

IMPLEMENTATION OF SMART CITY FOR IMPROVING PUBLIC SERVICE QUALITY: A STUDY IN SITUBONDO REGENCY

IMPLEMENTAÇÃO DE CIDADES INTELIGENTES PARA A MELHORIA DA QUALIDADE DOS SERVIÇOS PÚBLICOS: UM ESTUDO NO MUNICÍPIO DE SITUBONDO

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Abstract

Digital transformation through the development of smart cities has become a strategic approach to improving the quality of public services and the effectiveness of regional governance. This study aims to analyze the implementation of six dimensions of smart cities in Situbondo Regency and the factors that influence their effectiveness in improving public services. This study employs a descriptive qualitative method with purposive sampling and interactive analysis, which includes data condensation, thematic categorization, and source triangulation. All dimensions of smart cities have progressed. However, a mature policy ecosystem has not yet been established. The coherence of objectives between organizations is still weak, policy instruments are not yet integrated, community digital literacy is uneven, and multi-actor collaboration is not yet stable. While smart governance and the smart economy have shown more significant improvements, the smart society and smart environment encounter challenges related to social readiness and technological limitations. This study confirms that the success of a smart city is not only determined by technological capacity, but also by policy harmonization, social readiness, system interoperability, and sustainable policy learning mechanisms as the basis for strengthening regional digital transformation.

Resumo

A transformação digital por meio do desenvolvimento de cidades inteligentes tornou-se uma abordagem estratégica para melhorar a qualidade dos serviços públicos e a eficácia da governança regional. Este estudo tem como objetivo analisar a implementação das seis dimensões das cidades inteligentes no Município de Situbondo e os fatores que influenciam sua eficácia na melhoria dos serviços públicos. A pesquisa adota um método qualitativo descritivo, com amostragem intencional (purposive sampling) e análise interativa, que inclui condensação de dados, categorização temática e triangulação de fontes. Todas as dimensões das cidades inteligentes apresentaram avanços; no entanto, um ecossistema de políticas maduro ainda não foi estabelecido. A coerência de objetivos entre as organizações permanece fraca, os instrumentos de política ainda não estão integrados, a alfabetização digital da comunidade é desigual e a colaboração entre múltiplos atores ainda não é estável. Embora a governança inteligente e a economia inteligente tenham demonstrado avanços mais significativos, a sociedade inteligente e o ambiente inteligente enfrentam desafios relacionados à prontidão social e às limitações tecnológicas. Este estudo confirma que o sucesso de uma cidade inteligente não é determinado apenas pela capacidade tecnológica, mas também pela harmonização de políticas, prontidão social, interoperabilidade



Keywords: Digital Governance. Digital Transformation. Policy Implementation. Quality of Public Services. Smart City.

dos sistemas e mecanismos sustentáveis de aprendizagem de políticas como base para o fortalecimento da transformação digital regional.

Palavras-chave: Governança Digital. Transformação Digital. Implementação de Políticas. Qualidade dos Serviços Públicos. Cidade Inteligente.

1 INTRODUCTION

The development of information and communication technology (ICT) in the last two decades has brought fundamental changes to the way governments and cities are managed. Cities are no longer understood solely as physical spaces, but have transformed into digital ecosystems connected through sensor networks, the Internet of Things (IoT), big data analytics, cloud computing, and public service applications capable of generating data in real time. The integration of these various technologies has enabled the emergence of a modern governance model that is more efficient, responsive, and adaptive to the dynamics of society. It is in this context that the concept of smart cities has developed as a strategic approach that combines the use of digital technology with efforts to improve government performance and the quality of life of the community in a sustainable manner (Al Nuaimi *et al.*, 2015; Neirotti *et al.*, 2014). This concept is reinforced by the view that smart cities result from the integration of technology, information infrastructure, and human involvement that can create effective, inclusive living spaces oriented towards public welfare (Mohanty, 2016).

Various countries around the world have implemented the smart city concept with varying results and challenges (Aminah *et al.*, 2022). One of the most well-known is the Songdo project in South Korea, which was designed entirely as an IoT-based city with a highly integrated technology network, ranging from environmental management, energy monitoring, smart transportation, to a centralized data system. However, technological advances do not necessarily guarantee the creation of the expected quality of life. The lack of community participation and social interaction spaces has led to criticism that Songdo is too technology-oriented and neglects social aspects (Mullins, 2017). This teaches us that smart city implementation requires a balance between digital innovation and social sustainability. Unlike Songdo, Barcelona prioritizes a participatory approach

through the use of platforms such as Sentilo, Decidim Barcelona, and Open Data BCN. Through these platforms, residents are involved in determining city development priorities, monitoring public service performance, and promoting open data-based innovation. This approach has proven to increase government transparency and accountability, although challenges such as the digital divide and funding sustainability remain (Calzada, 2018). Barcelona is an example that technology must be used to strengthen citizen participation so that urban development is truly inclusive.

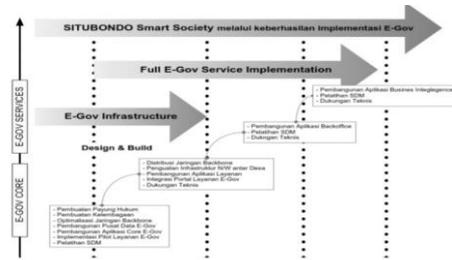
In Southeast Asia, Singapore has developed Smart Nation as a national strategy to strengthen digital public services, government data integration, and the use of city sensors. This transformation has succeeded in improving the efficiency of public services and simplifying administrative processes for the community in various sectors, such as health, education, and transportation. However, concerns about privacy, data security, and the potential for excessive surveillance indicate that the smart city model also requires a strong ethical and regulatory framework (Sha & Taeihagh, 2024). Singapore's experience shows that the success of a smart city is largely determined by the readiness of regulations, infrastructure, and public trust in digital systems.

Lessons from various countries show that smart cities require more than just the application of technology. They require collaborative governance, active public participation, and institutional readiness to support change. This is in line with the view that the success of a smart city is largely determined by the quality of governance and collaboration between actors, including the government, the private sector, academics, and the community (Twist *et al.*, 2023). Thus, a smart city can only function effectively if technology is combined with inclusive and participatory policies. In view of these global dynamics, Indonesia has begun to strengthen its government digitalization initiatives through the “*Movement Towards 100 Smart Cities*” program, which was launched in 2017. This program assists local governments in developing smart city master plans by integrating six main dimensions, namely smart governance, smart economy, smart living, smart people, smart environment, and smart mobility. Although this program provides strategic guidance, its implementation still faces a number of obstacles, such as limited digital infrastructure, low public literacy, limited civil servant competence, and suboptimal coordination between agencies (Herdiyanti *et al.*, 2019). This shows that the development of smart cities requires strong institutional capacity support.

To strengthen the direction of digital development, the government issued Presidential Instruction No. 95 of 2018 concerning the Electronic-Based Government System (SPBE), which served as the national framework for integrating government digital services, improving interoperability, and accelerating bureaucratic transformation (Yeremias *et al.*, 2024). This policy was then reinforced by PermenPAN-RB No. 59 of 2020 as guidelines for evaluating SPBE, which regulates data management standards, information security, service integration, and the quality of digital public services (Frinaldi *et al.*, 2024; Santoso *et al.*, 2024). With this foundation, local governments are expected to develop smart cities in a measurable manner and in line with national digitalization goals (Situmorang & Ritonga, 2025).

Situbondo Regency Government is one of the regions that has adopted this national policy in its medium-term planning documents and regional technical regulations, such as the 2016-2021, the medium-term planning documents and regional technical regulations 2021-2026, and Situbondo Regent Regulation No. 51 of 2019 concerning the Smart City Master Plan. Article 5 of the Regent Regulation stipulates six elements of smart cities that must be the focus of regional development, namely smart governance, smart branding, smart economy, smart living, smart society, and smart environment. Meanwhile, Article 7 stipulates the strategic objectives of smart city development, which include: a) improving the management of local government finances and assets to be effective, efficient, and communicative, and continuing to improve bureaucratic performance through innovation and the adoption of integrated technology; b) increasing regional competitiveness by improving the region's appearance and marketing its potential at the local, national, and international levels; c) creating an ecosystem that supports community economic activities in line with the region's leading economic sectors that are adaptive to changes in the current information era, as well as improving community financial literacy through various programs; d) ensuring a decent standard of living for the community through three elements, namely environmental comfort, health quality, and transportation and logistics modes; e) creating a humanistic and dynamic socio-technical ecosystem for the community, both physically and virtually, to create a productive, communicative, and interactive society with high digital literacy; and f) managing a smart environment and realizing sustainable development.

Efforts to implement the concept of smart city in Situbondo are realized through the development of an e-government roadmap which includes:

Figure 1*Situbondo Regency E-Government Roadmap*

Source: Situbondo Regency Communication and Information Agency (2025)

Based on the roadmap as in figure 1, development is carried out through structured and sustainable stages. Starting from E-Gov Core, which builds the foundation through regulations, institutions, backbone networks, data centers, and basic human resource training, followed by the Design & Build stage, which expands and integrates digital infrastructure to villages through network strengthening, service application development, e-Gov portal integration, and technical support. Further, a back-office system and advanced training for officials were developed to ensure operational readiness before entering the E-Gov Service Implementation stage, which includes the development of decision support applications, optimization of digital services, and data strengthening. This entire process is linked to a broader agenda of digital infrastructure development, information system integration, capacity building for officials, and the implementation of various public service applications to accelerate public administration services. In addition to strengthening the digital bureaucracy, the government also encourages community empowerment through digital literacy training, technology-based MSME development, strengthening the creative economy, and increasing human resource capacity in the fields of education, arts, and culture. These comprehensive efforts are in line with the view that community empowerment is an important element in creating a sustainable and inclusive smart city (Kutty *et al.*, 2022).

These innovations have yielded various positive achievements. One of them is the Smart Society award received by the Situbondo Regency Government in 2021 from the Ministry of Communication and Information Technology. This award was given for the successful implementation of digital innovation in public services, including the application of e-retribution for traditional market traders, which aims to increase transparency, reduce local revenue leakage, and strengthen fiscal accountability (Hozaini, 2021). This shows that the use of digital technology can improve the integrity of regional

financial management and have a direct impact on the community. However, data from the Central Statistics Agency (2025) shows that the development of smart cities in Situbondo is not yet evenly distributed across all dimensions. The data includes:

Table 1

Smart City Development Data

No	Index	Year		
		2022	2023	2024
1	Bureaucratic Reform Index	68.33	70.14	82.81
2	Electronic Based Government System Index	3.19	4.17	4.48
3	Community Literacy Development Index	67.53	62.81	55.76
4	Human Development Index	60.76	70.65	70.71
5	Health Index	0.763	0.819	0.840
6	Economic Growth Index	4.39	4.90	4.81
7	Regional Competitiveness Index	2.98	2.84	2.87
8	Environmental Quality Index	73.02	75.40	76.17

Source: Situbondo District Statistics Agency (2025)

Although indicators such as Bureaucratic Reform, Electronic Based Government System, Human Development Index, Environmental Quality Index, and Health Index have shown significant improvement, literacy rates among the population tend to decline and technology adoption remains uneven across all segments of society. Regional competitiveness and economic growth also remain volatile. This imbalance shows that the acceleration of bureaucratic digitalization has not been fully matched by the social readiness of the community to utilize technology. Thus, digital transformation in Situbondo still faces challenges related to community empowerment, digital literacy, and equitable access to technology. This gap makes Situbondo Regency an interesting case study for further research, especially in the context of the relationship between smart city implementation and the quality of public services (Greisler & Stupak, 2006). Situbondo has a good digital foundation and has gained national recognition. However, challenges in the form of limited digital literacy, uneven utilization of digital services, and the imbalance between technological acceleration and community readiness have prevented the optimal implementation of the smart city. Therefore, it is important to analyze the extent to which smart city implementation contributes to improving the quality of public services and what factors influence smart city implementation in improving the quality of public services in Situbondo Regency.

2 LITERATURE REVIEW

2.1 Public policy

Public policy is a core concept in public administration studies. Public policy as “whatever governments choose to do or not to do,” emphasizing that government actions or inaction still result in policy consequences (Dye, 2008). This definition shows that policy is not only a legal product but also a strategic choice by the government to act or not act on a public issue. Therefore, public policy analysis must focus on the actual actions of the government in managing public issues. In the context of Smart Cities, public policy includes local government decisions in implementing digital transformation to improve public services, governance, economic competitiveness, and the quality of life of the community.

2.2 Policy implementation

Policy implementation is a crucial stage that determines the success of a policy. Howlett (2009) explains that the success of implementation is influenced by policy design and the suitability of the instruments used. He outlines six main variables, namely: (1) goal coherence, which requires clarity and consistency of policy objectives; (2) instrument coherence, which emphasizes the compatibility between objectives and instruments, including compulsory instruments such as regulations and legal obligations, as well as voluntary instruments such as campaigns, education, and partnerships; (3) contextual fit, which is the suitability of policies to the social, economic, cultural, political, and infrastructural conditions of the region; (4) complementarity, which is the integration of instruments to avoid overlap; (5) adaptability, which is the ability of policies to adjust to changes in the environment; and (6) effectiveness/efficiency, which is an assessment of the achievement of objectives and the optimization of resources. Howlett’s implementation model is relevant for analyzing Situbondo Smart City because it explains the relationship between policy objectives, instruments, and regional socio-economic conditions. The six variables provide a basis for assessing the design and implementation of the Situbondo Smart City Master Plan (Howlett, 2011).

Furthermore, Edwards III (1980) explains that the success of implementation is also determined by four main factors, namely: communication, which includes clarity, consistency, and transmission of policy messages; resources, which include human resource competencies, technical information, facilities, and authority; the disposition of implementers, namely the attitude, commitment, and understanding of officials towards policies; and bureaucratic structure, which includes SOPs, coordination, and workflow. Both Howlett's and Edwards III's models are relevant for analyzing Smart City implementation because digital transformation requires cross agency coordination, bureaucratic readiness, and the selection of appropriate policy instruments. Edwards III's implementation model is used in this study because the four variables influence the implementation of Smart City policies. Communication ensures inter agency integration and public understanding; human resources and technology form the basis of digital services; the disposition of implementers influences the acceptance and use of innovation; and an integrated bureaucratic structure accelerates coordination. If these four factors are met, the implementation of Smart City will be more effective and have an impact on improving the quality of public services.

2.3 Smart city

Smart City is a concept of modern city development that integrates information and communication technology (ICT) to improve government effectiveness, transparency, responsiveness, and public participation (Greisler & Stupak, 2006). Smart City is not only oriented towards the digitization of public services, but also towards the transformation of bureaucracy towards data-based and innovation-based government. The Ministry of Communication and Information Technology has developed six dimensions of Smart City, namely: (1) Smart Governance, which emphasizes bureaucratic digitalization and SPBE integration; (2) Smart Branding, which strengthens regional identity and competitiveness through technology; (3) Smart Economy, which develops a digital and innovative economy; (4) Smart Living, which improves quality of life, health, mobility, and spatial planning; (5) Smart Society, which comprises digital literacy, citizen participation, and security; and (6) Smart Environment, which refers to sustainable environmental management and environmentally friendly energy (Anityasari, 2019). Thus, Smart City is a city development strategy that combines technology, public

management, and community collaboration to create effective, inclusive, and sustainable public services.

2.4 Quality of public services

The quality of public services is a multidimensional concept that reflects the government's ability to provide services that are effective, efficient, transparent, and tailored to the needs of the community. The OECD identifies five key variables in the quality of modern services, namely: accessibility, which is the ease of access to services for the entire community; transparency, which is the openness of information regarding procedures, costs, and service standards; accountability, which is the government's ability to be accountable for its actions and policies; efficiency and effectiveness, which is the ability to provide fast, accurate, and resource efficient services; and citizen centricity, which is the orientation of service provision based on the needs and experiences of the community (OECD, 2017). The OECD's quality of public services is relevant for analyzing Smart City implementation because it emphasizes five main aspects in line with the characteristics of Smart Cities. These integrate cross agency digital systems to provide services that are accessible, transparent, and responsive. Beyond service aspects, OECD principles also support broader Smart City objectives, such as fostering economic growth through digital service accessibility, strengthening regional branding through information transparency, enhancing quality of life through efficient services, and improving environmental management through technology-based monitoring systems. Thus, OECD principles serve as a normative foundation ensuring that Smart City implementation is not only technically effective but also aligned with community needs and sustainable regional development.

3 RESEARCH METHOD

This research uses a qualitative method with a descriptive approach to understand the phenomenon of Smart City implementation through an interpretation of the social context, actor interactions, and policy dynamics (Creswell, 2009). The qualitative approach was selected because it is able to describe the phenomenon holistically and naturally in accordance with the characteristics of public policy research (Creswell,

2009). The research was conducted in Situbondo Regency for three months as a location that has developed a Smart City Master Plan. Informants were selected using purposive sampling, specifically targeting individuals who were directly involved in the implementation of Smart City initiatives and the enhancement of public service quality. The informants came from several regional agencies involved in the implementation of the six dimensions of Smart City, including the Communication and Information Agency; the Tourism, Youth and Sports Agency; the Cooperative, Industry and Trade Agency; the Health Agency; the Transportation Agency; the Education and Culture Agency; the Environment Agency; the Social Service; the Investment Service and Integrated One Stop Service; and the Regional Development, Research, and Innovation Agency. This selection ensured that the information obtained was relevant, accurate, and in line with the research focus. This consideration aimed to ensure that the information obtained was relevant to the research focus being studied. The data sources in this study comprised two parts. The first is primary data sources, where the researcher conducted in depth interviews with the informants. The second is secondary data sources, where the researcher used previous studies, documentation, and observation (Creswell, 2009). The data analysis used an interactive method of a post-positivist nature, which ideally consisted of three major axes, namely data condensation, categorization into three strategic themes (continuous improvement, quality improvement of results, and human resource development), and verification through triangulation (Miles *et al.*, 2014).

4 DISCUSSION

4.1 Smart governance

Smart Governance in Situbondo Regency shows a process of public governance transformation moving towards digital based governance, although it has not been fully integrated (Twist *et al.*, 2023). The local government has included the digitization of public services in its planning documents, but the interpretation among organizational units still varies, resulting in variations in implementation orientation (Howlett, 2009). This condition indicates that the coherence of objectives is not yet stable because there is no mechanism for harmonizing consistent policy interpretations. The literature states that the coherence of objectives is a basic prerequisite for the success of digital governance

and this fragmentation can hinder the achievement of optimal service results (Sabatier & Mazmanian, 1980).

Smart Governance instruments consist of regulations, service SOPs, digital applications, and socialization, but the integration between instruments has not shown adequate harmony (Howlett, 2011). Public service applications run independently without interoperability, thereby reducing the efficiency that should be a key feature of smart governance (Gil-Garcia & Zhang, 2016). Meanwhile, mandatory instruments such as SOPs are consistently used, but supporting instruments such as digital innovation still depend on the initiatives of certain units. This confirms that policy instruments have not been designed as an integrated policy package as recommended in the literature on instrument choice.

The level of policy suitability to the social context, or contextual fit, is in the middle category because digital literacy is not yet evenly distributed across all regions (Howlett & Ramesh, 2014). Digital services are more accessible to urban communities, while rural communities face network constraints and device limitations. This condition results in a gap in the benefits of digital services because the readiness of communities varies between regions. Other research shows that community readiness is crucial to the success of digital innovation adoption, meaning that smart governance requires increased social capacity (Nam & Pardo, 2011).

Complementarity among actors in Smart Governance operates at the level of administrative coordination without forming strategic collaborations that generate shared value. Relationships between OPDs have been established but have not resulted in cross sectoral and sustainable policy integration. The involvement of the non-governmental sector remains low, resulting in the potential for collaboration not yet evolving into a co-creation model. The literature on collaborative governance indicates that multi-actor collaboration is central to the implementation of smart governance; thus, this shortcoming constitutes a structural obstacle (Ansell & Gash, 2008).

The adaptability of bureaucracy is evident in several service innovations that respond to community needs; however, these innovations are not yet grounded in long-term policy learning mechanisms (Howlett & Ramesh, 2014). Policy adaptation relies more on the creativity of implementers than on institutional systems that support continuous adjustment. Dependence on individuals makes the sustainability of innovation vulnerable to personnel changes. The policy implementation literature emphasizes that

adaptability is only effective when built through structured evaluation and feedback systems.

The efficiency and effectiveness of smart governance increase, particularly in services that have been digitized, such as population administration and licensing (Osborne, 2010). However, effectiveness is not yet evenly distributed due to limitations in human resources, communication constraints, and variations in implementer commitment, as explained (Edwards III, 1980). Some services show improvements in process quality but have not consistently resulted in increased public satisfaction. This indicates that digitalization has not fully enhanced effectiveness if organizational factors have not been strengthened.

Overall, smart governance in Situbondo can be categorized as an emerging smart governance regime that shows progress but still requires stronger policy integration. Coherence of objectives, alignment of instruments, social readiness, and cross sector collaboration need to be strengthened to achieve mature digital governance. These findings are consistent with international literature emphasizing that digital transformation requires a structured and inclusive ecosystem approach (Twist *et al.*, 2023). Thus, Situbondo is on the right track, although it requires institutional strengthening and policy harmonization.

4.2 Smart economy

The Smart Economy in Situbondo Regency shows progress towards the digitalization of the local economy, although its integration has not yet fully formed a complete innovation ecosystem (Komminos, 2015). The local government has prioritized MSMEs and the creative economy in its development policies, but the orientation between OPDs is not always consistent, resulting in variations in implementation (Howlett, 2009). This fragmentation indicates that policy coherence has not been fully established, even though the general direction of policy is clear. In the smart economy literature, policy coherence is the main foundation for the success of technology based economic transformation (OECD, 2020).

Smart economy instrument consist of digital training for MSMEs, mentoring, provision of promotional platforms, and regulatory support, but their integration is not yet optimal (Faiz *et al.*, 2024). Some instruments work effectively separately but do not

reinforce each other, resulting in superficial digitalization. This condition is in line with the instrument mix theory, which emphasizes the importance of alignment between instruments so that policies produce comprehensive impacts (Howlett & Ramesh, 2014). This gap indicates the need for instrument interoperability and more intensive mentoring.

The contextual fit of the Smart Economy shows an imbalance between policy design and the objective conditions of MSME actors (Nam & Pardo, 2011). Digital training is going well, but some MSME actors do not yet have adequate equipment or sufficient digital literacy to put the training results into practice. This mismatch has resulted in most MSMEs only utilizing digitalization at the initial stage but not continuing its use consistently. The literature shows that social readiness and technological capabilities are critical factors in the implementation of the digital economy (Komminos, 2015).

Complementarity among actors is at a minimal level of coordination and has not yet become a strategic collaboration that supports innovation based economic growth (Klijn *et al.*, 2025). The involvement of the private sector and universities has not been formalized in a sustainable partnership system. However, international studies emphasize that a smart economy requires co-creation through intensive interaction between government, business, and community (OECD, 2020). This shortcoming hinders the acceleration of innovation and commercialization of local products.

The adaptability of regional economic policies tends to be reactive and is not yet based on long term learning mechanisms (Howlett & Ramesh, 2014). The government is quick to respond to the needs of MSMEs but does not have a performance assessment system that links training outcomes to business development. This condition means that the adaptations that occur do not always result in sustainable improvements because they are not data driven. Within the implementation framework, adaptability should be a structured process that encourages policy innovation (Twist *et al.*, 2023) .

The efficiency of the Smart Economy has improved in several programs, such as social media based marketing, which has been able to expand the reach of local products (Osborne, 2010). Yet, effectiveness has not been evenly distributed because it still depends on the ability of individual MSMEs to utilize the technology provided. According to Edwards III (1980), the effectiveness of implementation is influenced by communication, resources, and organizational structure, which in the context of

Situbondo are not yet fully stable. This imbalance causes policy outcomes to fluctuate between MSME groups.

Overall, the Smart Economy in Situbondo can be categorized as a nascent smart economic system that is developing but lacks adequate integration of instruments and multi-actor collaboration. Digital economic transformation requires the harmonization of objectives, strategic collaboration, and capacity building for business actors to utilize technology optimally (Faiz *et al.*, 2024). These findings align with the literature emphasizing the importance of an ecosystem approach in innovation-based economic development. Thus, while Situbondo is on the path to transformation, it needs to strengthen its governance to achieve a more equitable economic impact.

4.3 Smart branding

Smart Branding in Situbondo Regency shows positive developments in efforts to build regional identity through digital promotion, events, and local community involvement, although its integration has not yet fully formed a solid branding ecosystem (Kavaratzis *et al.*, 2013). The local government has positioned branding as an instrument to increase tourism and investment appeal, but the interpretation among OPDs still differs, so the coherence of objectives has not been fully established (Howlett, 2009). This difference in orientation indicates that strategic coordination has not been optimal in directing all actors towards the same identity narrative. The literature shows that coherence of objectives is necessary for branding to create a stable perception in the public eye (Zenker & Braun, 2017).

Smart Branding instruments include digital promotion, event organization, collaboration with communities, and cross platform publications, but consistency between instruments is still low (Howlett, 2011). Promotional narratives differ between OPDs, resulting in inconsistent messages and a weaker regional identity in the digital space. This lack of synchronization confirms the importance of integrating branding instruments as stated in modern place branding literature (Kavaratzis, 2004). Hence, Situbondo needs an integrated approach so that all instruments can produce a consistent image enhancement.

The contextual fit of Smart Branding is quite good because the community has high local pride and participates in promotional activities even though digital literacy

levels still vary (Nam & Pardo, 2011). Limited digital literacy means that some people cannot be fully involved in digital media-based promotion. This condition results in a gap in involvement between urban and rural communities in regional branding activities. The study (Howlett & Ramesh, 2014) emphasizes that contextual mismatches can reduce the effectiveness of technology based policies.

Complementarity among actors in Smart Branding is still at the level of informal participation and has not yet formed a structured co creation ecosystem (Zenker & Braun, 2017). *Pokdarwis* or Tourism Awareness Group, tourism actors, and local communities are actively involved, but this collaboration has not been formalized into a long-term partnership system. Literature on place branding encourages the development of multisectoral collaboration to ensure the sustainability and consistency of regional identity narratives (Kavaratzis *et al.*, 2013). This shortcoming explains why Situbondo's branding has not had an even impact on increasing tourist visits.

The adaptability of branding policies demonstrates a rapid response to social media trends, but it is not supported by data based analysis, so the adaptations made do not always result in strategic improvements (Howlett & Ramesh, 2014). Local governments tailor promotional content to public needs, but they do not have a system for evaluating the effectiveness of their digital campaigns. Reliance on the intuition of implementers makes the adaptation process more tactical than strategic. The literature emphasizes that adaptation must be based on evaluation so that branding can maintain its relevance amid public dynamics (Kavaratzis, 2004).

The effectiveness of Smart Branding can be seen through the increased exposure of tourist destinations in the digital space, although it has not yet significantly increased the number of visits (Osborne, 2010). Variations in commitment among actors and limited resources are obstacles to maximizing the overall potential of branding, as explained by Edwards III (1980). Meanwhile, non-standardized promotional activities cause branding messages to not always be consistently understood by people outside the region. This indicates the need for narrative harmonization to increase branding effectiveness.

Overall, Smart Branding in Situbondo is at the emerging place branding system stage, which is beginning to show a strong identity but is not yet coordinated as a mature branding ecosystem. Narrative coherence, instrument integration, increased digital literacy, and strengthened multi actor collaboration are important factors that must be strengthened in order for regional branding to be more competitive (Zenker & Braun,

2017). These findings are consistent with international literature emphasizing that modern place branding requires a participatory and value-based approach. Thus, Situbondo has a solid foundation but needs to strengthen its branding governance to achieve broader development impacts.

4.4 Smart living

Smart Living in Situbondo Regency shows progress in the health, education, and public space sectors, although the transformation has not yet fully formed integrated technology based social services (Giffinger *et al.*, 2007). The local government has provided a number of innovations such as digital queuing and application based health services, but their implementation still varies between OPDs, so that coherence of objectives has not yet been fully achieved (Howlett, 2009). These variations in interpretation indicate that strategic coordination related to Smart Living has not yet led to integration between sectors. The literature emphasizes that coherence of objectives is very important in building cities that are oriented towards improving the quality of life of their citizens (Angelidou, 2015).

Smart Living policy instruments include the digitization of health services, improvement of educational facilities, provision of public spaces, and welfare programs, but harmony between these instruments has not yet been fully established (Howlett, 2011). Digital services in the health sector are still sectoral in nature and are not yet connected to regional health information systems, so their benefits are not optimal. Meanwhile, digitization has not been accompanied by equitable infrastructure development, resulting in limited utilization, especially in peripheral areas. The smart living literature emphasizes that the service ecosystem must be integrated in order to achieve overall efficiency and effectiveness (Ahvenniemi *et al.*, 2017).

Contextual fit Smart Living shows heterogeneous conditions because the community has accepted various service innovations, but the level of digital literacy and network access still varies between locations (Nam & Pardo, 2011). Urban communities find it easier to utilize digital services, while rural communities still experience device and network barriers. This mismatch increases the gap in service utilization even though policies are already in place. According to Howlett (2011), it is emphasized that policy design must be adapted to social conditions to ensure inclusive implementation.

Complementarity among actors in Smart Living is already evident, particularly through cooperation between the government, schools, health centers, and the community, but this collaboration is still operational in nature and has not yet developed into strategic collaboration (Klijn *et al.*, 2025). Strengthening cross sector collaboration is necessary so that social services can be designed as an integrated system that reinforces each other. Collaborative governance literature states that the quality of public services will improve when actors work within a cocreation framework (Ansell & Gash, 2008). The conditions in Situbondo show that the potential for collaboration already exists but requires strengthening of structures and mechanisms.

The adaptability of Smart Living shows a quick response to the daily needs of the community, such as health services, but this adaptation has not been framed within a long term policy learning mechanism (Howlett & Ramesh, 2014). Local governments adjust programs based on community complaints, but do not yet have a structured evaluation system to measure the impact of policies in a sustainable manner. Dependence on implementing initiatives makes adaptation personal and not always sustainable. Policy literature emphasizes that effective adaptation must be based on data and routine evaluation so that service improvements can take place systematically.

The efficiency of Smart Living has improved in basic health services and some educational services, but its effectiveness is not yet uniform due to factors such as human resources, infrastructure, and inter organizational communication (Osborne, 2010). This situation is in line with the view (Edwards III, 1980) that communication, resources, and the disposition of implementers are important factors in determining the success of implementation. Some services show an increase in public satisfaction, but others still face technical and administrative obstacles. This condition indicates that efficiency must be followed by policy consistency so that the impact can be felt comprehensively.

Overall, Smart Living in Situbondo is in the early stage of citizen centered governance with a number of advances, but there is still a need to improve integration between instruments and strengthen institutional adaptability. International literature emphasizes that Smart Living must be built on an inclusive and connected service ecosystem so that the community can enjoy a better quality of life (Giffinger *et al.*, 2007). The findings of this study indicate that Situbondo is on the path to transformation but requires policy consolidation to achieve more significant results. Thus, Smart Living has

the potential to develop better if all actors strengthen coordination and integration of technology in social services.

4.5 Smart society

Smart Society in Situbondo Regency shows progress in the aspects of education, literacy, health, and community participation, although its integration has not yet formed a solid innovation based social ecosystem (Komminos, 2015). The local government has implemented various community capacity building programs, but the orientation between OPDs still varies; therefore, the coherence of objectives has not been fully achieved (Howlett, 2009). These differences in interpretation mean that the direction of Smart Society policies does not yet have strong alignment between sectors. The literature emphasizes that coherence of objectives is an important foundation in building an inclusive and empowered smart society (Angelidou, 2015).

Smart Society policy instruments include digital literacy programs, improving the quality of education, strengthening health services, and community development, but the synergy between these instruments is not yet optimal (Howlett, 2011). Digital literacy programs are running well but are not always followed up with mentoring. Therefore, the results are not always sustainable. In addition, cultural and character education programs are not integrated with technology based social innovation, resulting in fragmented impacts. The literature shows that policy instruments must complement each other to form an inclusive and adaptive learning ecosystem (Komminos, 2015). Contextual fit Smart Society is at a good level in socio cultural aspects, but still weak in terms of community digital readiness (Nam & Pardo, 2011). Culture and community-based empowerment programs have community support, but the use of technology for education and digital literacy is not always optimal due to differences in access and devices. This gap has an impact on the uneven ability of the community to utilize digitized social services. According to Howlett (2011), policy alignment with context determines the success of implementation, especially in sectors involving multiple community groups.

Complementarity among actors in the Smart Society has emerged through joint activities involving the government, educational institutions, communities, and the public, but this collaboration is not yet strategic and sustainable (Klijn *et al.*, 2025). Community involvement is mostly in the form of program participation without a co

creation mechanism that allows the community to be involved in policy formulation. The Smart Society literature emphasizes the importance of intensive community participation so that policies can create broader social value (Twist *et al.*, 2023). The conditions in Situbondo show that the potential for collaboration already exists but requires structural strengthening to become an integrated social system.

The adaptability of Smart Society demonstrates the ability of the social sector to respond to community needs, but this adaptation has not been organized through a long term policy evaluation system (Howlett & Ramesh, 2014). The government responds quickly to complaints and social dynamics but does not have a data collection mechanism capable of explaining the sustainable impact of programs. As a result, social innovation does not always produce stable and consistent changes between periods. Policy literature emphasizes that effective adaptation must be based on institutional learning in order to maintain sustainability.

The efficiency of the Smart Society is evident in the improvement in the quality of basic education and health services, but its effectiveness is not yet evenly distributed due to differences in human resource capacity and infrastructure support (Osborne, 2010). Further, Edwards III (1980) states that the effectiveness of implementation is greatly influenced by communication, resources, and the disposition of implementers, which in the context of Situbondo still varies between sectors. Some programs have succeeded in increasing community participation, but other programs have not shown significant impact due to limited technological support and assistance. This situation indicates the need for more consistent implementation so that the results can be more evenly distributed.

Overall, the Smart Society in Situbondo can be characterized as a community-driven but technologically limited society. While it possesses cultural and social strengths, it continues to face challenges in the effective use of technology. Digital literacy, integration of social instruments, and strengthening multi actor collaboration are aspects that need to be improved to form an inclusive and innovative smart society (Komminos, 2015). These findings are consistent with international literature emphasizing that a Smart Society must be built through a combination of social innovation, education, and technology. Situbondo possesses strong social capital but requires systemic support to accelerate the digital transformation of its society.

4.6 Smart environment

The Smart Environment in Situbondo Regency shows progress in cleanliness management, waste reduction, and community involvement, although its integration with environmental technology is still limited (Ahvenniemi *et al.*, 2017). The local government has directed environmental policy towards the concept of sustainability, but differences in interpretation between Local government Organizations mean that the coherence of objectives is not yet optimal (Howlett, 2009). Some Local government Organizations interpret Smart Environment as physical cleanliness, while others emphasize digital innovation, resulting in a lack of harmonization in policy direction. The literature emphasizes that coherence of objectives is very important for technology based environmental policies to be effective.

Smart Environment instruments include waste banks, complaint systems, greening programs, and educational activities, but synergy between instruments has not been fully established (Howlett, 2011). Waste banks are operational but are not yet connected to the district waste management system, so the sorting chain is not optimal. Meanwhile, the digital complaint system is running well but is not yet equipped with analytics for continuous environmental data monitoring. The smart environment literature emphasizes the need for instrument integration so that environmental management can be supported by accurate and responsive data (Bibri & Krogstie, 2017).

The contextual fit of the Smart Environment is quite good in social aspects because the community has a high concern for cleanliness, but the use of technology for environmental monitoring is still limited (Nam & Pardo, 2011). Limited digital infrastructure means that various programs cannot be optimally utilized, especially in areas that do not have adequate networks. Public awareness of the environment is high but is not yet fully connected to the technology that collects environmental data. Howlett (2011) explains that contextual fit is crucial in determining whether environmental policies can function inclusively and efficiently.

Complementarity among actors in Smart Environment shows active community involvement, but cross sector collaboration has not yet been established as an institutionalized system (Klijn *et al.*, 2025). Community participation is strong through cleanup activities and waste banks, but the relationship between the government, the private sector, and the community has not yet built sustainable shared values. The

literature emphasizes that effective environmental management requires co creation that connects technology, society, and government (Bibri & Krogstie, 2017). The absence of this strategic collaboration mechanism means that the impact of policies has not been evenly distributed.

The adaptability of Smart Environment is quite responsive to cleanliness issues, but there is no structured policy learning mechanism to monitor changes in environmental conditions (Howlett & Ramesh, 2014). Local governments follow up on community reports quickly but have not integrated these reporting patterns as a basis for long term analysis. Reliance on manual responses makes adaptation tactical and does not result in sustainable innovation. Policy literature states that adaptation requires a data-based evaluation system to maintain program sustainability.

The efficiency of Smart Environment has improved in terms of urban cleanliness, but its effectiveness remains limited due to constraints in human resources, technology, and data based monitoring systems (Osborne, 2010). Variations in commitment among actors and communication between organizations are obstacles to achieving consistent results, as explained by Edwards III (1980). Some programs show good results but are not digitally documented, making it difficult to measure performance improvements. This condition indicates that strengthening technology and evaluation systems is an urgent need.

Overall, the Smart Environment in Situbondo can be categorized as a community based ecological system that has strong social capital but is still limited by the lack of environmental technology (Ahvenniemi *et al.*, 2017). Technology integration, human resource capacity building, and strengthening multi actor collaboration are important steps to strengthen environmental sustainability. These findings are consistent with the literature, which emphasizes that a smart environment requires data support, collaboration, and technological innovation to produce long-term impacts. Thus, Situbondo has great potential but requires a more integrated environmental management system to achieve a mature Smart Environment.

4.7 Final synthesis

The smart city transformation in Situbondo Regency shows that all dimensions of smart governance, smart economy, smart branding, smart living, smart society, and smart

environment are moving towards modern governance, although their implementation still faces similar structural and technological challenges in various sectors (Twist *et al.*, 2023). A common pattern emerging from the six dimensions is the lack of optimal coherence of objectives and integration of policy instruments, resulting in uneven implementation effectiveness across public services (Howlett, 2011). These findings reinforce the view that multisectoral policies require harmonization and coordination mechanisms across organizations in order to form a more stable and sustainable policy ecosystem (Sabatier & Mazmanian, 1980). Overall, Situbondo is in a transitional phase towards a smart city ecosystem that requires strengthening technical, social, and institutional capacities to achieve long term sustainability.

5 CONCLUSION

The implementation of smart cities in Situbondo Regency demonstrates progress across six main dimensions; however, the integration has not yet fully established a mature policy ecosystem, resulting in uneven impacts across all public service sectors. The coherence of objectives among government organizations still varies, leading to differences in implementation orientation and, consequently, inconsistent policy effectiveness across dimensions. Furthermore, the integration of the policy instrument mix is not yet optimal, causing various digital innovations to operate independently without the support of a complementary system, as recommended by the literature. Overall, Situbondo is on a transformative path toward becoming a smart city, with a need to strengthen digital capacity, cross-sector coordination, and policy learning mechanisms to achieve more inclusive and efficient public service sustainability.

Policy recommendations focus on strengthening the coherence of objectives between government organizations to ensure that all dimensions of the smart city progress in the same direction and produce more consistent impacts in accordance with the principles of governance integration. Local governments need to build the interoperability of digital instruments through the integration of cross sectoral information systems so that each application and service can complement each other and improve the overall effectiveness of public services. In addition, improving the digital literacy of the community and business actors must be carried out continuously to ensure that the social context is in line with the digital innovations developed so that policy adoption can be

inclusive. The government must also reinforce data-driven monitoring and evaluation mechanisms to ensure that each innovation can be systematically adapted, thereby supporting the long-term sustainability of smart city transformation.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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