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Digital Transformation in Action Examining the Reality of Smart City Implementation Journey

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Abstract: Digital transformation in government governance is one of the main strategies for increasing the efficiency and quality of public services. The smart city concept is present as an innovative solution in facing various urban challenges by utilizing digital technology. This research aims to analyze the implementation of the Electronic Based Government System (SPBE) as a policy in supporting smart cities in Klungkung Regency and identify factors that hinder its implementation. The research method used is a qualitative approach using interview, observation and documentation techniques. The research results show that although SPBE has been implemented to support the integration of government services, there are still significant obstacles, especially in the aspects of infrastructure and human resource readiness. The geographical constraints of Klungkung Regency, which consists of land and islands, also pose a challenge in equalizing digital access. By improving infrastructure, strengthening human resource capacity, and optimizing policy coordination between the central and regional governments, it is hoped that the implementation of smart cities in Klungkung Regency can run more effectively and sustainably.

Keyword: Digital Transformation, Smart City, Electronic Based Government System (SPBE), Klungkung Regency, Public Policy.

INTRODUCTION

Digital transformation in public services in Indonesia is one of many strategic steps to maximize the use of technology in improving the quality of services to the community (Suwarno & Wati, 2020). One of the policies that encourages the use of information and technology (ICT) in Indonesia is Presidential Instruction of the Republic of Indonesia Number 3 of 2003 concerning National Policy and Strategy for the Development of e-Government. This instruction emphasizes the use of information and communication technology (ICT) in the government process which will have an impact on increasing efficiency, effectiveness,

transparency, and public services. However, the journey towards an inclusive and sustainable digital transformation is not easy. Indonesia, which is known as an archipelagic country with wide geographic and demographic diversity, certainly faces complex challenges in realizing this vision (Kuswati et al., 2022). Therefore, the government has established various policies to accelerate the implementation of information and communication technology (ICT) in governance and encourage the integration of various elements of a smart city. Currently, the concept of a smart city in Indonesia has been implemented gradually at various levels, from cities, districts to villages (Akbar & Djunaedi, 2024). For example, in Bali Province, the government launched the "Bali Smart Island" innovation program where the program was realized through the integration of the implementation of the smart city concept in regencies or cities and the concept of the smart province of Bali. However, the implementation of the smart city concept in cities and regencies certainly has differences, considering the different characteristics, cultures, and community activities between city and district areas (Akbar & Djunaedi, 2024). The diverse characteristics and potentials in district areas cannot be generalized in the application of the smart city concept on a district scale. The unique value of the smart city concept in district areas lies in the objects supported by the smart city innovation program based on differences in regional characteristics and potential. Especially for district areas that have different characteristics or characteristics from other areas, it will result in the impact of implementing a specific smart city concept according to the unique characteristics of each district (Nday & Djunaedi, 2021). Geographical, economic, and social factors contribute to the digital divide and slow down the process of digital inclusivity in public services. Klungkung Regency is part of the administrative area of Bali Province and is the smallest district after Denpasar City. This regency has unique geographical characteristics, where its territory is divided into two parts: one third is on the island of Bali, while the other two thirds consist of the islands of Nusa Penida, Nusa Lembongan, and Nusa Ceningan. Despite its relatively small area, Klungkung Regency has succeeded in implementing the smart city concept known as Klungkung Smart City. In 2022, the Ministry of Communication and Information (Kemkominfo) designated Klungkung Regency as one of 50 regencies/cities that are members of the Movement Towards Smart Cities (Smart City) program. As a follow-up, Klungkung Regency prepared a smart city master plan with the assistance of a team of experts from the Ministry of Communication and Information through technical guidance. In line with these efforts, Klungkung Regency successfully won a national award for the preparation of a Smart City-based development master plan.

In realizing the smart city concept, Klungkung Regency has developed an Electronic-Based Government System (SPBE). This initiative is in line with the policy of the Bali Provincial Government in realizing Bali Smart Island (Sanjaya & Darma, 2023). This policy is also in accordance with Presidential Regulation of the Republic of Indonesia Number 95 of 2018 concerning the Electronic-Based Government System (SPBE). Based on data from the Ministry of State Apparatus Empowerment and Bureaucratic Reform of the Republic of Indonesia, Klungkung Regency has an Electronic-Based Government System (SPBE) Index of 3.02, which is categorized as "good". This evaluation and assessment is an encouragement for local governments to continue to improve the quality of public services in order to comply with applicable regulations and meet the needs of the community. The results of the evaluation of

the Electronic-Based Government System (SPBE) throughout Bali Province can be seen in the following table.

Table 1 Results of the 2023 Electronic-Based Government System Evaluation (SPBE) for the Regency/City of Bali Province

Nama Instansi	Indeks SPBE	Predikat
Kota Denpasar	3,80	Sangat Baik
Kabupaten Tabanan	3,77	Sangat Baik
Kabupaten Badung	3,66	Sangat Baik
Kabupaten Buleleng	3,45	Baik
Kabupaten Jembrana	3,14	Baik
Kabupaten Gianyar	3,14	Baik
Kabupaten Klungkung	3,02	Baik
Kabupaten Bangli	2,48	Cukup
Kabupaten Karangasem	2,30	Cukup

Source: Bali Satu Data, 2024

Based on the evaluation index value, Klungkung Regency does have a value that is categorized as good, but overall from the evaluation results of the Electronic-Based Government System (SPBE) index, Klungkung Regency is ranked in the bottom three in Bali province. Not only that, the Klungkung Regency government from 2021 to 2023 has a stagnant index value of 3.01-3.02. This can be seen in the following table.

Table 2 SPBE Index of Klungkung Regency Government

Nama Indeks	2021	2022	2023
SPBE	3,01	3,01	3,02
Domain Kebijakan SPBE	2,20	2,20	2,90
Kebijakan Internal Tata Kelola SPBE	2,20	2,20	2,90
Domain Tata Kelola SPBE	2.30	2.30	2,90
Perencanaan Strategis SPBE	1,75	1,75	2,50
Teknologi Informasi dan Komunikasi	2,75	2,75	3,00
Penyelenggaraan SPBE	2,50	2,50	3,50
Domain Manajemen SPBE	1,64	1,64	1,09
Penerapan Manajemen SPBE	1,88	1,88	1,13
Audit TIK	1,00	1,00	1,00
Domain Layanan SPBE	4,13	4,13	3,82
Layanan Administrasi Pemerintahan Berbasis Elektronik	4,00	4,00	3,70
Layanan Publik Berbasis Elektronik	4,33	4,33	4,00

Source: PanRB Monitoring Results Report (2024)

Based on the evaluation index, Klungkung Regency has had a good score for three consecutive years, but the score is stagnant at 3.01-3.02. When viewed from the evaluation results, this is because the Electronic-Based Government System (SPBE) management domain still has a low score without any improvement for three consecutive years, namely in the implementation of SPBE management and ICT Audit. This is because all indicators in the implementation of SPBE management and all implementation of ICT audit aspects in the

infrastructure, application, and security audit management indicators of the Electronic-Based Government System (SPBE) have not been met in the Klungkung Regency government environment. Various activity programs have been carried out to realize Klungkung Smart City, such as developing a digital-based application system to connect all services in an integrated manner both in mainland and island areas. However, based on the results of the researcher's initial observations, the Klungkung Regency Government has not been able to significantly increase the value of the Electronic-Based Government System (SPBE) index because the government in Klungkung Regency does not yet have an ICT auditor even though the ICT auditor team decree has been made. In addition, there are problems related to infrastructure in Klungkung Regency due to its separate geographical location, making it difficult to equalize infrastructure. This is because there are still blank spot areas in Klungkung Regency, which can be seen in the following table.

Table 3 Blank Spot Locations in Klungkung Regency

No	Longitude	Lattitude	Desa	Kecamatan
1	115.576.267	-8.702.305	Desa Sekartaji	Nusa Penida
2	115.606.315	-8.739.699	Desa Sekartaji	Nusa Penida
3	115.619.047	-8.765.148	Desa Sekartaji	Nusa Penida
4	115.561.137	-8.771.106	Desa Sekartaji	Nusa Penida
5	115.593.260	-8.800.543	Desa Sekartaji	Nusa Penida
6	115.523.345	-8.774.407	Desa Sekartaji	Nusa Penida
7	115.494.826	-8.759.536	Desa Sekartaji	Nusa Penida
8	115.474.590	-8.745.228	Desa Sekartaji	Nusa Penida
9	115.462.985	-8.724.933	Desa Sekartaji	Nusa Penida

Source: Klungkung Regency BTS Tower Development Proposal, 2023

From the data above, it can be seen that all blank spot areas in Klungkung Regency are in Nusa Penida District. In addition, in the Klungkung Regency area, Fiber Optic technology has not been installed one hundred percent, there are still areas that use wireless technology, most of which are in Nusa Penida. It can be said that the geographical conditions of Klungkung Regency, which are separated between the mainland and the islands, have a significant impact on the implementation of the Electronic-Based Government System (SPBE) in Klungkung Regency. This is in line with research conducted by (Nurlaila et al., 2024) where geographical, economic, and social factors contribute to the digital divide and slow down the process of inclusiveness in public services. Klungkung Regency, which has a rich culture and tourism potential, has a great opportunity to implement a smart city. However, the geographical conditions of the separated area cause the implementation of an electronic-based government system in realizing a smart city in Klungkung Regency to be less than optimal. This finding has attracted researchers to explore more deeply about how the implementation of an electronic-based government system as a policy on the journey to realizing a smart city in Klungkung Regency. This study is expected to provide practical solutions in an effort to support the vision

of an inclusive and sustainable Smart City, as well as become a model for other regions that have similar challenges.

METHOD

This research was conducted at the Communication and Information Service (Diskominfo) of Klungkung Regency, which has the authority in the fields of communication, informatics, and statistics, including coding as part of the regional government's duties. In addition, the functions and work units that play a role in the implementation of Electronic-Based Government System (SPBE) technology and the Klungkung Smart City program are also under the auspices of the Klungkung Regency Diskominfo. The research method used is qualitative descriptive research, as defined by Lambert. (Ahmad Fauzi, et al., 2022). Qualitative descriptive research is a type of research that focuses on understanding individual experiences through verbal data. This study uses an empirical approach, which means that data is collected and analyzed through direct observation or measurement.

This approach collects evidence that can be verified and observed. (Creswell, 2018). Data collection techniques include observation, interviews, and document studies. The selection of research informants was carried out using purposive sampling techniques, which is a method used to identify individuals who have valuable knowledge, experience, or insight related to the research topic or perspectives related to the research topic. (Moleong, 2018). The informants selected are individuals who meet certain criteria and are considered to have the best understanding of the research subject, so they are deliberately selected by the researcher. (Kurniawan, 2020).

The author uses triangulation to verify the accuracy of the data in the study. Triangulation involves cross-checking information from various sources using different methods and carried out at different times. The author uses source triangulation to test the credibility of the data, namely by comparing information from various sources (Sugiyono, 2019). In addition, the researcher ensures the validity of the research data through persistence in field observations, careful data analysis, and careful interpretation of the data on various information obtained before finally being analyzed thoroughly.

RESULTS AND DISCUSSION

Implementation of Electronic-Based Government System in Realizing Smart City in Klungkung Regency

The implementation of SPBE in realizing Klungkung Smart City can run well if it meets the four indicators or variables that must be met according to George Edward III, namely:

Communication

Transmission or distribution of communication is part of the communication indicator in policy implementation. The goal is that information is not only conveyed to policy implementers but also to related parties and target groups (Asyafin et al., 2021). Referring to the research results, it can be concluded that the Klungkung Regency Communication and Informatics Office has conveyed information related to the electronic-based government system in realizing a smart city in Klungkung Regency not only to its employees and each regional apparatus as policy implementers, but also to the community as a target group through the

official website of Klungkung Regency (https://www.klungkungkab.go.id). The use of this website is one of the effective communication strategies in increasing information openness, although the management mechanism still faces challenges in terms of regulation and periodic information updates, as also found in previous studies that highlighted the absence of a strong legal basis regarding the operationalization of local government websites (Yogiswara et al., 2019).

In addition, the Klungkung Regency Communication and Informatics Office also strengthened its communication by coordinating with external agencies such as the Bali Provincial Communication and Informatics Office and the National Cyber and Crypto Agency (BSSN) to ensure the effectiveness of the implementation of the policy. In practice, this communication is carried out by coordinating through various channels, such as WhatsApp groups, Klungkung e-mail, email, and coordination and evaluation meetings that are routinely held every year. This effort shows an adaptive and collaborative communication pattern in the implementation of an electronic-based government system. Compared to the Bali Provincial Government which has built service integration through collaboration with various stakeholders, including district/city governments and vertical institutions (Sanjaya & Darma, 2023), the communication pattern in Klungkung Regency is more focused on strengthening coordination between regional devices and optimizing the use of digital media. However, the challenges in disseminating information in the archipelago remain a concern, especially in ensuring that communication can reach the entire community evenly and support active participation in the use of digital services.

Resources

Resources are a crucial factor in determining the success or failure of policy implementation. Three main indicators in the resource aspect include human resources, budget, and facilities and infrastructure. In terms of human resources, the results of field research show that the number of professional staff in the Klungkung Regency Communication and Informatics Office is still insufficient. One clear evidence is the number of sandiman which is still very limited, namely only one person. The small number of sandiman as a system and network security team in the electronic-based government system causes protection of the system to be less than optimal. This finding makes it clear that not only the educational background of the workforce is an obstacle, as stated in the study (Yogiswara et al., 2019), but also the limited number of human resources in terms of quantity also affects the effectiveness of system protection. In addition, until now the Klungkung Regency Government has not had an ICT auditor team in the implementation of the electronic-based government system. The absence of this auditor has resulted in the evaluation assessment carried out by the Ministry of PANRB every year being less than optimal. In terms of budget resources, the implementation of the electronic-based government system in Klungkung Regency depends on the Regional Revenue and Expenditure Budget (APBD).

However, the available budget allocation is still insufficient because the existing funds are not only focused on electronic-based government systems, but must also be allocated for various other regional needs. This budget limitation certainly has an impact on the effectiveness of the policies implemented. This condition is different from the provincial level, where the development of SPBE has become a priority program with a more targeted budget, allowing

them to build integrated data centers and more advanced infrastructure (Muka et al., 2020). This shows that budget limitations not only hinder infrastructure development, but also affect the effectiveness of district policy implementation, especially at the level of system maintenance and increasing HR capacity. Meanwhile, in terms of facilities and infrastructure, the facilities available at the Communication and Information Office a Klungkung Regency is still not fully adequate. Although supporting facilities have been provided evenly in both mainland and island areas, signal quality problems are still an obstacle, especially in island areas. In the Nusa Penida area, there are nine blank spots and 20 areas that still use wireless technology because it is not yet possible to install fiber optics.

Although the GSM (Global System for Mobile Communication) solution has been implemented, unstable signals often cause network connection disruptions. In contrast to the coverage of services at the provincial level, where free internet networks through Bali Smart Island have been widely available in public facilities (Sanjaya & Darma, 2023), the results of this study show that the challenges at the district level are more complex, especially in reaching areas with difficult geographic conditions. In addition, system and network security facilities are still limited. Currently, only one UPS (Uninterruptible Power Supply) unit is available, whereas ideally two units are needed to maintain electricity stability. A firewall as protection from cyber threats is also not yet available, although its procurement has been proposed. However, budget constraints are the main obstacle in realizing the procurement of these devices.

Based on these conditions, there are still various challenges in fulfilling the resource indicators needed to implement the electronic-based government system policy to realize a smart city in Klungkung Regency. In fact, the availability of adequate resources is an important factor in the success of policy implementation. With optimal resource support, policy implementation can run effectively and achieve maximum results (Asyafin et al., 2021). 3. Disposition The success of a policy is also influenced by the disposition or attitude of the policy implementer. The attitude of the implementer plays an important role in determining the direction and success of the policy, because their support can optimize the implementation process (Asyafin et al., 2021). Referring to the results of the study, it can be concluded that the attitude and support of the leadership in the implementation of the electronic-based government system to realize a smart city in Klungkung Regency are good and very supportive.

This can be seen from the issuance of the Klungkung Regent's Decree concerning the implementation of a smart city, the Klungkung Regent's Decree regarding the agenda information system, disposition and digital archiving to realize paperless government administration using the Klungkung e-mail application, and the plan to develop Lembongan Smart Digital to strengthen digital in the island region. This study is in line with the findings (Yogiswara et al., 2019) which show that the commitment of the Klungkung Regent in supporting transparency and openness of public information is based on the principles of good corporate governance which include transparency, accountability, and good management. Meanwhile, incentives or additional wages for policy implementers are still considered unnecessary, considering that the tasks carried out remain in accordance with the main tasks and functions of the Klungkung Regency Communication and Information Service. 4. Bureaucratic Structure The bureaucratic structure includes aspects of organization, division of authority, and relationships between units within the organization and with other organizations.

In bureaucracy, there are two main characteristics that stand out, namely fragmentation and standard operating procedures (SOPs) which play a role in regulating the implementation of policies (Ariyani et al., 2014). Standard Operating Procedures (SOPs) can facilitate the implementation of policy implementation. Referring to the research results, it can be concluded that the policy of an electronic-based government system in realizing a smart city in Klungkung Regency refers to the Klungkung Regent Regulation Number 22 of 2022 concerning the Architecture and Map of the Regional Government Electronic-Based Government System Plan and Klungkung Regent Regulation Number 21 of 2023 concerning the Klungkung Smart City Masterplan 2023-2032 as a guideline for the work program of each work unit affiliated with the Klungkung Regency Communication and Informatics Service, but specifically the procurement of applications in each regional apparatus has different SOP characteristics according to the application work mechanism of its needs.

Furthermore, in fragmentation, effective policy implementation requires a clear, flexible, coordinated and well-supported division of tasks. Based on this study, the division of tasks and responsibilities in the SPBE policy in Klungkung has been regulated in the Klungkung Regent's Decree, which establishes the SPBE and Smart City Implementation Team for Klungkung Regency. The existence of this team ensures that each unit has a clear role in implementing digital policies. However, when compared to the previous one by (Muka et al., 2020) regarding the Government Bali Province, there are significant differences in organizational structure. The Bali Provincial Government has an SPBE Coordination Team, an SPBE Development Team involving academics and professionals, an SPBE Technical Team, and a CSIRT Team for cybersecurity. Meanwhile, this study did not find any specific structure for cybersecurity or a cross-sector coordination team in Klungkung Regency.

Klungkung Smart City is a concept of a smart region in utilizing its resources effectively and efficiently for sustainable city development and management, excellent public services and improving quality human resources supported by the implementation of information and communication technology. As part of the effort to build a smart city, the implementation of an electronic-based government system in Klungkung Regency is directed to support the development of the six dimensions of a smart city proposed by the Citiasia Center From Smart Nation (CCSN), namely:

1. Smart Governance has the aim of realizing effective, efficient, communicative governance and governance of regional government and to improve bureaucratic performance through innovation and integrated technology adoption. The results can be seen from various applications that support governance in Klungkung Regency, including Pitra Bakti (birth and death certificate application), JDIH-DPRD Klungkung Regency (application for marketing legal products that can be accessed by everyone), E-Perda and Si Tampan Online (application for data integration), Lokasiwa (community organization monitoring program), and Siada E-Surat (Klungkung Regency government data management informatics system). The application is available and can be accessed by the public via https://klungkungkab.go.id, thus supporting transparency and public participation. Although the implementation of smart governance has gone well, challenges still remain, such as increasing technology adoption by the community and ensuring that infrastructure is evenly distributed, especially in the archipelago.

2. Smart Economy aims to create an economic ecosystem in regions that is adaptive to the challenges of the digital era while strengthening local competitiveness. The results can be

seen from several innovations that have become flagship programs of Klungkung Regency, including the Panputulagas Program (care troops for orderly measurement serving until completion), Gemarikan (a program for liking to eat fish), Wastamangan (environmentally friendly agricultural areas), Give Me a Hook Not a Fish (job training program), and Uyyah Kusamba (a program for empowering Kusamba coastal communities to maintain their local salt products). These innovations have been running well even though they have not been fully integrated into the technology platform, but the electronic-based government system policy implemented in Klungkung Regency will continue to provide support through digital-based administrative services and more organized data access.This effort reflects the initial steps to connect local economic potential with electronic-based systems in the future.

3. Smart Branding aims to increase regional competitiveness by arranging the face of the city and marketing regional potential. The results are seen from several innovations, including the Adung (Aan Manduang) innovation which is a program to improve the tourist destination of two integrated areas, namely Aan Village and Manduang Village, the Bersamamu innovation (learning together in the museum), the Aksiku innovation (attractions to preserve arts and culture), the Bali Cultural Center Development program initiated by the Bali Provincial Government, and One Stop Service Manli (information system on investment and investment) this program facilitates the investment process with a platform that integrates various services in one application. Innovation in this dimension has been running well, with this smart branding innovation, Klungkung Regency has not only improved regional branding but also increased its competitiveness and attracted the attention of more investors and the wider community.

4. Smart Society aims to support community welfare and a forum for social interaction, as well as programs that regulate public order and security. In Klungkung Regency, the implementation of this dimension can be seen from several innovations that optimize information technology in directly touching the community, including Klungkung in the palm of your hand (a community empowerment program for customary institutions and customary law), Teresna innovation (teruna resik obat) which is an anti-drug youth program, Sipusda innovation (regional library information system), Hallo BPBD (Regional Disaster Management Agency information system), and Papagtibum innovation (Satpol PP information system). Through these technology-based innovations, Klungkung Regency not only creates a more connected community but also strengthens order and welfare through information-based services that are easily accessible by public.

Smart Living aims to create a livable, comfortable, and efficient living environment. The results can be seen from several innovations in Klungkung Regency, including the Tarusanti innovation (spatial planning program), Sidakarya innovation (residential area program), Smart PSC innovation (Health service application), Santipadu innovation (Health service application), and Siwalatri innovation (ship transportation/service application). With this innovation, Klungkung Regency strives to create a better and more comfortable living environment through the use of technology in various aspects of daily life from spatial planning to public services, all of which can be accessed more efficiently and integrated.

5. Smart Environment aims to maintain, control, and utilize natural resources. The results can be seen from several innovations in Klungkung Regency, including the TOSS innovation (local waste processing facility) and an information system regarding energy management. This TOSS innovation has entered the Top 5 outstanding achievements of public

services in 2022. With the implementation of an electronic-based government system in waste and energy management, Klungkung Regency is getting closer to the goal of a sustainable smart environment.

Based on the explanation above, the implementation of the electronic-based government system in realizing a smart city in Klungkung Regency has gone well even though it still faces several challenges. The indicators of communication, resources, disposition, and bureaucratic structure in the implementation of the electronic-based government system in realizing a smart city in Klungkung Regency have been met quite well. However, there are several aspects that still need to be improved, especially in the resource indicator, especially in the availability of the ICT auditor team. This causes the assessment of the electronic-based government system in Klungkung Regency to stagnate at 1 on a maximum scale of 5 which affects the evaluation results from the Ministry of PanRB. However, in general the implementation of the smart city concept through the electronic-based government system in Klungkung Regency is quite adequate and shows significant progress in efforts towards a more efficient and modern smart city

Inhibiting Factors in the Implementation of the Electronic-Based Government System as a Policy in Realizing a Smart City in Klungkung Regency

Limited Technology Infrastructure

The main obstacle in the implementation of the electronic-based government system in Klungkung Regency is the condition of the technology infrastructure that has been used for a long time and has not been updated. Devices such as servers, CCTV, and supporting devices at the Command Center are more than five years old, which should have been updated to continue to be able to support increasingly developing digital services. Without this update, the risk of technical disruptions is greater, which could have an impact on less than optimal electronic-based public services. In addition, the Uninterruptible Power Supply (UPS) backup device that functions to maintain system stability during a power outage is also still limited. Currently, only one Uninterruptible Power Supply (UPS) is available, whereas ideally at least two units are needed to keep the system safe from the possibility of sudden power outages. If this device is not upgraded immediately, it could have an impact on operational disruptions to the government system.

Geographical Limitations and Technology Accessibility

One of the challenges in implementing an electronic-based government system in realizing a smart city in Klungkung Regency is the geographical factor, especially the Nusa Penida area. Several areas in Nusa Penida still experience weak signal problems. This condition makes it difficult for the public to access digital government services. This obstacle hinders the principle of inclusivity in a smart city where all people should have equal access to electronic-based services. Without network improvements, the community, especially in the Nusa Penida area, will continue to have difficulty utilizing digital services, thus reducing the effectiveness of the implementation of an electronic-based government system as a whole.

Limited Human Resources

The lack of human resources with expertise in the field of information technology is a challenge in the implementation of an electronic-based government system in realizing a smart city in Klungkung Regency. Until now, Klungkung Regency has not had an ICT Auditor Team, which has caused the evaluation assessment from the PanRB Ministry to stagnate every year. In addition, the number of information security experts (sandiman) is also still very limited, even though this role is very important in maintaining the security of government data from cyber threats. With the lack of experts in this field, the management and security of government data is less than optimal, , thus potentially increasing the risk of data leaks and system disruptions.

Fragmentation of Server and Data Management

One of the main principles of a smart city is data integration so that government services become more efficient and interconnected. However, currently the servers in Klungkung Regency are still managed separately by each regional apparatus, causing data management to be decentralized and less efficient. If this system is not immediately integrated into one data center managed by the Klungkung Regency Communication and Informatics Office, coordination between agencies will remain hampered. Data spread across various servers makes the analysis and decision-making process slower, which will ultimately hinder the effectiveness of the smart city.

Recommendations for Improving the Implementation of an Electronic-Based Government System as a Policy in Realizing a Smart City in Klungkung Regency

Resolving obstacles in implementing an electronic-based government system in realizing a smart city in Klungkung Regency requires several strategic steps, namely:

Modernization of Technology Infrastructure, the condition of infrastructure that is more than five years old needs to be updated immediately so that it can support the operation of digital services optimally. The Klungkung Regency Government can allocate a special budget for device rejuvenation and implement a gradual strategy in modernizing technology infrastructure. In addition, the use of cloud computing can also be an alternative to increase efficiency and reduce dependence on physical devices that are susceptible to performance degradation.

Strengthening Digital Networks and Accessibility, To overcome communication network problems in areas such as Nusa Penida, it is necessary to increase internet access through the construction of additional telecommunications infrastructure such as the addition of Base Transceiver Stations (BTS). The Klungkung Regency Government can collaborate with cellular operators to expand service coverage and consider utilizing satellite-based technology as a solution for areas that are difficult to reach by signal. With stable internet access, the implementation of an electronic-based government system in realizing a smart city will be more optimal and evenly distributed to all people in Klungkung Regency.

Providing Proposals for Employee Procurement and Increasing HR Capacity in the ICT Sector. The Communication and Informatics Office of Klungkung Regency can submit a proposal for the procurement of employees who have a computer science education background to add competent experts in managing the security of electronic-based government systems and

coordinate more intensively with the Klungkung regional inspectorate to form an ICT Auditor Team. Implementing the capacity of existing human resources can be done through periodic IT competency training and certification. This training can be done in collaboration with professional training institutions, universities, or the Ministry of Communication and Informatics so that IT personnel in each OPD have better abilities in managing digital infrastructure and system security. 4. System Integration and Data Center Centralization, integrating data centers so that all information can be managed more centrally under the coordination of the Communication and Informatics Office of Klungkung Regency. With a more integrated system, data management will be safer, more efficient, and facilitate data-based decision-making analysis. The implementation of the One Data Klungkung concept can accelerate the digital transformation process in local government.

CONCLUSIONS

From the discussion that the author has conveyed through the presentation and analysis of research data and that has been presented in the previous chapters, the following conclusions can be drawn:

1. The implementation of the electronic-based government system in the Klungkung Regency Government in realizing Klungkung Smart City has been running well and has implemented the six dimensions of the smart city development concept. However, significant improvements are needed in digital technology in each dimension, especially in the dimensions of smart environment, smart economy, and smart branding.
2. For three consecutive years from 2021-2023, the value of the Klungkung Regency electronic-based government system index as assessed by the Ministry of PanRB has remained stagnant in the range of 3.01-3.02 with the predicate "Good". One of the main factors causing this stagnation is the absence of an ICT Auditor Team in Klungkung Regency so that the ICT audit index value remains at 1.00 from a maximum score of 5.00.
3. Inhibiting factors that influence the implementation of electronic-based government systems in realizing a smart city in Klungkung Regency are, limited technological infrastructure where the condition of the technological infrastructure has been used for a long time and has not been updated, geographical limitations and technological accessibility, especially in the island region, limited number of human resources in the ICT sector, and fragmentation of server and data management so that data is not yet centralized.

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