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Improving village information systems for sustainable development in Karawang Regency, Indonesia

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Abstract

The village information system is a critical factor in rural development. The information system allows the government to accurately identify the direction of village development, in accordance with the needs and resources of the village. This research aims to examine and analyze the dimensions that affect the implementation and development of village information systems, as one of the village government's tools in realizing Sustainable Development Goals. This research used a case study approach with qualitative methods, where data was collected through documentation, observation, and interview techniques. The results identified many challenges in the implementation of village information systems in Karawang Regency, such as the lack of regulations at the local level, limited human resource capacity, less information technology infrastructure, and suboptimal performance of pilot applications. Based on these findings, strategic policy recommendations for improvement include formulating local regulations, investing in technology infrastructure, training and developing human resources. This research has positive implications for the application of village-based information systems in realizing the Village SDGs in Karawang.

Keywords: *e-government, village information system, sustainable development, rural governance*

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Introduction

Current advances in information technology have had a significant impact on the government sector, providing opportunities for the adoption of information technology-based services. The current era, characterized by increased information disclosure, offers significant prospects for the effective management and use of information to improve the overall quality of public services. In the context of a growing nation such as Indonesia, it is imperative for policymakers to recognize that e-government serves as a mechanism through which the general populace can engage with the government, particularly in the area of public service delivery (Reddick et al., 2012). In the context of developing countries, e-government is perceived as a driver of change in the public sector because it facilitates the establishment of processes that can be more efficient, accountable, and decentralized (Guanghua, 2009).

E-government is widely acknowledged as a potential solution to the challenges encountered by governments and public organizations in providing efficient services to their customers. E-government serves as a cost-effective system, improves service quality, reduces reaction times, and facilitates obtaining services. Furthermore, it functions as a tool to promote administrative transparency, lessening of corruption, and encourage political engagement (Kumar & Best, 2006). The use of information and communication technologies (ICTs) to improve the availability and delivery of

government services is known as e-government and operations, thereby benefiting citizens, businesses, and other relevant stakeholders. Several nations around the world have embraced e-government. However, its effectiveness in emerging or transitional nations is reported to be merely 15% (Heeks, 2003).

Since 2001, Indonesia has had an e-government system in place, as outlined in Presidential Instruction Number 6 of 2001. The objective of e-government initiatives in Indonesia is to reinforce the democratic system, enhance accountability and transparency, and facilitate the transition to an information society. To date, approximately 450 websites have been established by local governments throughout Indonesia (Furuholt & Wahid, 2008). In rural areas, the government has also initiated the building a community information system. This system is designed to disseminate information to village governments, particularly regarding the potential of village resources, village development, public facilities and services that are owned, as well as to fulfill the rights of every citizen, with a particular focus on village residents. Additionally, the system intends to educate the general public (Arief Rahman, 2015). The village has implemented a series of development initiatives, particularly in order to fulfill its goals for sustainable development as outlined in Law Number 6 of 2014 regarding villages. The establishment of a village information system presents a promising opportunity for various groups, particularly those residing in rural areas, to enhance transparency and accelerate governmental decision-making processes. Consequently, this facilitates the empowerment of rural communities through the increased utilization of government services (Rao, 2004).

Nevertheless, the introduction of e-government in Indonesia has encountered a number of obstacles, including limited financial resources, inadequate human resources, insufficient Technology for information and communication penetration, and a lack of regulatory frameworks and cultural support. Moreover, the advancement of e-government in Indonesia is confronted with significant obstacles, especially at the municipal government level. These challenges include technical complexities, disparities in digital access, and a notable reluctance among both the public and government personnel to embrace the e-government system (Harijadi & Satriya, 2000).

The village information system is a vital component of the local governance apparatus, serving as a conduit for disseminating information pertaining to the village's resources, development initiatives, and the public facilities and services available to its residents. Furthermore, it furnishes information regarding the implementation of development programs at the village level. As defined in Law No. 6 of 2014, the Village Information System encompasses a range of data, including that pertaining to villages, village development, rural areas, and other information pertinent to the advancement of both villages and rural regions. It is anticipated that the Village Information System will facilitate the advancement of villages by optimizing local potential.

In accordance with the Minister of Village, Disadvantaged Regions, and Transmigration Regulation No. 13 of 2020, villages are required to implement sustainable development programs comprising 18 goals, including the eradication of poverty, hunger, and malnutrition; the These include innovation, infrastructure, lowering inequality, sustainable cities and communities, climate action, responsible production and consumption, life on land and beneath water, peace, justice, and robust institutions, and action alliances, and sustainable village institutions and adaptive village culture. These are to be achieved as part of the implementation of Presidential Regulation No. 59 of 2017's sustainable development targets. In light of the above, it is

imperative that the integration and updating of data in each village as part of the SDGs Village program be supported through the implementation and development of a village information system.

As reported by the Directorate General of Village and Rural Development, the Village Development Index, which serves as a benchmark for village independence, remains relatively low. The data indicate that of the 74,955 villages in Indonesia, 6,238 are classified as independent, 20,249 as advanced, 33,902 as developing, 9,584 as underdeveloped, and 4,982 as very underdeveloped. The highest percentage is found in developing villages, which account for 45.2% of the total number of villages. In Karawang Regency, approximately 44.8% of villages remain classified as developing.

The importance of information systems in government has been a relevant topic of discussion in the scientific literature, previous research has been conducted on the implementation of information systems in several countries such as India, Bangladesh, Sri Lanka, and even European countries such as Poland shows that the application of information technology in village governments can improve the quality and efficiency of public services, as well as support rural development through data management in rural areas (Prabawati et al., 2023)

In India, the application of government technology in rural areas is beneficial in the process of rural economic development, as Indian villages have a significant part in the Indian economy. So that community information system will help the connectivity and interaction of village communities to be more productive and creative. As well as facilitating the mapping of the provision of infrastructure and basic facilities that support the livelihood of the community (Khurana & Raj, 2021; Rao, 2004).

In Sri Lanka, the application of information technology in rural areas is beneficial in providing quality services, efficiency and responsiveness of public organizations (Karunasena & Deng, 2012). Village information systems aim to improve village services by making the transition from manual processes to computerized processes, so as to improve service quality, productivity, and responsiveness of village officials. This results in positive assessments of functionality, reliability, usability, and efficiency, ultimately empowering village officials in their communication and service delivery (Ardiansyah et al., 2022).

In Europe and especially Poland, the role of ICT in rural areas is beneficial in Bridging the Digital Gap and Improving Quality in Rural Areas, enhancing rural resilience by recognizing local strengths and weaknesses, defining actionable strategies, and promoting tailored approaches that reflect the unique characteristics of each rural community, ultimately aiming to attract investment and foster sustainable growth (Pérez-delHoyo & Mora, 2019). In Bangladesh, findings show that the challenges in the application of information technology in rural areas are in the accessibility of the use of village information systems as well as The effectiveness of human resources in information technology utilization given that many rural people are illiterate and not technologically literate (Jamal Uddin & Mezbah-Ul-Islam, 2012).

The village information system's deployment in various regions encountered numerous challenges, as exemplified by the case study conducted in Karawang Regency. The researcher's investigation highlighted several issues that hindered the successful implementation of the village information system, including challenges related to human resources, regulatory framework, infrastructure, and application development. Considering these challenges, this study seeks to investigate the extent of government efforts in implementing village information systems in Karawang Regency with various challenges and barriers to implementation.

Although research related to village information systems has received attention in several countries, research that specifically examines the village information system's deployment in relation to the Village SDGs still needs to be completed, as is the case in Karawang district villages. This study aims to close the gap in the literature on village-level government information technology, particularly in light of the implementation of village information systems in realizing the Village SDGs in Karawang Regency.

This study aims to explore the achievement of sustainable development in villages through the implementation of village information systems by looking at the factors that influence its implementation in Karawang district. In addition, this study also highlights the commitment and efforts of the village government in achieving village sustainable development goals by formulating the priority scale of each village in the village SDGs map based on village data through the village information system, as well as highlighting various challenges in the implementation of village information systems such as budget and infrastructure issues and the readiness of human resources in the realization of independent villages.

In this study, the researcher looks at the analysis of the village information system's deployment from a different perspective, namely discussing in detail The village information system's deployment as one of the village authorities tools in realizing the village development movement, especially in achieving the Sustainable Development Goals launched by the Ministry of Villages. The researcher focuses on examining and analyzing the dimensions that influence the implementation and development of village information systems, which can be seen from the following aspects: Support, referring to the government's commitment to the implementation and development of village information systems; Value/benefit, perceived by the community in relation to accessibility in obtaining village information; Capacity, relating to the availability of resources in the implementation and development of village information systems.

This study explores several research questions aimed at understanding the implementation of village information systems in Karawang District to achieve the Village SDGs. The first question examines the policy support and government commitment in supporting the deployment of these systems. The second question delves into the capacity and availability of resources required for the successful implementation of village information systems in realizing the Village SDGs. The third question focuses on the benefits gained through the deployment of these systems. Finally, the study investigates how sustainable development objectives are applied at the district level within this context.

This research is important because it can provide significant contributions in the form of practical guidance and relevant policy recommendations for determining the direction of village development through village information systems. These insights are not only applicable to the local government of Karawang District but can also be applied by other local governments facing similar challenges in the deployment of village information systems.

Research Method

This research uses a qualitative approach that is focused on natural object conditions where the researcher acts as the main instrument in the process of data collection and analysis (Cresswell, 2016). This approach, researchers focus on investigating the process of implementing village information systems in realizing sustainable development, the benefits and challenges faced. The research design used

is a case study. According to (Yin, 2014), a case study is an empirical investigation that investigates contemporary phenomena in the context of real life. Through case studies, researchers seek to gain richer insights into the behaviors, processes, and experiences associated with the case, so as to understand the context and dynamics that influence the phenomenon under study. The type of case study used in this research is a multiple case study, which is a type of research that involves various cases or issues in one study. various cases or issues in one study, to ensure the discussion and research process remains focused. research process remains directed. Multiple case studies are used to analyze cases related to the implementation of village information systems in several villages in Karawang district based on the village development index as a measure of the success of village development. The following conceptual framework outlines the guiding principles for each stage of the research process.

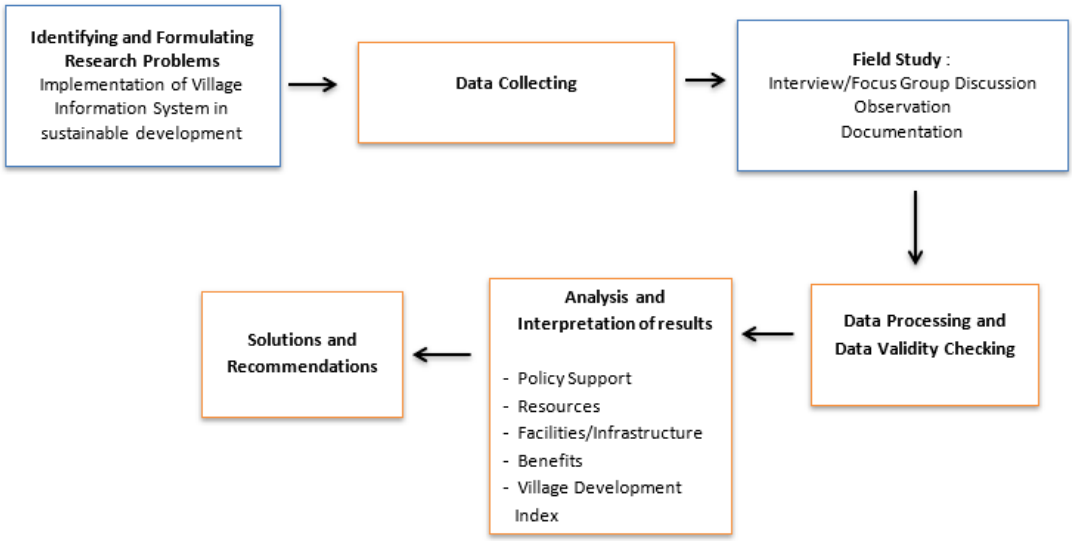

Figure 1. Conceptual Framework
Source: processed by The Author, 2024

This research uses purposive sampling to identify participants who meet certain criteria (Sugiyono, 2013). The main source of information in this study is the Karawang Regency Community and Village Empowerment Office and several villages in the Karawang Regency area that have implemented village information systems in governance, service delivery to the community and in the delivery of village data information for at least 2 years. In addition, villages were selected based on the village development index with the categories of "advanced" and "independent". This approach ensures that the sample is relevant and knowledgeable.

In order to gather primary data about the extent of village information system implementation, three factors were examined: the value of support/benefit, the capacity/capability of village information system implementation, and focus group discussions and interviews with key stakeholders, specifically the Community and Village Empowerment Office and village governments in Karawang district. Direct observation was used to understand how village information systems are used in governance and sustainable development.

Secondary data was obtained from existing documents and previous research, including provisions related to the implementation of village information systems, Village Medium-Term Development Plans, and Village Government Activity Plans in Karawang Regency. Data reduction or simplification (data reduction), data presentation

(data display), and conclusion drawing are the three streams of simultaneous actions that comprise the interactive model that served as the basis for the qualitative data analysis of the obtained data (Gentles, 2015; Miles & Huberman, 2014).

Result and Discussion

Implementation of E-Government in Indonesian

In a broader context, it may be observed that developing nations, such as Indonesia, keep showing a slower pace of e-government implementation in comparison to their developed counterparts. E-government program in poor nations encounter significant rates of failure, with 35% being categorized as total failures, 50% as partial failures, and a mere 15% deemed successful (Heeks, 2003; Mellouli et al., 2020). This failure shows a lack of organizational skills and expertise in e-government system development, application, and use. The deployment of a digital government in Indonesian districts varies due to management styles, infrastructure, and personal characteristics in this vast and varied nation (Furuholt & Wahid, 2008; Ralf Klischewski, 2013).

Several variables make e-government deployment in Indonesian local governments difficult. Financial limits, human resources, infrastructure, municipal attention, political will, and legal and regional rules are among these variables. These essential characteristics greatly impact a digital government achievement (Rose, 2004). Indonesia needs a digital government to develop towards democratic governance. It helps create an egalitarian power structure, improve relations among central and local governments, and promote openness (Furuholt & Wahid, 2008). Based on the results of the United Nations E- Government Survey, in 2024 Indonesia's E-Government development index is ranked 64th out of 193 countries in the world, with an index value of 0.7991 (UN, 2024).

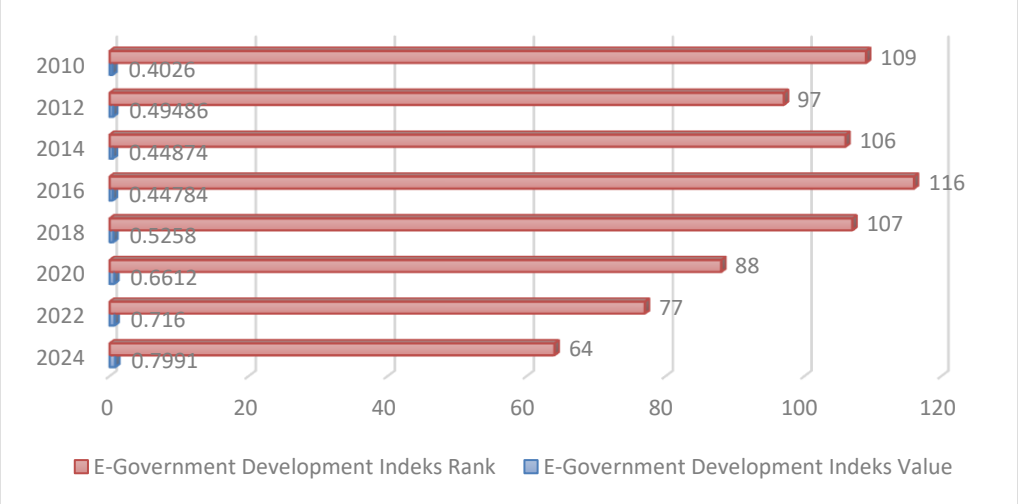

Figure 2. E-Government Indonesian Development Index
Source: UN E-Government Survey, 2024

Based on the data above, the E-Government Survey 2024 has ranked Indonesia 64th for its performance in the development and implementation of an Electronic-Based Government System (EBS) that reflects improvements in digital services, infrastructure, and human resources. The results of the survey made Indonesia rise 13 ranks from 77th in 2022. Indonesia's electronic government improvements are consistent with the global trend of adopting digital governance strategies, with a focus

on improving service delivery, transparency, and inclusiveness. However, Indonesia still faces challenges related to the digital divide and ensuring equal access to technology, especially in rural and remote areas.

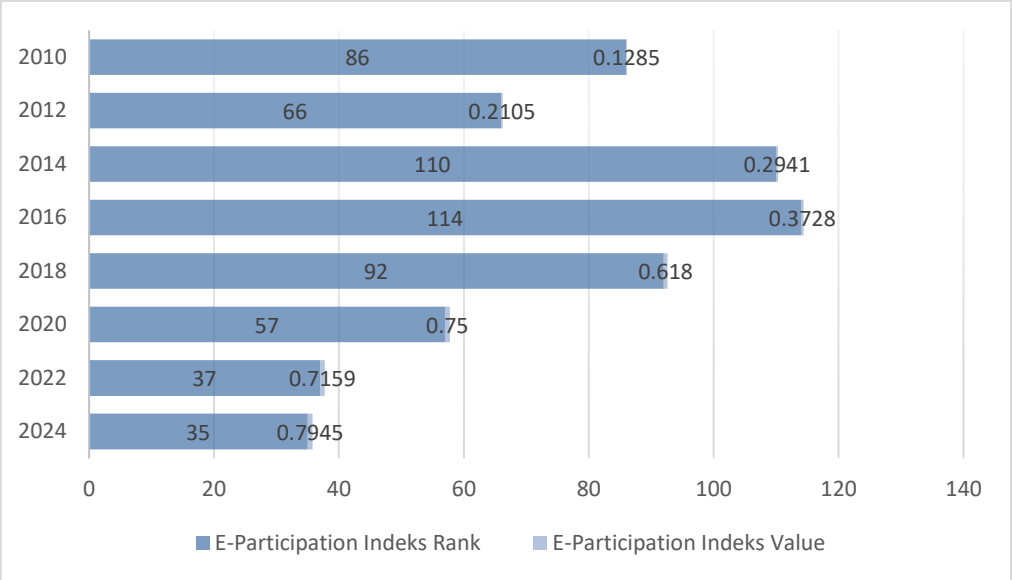

Figure 3. E-Participation Indonesian Index
Source: UN E-Government Survey, 2024

According to the aforementioned data, Indonesia jumped 2 spots on the E-Participation Index in 2024. Previously ranked 37 in 2022; in 2024, it was ranked 35 with a score of 0.794. That is already higher than the global average (0.4450). It is also higher than the Regional Average for Asia (0.5024) and Southeast Asia (0.5444). This index measures Communication and Information Technology use in countries to provide online services, increase participation in governance, and realize the in governance, and realizing transparency. The Indonesian government has made efforts to improve digital services, but the use of e-participation tools is still slower than other countries. compared to other countries. Thus, further improvements are needed in public sector transparency, citizen engagement, and the overall effectiveness of digital tools for governance.

The difficulties of Indonesian adoption of electronic government process local governments are caused by several things such as problems in financing, human resources, absence of auxiliary infrastructure, inadequate focus from local government entities, political backing, laws and local ordinances that are essential for e-government to be implemented successfully (Rose, 2004). In Indonesia, e-government is essential to promoting the shift to democratic governance practices, implementing the balance of power, facilitating communication between the national and local governments, and increasing transparency (Furuholt & Wahid, 2008).

Implementation of Village Information Systems in Karawang Regency

In the ever-evolving digital era, local governments are required to adapt to advances in communication and information technology are used to increase openness and efficiency, and the quality public services. One of the measuring tools used to assess the extent of the usage information technology in governance is the Electronic-Based Governance System Index (SPBE). This index is a crucial indicator in evaluating the ability of a city or district to implement an electronic-based government system,

which involves digital data and information management, online public services, and technology's application in government administrative procedures. The implementation of SPBE not only focuses on the utilization of hardware and software, but also includes policies, human resources, and information security aspects that support the entire system. With the SPBE index, local governments can find out the extent of progress that has been achieved, as well as aspects that need to be improved in the application of information systems in government. The SPBE Index also helps the government in planning and budgeting ICT development programs that can enhance the quality of public services and government accountability.

As a key indicator to map the level of digitalization in cities and regencies, the SPBE index provides a clear picture of their readiness to face technological challenges, and accelerate digital transformation in the government sector. Thus, the implementation of SPBE in cities and regencies is a strategic step towards a more modern, efficient, and responsive government.

The following is a graph of the SPBE Index of cities/regencies in West Java Province in 2021-2023

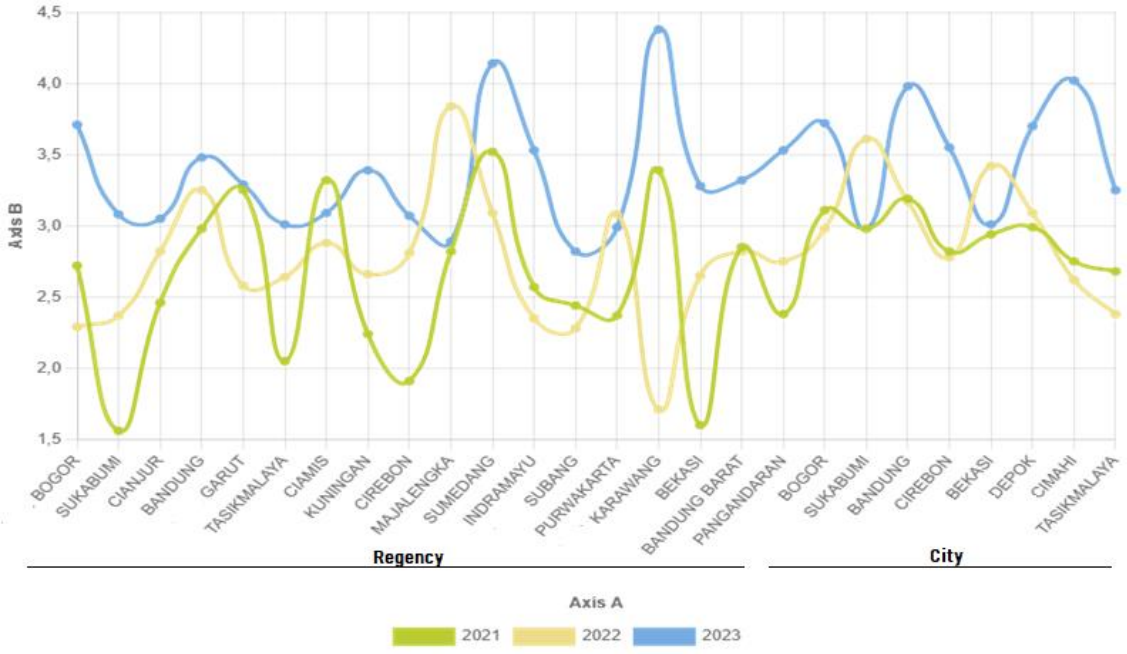

Figure 4. Regional Electronic-Based Government System Index in West Java Province in 2021-2023
Source: (Communication and Informatics Office of West Java Province, 2023)

The SPBE Index for cities and districts in West Java covers several important aspects related to the use of ICT in local government. The index not only assesses technology infrastructure, but also policies, public services, and data and information management. Some cities/districts in West Java have a higher SPBE index because they have implemented a better electronic-based government system. Such as Karawang Regency obtained the highest SPBE index in West Java Province and the 2nd highest at the national level in 2023 with an index of 4.38 (Maulana, 2024).

Applying digitization concepts to the public sector requires owning and paying serious attention to three success factors (Indrajit, 2016).

Support

The support element refers to the factors needed to support the successful implementation of e-Government. This support parameter consists of various elements that must be fulfilled in order for e-Government to run smoothly and effectively, including Government Leadership and Commitment; Supportive Regulations and Policies; Collaboration Between Government Agencies. Leadership and Commitment of regional heads are essential components in the development of Village Information Systems in the regions, especially to ensure the sustainability of programs related to the development of Village Information Systems. (Heeks, 2003) shows that government commitment and leadership is one of the factors determining the success of e-government implementation in the long term. Other factors that contribute to the success of e-government implementation include the involvement of all stakeholders, expanding human resources capabilities and forming alliances with outside parties. Frequent assessments should be carried out to provide input for enhancement in order to guarantee that the deployment of electronic government fulfills expectations (Furuholt & Wahid, 2008). The commitment of the regional head is necessary because the Village Information System development model is cross-sector and cross-level government. In addition, this model also requires a policy of sharing financing from the Regional Budget. The commitment of the head of the region is also needed to integrate and ensure the interoperability of data and info systems in a thorough a way (Nurdin, 2021).

The usage of information technology is not a new thing for the Karawang Regency Government to implement in governance. Various initiatives for the use of government information technology have been successfully realized, although the success of realizing these various initiatives has not been fully matched by the success in capturing the value of their benefits. In terms of leadership and commitment, the Karawang district government already has initiatives in the development of e-Government which are formulated in the vision of the Karawang district regent, the Karawang District Medium-Term Development Plan 2021-2026 and the strategic plan of the village community empowerment office. The seriousness of the Karawang district government in the application of information technology in governance is strengthened by the existence of an electronic-based government system policy formulated through Karawang district regulation no 16 of 2018 and Karawang regent regulation no 35 of 2022 concerning guidelines for Information Security Management, Technical Standards and Security Procedures for Electronic-Based Government Systems within the Karawang District Government. As one of the regions committed to the implementation of e-Government, Karawang Regency is developing information technology in various sectors including the village government sector by implementing a village information system in order to realize sustainable development goals.

Village Ministerial Regulation No. 21/2020 on Village Community Development and Empowerment Guidelines mandates villages to target village Sustainable Development Goals (SDGs) indicators, so Village Information Systems are needed by villages. In Karawang district, the implementation of the village information system is based on the newly created Karawang district head regulation No. 40 of 2024 on Village Public Information Service Standards. The existence of policy support in the development and preparation of e-government is very important, even at the village government level, regulations that are meant for citizens as well as the government must exist (Rahmadany, 2021). At the village level, the village head needs to issue a village regulation or village head regulation, which describes: Village Information

System management structure; Establishment of a Data Forum; Appointment of village operators and/or village data cadres; Incentive system for each actor.

The implementation of village information systems, many village governments do not have commitments and plans in the development of village information systems, both from policy support, funding commitments and capacity building of village officials, cross-sector coordination dynamics are also still a major challenge in the development of Village Information Systems and their governance. Moreover, the implementation of the One Data policy has not been running optimally, which implies that the data collection system in the village is not connected to the data system in the central government, even with sectoral Regional Apparatus Organizations (OPD). From an institutional perspective, the commitment of the village head and the presence of village apparatus champions who have an interest in information technology are key to the successful development and management of the Village Information System (Febrianto, 2021; Sayogo, Djoko Sigit., 2018)

Capacity

Element Capacity is an indicator of a government-issued element of capability or authority. a. The availability of sufficient funds to carry out various initiatives, particularly those related to financial resources, b. The presence of sufficient information technology facilities because it is 50% the key to the successful execution of the E-government concept, and c. The availability of personnel who have the abilities and experience to implement the electronic government concept. On a practical level, it was discovered that the community did not care much about having an e-government due to a lack of infrastructure and networks. Despite the aggregate data, the percentage of internet users in the Karawang district will have increased to 67.77% by 2020, and rural communities in Karawang Regency still have limited network facility access to the internet. It has a small user base relative to the total population. In terms of the allocation of resources for the deployment of the electronic government in this present model, the human resources who are the implementers do not yet satisfy the expected standards and require a technical training process accompanied by technical guidance.

The Village Government in Karawang Regency has begun to utilize information technology in carrying out the administrative functions of the Village Government, including Village Financial System, Village Profile, e-planning, and other applications that are in the process of being applied to the village. Village. In Karawang Regency itself, not all villages have a village information system; out of 297 villages, only about 30% have a Web-based village information system and an Android application. Such as in Jatibaru Village, Kalibuaya Village, Talagasari village, which have implemented a Web and Application-based village information system in administering their government, giving local statistical information and offering community services. One of the instruments utilized to achieve long-term prosperity in the village is the implementation of the village electronic information system in three communities. This is evident from the statistics on the developing village index's accomplishments, which serve as an easily accessible indicator of how well village development is being implemented by the village community.

The optimal performance of the application dominates the e-Government constraint on the application dimension. An inactive application was discovered, However, its informational focus and lack of integration with online and website-based eGovernment services made it subpar. Applications with maximum performance and

comprehensive, detailed, and integrated content are essential to the success of e-Government, which benefits society. Although applications that integrate with public services are already available, they need development that is oriented toward ease of use (Cheshmehzangi, 2022).

In practical terms, It was discovered that residents had little interest in e-government because of the constraints it presents in terms of networks and facilities. The following is the percentage of internet users in Karawang Regency in 2018 – 2020.

Table 1. Data on the Percentage of Internet Users in Karawang Regency
The year 2018- 2020

County Town	**Percentage Data**		
Year	2018	2019	2020
Karawang	52,28 %	62,25 %	67,77 %

Source : Karawang Regency Communication and Information Office, 2020

While the overall data indicates an increase in internet users in Karawang Regency, rural communities in the region continue to face limitations in internet access due to constraints in network facilities. The number of users is relatively low in comparison to the total population. This situation is a consequence of the insufficient amount and quality of personnel in charge of rolling out e-government, who lack the requisite competence.

The e-government constraint on the application dimension is primarily determined by the optimal performance of the application. The application was found to be inactive and suboptimal, as it was limited to information and lacked integration with online services and website-based e-government services. Additional challenges include inadequate compatibility and unity, as well as complex and insufficient material. Tools with outstanding reliability, comprehensive and extensive content, and built-in features help online government succeed, which benefits civilization. Although there are currently tools that integrate with government offerings, further development is required to make them more user-friendly.

Value

E-Government initiatives are useless if no one benefits from the implementation of the concept. It is not only the government itself that determines whether or not the benefits of E-Government are obtained, but also the community and those concerned. The government should understand what is needed by the community in a significant way that is felt by the community. The concept that is included in this is the Government to Governance (G2G) system which aims to create an efficient government performance and Government to Citizen (G2C) which has the aim of optimizing services to the community. Some elements of value in the implementation of SID can include: 1) Accurate and precise data, The accuracy and precision of data is essential so that the information presented to stakeholders (village government, citizens, related institutions) can be used correctly. For example, population data, village potential data, financial data, and others. 2) Accessibility: The village information system must be easily accessible to all parties in need, whether by the community, village officials, or the government. This accessibility must also consider infrastructure limitations. 3) Transparency, Village information systems should enable transparency in information management, especially in the management of village budgets, policies, and other public services. This is important to encourage community participation. 4) Community Participation, one of the main objectives of SID is to increase community participation

in village decision-making and development planning. The system should allow the community to provide input and feedback. 5) Efficiency and Effectiveness, by using a village information system, it is expected that administrative processes and services at the village level will become more efficient and effective. This will reduce the time and cost required to manage data and information. 6) Data Security, Data security is very important in a village information system. Residents' personal data, sensitive information about the village budget or policies, must be kept confidential to prevent misuse. 7) Sustainability: The village information system must be sustainable in the long term. This includes system maintenance, user training, and regular data updates. 8) Integration with Other Systems, Village information systems need to be integrated with larger systems, such as central or regional government information systems, to ensure accurate and consistent data between the village level and the provincial or national level (Bettina Distel, 2023; Chang et al., 2009; Indrajit, 2016; Karunasena & Deng, 2012).

Based on data obtained from the field, in 2024 the Karawang district government provided a model for developing an integrated village information system through Sidade OK, (Karawang Online Village Data Information System) which is a website-based information system that displays village data, both geographical data, village government data, village council data, village institutions data as well as legal products and village information within Karawang Regency as a form of realization of village public information transparency. Only 137 of the 297 communities in Karawang Regency have been identified in the Karawang online community data collection system, which is run by the Karawang County Information and Communication Office. Among the information system's functions are making it simpler for the community to learn about the rules and regulations in their individual villages; ensuring that information about the village government and other relevant institutions is transparent; Helping village communities to find out various policies and activities that are being, have been and will be carried out by the village government; Presenting various village news and information for the community and stakeholders in Karawang Regency; Becoming basic information that can be utilized by various agencies and stakeholders who need village data in Karawang Regency (https://sidadeok.com/index.php).

A number of villages in Karawang district currently have a village database run by the municipality in addition to the Sidade OK. This system not only shows village data and information but also offers website-based public service features and Android applications for community convenience such as Kalibuaya village, Talagasari village, Jatibaru village. Considering the findings of interviewing and observing that were done, there are two types of services in the village information system in Karawang district, namely external and internal. For external service types (Government to citizen) provides services to the community independently in taking care of all administrations needed administratively related to population services. While the type of service that is internal (Government to Government) is used for the Village Government itself such as the attendance of village officials.

The presence of services through the village information system aims to provide convenience to the Village Community in accessing population administration services that are fast, free of charge and affordable. Researchers found data that the village information system has advantages in terms of features that are easier to understand and can be accessed anywhere and anytime. website-based services also provide benefits. Both the benefits for the Village government apparatus as the service organizer and for the community as the target service recipient. As the organizer of the website-based outreach innovation, the municipality sees the benefit of increased

productivity. Previously, work was done by hand, but now it is done through an online platform that streamlines all job-related tasks. As with village information services, village officials only need to upload news on the website so that people who need information only need to access it.

Additionally, instead of typing each letter that was created in the past to complete community correspondence, the administration of the village now just must fill out the necessary information in the form that is available on the website. This provides convenience and speed in working because it can minimize errors in typing letters. The next advantage is cost efficiency, in this case the village government apparatus can save the budget for office stationery because of its minimal use.

Based on the results of researcher interviews with community users of information system services in several villages in Karawang district, explaining this system is very helpful to the community, and the benefits they get are very much for the community because all the processes of managing letters are more facilitated and it is said that depending on the condition of the internet signal, if the signal is good, it will be easier to access and all the processes of managing letters become faster and certainly do not wait a long time. Village information systems in several villages in Karawang district also provide a complaint service feature that allows the community to provide input and feedback and get involved in decision-making and village development planning.

However based on research findings, implementing Village Info several villages in Karawang still faces significant obstacles. One of the main obstacles is budget constraints. Village governments need to allocate sufficient funds to support it, including the purchase of hardware and software, and training for staff and villagers. Budget constraints are often an obstacle to planning and executing a successful Village Information System implementation project. Due to budget constraints, Karawang's numerous settlements possess not continued to use the Village Information System due to the high maintenance costs involved. This certainly affects the sustainability of the village information system implementation. In addition, there are technical issues that often arise within community data system deployment, such as limited internet access and data security issues. However, villages often do not understand the importance of data security and do not pay proper attention to data governance. This can lead to data vulnerability and privacy violations. In addition, the implementation of village information systems in Karawang district is still not all integrated with local and central government information systems, which often leads to data inaccuracies, such as in determining data on social assistance recipients.

Overview of the Village Sustainable Development Goals in Karawang Regency

The Village Information System functions as a platform to collect and manage village data, which is essential for planning and monitoring the achievement of the SDGs. This data includes information on demographics, economy, health, education, and environment. With the Village Information System in place, information about budget utilization and village development programs can be accessed by the community. This supports the principles of transparency and accountability, which are part of the SDGs. Through the collected information, villages can plan sustainable economic development strategies. Overall, the effective implementation of the Village Information System can accelerate the achievement of the SDGs at the village level by providing a strong information base and encouraging cooperation between residents

and the government and supporting collaboration between the government and the community (Janowski, 2016).

The Village, Underprivileged Areas, and Transmigration Ministry has issued the Village Development Index (IDM) as a benchmark for the success of village development. The Village Development Measure is a composite index that is derived from the Ecological/Environmental Resilient Index, the broader Social Resilience Index, and the Economic Resilience Index. This set of indicators has been developed to advance and empower villages, where social, economic, and environmental aspects are complementary strengths for sustaining the potential and capacity of villages, as well as enhancing village life. Based on the Village Development Index data, the status classification is as follows:

Table 2. Village development index

Very Underveloped	IDM < 0,5989
Underveloped	0,4907 < IDM ≤ 0,5989
Developing	0,5989 < IDM ≤ 0,7072
Advanced	0,7072 < IDM ≤ 0,8155
Independent	IDM > 0,8155

Source : Village Minister Regulation No. 6/2016

The classification aims to determine the status and provide policy recommendations according to the needs of the region. The Village Development Index guides the precision of policy interventions and correlates appropriate municipal development initiatives with local involvement, in line with the characteristics of the areas. The typology is consistent with the Ministerial Ordinance no. 6 of 2016, which governs the Village Development Plan. In the indicators of village development, which are described in the Village Development Index Book of the Ministry of Village, there are at least three dimensions. Here the author conveys the three aspects in the indicators of developing villages, namely:

Table 3. Indicators of Developing Village

No	Dimension	Variable
1	**Social Resilience**	Social Capital
		Health
		Education
		Housing
		Environmental Quality
2	**Ecological Resilience**	Potential Disaster Prone
3	**Economic Resilience**	Diverse Rural Community Produce
		Availability of Trading Centers
		Distribution and logistical entry point
		Financial Institution Access
		Commercial institutions
		Local accessibility

Source : Village Minister Regulation No. 6/2016

The Village Development Index (IDM) is an important tool for measuring the achievement of development goals at the village level and serves as an indicator for assessing the attainment of the Sustainable Development Goals (SDGs) in villages. IDM measures various dimensions of village development, including economic, social, and environmental aspects. By using IDM, villages can identify their development needs

and priorities. This helps in planning targeted programs to achieve relevant SDGs. IDM provides the necessary data to monitor and evaluate the progress of villages in achieving the SDGs. This data enables the government and communities to assess the effectiveness of development programs. The results of IDM can be used by the government to formulate more integrated and comprehensive policies in support of achieving the SDGs, thereby creating synergy between local and global policies. Overall, IDM serves as an effective tool to guide, monitor, and evaluate village efforts in achieving sustainable development goals, as well as enhancing the welfare of village communities.

The Village Development Index (IDM) in Karawang Regency reflects varying conditions of village development. There are disparities in the levels of development among villages in Karawang, with some villages in urban areas tending to be more advanced compared to those in rural areas. Here is the description of the Village Development Index in Karawang Regency.

Table 4. Ranking of the developing village index in Karawang Regency

Local Rank	National Rank	District Name	IDM Value	Status IDM
1	111	Cikampek	0,8577	Independent
2	265	Kota Baru	0,8287	Independent
3	557	Karawang Timur	0,7965	Advanced
4	592	Jatisari	0,7933	Advanced
5	877	Klari	0,7748	Advanced
6	1.255	Majalaya	0,7570	Advanced
7	1.391	Lemahabang	0,7497	Advanced
8	1.425	Tirtamulya	0,7485	Advanced
9	1.456	Purwasari	0,7474	Advanced
10	1.702	Telukjambe Timur	0,7365	Advanced
11	1.965	Telagasari	0,7267	Advanced
12	2.108	Jayakerta	0,7219	Advanced
13	2.181	Rengasdengklok	0,7197	Advanced
14	2.365	Tempuran	0,7141	Advanced
15	2.493	Cilamaya Wetan	0,7103	Advanced
16	2.508	Tirtajaya	0,7096	Advanced
17	3.118	Pakisjaya	0,6904	Developing
18	3.202	Tegalwaru	0,6878	Developing
19	3.279	Pangkalan	0,6855	Developing
20	3.622	Batujaya	0,6763	Developing
21	3.715	Telukjambe Barat	0,6734	Developing
22	3.728	Cilamaya Kulon	0,6729	Developing
23	3.749	Cibuaya	0,6723	Developing
24	3.802	Banyusari	0,6708	Developing
25	3.828	Rawamerta	0,6703	Developing
26	3.847	Kutawaluya	0,6698	Developing
27	4.007	Pedes	0,6647	Developing
28	4.534	Ciampel	0,6458	Developing
29	4.768	Cilebar	0,6343	Developing

Source: The Village, Underprivileged Areas, and Transmigration Ministry, 2022

Based on the data above, the Village Development Index in Karawang Regency, the highest percentage is found in developing villages, which account for 45.2% of the total number of villages. In Karawang Regency, nearly 44.8% are still classified as developing villages. The Village Development Index (IDM) in Karawang Regency still shows many villages with a developing status due to several factors (1) Limited Data and Information: Village Information System is not implemented effective, the data needed to plan and monitor village development may be incomplete. This limitation in information can hinder the understanding of the needs and priorities of the village; (2) Lack of Access and Community Participation: A Village Information System that is not well-accessed or known by the community can reduce active citizen participation in development planning. Without community involvement, the programs planned may not meet local needs; (3) Suboptimal Use of Data: collected data is not used effectively by decision-makers, it becomes difficult to formulate appropriate policies. This can result in villages remaining in a developing status. (4) Technology and Infrastructure Support: The use of the Village Information System requires adequate technological infrastructure support. If the village infrastructure is lacking, access to the Village Information System and the use of data may be hindered, thereby obstructing progress (Yusuf et al., 2018).

Implications and Recommendations

Based on the research findings above, according to it, putting information systems in place at the village level significantly improves administrative effectiveness and the standard of public amenities and the direction of development in the village (Alvarenga, A., Matos, 2020). However, the findings also show that there are challenges in terms of policy support, infrastructure limitations, human resource capacity, and data integration between villages and district governments. Based on this, the managerial implications of the research findings regarding village information systems in realizing sustainable development in Karawang Regency show the importance of increasing the capacity and management of information technology at the village level. Village governments need to pay attention to aspects of training and human resource development so that information systems can be optimally utilized in supporting more precise and efficient decision making. In addition, better integration of information systems with village administrative data and processes can improve transparency and accountability in budget management and public services (Mergel, I., 2019; Yuan, Y. P., Dwivedi, 2023). In this context, clear policy support from both district and central government is needed to ensure the sustainability and development of effective village information systems. Good management will result in improved services to the community and accelerate the development process at the village level.

Practical implications of the research indicate the need for improvements in the application of Improving efficiency through village-level information technology and quality of public services in realizing sustainable development in the village. From an operational perspective, putting in place a more organized information system helps speed up processes like demographic data management, budgets, and village activity reports. In addition, with a more integrated information system, supervision of the use of village budgets can be more transparent and accountable, reducing the potential for misuse of funds. For the community, an efficient village information system can facilitate access to information related to government programs, social services, and various village development activities. Therefore, optimal implementation of village information systems requires training for village officials, provision of adequate

infrastructure, and socialization to the community so that they can make good use of this technology (Twizeyimana, J. D., & Andersson, 2019).

The theoretical implications of the research findings on village information systems in Karawang Regency provide an important contribution to the development of information systems theory in the context of local government. This research underscores the importance of implementing technology-based information systems to improve the efficiency and effectiveness of village administration management. Theoretically, the findings reinforce the concept of e-governance and show how information technology can be a catalyst in improving the relationship between government and society, as well as supporting the creation of a more transparent and accountable government. This research also provides insights into the challenges and barriers faced in the implementation of information systems at the village level, such as limited infrastructure and human resource capacity, which enriches the literature on technology adoption in the public sector(Wang & Lo, 2015). As such, the findings open up room for further research into the factors that influence the success of information systems at the local government level.

Considering the results of the study on rural database systems in Karawang, there are several recommendations that can be applied to get better effectiveness and sustainability of information network at the village level. First, it is recommended to strengthen training and capacity building of human resources to the grade concerning the area, to ensure officials can optimally utilize information systems in carrying out administrative tasks and public services. Secondly, there is a need to improve information technology infrastructure in the village, such as providing more stable internet access and adequate hardware, to support the smooth operation of the system. Third, the integration of information systems between villages and with the government must be strengthened so that data and information can be accessed more quickly and accurately, which in turn can improve data-based decision-making. Fourth, the community must be made aware of the advantages of its data system in order for them to obtain pertinent information and take an active part in the village's growth. It is anticipated that by putting these suggestions into practice, Karawang's village database will be able to significantly enhance the standard of public amenities and the openness of village governance.

The direction of village information system development in Karawang, Considering the results of the study, should focus on improving the integration of information technology in supporting more efficient and transparent governance. The development of village information systems should be directed at improving and updating technological infrastructure, including more stable internet access and adequate hardware systems for all villages. In addition, the development of data-based applications that are more interactive and easily accessible to the community will accelerate the process of information distribution and increase public participation in village programs. Going forward, it is important to develop a system that allows data integration between villages and with the district government, thus facilitating monitoring, evaluation, and development planning. Capacity building of village apparatus through continuous training should also be a priority, so that they can manage the information system well. With a development direction that focuses on collaboration, openness, and improving the quality of resources, the village information system in Karawang Regency can be an effective tool to support better and sustainable village development.

Conclusion

In Karawang district, the establishment of efficient databases at the community scale is crucial to promoting sustainable development. A well-managed village information system can improve administrative efficiency, facilitate data access, and accelerate accurate data-based decision-making processes. This enables village governments to plan and implement development programs that are more targeted, transparent and accountable. However, challenges such as policy support, infrastructure limitations, human resource capacity, and data integration between villages and local governments need to be addressed for the village information system to function optimally. To overcome these challenges, appropriate policy recommendations are needed such as formulating regulations at the local level, strengthening training and capacity building of human resources at the village level, improving information technology infrastructure in the village, such as providing more stable internet access and adequate hardware, integrating information systems between villages and with the district government must be strengthened so that data and information can be accessed more quickly and accurately, which in turn can improve data-based decision-making, socialization to the community on the benefits of village information systems is needed, so that they can access relevant information and actively participate in the village development process.

This research has positive implications in providing insights related to the overview of Village SDGs in Karawang Regency, especially in determining the direction of village development through information systems. With an integrated information system, data related to natural resources, socio-economic conditions, and development activities can be managed more accurately and transparently. This facilitates decision-making based on real-time data, which is essential for planning and implementing development programs that meet the needs of the community. Good village information systems also enable more active community participation in the midst of developing a government that remains more responsive and diverse. By raising the standard of public services, promoting equitable development, and enhancing village community welfare, all of this helps to realize the targets for sustainability.

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