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Diffusion of the SILETON Application in Strengthening Smart Governance in Agam Regency's Population Services

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Abstract

The development of information and communication technology drives the transformation of public services towards a more efficient, transparent, and participatory digital direction. The Agam Regency Government responded to this change by presenting the SILETON (Integrated Online Electronic Service System) application as an innovation in population administration services. However, in the implementation process, various obstacles were still found, such as low digital literacy of the community, limited technological infrastructure, and uneven levels of service adoption. This study aims to analyze the process of innovation diffusion of the SILETON application based on Everett Rogers' Diffusion of Innovation theory, assess its contribution to the implementation of smart governance, and formulate strategies for optimizing digital-based services at the regional level. The method used in this study is a descriptive qualitative approach, with data collection techniques in the form of in-depth interviews, observation, and documentation. Informants were selected purposively involving the Agam Regency Population and Civil Registry Office, application managers, and user communities. The results of the study show that the SILETON innovation diffusion process has shown significant progress, but is not evenly distributed across all levels of society. This application contributes to increasing transparency, efficiency, and public participation as characteristics of smart governance. Suggested optimization strategies include increasing digital literacy, strengthening network infrastructure, developing user-friendly application features, and active collaboration between agencies. These findings emphasize the importance of a holistic approach in driving the success of digital innovation in local government to create more inclusive and adaptive public services.

Keywords: Diffusion of innovation, SILETON application, Smart Governance, Service, SDGs 9

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INTRODUCTION

The development of information and communication technology has changed the way people live their daily lives, including in terms of interacting with public services. Digitalization has become an unavoidable mainstream, especially in government bureaucratic services that demand speed, accuracy, and ease of access. Along with this transformation, the public is increasingly demanding efficient, responsive, and uncomplicated services. Therefore, the government as a public service provider is required to continue to innovate, one of which is through the implementation of an electronic-based service system that can have a real impact on improving the quality of service.

Public service innovation in the digital era is inseparable from the role of technology and information systems in encouraging better, more efficient, and citizen-oriented services. The diffusion of innovation in digital public services can be influenced by several factors, including opinion leadership, institutional frameworks, and technological readiness (Borowski, Chen, & Mahmassani, 2020; Vargo, Akaka, & Wieland, 2020).

Public service transformation in the digital era is a necessity, especially in the context of implementing smart governance as part of a smart city framework. The use of information and communication technology (ICT) is considered a strategic approach to increase the effectiveness, efficiency, and responsiveness of government services (Gil-Garcia et al., 2016). In Indonesia, the implementation of Smart City has been encouraged through the Electronic-Based Government System (SPBE), as stated in Presidential Regulation No. 95 of 2018. Agam Regency, as one of the regions that supports smart governance, presents the SILETON application as an innovation in population and civil registration services.

Agam Regency as one of the regencies in West Sumatra has taken up the challenges and opportunities of digitalization quite progressively. Agam Regency has demonstrated a forward-thinking approach to public sector digitalization, embracing digital solutions to enhance administrative efficiency and citizen engagement. Previous studies have shown that digital innovation in local government improves service delivery, but its effectiveness depends on infrastructure readiness and skilled human resources (Putra & Affandy, 2022). In rural contexts, ICT-based applications have contributed to better

administrative governance, although challenges such as digital literacy and access to internet services remain significant (Safitri et al., 2023). Additionally, collaborative ecosystems and training support for local officials are vital to ensure inclusive and sustainable adoption of digital services (Hasibuan & Rahman, 2023). Through the Population and Civil Registration Service (Disdukcapil), the local government launched the SILETON application (Integrated Online Electronic Service System). This application is designed as an innovation in population services that allows people to obtain various important documents such as KTP, KK, and birth certificates online, either independently or with the help of village officials. The launch of this application is a response to the challenges of the increasing population and the wide coverage area of Agam Regency, which has 16 sub-districts and 92 villages (Figure 1).

Figure 1. SILETON Application Display Page Image

Source: sileton.agamkab.go.id 2025

As of April 2024, the SILETON application has successfully facilitated the issuance of more than 164,000 population documents, mostly through the village service channel. This shows that the application has been actively utilized by some people. However, when compared to the total population of Agam Regency which has reached more than 530,000 people, this figure only represents around 31% of the total population. This fact indicates that there is still a gap in access and utilization of digital services among the community. Several factors such as limited infrastructure, unequal digital literacy, and differences in geographical characteristics are suspected to be the main obstacles to equalizing the use of services.

The selection of the SILETON Application over other population applications is due to the relevance of SILETON to innovation diffusion research. SILETON focuses on population services. This application is designed to facilitate access to population services for the people of Agam Regency in large quantities.

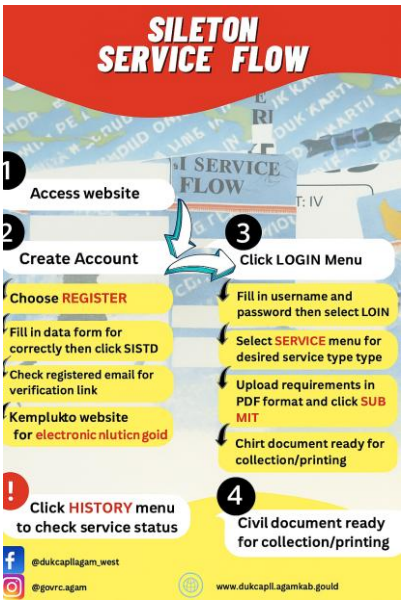

Figure 2. SILETON Application Service Flowchart

Source: sileton.agamkab.go.id 2025

In public administration, the adoption and dissemination of innovations depend not only on the quality of the technology developed, but also on how the innovation is socialized, accepted, and used by the wider community. The theory of innovation diffusion developed by Everett Rogers is an important framework in understanding this process. According to Rogers (2003), the diffusion process includes four main elements: the innovation itself, communication channels, time period, and social system. In the context of SILETON application, it is necessary to analyze how this innovation is communicated to the community, who are the agents of change, and how the social response is to the use of the technology. A meta-synthesis of public-sector innovation studies further indicates that successful diffusion requires aligned macro-institutional environments and bottom-up engagement mechanisms, suggesting that both regulatory support and community-based advocacy are critical (De Vries *et al.*, 2018). Moreover, recent research on ICT-based public initiatives in Indonesia underlines that the presence of local change agents such as village officials and community facilitators significantly

enhances social acceptance and uptake of new digital services (Febriyan *et al.,* 2018). Considering these frameworks, the implementation of SILETON must therefore be observed not only in terms of technological robustness but also through the lenses of social mobilization, multi-level governance, and culturally sensitive communication strategies.

Furthermore, the innovation diffusion process cannot be separated from the challenges that arise in the implementation process (figure 2). Technical constraints such as server down, complexity of service flows, or concerns about personal data security often become obstacles in the implementation of public service technology. In addition, challenges also come from internal bureaucracy, such as low response from service officers or lack of training for application operators. For this reason, it is important to analyze how the organizational readiness and human resource capacity at the Agam Disdukcapil are in supporting the sustainability of this digital innovation consistently and effectively.

The implementation of the SILETON application cannot be separated from the big goal of realizing smart governance at the regional level. Smart governance emphasizes data-based governance, transparency, efficiency, and community participation in the public service process. By integrating SILETON into the population service system, the Agam Regency Government is expected to not only be able to provide easy services, but also encourage increased public trust in the performance of the regional bureaucracy. Therefore, it is important to examine in depth how SILETON contributes to forming real and sustainable smart governance practices.

In addition, the demographic factor of Agam Regency, where the majority of the population is of productive age, provides its own opportunities in utilizing digital technology. The productive age generally has a high level of technology adaptation, so the potential for SILETON adoption is quite large if supported by the right communication strategy. However, to reach people from various social backgrounds, an innovative communication approach is needed that is tailored to local characteristics. This includes socialization strategies, digital education, and increasing technological literacy capacity at the grassroots level.

Based on this context, this study is important in exploring deeper the process of SILETON application innovation diffusion in Agam Regency. The main focus of the study is to understand the extent to which this innovation is accepted by the community, how challenges are overcome, and how this application contributes to more modern and adaptive governance. The results of this study are expected to be strategic recommendations for strengthening digital public services in the region and become a reference in developing similar innovations in other regions.

Moreover, despite the increasing adoption of digital innovation in government services, most existing studies tend to focus on implementations in urban areas or in developed countries. Little attention has been given to the innovation diffusion process in rural or semi-urban regions of developing countries like Indonesia, where disparities in digital infrastructure and literacy are more pronounced. This study attempts to fill that gap by exploring the innovation diffusion of the SILETON application in Agam Regency—a unique case that reflects the dynamics of digital transformation in a decentralized, rural-based governance context.

Based on the background above, this study addresses the following research questions:

1. How is the innovation diffusion process of the SILETON application taking place in Agam Regency based on Rogers' theory?
2. What is the contribution of the SILETON application to the realization of smart governance?
3. What strategies can be implemented to optimize the use of the SILETON application in the future?

LITERATURE REVIEW

The concept of public service

Public service is any form of activity carried out by the government or public institutions in order to meet the needs of the community for various basic services, whether in the form of goods, services, or administration. In Law Number 25 of 2009, public service is defined as an activity that aims to provide services to the community according to their rights and needs. Along with the development of the era and the

demands of efficiency, digitalization of services has become an absolute necessity to improve accessibility, quality, and speed of service. The government is now encouraging the implementation of the Electronic-Based Government System (SPBE) as the main foundation for the transformation of technology-based public services.

Smart Governance Concept

*Smart governance*is a governance concept that emphasizes the use of information technology to create a more transparent, efficient, and participatory government process. In this context, technology not only functions as an administrative tool, but also as a means of data-based decision making (evidence-based decision making), inter-agency collaboration, and active community involvement. According to Giffinger, smart governance includes aspects of citizen participation, efficiency of public services, and openness of information. In its application, smart governance aims to strengthen the legitimacy of the government while encouraging continuous improvement in public services.

Smart governance is one of the main pillars of smart city development. It refers to the use of digital technology to improve government performance, transparency, and public participation in decision-making (Yigitcanlar et al., 2024). The application of smart governance in public services includes the provision of online services, integration of databases, and open access to information.

Diffusion of Innovation Theory

The diffusion of innovation theory developed by Everett Rogers explains how an innovation is spread and adopted in a social system through a communication process over a period of time. Rogers identifies five main elements of innovation diffusion: (1) the innovation itself, (2) communication channels, (3) time, (4) the social system, and (5) decision makers. Each of these elements plays a crucial role in determining whether an innovation is successfully adopted.

1. Innovation refers to an idea, practice, or object that is perceived as new by an individual or unit of adoption. In the case of the SILETON application, the innovation lies in the digital transformation of

population administrative services, which shifts from manual procedures to an online, integrated system. The perceived relative advantage, simplicity, and compatibility of the application with users' needs contribute to its potential success.

2. Communication channels are the means by which information about the innovation is transmitted. The diffusion of SILETON utilizes both mass media (websites, social media, printed materials) and interpersonal channels (village officials, peer users), with interpersonal communication proving more influential in rural contexts where digital exposure is limited.
3. Time refers to the innovation-decision process that individuals or organizations go through, from knowledge to persuasion, decision, implementation, and confirmation. In the diffusion of SILETON, time is reflected in the gradual adoption by different community groups over months or years, highlighting the varying speed of acceptance between early adopters and the majority.
4. The social system includes all members of a community that are connected through shared norms, values, and relationships. Support from local governments, village leaders, and social influencers in Agam Regency provides an enabling environment that legitimizes and supports the innovation's spread.
5. Decision makers are individuals or groups responsible for deciding whether or not to adopt the innovation. In SILETON's case, decision makers include local government leaders, Disdukcapil management, village heads, and community representatives who promote, support, and facilitate the innovation process.

A thorough understanding of these five elements is essential to assess how effectively the SILETON application is being diffused and to identify specific challenges and opportunities in its implementation.

RESEARCH METHOD

This study uses a descriptive qualitative approach with the aim of deeply understanding the process of diffusion of SILETON application innovation in realizing smart governance in population administration services in Agam Regency. The qualitative approach was chosen because it is able to explore the meaning, understanding, and experience of actors and service users regarding the implementation of digital innovation in bureaucracy. This study does not focus on measuring numbers, but on interpreting the process that occurs in the field, especially related to how the SILETON application is disseminated, adopted, and accepted by various parties involved in the social system. This study refers to the Diffusion of Innovation theory by Everett Rogers, which explains that the spread of innovation includes four main elements, namely: innovation, communication channels, time, and social systems.

The unit of analysis in this study is the Population and Civil Registration Service of Agam Regency, as the developer and implementing institution of the SILETON application. The informant determination technique uses purposive sampling, by selecting informants based on their role and involvement in the innovation process, starting from policy makers, technical operators, to the community of service users. Data collection was carried out through in-depth interviews, direct observation, and documentation, with data validity tested using source and method triangulation techniques. Researchers position themselves as the main instrument in data mining, as well as conducting in-depth interpretations (thick descriptions) of phenomena that occur in the field. Through this method, it is hoped that a comprehensive analysis can be produced regarding how the diffusion of SILETON innovation is running, the challenges faced, and its contribution to the realization of smart governance in Agam Regency.

RESULT AND DISCUSSION

The findings of this study align with the view of Yigitcanlar et al. (2024), who highlight the importance of AI and technology adoption in enhancing local government services. This corresponds with the implementation of SILETON, which integrates digitalization into population administration services.

Furthermore, according to Vargo, Akaka, and Wieland (2020), innovation diffusion in public sector should be seen through the lens of service ecosystems and institutional

support. This perspective provides insight into how SILETON can be institutionalized and diffused effectively within the governance structure.

Before going to the coding stage, we first organize the informants. Informants in this study were taken using purposive sampling techniques. This classification is used to select informants with criteria related to the innovation diffusion process itself. The SILETON application innovation diffusion analysis research in Agam Regency, places the selection of informants based on their role and involvement in the adoption process, implementation, and experience of using the application. The following informant data were coded to facilitate the next coding stage (table 1).

Table 1. *Coding* research informant

Informant	Name	Position/ Category of Informant
I1	F-ZMP	Head of Population Administration Information Management Division (PIAK)
I2	SP	SILETON Application Management and Maintenance Officer
I3	NY	SILETON Application Service Admin
I4	D	General Public Users of the SILETON Application
I5	A	Young People Using SILETON Application
I6	H	Elderly Community (50 years and above)
I7	R	Bachelor's Degree Graduate Society
I8	V	High School Graduates Community
I9	T	Rural Community
I10	A	Urban Society
I11	R	SILETON User Students

Source: Researcher Processed Data (2025)

Next, the informant data which is the main source of this research will go through a coding process to obtain a memo or research discussion theme. The next analysis technique is coding (Bungin, 2021). which consists firstly of Open Coding, namely grouping or separating data into initial concept groups related to the phenomena being studied (table 2).

Table 2. Open Coding Results

Informant	Transcript	Draft Label/Highlight

I1	*The background of the development of this application is actually an effort to change the method to improve efficiency and accuracy in population data management. Agam Regency is quite large, so many people have difficulty and have to travel long distances to take care of population documents and of course it also requires costs.*	for efforts to change methods to improve efficiency and accuracy (Draft 1)
I3	*"The main feature of the Sileton application that is most widely used by the public is the online population document submission service, such as making Family Cards, Birth Certificates, and making KTP. This feature is very helpful because people no longer need to come directly to the Disdukcapil office, they just need to upload the required documents through the application."*	**New key features**which helps the community because they don't have to come directly to the office (Draft 2)
I2	*"Some areas in Agam Regency have limited network infrastructure, which hinders the smooth use of the application. We continue to coordinate with the Communication and Information Service to ensure a stable network throughout the region."*	have limited network infrastructure (Draft 3)
I9	*"But, indeed, not everyone in the village can easily use it, especially those who are old or not used to technology. Although this application helps, it still needs help from the village apparatus or people who understand more."*	*not everyone in the village can use it***(Draft 4)**
I6	*The writing on the application is small, while this man's eyes are not as sharp as they used to be. Sometimes he is confused about which one to press first, afraid of filling in the wrong data."*	*The writing on the application is small, while this man's eyes are not as sharp as they used to be.***(Draft 5)**
I2	*"Application development does not stop at the initial implementation. We must continue to perform maintenance and system updates to keep the application relevant and safe to use."*	*continue to perform system maintenance and updates***(Draft 6)**
I8	*"I first learned about this application from the village apparatus in the village. At that time, I came to the village office for population administration matters, and they said that now I could use the Sileton application to take care of it."*	*Knowing the application of village devices in the village***(Draft 7)**
I9	*"Yes, there is socialization from the village apparatus, but it is still limited. When the application was first introduced, the village apparatus held a meeting to explain how to use the application."*	*There is socialization but it is still limited***(Draft 8)**
I5	*"I first learned about the Sileton application from Facebook. At that time, I saw a post from the official account of the Agam Regency Disdukcapil explaining about online services and convenience through the Sileton application."*	I first heard about the Sileton application from Facebook (Draft 9)
I3	*"We provide a special email address that can be used by users to report complaints or provide suggestions.....In addition, on the official Disdukcapil website....., then at the village level we place a support team....."*	Providing email addresses, official Disksukcapil websites, and placing support teams in each village (Draft 10)

I1	*"For the development of the Sileton application, the process began with planning in 2021. In terms of time, we need around 8 to 10 months to design, develop, and test the application internally."*	The planning process since 2021, requires around 8-10 months (Draft 11)
I11	*"I think the Sileton application is quite helpful in saving time. I can take care of documents from my boarding house or campus without having to go back and forth to the village office or Disdukcapil."*	Silencer application saves time (Draft 12)
I6	*"..... because if I'm told to do it myself, I'm still really confused about applications like this, it takes time to adapt.."*	It takes time to adapt **(Draft 13)**
I2	*"The Sileton application is updated regularly, at least every 3 months to ensure the system..... Application performance evaluation is carried out every 6 months....."*	Updated regularly (Draft 14)
I1	*"The successful adoption of this application cannot be separated from the synergy between agencies and a shared commitment to improving the quality of public services in Agam."*	Success cannot be separated from synergy and commitment between agencies (Draft 15)
I7	*"In my opinion, as a person who has attended college and is familiar with the use of technology, this application is actually quite relevant to the needs, it's just that some things can be improved, such as the appearance and features of the application which are sometimes too complicated and not easy to understand, which can make new users feel confused."*	Relevant applications with needs only need feature improvements so that everyone can use them (Draft 16)

Source: Researcher Processed Data (2025)

After labeling the transcript results with draft codes, the next step is Axial Coding, which is to unite categories from the Open Coding concept results that have been identified into subcategory groups to see the data compaction in the interview transcription. The results of axial coding from the previous coding are as follows table 3.

Table 3. Axial Coding Results

Draft	**Sub categories**
Draft 1 Draft 2	**Sub category 1**: feature updates through the application to improve efficiency and accuracy
Draft 3 Draft 4	**Sub category 2**: Giving rise to relative advantage, compatibility,
Draft 4 Draft 5	**Sub category 3**: the suitability of applications and digital skills to several aspects of age
Draft 6	**Sub category 4**: data security aspect of each application update
Draft 7 Draft 8 Draft 9 Draft 10	**Sub category 5**: dissemination of information about the SILETON application through socialization of village employees, social media, and various official pages of the Agam Regency Population and Civil Registry Office
Draft 11 Draft 14	**Sub category 6**: Stages of SILETON application development over a period of time
Draft 12 Draft 13	**Sub category 7**: Speed of Users in adopting the SILETON application
Draft 15	**Sub category 8**: Support for synergy between agencies and various change agents in implementing SILETON application practices

Draft 1 Draft 2 Draft 3 Drift 10 Draft 12 Draft 16	**Sub category 9**: Perception of the advantages provided by the SILETON application
Draft 3 Draft 4 Draft 5 Draft 8 Draft 13 Draft 16	**Sub category 10**: perception of deficiencies or challenges in SILETON application

Source: Researcher Processed Data (2025)

Third, Selective Coding, which is integrating data that has been organized from categories and themes by articulating new understandings and findings from the phenomena studied. There are several categories that have been obtained from the results of previous coding as sub-chapters of discussion in this study as follows table 4.

Table 4. Selective Coding Results

Sub Category	Category
Sub category 1 Sub category 2 Sub category 3 Sub category 4	Category #1 Innovation
Sub category 5	Category #2 Information Channels
Sub category 6 Sub Category 7	Category #3 Time
Sub category 8	Category #4 Information Systems
Sub category 9	Category #5 Supporting Factors
Sub category 10	Category #6 Inhibiting Factors

Source: Researcher Processed Data (2025)

After the coding process, the final results of the Selective Coding analysis will be obtained, which is then continued to the process of discussing the main topic through memos by visualizing the existing data to describe the research results. The flow of the memo mindmap is as follows figure 3.

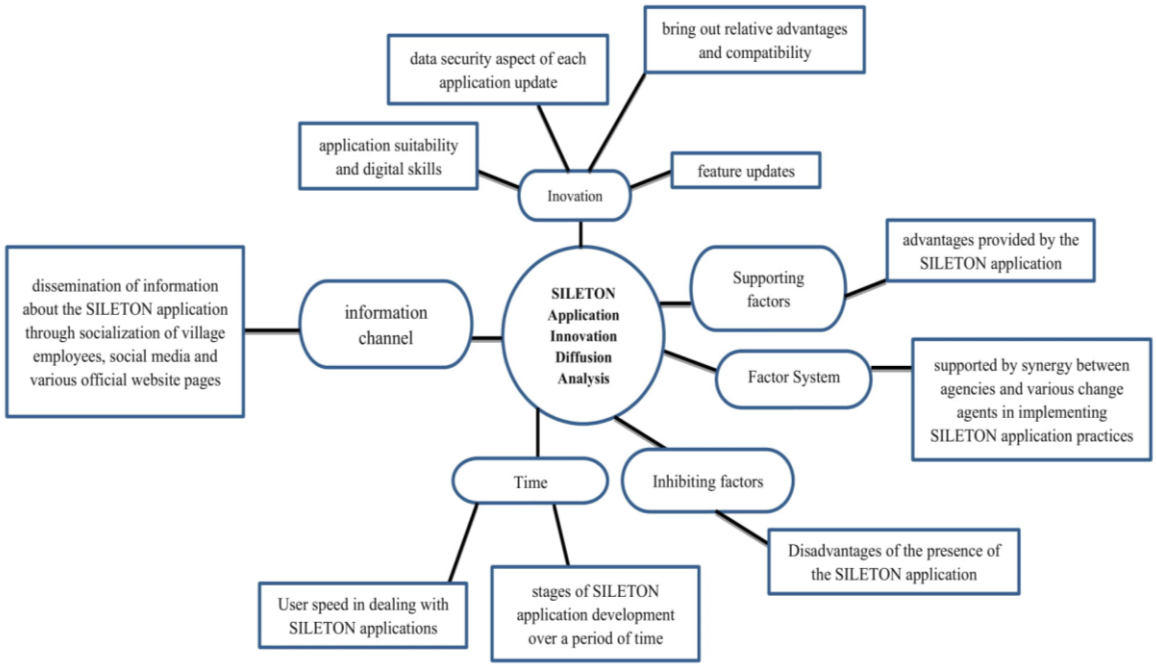

Figure 3. Mind Map study

Source: Researcher Processed Data (2025)

The process of innovation diffusion in the implementation of the SILETON application based on Rogers' Theory of Innovation Diffusion

The SILETON application innovation diffusion process is analyzed based on four main elements in Everett M. Rogers' theory, namely innovation, communication channels, time, and social systems. In terms of innovation, SILETON is perceived as a new idea that offers relative advantages compared to previous manual service methods. This application allows people to take care of population documents online without having to come to the office, saving time and money. In addition, its main features which include online submission of KTP, KK, and birth certificates are considered very relevant to the needs of the community, especially after the COVID-19 pandemic. Characteristics such as ease of use, suitability to needs, and observable results make this application have strong innovative value (Rogers, 2003).

In terms of communication channels, the dissemination of information about SILETON is carried out through two main channels, namely mass communication and

interpersonal communication. The Agam Regency Government utilizes the official website, social media, banners, and flyers to introduce this application. However, based on field findings, most people know about the existence of SILETON from direct communication with the village apparatus, which is the main agent in bridging information to residents. The interpersonal approach has proven to be more effective in increasing understanding and encouraging adoption, especially in rural areas that have limited access to digital media (Almulhim & Yigitcanlar, 2025).

The time element in the diffusion process shows that the development of the SILETON application took place over 8–10 months from 2021 until its launch, involving collaboration between the Disdukcapil, Dinas Kominfo, and third-party software developers. The initial phase of diffusion was marked by the introduction and training of officers and socialization to the village level. Although the application has been running for more than two years, the speed of adoption still varies between early adopters and wider community groups, especially the elderly and people with low digital literacy. Empirical studies in developing regions further support that training and time-bound interventions accelerate diffusion among hesitant groups (Rahmawati & Nugraha, 2022). Nevertheless, research in ICT adoption indicates that elderly users often require extended periods and tailored support to move from awareness to regular use (Setiansah et al., 2023). These findings suggest that ongoing technical support, community outreach, and phased adoption strategies are essential for optimizing the temporal dimension of the SILETON diffusion process.

The social system as the fourth dimension in Rogers' theory also influences the success of the SILETON application diffusion. Support from the local government through policies, budgets, and cross-agency involvement creates a social environment that supports the adoption of innovation. In addition, the active involvement of village officials and community leaders strengthens the legitimacy of this application in the community. However, there are still challenges in the form of disparities in digital infrastructure between urban and rural areas, as well as negative perceptions from some people who do not fully understand how the application works (Mehmood et al. 2024).

Overall, the diffusion process of the SILETON application in Agam Regency has shown positive progress, although it is not yet completely even. The advantages of the

application in terms of efficiency and transparency of services have been recognized by various parties, but technical complexity and digital literacy gaps are still major obstacles. With strategies such as increasing digital training, simplifying the user interface, and expanding information technology infrastructure, the SILETON application has great potential to become a model of digital innovation in regional public services, while also encouraging the realization of smart governance as a whole.

Contribution of the SILETON application to the implementation of smart governance in Agam Regency

The contribution of the SILETON application to the implementation of smart governance in Agam Regency is clearly visible through the increased transparency of public services. Through the document status tracking feature, the public can directly monitor the process of submitting population administration services online. This reduces dependence on information from officers and minimizes the potential for irregularities. The Disdukcapil also utilizes feedback from users to continuously improve and perfect the system, creating a participatory evaluation cycle that is the main characteristic of transparent and accountable governance.

In terms of efficiency, SILETON has succeeded in reducing service time which previously could take several days to just one working day, as long as the required documents are complete. Such efficiency exemplifies the principles of smart governance, which prioritize bureaucratic simplification, accelerated processes, and improved user experience (United Nations, 2006; Vrabie, 2025). Global examples reinforce this: Singapore's Moments of Life platform reduced many life-event services to under an hour (Number Analytics, 2024), and in Kenya, e-Citizen platforms eradicated queueing, cut waiting times dramatically, and lowered operational costs (E-Citizen Kenya, 2023). These findings confirm that digital-first public administration models can enhance administrative throughput, reduce system inefficiencies, and elevate citizen satisfaction core tenets of effective smart governance. This application allows people to submit documents from anywhere without having to come to the office, reducing the burden of queues and transportation costs. This efficiency is a real manifestation of the principle of

smart governance which prioritizes bureaucratic simplification, process acceleration, and increasing the comfort of public service users.

SILETON also encourages increased community participation in the public service process. Through the involvement of village apparatus as social intermediaries, people who were previously unfamiliar with digital technology can still access services. In addition, young groups such as students play an active role in disseminating information and assisting in the process of using applications at the family and community level. This collaboration is a concrete form of collaborative governance, where the community is not only a service user, but also an actor in the development and evaluation of the system. Simultaneously, younger community members especially students serve as informal facilitators, disseminating knowledge and guiding application usage within families and neighborhoods. Such dynamics embody collaborative governance, where community members not only consume services but actively participate in system development and evaluation (Sihotang *et al.,* 2023; Sumantri, 2021). Local evidence from Indonesia confirms that digital literacy initiatives tied to community engagement significantly boost participation, particularly when youth act as peer-support agents (Isnaini *et al*., 2024). In contexts of rural digital transformation, coordinated collaboration involving government, community leaders, and youth volunteers accelerates adoption and fosters trust in digital systems (Murtinah *et al.,* 2023).

Support from the local government for this innovation is very significant. The digitalization policy of services, budget allocation for system development, and coordination between institutions (Disdukcapil, Kominfo, and the village government) are institutional pillars that support the successful implementation of SILETON. This synergy strengthens the principles of integration and interoperability in smart governance, where the public service system does not run sectorally, but is coordinated across units for greater efficiency (Hardi et al., 2025; Maulana et al., 2025). Research on local e-government coordination confirms that perceived effectiveness, trust, and formal

inter-agency cooperation significantly enhance data sharing and service integration (Wahyuni et al., 2025).

However, challenges are still found in the process of optimizing SILETON's contribution to smart governance. Problems such as limited internet access in several villages, low digital literacy among the elderly, and an interface that is not yet fully user-friendly are obstacles to equalizing the use of the application. Therefore, ongoing efforts are needed in the form of digital training, technical improvements to the application, and expansion of technological infrastructure, so that the benefits of the application can be felt by all levels of society (Susanto & Goodwin, 2013).

Overall, the SILETON application has become a real example of the application of digital innovation in supporting the principles of smart governance in the regions. Transparency, efficiency, participation, and cross-sector collaboration built through this application show that the digitalization of public services is not only about technology, but also a transformation in governance that is more inclusive, responsive, and adaptive to changing times. In the future, strengthening digital literacy strategies and developing adaptive systems are the keys to maintaining and increasing SILETON's contribution to smart governance in Agam Regency (Zolotas *et al.,* 2021).

Strategy to optimize the use of SILETON application to strengthen smart governance in Agam Regency

The strategy for optimizing the use of the SILETON application in Agam Regency needs to start with increasing digital literacy of the community, especially in rural and remote areas that still have minimal access to technology. Many people, especially the elderly or residents with low levels of education, are still confused about using this application. Therefore, community-based training such as socialization at the village office, counseling through integrated health posts, and digital literacy programs based on community groups are strategic steps to bridge the gap in understanding technology at the grassroots level (Susanto & Goodwin, 2013).

In addition to increasing user capacity, strengthening internet network infrastructure is a fundamental aspect in supporting the smooth running of online-based services. Blank spot areas or areas with minimal signal are still a major challenge for the

adoption of the SILETON application evenly. Disdukcapil needs to collaborate with the Kominfo Service and network service providers to expand signal coverage. On the other hand, alternative solutions such as mobile service posts or digital kiosks that are directly integrated with SILETON can be an innovation in offline-online hybrid services for people who have difficulty accessing them (UNDESA, 2022).

The third strategy is to develop a more contextual and personal communication approach. The dissemination of information about the benefits and procedures for using the application needs to be adjusted to the characteristics of the local community. Educational content in the form of short videos, visual stories (storytelling), use of local languages, and testimonials from residents who have successfully used the application can be used to increase trust and interest. The appointment of digital ambassadors in each village who serve as information drivers and technical assistants will also accelerate the adoption process, especially among non-digital natives (Rogers, 2003).

Furthermore, strengthening inter-agency coordination is very important in ensuring the sustainability and integration of SILETON in governance. Collaboration between Disdukcapil, Dinas Kominfo, and village and sub-district governments needs to be sharpened in the form of regular meetings, preparation of joint SOPs, and clear division of authority. Integration of data and services across agencies is also the foundation for system interoperability, which is a key principle in smart governance (Vargo *et al*. 2020).

From a technical perspective, developing application features is also an important strategy. User assistance features such as interactive guides, quick help buttons, or chatbot integration need to be added to improve the user experience. In addition, a regular evaluation system for the performance of the application that is already running through user feedback, online surveys, or usage statistics data will help identify aspects that need to be improved. Simplifying the interface to be more friendly to all groups is also an important priority in improving application usability (Yigitcanlar *et al.,* 2024).

Overall, the SILETON optimization strategy is not only technological, but must be holistic, participatory, and sustainable. Increasing digital literacy, providing adequate infrastructure, adaptive communication approaches, institutional synergy, and technical improvements are complementary combinations to create truly inclusive digital public services. If this strategy is implemented consistently, the SILETON application can

become a model of public service innovation that is able to realize smart governance as a whole at the regional level (Zolotas *et al.* 2021).

The main supporting factors for the diffusion of innovation include local government policy support, the availability of basic infrastructure, the role of community facilitators, and the openness of young people to technology. On the other hand, the identified obstacles include low digital literacy, limited internet access in certain areas, dependence on social media, and the lack of online services for all types of documents (Rogers, 2003).

CONCLUSION

This study demonstrates that the diffusion process of the SILETON application innovation in population services in Agam Regency has progressed gradually, in line with Rogers' Diffusion of Innovation theory. The application offers significant relative advantages such as time efficiency and ease of service access. However, it still faces challenges related to the complexity of use and limited technological understanding within certain communities. Interpersonal communication, particularly through village officials, plays a crucial role in disseminating information and increasing the application's usage. SILETON contributes to smart governance implementation by enhancing transparency, efficiency, and public participation in administrative services. It facilitates online access to services, improves accountability, and fosters collaboration among local governments, village apparatuses, and residents. Despite these achievements, issues like digital literacy gaps and limited infrastructure remain barriers to fully realizing inclusive and intelligent governance.

To optimize SILETON's impact, several strategies have been identified, including improving digital literacy, ensuring equitable internet infrastructure, enhancing inter-agency coordination, and advancing application development. The structured and participatory implementation of these strategies is expected to drive digital transformation at the regional level. For this reason, it is suggested that the Agam Regency Population and Civil Registry Office adopt a collaborative approach in further developing SILETON by involving village officials, community leaders, and the younger generation as digital change agents. Prioritizing digital literacy and infrastructure

development is essential to ensure equal access and application utilization across all societal levels, thereby supporting the realization of sustainable and inclusive smart governance.

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