institutional factors have started to be implemented. However, the development of a Smart City in Palembang still faces several challenges, such as limited infrastructure, low digital literacy, and a lack of synergy between government agencies and the community. With thorough planning, continuous innovation, and active participation from all stakeholders, Palembang has great potential to become one of the leading smart cities in Indonesia.In conclusion, the Palembang City Government, especially the Department of Communication and Informatics, needs to enhance its performance in the Smart City development effort by advancing technology and providing digital training to improve human resources. Furthermore, collaboration among local government agencies (OPD) is crucial to accelerating Smart City development in Palembang.*

Keywords: *Smart City, Innovation, Government Role*

Received: July 21, 2025 Received in Revised: August 11, 2025 Accepted: September 13, 2025

INTRODUCTION

Smart Cities aim to improve the quality of life for citizens by providing efficient and responsive services through the use of digital technologies and data analytics (De et al., 2020; Chen & Chan, 2023; Sánchez-Corcuera et al., 2019; Macke et al., 2018). With more intelligent systems, cities can streamline operations and personalize services across various sectors such as transportation, healthcare, and energy ultimately making cities more livable (Parnell et al., 2023; Van, 2024; Wolniak & Stecuła, 2024; Mohammadzadeh et al. 2023). Another key objective of Smart Cities is to achieve sustainability by optimizing resource efficiency and reducing environmental impact.

According to Choi & Song (2022), Smart Cities implement energy-saving technologies and optimize urban resource management through the use of the Internet of Things (IoT) and real-time data, helping cities reduce carbon emissions and extend the lifespan of infrastructure. In the development of a Smart City in Palembang, it is essential to have legal frameworks and regulations that align with on-the-ground conditions.

Currently, Palembang City has several regulations related to Smart City development, one of the most recent being Palembang Mayor Regulation No. 25 of 2023 concerning the Implementation of Electronic-Based Government Systems within the Government Environment.

E-ISSN: 2776-1290, P-ISSN: 2776-1282

However, based on field findings, the regulatory indicator for Smart City development in Palembang still requires updates and additional regulations that better reflect current conditions and the rapid advancement of technology.

Given the fast-paced technological progress, the existence of up-to-date regulations to govern such developments is crucial (Wang et al., 2024; Walter, 2024). One vital aspect of Smart City development is the role of the government as a facilitator. According to role theory, the government functions as a facilitator by creating conducive conditions for development implementation and bridging various community interests to optimize progress. In the context of building a Smart City in Palembang, it is imperative that adequate facilities are in place. However, in practice, the Palembang City Government still falls short in terms of infrastructure and facilities.

This is evident from the researcher's field findings, which indicate the ongoing need to develop appropriate technological facilities to support Smart City initiatives. One of the Smart City dimensions that has been developed in Palembang is the SIDEMANG application. SIDEMANG is a service platform designed to simplify the process for Palembang residents in requesting official documents related to public facilities, while also allowing users to evaluate the effectiveness of the service provided by the Palembang City Government.

The application, introduced by the Mayor of Palembang on March 29, 2022, was developed by the Department of Communication and Informatics of Palembang City. However, field findings indicate that the innovation introduced by the Palembang City Government still faces significant implementation challenges. The application frequently experiences technical issues such as errors or even complete inaccessibility (Kushniruk et al., 2005; Botelho, 2021). These problems are reflected in the research findings, which show that public administrative services are still often carried out manually, resulting in slow and inefficient service delivery.

Official data from the Palembang City Central Bureau of Statistics (BPS) shows that this trend has continued into 2024. The growing population has led to an increased demand for public services and information. Government systems particularly those not yet fully digitally integrated often struggle to serve all citizens efficiently. With a large population, the need for adequate communication infrastructure has become increasingly urgent. According to a 2022 report by BPS, approximately 50% of Palembang residents have sufficient access to information about public services.

Palembang is a city with a steadily growing population over the past five years (2020–2024). In 2020, the population was recorded at approximately 1,668,848 people. In the following years, this number continued to rise, reaching 1,710,830 people by 2023. One of the main challenges in developing a Smart City in Palembang is the digital divide, which can significantly affect the adoption rate of smart technologies across different segments of society (Aditya et al., 2023; Rachmawati et al., 2021; Febriyanti et al., 2023). This gap exists between generations who grew up with technology and those who are not accustomed to digital devices.

Additionally, disparities in education levels and socioeconomic backgrounds can further hinder efforts toward digital literacy. Moreover, privacy concerns represent a serious barrier to building public trust in smart cities (Chouraik, 2024; Ismagilova et al., 2022; Jørgensen & Ma, 2025). While smart technologies offer substantial benefits, a lack of understanding regarding how data is collected, managed, and used can lead to significant privacy issues. Ensuring that citizens are informed about these aspects is a crucial step in overcoming such obstacles.

METHODS

This study employs a descriptive qualitative approach, involving 14 (fourteen) informants consisting of representatives from the Palembang City Government, local community members, and academics. The aim is to understand the informants' perspectives on the development of the Smart City in Palembang. Data sources include both primary and secondary

E-ISSN: 2776-1290, P-ISSN: 2776-1282

data. Primary data were collected through observation, interviews, and documentation, while secondary data were obtained from previous research and academic journals. Data Analysis Techniques: Data Reduction: This is the initial stage in qualitative data analysis aimed at processing raw data into a more manageable form for further analysis. It involves selecting, coding, and categorizing data based on themes or concepts relevant to the research objectives. Data Analysis: Refers to the process of selecting, narrowing down, simplifying, summarizing, and transforming raw data into information that is easier to interpret and meaningful for further analysis. Drawing Conclusions: This is the final stage of qualitative data analysis, intended to answer the research questions. The conclusions drawn at this stage are final and supported by empirical evidence collected through data gathering, data selection, triangulation, and categorization. For this study, we used 14 informants who met the criteria needed to answer the researcher's questions. These included staff from the Governance and E-Government Development Section, the Head of the Encryption and Information Security Section, the Network Controller, and a Junior Computer Expert from the Palembang City Communication and Informatics Agency, all representing the government institution aspect. The research also involved members of the public and academics to validate statements and ensure a consensus on the development of the Smart City in Palembang. The researcher spent approximately one month gathering information from these informants, asking questions related to regulations, technology, and human resources. The study has been approved by the relevant authorities and can be published to help the government prepare the necessary aspects for Smart City development in Palembang.

RESULTS AND DISCUSSION

Regulator

The lack of adequate regulation is one of the key obstacles in the development of a Smart City in Palembang. Existing regulations in Palembang still need to be revised and updated to align with current needs and technological advancements. For example, Palembang Mayor Regulation No. 14 of 2017 on the Guidelines for the Utilization of Information and Communication Technology in the Administration of Regional Government Toward Palembang Smart City, and Palembang Mayor Regulation No. 25 of 2023 regarding the implementation of an electronic-based government system within the city administration, are steps in that direction. However, when compared to cities such as Surakarta, Palembang's regulations appear less comprehensive. Surakarta has established a more robust regulatory framework to support Smart City development, such as Surakarta Mayor Regulation (Perwali) No. 8.6 of 2022, which outlines the strategic analysis for Smart City development, the Surakarta Smart City Master Plan, and the Executive Summary for the Smart City of Surakarta (2021–2026). Unlike Palembang, which focuses solely on electronic-based governance systems within government institutions, Surakarta's regulations present a more holistic plan for Smart City development.

This issue is further supported by input from key informants, such as staff from the Governance and E-Government Development Division and the Communication Network Controller at the Palembang City Communication and Informatics Agency. They acknowledged that while Palembang does have some regulations such as Mayor Regulation No. 14 of 2017 these are not yet sufficient. The informants emphasized the need for regulatory updates and additions that reflect the current technological landscape (Luthringer et al., 2015). This is essential to establish a solid legal foundation for effectively implementing Smart City initiatives in Palembang. The reason why the regulations owned by the City of Palembang are still lacking or can be said to be insufficient in terms of building a Smart City is because this is not a priority for the Palembang City Communication and Information Agency. This is due to a lack of awareness and readiness from the resources owned by the government and the community of Palembang City. This is also supported by the results of interviews with several informants that have been collected using the data reduction method.

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Dynamizer

Socialization efforts were only carried out once, in 2022, solely to introduce the SIDEMANG application, and even then, the initiative involved only government actors. The lack of outreach to the public regarding Smart City development in Palembang has resulted in low levels of public understanding and participation in the programs being implemented. Citizens do not yet fully comprehend the concept of a Smart City, its potential benefits, or their roles in supporting the success of such initiatives. As a result, innovations introduced by the government such as public service applications, technology-based urban management, and improved service efficiency have not been optimally utilized due to the limited engagement from residents. Without effective socialization, there is also a higher risk of misunderstandings, resistance, or distrust toward newly implemented policies. Therefore, more serious efforts are required to promote public awareness and involvement (Khatibi et al., 2021). In comparison, the Bandung City Government has taken a more proactive approach by involving various actors in socializing Smart City programs, extending outreach down to the neighborhood level (RW).

These local leaders play a crucial role in mobilizing community participation and strengthening collaboration to support Smart City development in Bandung. Increasing the capacity of neighborhood leaders is expected to enhance their knowledge and skills in identifying and managing self-reliant community initiatives based on information and communication technologies. This point is supported by interviews with several Palembang residents, which reveal that public outreach about Smart City programs has yet to reach the broader community. Therefore, the Palembang City Government particularly the Department of Communication and Informatics needs to intensify its socialization efforts. Residents should be fully involved in the development of the Smart City, as they are the primary users of public services. The government must devise strategies to ensure that the public not only understands and accepts the Smart City concept, but also embraces it across all demographic groups, from youth to the elderly.

Facilitator

Findings from this study indicate that the facilities provided by the Palembang City Department of Communication and Informatics are generally sufficient but not yet fully adequate to support the development of a Smart City. The limited availability of technological infrastructure in public spaces poses a significant barrier to the dissemination of information to the public. The research also revealed that the lack of technological readiness for Smart City development in Palembang is driven by several key factors. Chief among them are the limitations in digital infrastructure, such as uneven internet coverage and insufficient server capacity. While the Department of Communication and Informatics has installed approximately 50 free Wi-Fi access points at various locations throughout the city, the impact on public information dissemination remains limited particularly in suburban and outlying areas. In comparison, Bandung City has made more substantial progress by deploying around 500 free Wi-Fi access points, including in parks and remote neighborhoods, thereby significantly improving digital access and public engagement.

The problems experienced in the facilitator indicator are a lack of funds to complete the facilities needed to build a Smart City in Palembang, as well as a lack of adequate human resources to use or apply the facilities that support the Smart City in Palembang. This was validated by several informants from the Palembang City Communication and Informatics Agency who stated that the current lack of facilities is due to a lack of finances and human resource readiness in managing these facilities. These findings are further supported by interviews with Palembang residents, as well as officials from the Department of Communication and Informatics, including the Head of Encryption and Information Security and the Communication Network Controller. They confirmed that the lack of digital facilities in public areas continues to hinder the distribution of public information. They also emphasized the need for more digital devices and infrastructure such as free Wi-Fi hotspots in public spaces to allow the public to access internet

E-ISSN: 2776-1290, P-ISSN: 2776-1282

services freely and conveniently. Moreover, residents expressed hope that digital infrastructure would also be expanded to Palembang's suburban areas, many of which still lack basic digital connectivity. In these areas, accessing the internet remains challenging, highlighting the urgent need for equitable digital development throughout the entire city.

Innovator

Based on the researcher's findings, the Palembang City Department of Communication and Informatics has made efforts to update its public service systems through the SIDEMANG application. However, its implementation has not aligned with official claims. In reality, many residents in Palembang still rely on manual procedures for accessing public administrative services. This situation highlights the need for regular evaluation and monitoring to ensure that the application is truly usable and beneficial to the public particularly in streamlining administrative processes to deliver faster and more effective services. This stands in contrast to the Bogor City Government, which has made notable digital service innovations. For instance, the SiBadra application enables rapid responses to public complaints, while the SOLID (Social Data Integration) application allows residents to register for social services such as BPJS (national health insurance), social assistance (BANSOS), and the Integrated Social Welfare Data (DTKS) online.

However, field observations and interviews with several Palembang residents reveal that SIDEMANG has not been functioning optimally. Users frequently encounter system errors or disruptions when trying to use the application, which has led many residents to continue accessing administrative services manually at local government offices. This manual process is no longer effective, particularly given the city's growing population. Therefore, it is crucial that the Department of Communication and Informatics urgently addresses and improves the application's performance. This reality contradicts the official statement from the Department of Communication and Informatics, which claims that the SIDEMANG application is fully functional and accessible across various districts in Palembang. Yet, field evidence points to the continued reliance on manual systems, demonstrating inefficiencies in the delivery of public services and underutilization of available digital technologies.

These findings are also supported by a related study by Purnama et al. (2024) titled "The Effectiveness of Smart Living Implementation Through the Teman Bus Application in Palembang City." The study shows that while the Teman Bus application introduced significant improvements in transportation services compared to the previous system, it also faced frequent technical issues, including system errors and inconsistencies between route information in the app and the actual routes on the ground. Chatterjee & Kar (2018) said that, this suggests that while digital innovation is essential, technical reliability and user experience remain critical challenges in successful Smart City implementation. When it comes to the innovator role, the Palembang City Communication and Informatics Agency's application, SIDEMANG, is facing issues from both the government and the public. From the government's side, the challenge lies in a lack of readiness to apply digital applications to public services, which hinders the public service system.

Meanwhile, from the public's perspective, the problems in using the application can be seen in the generation gap between millennials, Gen Z (or "Zoomers"), and even baby boomers who use the app, which highlights the need for the application to be extremely well-prepared. This is also supported by the results of interviews with informants, which were summarized using data reduction. They state that public trust in the government is another factor why this application is not yet fully functional under the current administration. This lack of public trust in the government's ability to innovate public service systems stems from the high number of personal data loss cases due to an unsecure security system. In conclusion, based on the various indicators used in the theory of roles for this research, the Palembang City Communication and

E-ISSN: 2776-1290, P-ISSN: 2776-1282

Informatics Agency's role in implementing Smart City development in Palembang has not been fully met due to a lack of readiness in the aspects of the roles used.

Catalyst

Through various initiatives, the Department of Communication and Informatics (Diskominfo) of Palembang has positioned itself as a key driver in creating a digital ecosystem that supports the city's transition toward a smarter and more integrated urban environment. This catalytic role is evident in its efforts to facilitate digital infrastructure such as providing public internet access, developing public service information systems, and launching digital platforms aimed at enhancing government transparency. In addition, Diskominfo has established cross-sectoral collaborations, reflecting that its catalytic function is not only technical but also strategic (Berthanila et al., 2025). It plays a crucial role in building innovation networks that accelerate the adoption of technology across multiple sectors of society. In this regard, Diskominfo is not only driving the acceleration of Smart City development but also ensuring that the process remains inclusive and sustainable for all citizens of Palembang. Nevertheless, the Palembang City Government still lags behind compared to what has been achieved by the Jakarta City Government.

Jakarta has developed an official complaint-handling application called Citizen Relationship Management (CRM). Currently, there are 13 official public service apps, including JAKI (Jakarta Kini). Through JAKI, citizens can access a wide range of public services, including verified official information from Jakarta's regional departments (OPD) to counter misinformation, health services such as ambulance calls and disease screening (both communicable and non-communicable), and reporting issues in their surroundings. One of JAKI's core functions is serving as an official complaint channel managed by the Jakarta Provincial Government. Complaints submitted through the app are forwarded to the appropriate OPD for follow-up. JAKI is not only accessible to the general public but is also used by government stakeholders from sub-district and urban village officials to regional departments. As of now, Palembang does not yet have a comparable system, which highlights a significant gap in its Smart City infrastructure and community engagement mechanisms.

Technology

The city of Palembang has shown some progress albeit not yet significant in terms of urban security systems, evidenced by the functioning CCTV networks in several key locations. These operational CCTV systems play an important role in supporting public safety and order and represent part of Palembang's efforts toward becoming a Smart City. However, there remains a need to expand CCTV coverage in public spaces, including smaller alleyways, to enhance overall city security. This approach has already been implemented in Jakarta, where CCTV cameras have been installed not only on major roads prone to traffic congestion but also in small alleys to prevent crime. Palembang also faces significant challenges, particularly concerning budget constraints for maintaining communication networks and CCTV systems. Although the existing technology infrastructure such as CCTV has been installed and is operational in certain areas, limited financial resources have hindered both the sustainability and effectiveness of these systems. Furthermore, the expansion of network infrastructure, including preparations for adopting 5G technology, remains constrained by inadequate budget allocations. Therefore, there is an urgent need for more well-planned financing strategies and support from multiple stakeholders to ensure that Palembang's digital infrastructure and security systems can continue to develop and function optimally.

Based on interview data, the researcher found alignment between the views of the Palembang Department of Communication and Informatics and local citizens. Both parties acknowledge that the availability of public technology and free WiFi is currently insufficient to meet the public's need for access to public information. In addition, security and maintenance of these facilities must be given more serious attention. Building a Smart City in Palembang requires

E-ISSN: 2776-1290, P-ISSN: 2776-1282

adequate technological support, particularly reliable internet services, which are vital for enabling digital transformation. However, a Smart City is not only about internet access but also about ensuring public safety. The researcher discovered that the current CCTV system is still suboptimal. According to data from Mr. Rianda Pratama, M.Kom., from the Palembang Department of Communication and Informatics, only 10 CCTV cameras are actively monitored by the agency, and these are only located in limited areas such as around the Grand Mosque of Palembang. This number is clearly inadequate from a citywide security perspective, as the lack of real-time surveillance through existing technology may contribute to higher crime rates.

Human Resources

In the city of Palembang, the presence of qualified human resources (HR) is a critical factor in operating, managing, and developing smart systems such as communication networks, CCTV surveillance, digital government services, and other technological infrastructures. Adequate human resources also include the ability to adapt to technological changes and collaborate across sectors to realize efficient, transparent, and sustainable urban governance. The researcher found that one of the main challenges in developing a Smart City in Palembang is the lack of adequate human resources, both among government officials and the general public. Limited understanding and skills in digital technology have hindered the optimal use of existing digital systems. Therefore, training and capacity-building programs are urgently needed, especially for the Palembang Department of Communication and Informatics, which plays a central role in managing the city's digital infrastructure. On the other hand, the public also needs to be educated and equipped with digital literacy so they can actively and responsibly participate in utilizing technology-based services (Reddy et al., 2022). Enhancing human capital in this manner will serve as a crucial foundation for building an inclusive and sustainable Smart City in Palembang.

The study also revealed that the human resources within the Department of Communication and Informatics remain insufficient. Interviews with a Young Expert Computer Analyst and the Head of Encryption and Information Security Division indicated that the personnel currently lack competence due to insufficient digital training, especially on Smart City themes. There is also a low level of awareness and understanding regarding the Smart City concept itself. Additionally, public responses suggest that individuals with digital technology expertise tend to prefer working in the private sector due to higher salaries and more flexible work arrangements, rather than in government institutions. These findings are further supported by a study conducted by Isabella et al. (2023) titled "Implementing Digital Literacy Policies and the Challenges of Towards Smart City in Palembang City", which emphasized that digital literacy is a crucial element in creating a capable workforce and in maximizing the benefits of smart technologies for building a sustainable and inclusive Smart City.

Institutional

The institutional dimension is crucial for the development of a Smart City, as it requires support from the government and robust policies as the foundation for implementation. These policies should not only govern inter-agency relations but also include non-institutional forms and multi-sectoral cooperation. The institutional approach encompasses the development of adaptive policies, clear regulatory frameworks, inter-agency coordination, and transparent, responsive governance. The researcher found that the development of a Smart City in Palembang has established a sufficient institutional foundation, as evidenced by the existence of preliminary policies, institutional structures, and digital service initiatives. However, to achieve optimal Smart City implementation, the current institutional indicators must be expanded and updated. These improvements should include the formulation of regulations that are more responsive to technological advancements, strengthening cross-sectoral coordination, enhancing human resource capacity, and actively and systematically involving the public.

E-ISSN: 2776-1290, P-ISSN: 2776-1282

With institutional reinforcement, Palembang will be better equipped to build a sustainable, inclusive, and citizen-responsive Smart City ecosystem. The Palembang City Government could learn from the example of the Surakarta City Government, which already has a clear Smart City development plan. This conclusion is supported by interviews with informants from the E-Government Governance and Development Section, Young Expert Computer Analysts, as well as community members, who stated that institutional frameworks and regulations need to be expanded to provide a strong legal foundation for Smart City policies. However, the government must also consider and analyze existing real-world problems, ensuring that future policies align with current conditions and challenges.

Additionally, the government should engage a wide range of stakeholders government institutions, the private sector, and the community because Smart City initiatives are ultimately designed to benefit and involve all layers of society. It is also the government's responsibility to encourage citizens to embrace and utilize technology in their daily lives. This view is further supported by a study conducted by Isabella et al. (2024) entitled "Cultivating Tech-savvy Communities: Revitalizing Digital Literacy in Palembang City", which emphasizes that the success of Smart City implementation depends heavily on the support of regulations, policies, and equitable internet infrastructure across all regions in Indonesia, including Palembang. The government and relevant stakeholders must continue to improve Smart City-related facilities and infrastructure, such as expanding stable internet access and promoting the digital economy through the development of online businesses. Joint government-community education programs should also be actively promoted to ensure that the people of Palembang gain a deeper understanding of Smart City concepts and applications.

CONCLUSION

Based on the research findings and discussions presented in the previous chapter, it can be concluded that the role of the Department of Communication and Informatics (Diskominfo) of Palembang City in developing a Smart City has not yet been fully optimized. This is evident through the application of role theory indicators: the Regulator role still requires regulatory updates, the Dynamizer role needs increased outreach and public engagement, the Facilitator role demands the provision of more digital infrastructure, the Innovator role calls for the development of new innovations, and the Catalyst role highlights the need for enhanced inter-agency collaboration. Furthermore, in terms of Smart City dimensions: technology still requires the adoption of more advanced tools; human resources must be further developed in terms of digital skills; and the institutional framework needs to be adjusted through more adaptive and supportive policies. The implementation of Smart City initiatives in Palembang also faces several challenges, such as limited digital infrastructure, insufficient technological literacy among the public, and the lack of integration among government agencies. Therefore, a strong commitment from local government, active community participation, and collaboration with the private sector are essential for ensuring the sustainability of this initiative. Overall, while the development of a Smart City in Palembang has shown positive progress, it still requires improvements in the areas of technology, regulation, and public engagement in order to realize a truly modern and inclusive urban environment.

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E-ISSN: 2776-1290, P-ISSN: 2776-1282