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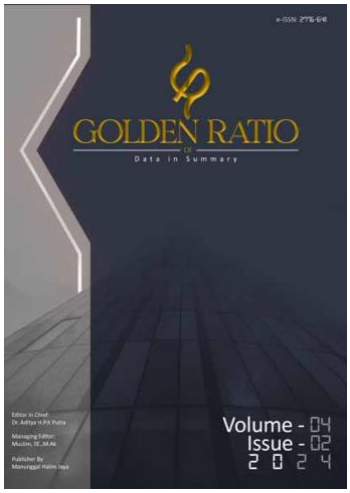

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DESCRIPTIVE OF QUANTITATIVE DATA | SUPPLEMENTARY

The Role of DISKOMINFO in Accelerating Development Smart City Development in Samarinda City

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Abstract: This study aims to analyze the role of the Department of Communication and Informatics (DISKOMINFO) in accelerating the development of the smart city initiative in Samarinda, and to provide recommendations for further improvement. As the capital of East Kalimantan Province and a key economic hub, Samarinda recognizes the importance of adopting technology to enhance public services and create a sustainable environment. A qualitative approach was employed to understand DISKOMINFO's role in the smart city initiatives. Primary data sources included DISKOMINFO employees, relevant stakeholders, and the community involved in the smart city projects. Informants were selected purposively. Data collection involved in-depth interviews with DISKOMINFO staff, stakeholders, and selected community members, along with the analysis of official documents and reports related to the smart city initiatives. The data was analyzed using content analysis to identify patterns, themes, and relationships between concepts. The findings indicate that DISKOMINFO plays a crucial role in coordinating, implementing, and overseeing smart city initiatives in Samarinda. The study also reveals that while significant progress has been made in certain areas, further efforts are needed to improve inter-agency collaboration, enhance technological capacity, and increase active community participation. The results of this research are expected to serve as a reference for policymakers in strengthening sustainable smart city initiatives in Samarinda.

Keywords: DISKOMINFO Samarinda, Smart City.

1. INTRODUCTION

The development of smart cities has become a primary focus for many urban centers globally, including Samarinda City. The concept of a smart city integrates information and communication technology (ICT) to enhance the quality of life for citizens, improve the efficiency of public services, and create sustainable environments. As cities worldwide face increasing urban challenges, the adoption of smart city frameworks is seen as a vital strategy for addressing issues such as traffic congestion, environmental degradation, and the demand for more efficient public services (Khan et al., 2015). In this context, the Department of Communication and Informatics (DISKOMINFO) plays a strategic role in facilitating the transformation toward a smart city.

Samarinda, as the economic hub and capital of East Kalimantan Province, has recognized the importance of technological adaptation to improve public service quality. DISKOMINFO, the agency responsible for managing information and technology within the city, is at the forefront of realizing Samarinda's vision of becoming an "Informative City towards a Smart City (Sumber: https://DISKOMINFO.samarindakota.go.id/laman/sejarah-dinas). The role of DISKOMINFO extends beyond merely providing technological infrastructure; it also encompasses data management, public communication, and empowering communities through information technology (Giffinger & Gudrun, 2010). This multifaceted approach is critical to achieving the city's smart city ambitions, which include enhanced access to information, improved public service efficiency, and greater public participation in governance (Caragliu et al., 2011). Given the importance of DISKOMINFO's role in the development of a smart city, this research aims to conduct an in-depth analysis of the strategies and

implementations undertaken by DISKOMINFO in Samarinda. The focus of this study is to explore DISKOMINFO's efforts in developing technology infrastructure to support the acceleration of smart city initiatives. Furthermore, the research seeks to identify the supporting and inhibiting factors that impact DISKOMINFO's ability to facilitate these developments (Meijer & Bolívar, 2016).

This study is highly relevant in the context of global smart city development trends, as it addresses both the general phenomenon of urban digital transformation and the specific challenges faced by Samarinda (Albino et al., 2015). By examining the effectiveness of DISKOMINFO's strategies, the research will provide valuable insights into the agency's role in driving the smart city agenda in Samarinda. The objective of this quantitative study is to evaluate the extent to which DISKOMINFO contributes to the acceleration of smart city development in Samarinda and to offer recommendations for further improvement. The findings are expected to contribute to the broader discourse on smart city development, providing practical implications for policymakers, academics, and the community in supporting the sustainable vision of Samarinda as a smart city (Nam & Pardo, 2011).

2. LITERATURE REVIEW

2.1 Concept of Smart City

A city becomes a distinct concept when it is studied as a specific context, with emphasis on functional rather than rigid definitions (Matyja, 2017). Modern cities are seen as socio-economic systems, marked by the complexity of elements and relationships that integrate urban components for growth (Stawasz & Sikora-Fernandez, 2015). Urban development is driven by migration from rural to urban areas, with 55% of the global population living in urban areas by 2018. This figure is projected to rise to 68% by 2050, mainly in Asia and Africa (United Nations, 2018). This trend highlights the need for innovative management of urban complexities.

Intensive urban development poses challenges such as uncontrolled growth, environmental pollution, infrastructure strain, waste management, an aging population, economic disparities, and low citizen participation (Winkowska, Szpilko, & Pejić, 2019). The smart city concept has gained popularity as a strategy to address these issues, promoting creative, sustainable urban areas that enhance quality of life and economic prospects (Lee et al., 2014). "Smartness" in this context refers to improvements in infrastructure, resources, and public services, aiming for efficient use of resources, better service quality, and reduced administrative costs (Allwinkle & Cruickshank, 2011; Zanella et al., 2014). It is understood that a city can be defined as smart if it has the following elements:

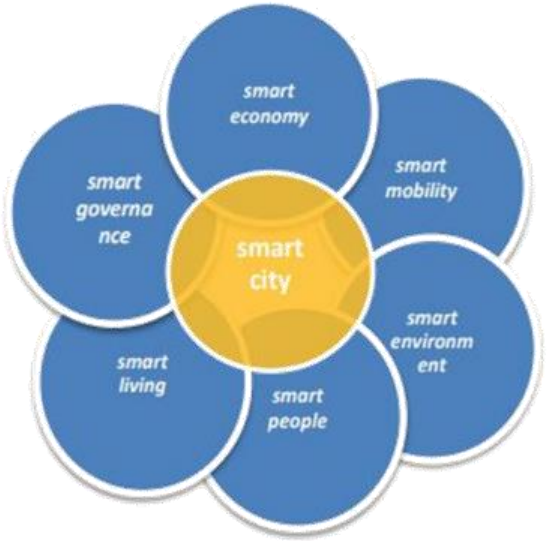

Figure 1. Smart City Element

1) Smart Economy: This concept involves leveraging information technology and innovation to strengthen the city's economic sector. It includes the development of business hubs and initiatives

to drive knowledge-based economic growth, such as fostering high-tech entrepreneurship, investing in creative industries, and empowering SMEs through technology.

2) Smart Mobility: This area focuses on innovative and sustainable transportation solutions that utilize technology to enhance transportation efficiency, improve logistics systems, and provide smart public transport options. These solutions may include app-based public transit, autonomous vehicles, and environmentally friendly infrastructure.
3) Smart Environment: Emphasizing the use of technology to maintain environmental sustainability, this concept includes deploying sensors and monitoring technology to measure and manage air, water, and soil quality. It also encompasses strategies to improve energy efficiency and reduce the carbon footprint.
4) Smart People: Centered on enhancing the well-being and engagement of residents, this concept includes initiatives to improve access to healthcare, education, and cultural services. It also involves using technology to boost citizen engagement, participation in decision-making, and community empowerment.
5) Smart Living: This focuses on providing services and infrastructure that make daily life more comfortable, safe, and efficient, including smart homes, tech-based healthcare services, smart city security, and effective waste management.
6) Smart Governance: This concept involves applying information technology to improve the efficiency and transparency of city management. Smart governance includes e-government systems, big data for decision-making, and citizen engagement through online platforms for feedback and participation in decision-making processes.

2.2 Smart City Development in Indonesia

The development of the smart city concept has transformed urban landscapes into intelligent and connected ecosystems, where information and communication technology (ICT) serves as the backbone for sustainability and efficiency. Within this context, the Department of Communication and Informatics (DISKOMINFO) plays a crucial central role in managing ICT and guiding urban digital transformation.

According to Susanty & Yuningsih (2021), DISKOMINFO's key roles in ICT management include:

1. Provision of ICT Infrastructure: DISKOMINFO is responsible for providing the ICT infrastructure that forms the foundation of a smart city. This includes developing broadband networks, implementing smart sensor technology, and offering digital platforms that support extensive connectivity. A robust infrastructure enables the city to integrate data from various sources and better serve the needs of its residents.
2. Data Management: Effective data management is a critical aspect of DISKOMINFO's role in a smart city. DISKOMINFO must manage and analyze data collected from various sensors and connected devices to provide valuable insights. Efficient data management allows the city to make smarter decisions, respond to residents' needs, and improve urban service quality.
3. Development of Public Service Support Applications: DISKOMINFO's role extends beyond technical aspects to include the development of applications that support public services. These applications may include city information systems, tech-based healthcare services, or citizen participation platforms to enhance community engagement. By leveraging application technology, DISKOMINFO can facilitate residents' access to city services.

2.3 Smart City Development in Indonesia

The development of the smart city concept in Indonesia has become a key focus for the government as it addresses the challenges of urbanization, population growth, and increasingly complex urban services. In Indonesia, the smart city concept not only relies on technology but also emphasizes community participation, sustainability, and the improvement of quality of life (Arafah & Winarso, 2020). The Indonesian government has launched various initiatives to promote smart city development, integrating information technology in public services, improving urban infrastructure,

and enhancing living standards. Major cities like Jakarta, Surabaya, and Bandung have pioneered the implementation of smart city concepts. The success of smart city development in Indonesia is also supported by collaboration between the government and the private sector. Involving technology companies, service providers, and local business communities has accelerated the implementation of smart technologies in various sectors, including transportation, healthcare, and waste management (Fauzi, 2023).

As technology advances, the implementation of smart cities in Indonesia leverages the Internet of Things (IoT), big data, and artificial intelligence (AI). The use of smart sensors, data analytics, and digital platforms has become key components in enhancing urban efficiency and sustainability. Despite significant progress, smart city development in Indonesia faces challenges, including the uneven availability of infrastructure, data security, and levels of community engagement (Erwin et al., 2023). Addressing these challenges requires integrated strategies and the involvement of various stakeholders. It is crucial to recognize that smart city implementation in Indonesia must also consider social and cultural aspects. Technology acceptance by the community, understanding local culture, and inclusivity in smart city planning are key factors for success. Case studies have been conducted to evaluate the impact and success of smart city projects in Indonesia. These analyses are essential for learning lessons and designing more effective strategies for future smart city development.

The journey of smart city development in Indonesia is a fascinating evolution where the government, private sector, and community work together to create smarter, more efficient, and inclusive urban environments. By understanding local challenges and potential, Indonesia can continue to be a hub of innovation in designing smart solutions for the future of urban life (Prasetyo et al., 2018).

3. RESEARCH DESIGN AND METHOD

3.1. Research Design

This study employs a qualitative approach to deeply understand the role of the Department of Communication and Informatics (DISKOMINFO) in accelerating the development of the smart city in Samarinda. This approach explores the complex aspects of DISKOMINFO's strategy implementation and its impact on the community.

3.2. Data Sources

The primary data sources for this research include all DISKOMINFO employees in Samarinda, relevant stakeholders, and community members involved in the smart city initiatives. Key informants and participants were selected purposively, targeting respondents with significant knowledge and experience related to DISKOMINFO's role. Secondary data sources include profiles of DISKOMINFO Samarinda, books, journals, and relevant articles that support the research.

3.3. Data Collection Techniques

The data collection techniques used in this study include:

a. In-Depth Interviews: Interviews will be conducted with DISKOMINFO employees, stakeholders, and selected community members to gain deep insights into the strategies, implementation, and perceptions of DISKOMINFO's role.
b. Document Analysis: Data will be gathered from official DISKOMINFO documents, policies, and reports related to the smart city in Samarinda to provide context and support the findings from the interviews.

3.4. Research Focus

The research focuses on the following areas:

a) Provision of ICT Infrastructure

b) Data Management
c) Development of Public Service Support Applications

3.5. Data Analysis

Qualitative data will be analyzed using content analysis to identify patterns, themes, and relationships between concepts. This analysis will provide a deep understanding of DISKOMINFO's role and its impact in the context of smart city development.

4. RESULT AND DISCUSSION

4.1. Provision of ICT Infrastructure

The Department of Communication and Informatics (DISKOMINFO) in Samarinda plays a crucial role in laying the foundation for the city's smart city initiatives through the provision of robust Information and Communication Technology (ICT) infrastructure. According to key personnel from the ICT Infrastructure Sub-Section, the primary responsibilities of this department include developing policies, providing technical guidance, monitoring and evaluating ICT services, managing data centers, and fostering innovation in e-government implementation. DISKOMINFO's role in ICT infrastructure is vital for supporting various smart city applications and services that enhance urban life. The installation of extensive fiber optic networks across Samarinda has been a strategic initiative by DISKOMINFO. These networks serve as the backbone of the city's ICT infrastructure, offering fast and stable internet connectivity. This reliable connectivity is essential for enabling smart city services such as smart traffic management, environmental monitoring, and healthcare services. By ensuring widespread access to high-speed internet, DISKOMINFO helps bridge the digital divide, providing equal access to technology and information for all residents, regardless of their location.

In addition to fiber optic networks, DISKOMINFO has also focused on expanding internet access in public spaces. The provision of free Wi-Fi in various public areas, including city parks and shopping centers, is another significant initiative. This not only enhances public convenience in accessing the internet but also supports the development of a more inclusive digital ecosystem. Free Wi-Fi access enables residents to stay connected, work, and learn in public spaces, thereby promoting greater public engagement with technology. This initiative is key to accelerating the adoption of digital technologies across various aspects of daily life. DISKOMINFO has significantly invested in enhancing the capacity and capability of the city's data centers. These data centers are critical for securely managing and storing the vast amounts of data generated by smart city applications. A reliable data center infrastructure supports essential smart city functions such as smart energy management, public safety systems, and big data analytics. Effective data management allows the city to make informed and timely decisions, improving the overall quality of public services and operational efficiency. DISKOMINFO's focus on strengthening data center capabilities underscores the importance of secure and efficient data management in the smart city context.

However, the provision of ICT infrastructure in Samarinda is not without challenges. One of the key challenges includes the need for substantial investment to develop and maintain the infrastructure. Additionally, effective coordination among various government agencies is crucial to ensure the seamless implementation of ICT projects. Despite these challenges, DISKOMINFO's proactive approach in enhancing ICT infrastructure has positioned Samarinda on a path toward becoming a more connected, efficient, and sustainable smart city. The efforts by DISKOMINFO to provide and enhance ICT infrastructure highlight the department's central role in the city's digital transformation. By laying a strong ICT foundation, DISKOMINFO enables the implementation of innovative solutions that improve the quality of life for residents. The department's work in ensuring fast, stable, and widespread internet connectivity, along with secure data management, is critical to the successful realization of Samarinda's smart city vision. As the backbone of the city's smart city initiatives, DISKOMINFO's effective management of ICT infrastructure is essential for creating a smarter, more sustainable urban environment.

4.2. Data Management

Data management is a crucial element in the development of a smart city. Effectively collected, stored, and analyzed data can serve as the foundation for more accurate decision-making and drive initiatives that foster a more efficient and inclusive urban environment. In Samarinda, the Department of Communication and Informatics (DISKOMINFO) has implemented various systems and technologies to ensure that available data is optimally utilized to support the city's smart city development. One of DISKOMINFO's primary focuses in smart city development is data management. The department has deployed several systems to collect, store, and analyze data from various sources, including relevant government agencies and IoT devices scattered throughout the city. The data collected is securely stored in the city's data center, where it is efficiently managed. The use of big data technology enables more in-depth data analysis, including predictive analytics, which can assist in better planning and decision-making.

A strategic step taken by DISKOMINFO is the integration of data from various city departments. This integration provides a comprehensive view of the city's conditions, covering areas such as infrastructure, transportation, healthcare, and public safety. With integrated data, policy planning and implementation can be more cohesive and effective, as all necessary information is available on a unified platform. These efforts include data integration from various departments, the use of big data technology, and the implementation of cybersecurity systems to protect data from threats. DISKOMINFO's role in data management is critical to ensuring that the data generated is effectively used for decision-making. Big data technology plays a pivotal role in data management within the smart city framework. By leveraging big data, DISKOMINFO can conduct large-scale data analysis more quickly and accurately. This technology supports predictive analytics, which can help identify trends and patterns useful in city planning, such as traffic predictions, public health analysis, and energy management. Through deeper analysis, the city can take proactive steps to address various challenges and optimize the use of available resources.

Data security is an indispensable aspect of data management in a smart city. DISKOMINFO has implemented robust cybersecurity systems to protect data from various threats, such as cyber-attacks and data breaches. These systems include the use of encryption, firewalls, and stringent security protocols to ensure that data remains protected. Ensuring data security also safeguards the privacy and trust of the public, which is crucial in smart city development. A strong cybersecurity system ensures that data is protected from threats, thereby maintaining the privacy and trust of the community. However, data management in the context of a smart city is not without its challenges. One of the main challenges is the complexity of integrating systems from various departments and data sources. This integration requires advanced technology and effective coordination among different agencies. Additionally, the need for competent human resources in data science is also a significant challenge. The city requires experts capable of managing, analyzing, and interpreting data effectively to support various smart city initiatives.

4.3. Development of Public Service Support Applications

The development of public service support applications is a crucial component in the strategy for smart city development. By leveraging digital technology, DISKOMINFO Kota Samarinda aims to create more efficient, responsive, and inclusive public services. One of the most significant innovations in this area is the development of the Satu Aplikasi Terintegrasi (SANTER). SANTER represents the implementation of e-government by the Samarinda city government, aiming to modernize and streamline the governmental and bureaucratic systems. The goal is not only to utilize the latest technology but also to emphasize the benefits for the community. SANTER embodies principles of good governance, such as transparency, openness, accuracy in policy-making, improved public service quality, and enhanced community participation. The success of e-government depends not only on the use of advanced technology but also on the overarching objectives of its implementation. Designed to meet the public service needs of Samarinda's residents, SANTER offers a variety of features intended to facilitate access to public services. However, despite its potential, SANTER is still in development

since its launch on January 21, 2022. Several features are not yet fully functional and remain under development.

SANTER is expected to evolve further and compete with applications developed by the private sector. Previous research suggests that SANTER has significant potential to be highly beneficial for the residents of Samarinda (Christover et al., 2023). The main goal of SANTER is to integrate various features, previously scattered across different websites or applications, into a single platform that is easily accessible and usable by the people of Samarinda. However, despite its great potential, SANTER's current usefulness does not fully meet expectations. Some service features are still unavailable or non-functional, and certain service units have been removed without clear justification, reducing the application's overall potential. While features like CCTV access are useful, they do not fully align with SANTER's primary purpose as a comprehensive provider of public services. SANTER is envisioned to integrate various online or digital document processes for residents, businesses, and the government. Despite its current limitations, if developed with strong commitment from the government, SANTER holds great potential to become a highly valuable tool in the future.

4.4. Discussion

In today's digital era, strong and reliable ICT infrastructure forms the foundation for innovations and applications that support more efficient, inclusive, and sustainable urban life. The Department of Communication and Informatics (DISKOMINFO) in Samarinda has taken proactive steps by initiating various programs to enhance the quality and reach of the city's technological infrastructure. These initiatives include the installation of fiber optic networks, the provision of free Wi-Fi access in public areas, and the expansion of the city's data center capacity. DISKOMINFO is committed to providing efficient digital infrastructure tailored to the needs of Regional Devices (Perangkat Daerah). This infrastructure is also aimed at improving the financial efficiency of regional devices and supporting digital transformation within the East Kalimantan Provincial Government (Pemprov Kaltim).

Analyzing this from the perspective of smart city elements, the provision of reliable ICT infrastructure, such as fiber optic networks and free Wi-Fi access, supports the growth of the digital economy in Samarinda. It creates opportunities for new businesses and encourages existing ones to operate more efficiently (smart economy). From the smart mobility aspect, ICT infrastructure facilitates the implementation of intelligent traffic management systems connected with CCTV, improving transportation efficiency and reducing congestion. In terms of smart environment, ICT infrastructure enables better environmental monitoring, aiding in natural resource management, waste management, and pollution control. Improved internet access, especially through free Wi-Fi in public areas, enhances public access to information and education, supports digital skill development, and contributes to building smart people. Easy and fast internet access also enhances the quality of life by facilitating online health services, education, and entertainment (smart living). Additionally, robust ICT infrastructure supports a more transparent and responsive government, enables the integration of public services, and increases citizen participation in governance (smart governance).

The Head of ICT and Encryption at DISKOMINFO Kaltim emphasized that many regional devices are still using infrastructure outside of what DISKOMINFO provides. This situation leads to some data being stored outside official networks, making it vulnerable to security issues. Therefore, it is crucial for all regional devices to optimally utilize the provided infrastructure, in accordance with the mandate of Presidential Regulation No. 95 of 2018 on Electronic-Based Government Systems.

Data management is a crucial element in the development of a smart city, aimed at enhancing the efficiency, effectiveness, and quality of life for urban residents. DISKOMINFO Kota Samarinda has implemented various systems to collect, store, and analyze data from multiple sources. These efforts include data integration across different departments, the use of big data technology, and the implementation of cybersecurity systems to protect data from potential threats. Cybersecurity plays a critical role in supporting the success of digitalization by safeguarding important data, including government data, from potential misuse by unauthorized parties. In this context, DISKOMINFO Kaltim has connected 37 Regional Devices with intra-network infrastructure and provided a central

data center. Although not yet encompassing all regional devices, this step lays a crucial foundation for secure and efficient digitalization.

An analysis based on smart city elements indicates that effective data management supports more accurate economic analysis and better decision-making, thereby fostering sustainable economic growth. In terms of mobility, efficient data management aids in better transportation planning and management, including traffic prediction and route optimization. Accurate environmental data enhances effective environmental management, including air and water quality monitoring, and waste management. The integration and security of data improve public access to relevant information, supporting education, health, and social services. Open and accessible data encourages city residents to engage and participate in the urban development process. Citizens can provide feedback, report issues, and participate in decision-making through transparent digital platforms, strengthening local democracy and increasing public trust in city governance. Additionally, good data management supports better healthcare, security, and urban planning, ultimately improving residents' quality of life. In governance, the integration of data across departments and the use of big data contribute to more efficient and transparent government operations, enabling citizen participation in decision-making processes.

Modern human life is now inseparable from the technology that supports daily activities. The rapid advancement of Information and Communication Technologies (ICT) with its sophisticated features has significantly eased many aspects of human work. The utilization of the latest technology has increasingly opened opportunities for close interaction between governments, businesses, and communities. Today, technological progress is felt by everyone in various activities. The development of technology is inevitable and will continue to progress alongside advancements in science. Technology evolves rapidly, and innovations are continuously made to keep pace with the changing times. In the era of globalization, nearly all activities require technology, whether directly or indirectly. This is especially true for government operations, which have become highly dependent on the role of technology. The Department of Communication and Informatics (DISKOMINFO) in Samarinda has developed various applications to support more efficient and responsive public services. One significant innovation is the development of the Satu Aplikasi Terintegrasi (SANTER), designed to facilitate public access to government services. SANTER provides a wide range of services, including information access, text, graphics, CCTV camera access, and other data needed by the residents of Samarinda, all available free of charge. The SANTER application offers four categories of services: public services, business services, environmental services, and government services. In the public services category, there are seven features available:

1. Quick Response 112
2. Information Monitoring
3. Peduli Lindungi (COVID-19 tracking)
4. Online Civil Registry Services
5. Social Assistance Check
6. Basic Necessities Price Information
7. E-School

In the business services category, six features are offered:

1. Payment Services
2. Samarinda Craft
3. Sinaker (Labor Information System)
4. Tourism Information
5. Sinaker (Job Vacancy Information)
6. E-Tax

In the environmental services category, three features are available:

1. City Parks
2. Green Samarinda

3. Trash Management

In the government services category, the application offers several features:

1. City Government Website
2. Legal Information Documentation
3. Electronic Procurement Service (LPSE)
4. Public Information Services (PPID)

Figure 2. Main Page Display of Santer Application

An analysis based on smart city elements reveals that the SANTER application facilitates faster and more efficient business transactions, supports the digital economy, and enhances the city's competitiveness. In terms of mobility, the infrastructure issue reporting feature improves government responsiveness to transportation and infrastructure challenges, promoting better mobility. Environmental issue reporting supports more effective and responsive environmental management. Additionally, public health and transparency platforms encourage citizen engagement in governance and healthcare services, enhancing quality of life. SANTER also strengthens public service delivery in health and safety, boosting comfort and well-being, while promoting transparency, accountability, and citizen participation in governance, thereby reinforcing good governance practices. Despite the various initiatives undertaken, providing ICT infrastructure is not without its challenges. One of the primary challenges is the significant investment required for the development and maintenance of ICT infrastructure. The government needs to allocate substantial funds and establish partnerships with the private sector to support these investments. Additionally, coordination between agencies presents its own set of challenges. Effective implementation demands strong collaboration among various departments and related institutions to ensure that all aspects of the ICT infrastructure operate harmoniously and support each other.

5. CONCLUSIONS

DISKOMINFO Kota Samarinda's efforts in providing ICT infrastructure, managing data, and developing public service applications represent strategic steps towards realizing an inclusive and sustainable smart city. DISKOMINFO plays a crucial role in accelerating the development of a smart city through the provision of ICT infrastructure, data management, and the development of the SANTER (Satu Aplikasi Terintegrasi) public service application. The success of these initiatives requires strong collaboration between the government, the private sector, and the community, as well

as ongoing support in terms of investment and human resource capacity development. The challenges faced, such as the need for significant investment, coordination between agencies, and the complexity of system integration, demand strong attention and commitment from the government and all stakeholders. However, the considerable potential of these programs can serve as a foundation for profound digital transformation, bringing positive impacts to the people of Samarinda.

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