STRATEGIES FOR ENHANCING THE DIGITALIZATION OF LOCAL PUBLIC SERVICES AS A SOCIAL INNOVATION IN BOGOR REGENCY

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Abstract

The digitization of civil registration services is a local government initiative to improve the effectiveness of public services and public satisfaction. However, its implementation has not yet been fully optimized or evenly distributed due to disparities in human resource readiness, technological infrastructure, and public digital literacy. This study aims to analyze the impact of social innovation on service effectiveness, the impact of service effectiveness on public satisfaction, compare service effectiveness and public satisfaction between Cibinong Subdistrict and Caringin Subdistrict, and formulate strategies for improving digital-based civil registration services. The study employs a mixed-methods approach, with data collected through questionnaires, interviews, observations, and documentation. Data analysis utilized simple linear regression, the Mann–Whitney U test, SWOT analysis, and QSPM. The results indicate that social innovation has a positive and significant effect on service effectiveness, with a significance value of 0.000, a regression coefficient of 0.856, and an R^2 of 0.762. Service effectiveness also has a positive and significant effect on community satisfaction, with a significance value of 0.000, a regression coefficient of 0.932, and an R^2 of 0.727. The Mann–Whitney U test revealed a significant difference between Cibinong Subdistrict and Caringin Subdistrict in terms of service effectiveness and public satisfaction, with an Asymp. Sig. (2-tailed) value of < 0.001. The priority strategy based on the QSPM is to enhance civil servant competencies through digital training, strengthen technology infrastructure, and improve public digital literacy, with a TAS value of 6.82.

Keywords: Digitization Of Services, Public Satisfaction, Service Effectiveness, Service Strategies, Social Innovation

INTRODUCTION

Digital transformation in public services represents an effort by governments to use digital technologies to improve the delivery and accessibility of public services. Digital government has evolved beyond the simple adoption of technology toward broader transformation, engagement, and contextualization of government processes and relationships with citizens (Janowski, 2015). In Indonesia, digital-based public service innovation has also been developed as an alternative to conventional face-to-face services, particularly to facilitate service delivery and reduce limitations associated with direct interaction (Lestari et al., 2021). The United Nations (2022) further highlights the importance of digital government development at both national and local levels, including the availability of online services and efforts to ensure that digital transformation is inclusive.

Social innovation in the public sector can involve developing and implementing new approaches to address social needs and improve the handling of public problems (Mulgan et al., 2007). In the context of public services, digitalization can therefore function as an instrument for social and administrative innovation when technology is used to develop new or improved ways of delivering services. However, digitalization does not automatically guarantee effective service delivery. Evidence from Indonesia indicates that the implementation of digital public services continues to face technical and organizational challenges, including the need to improve service quality, infrastructure, reliability, public trust, and citizen support (Lestari et al., 2021). The United Nations (2022) also emphasizes the importance of local digital government development and inclusion in the broader digital transformation process.

Subdistricts play an important role as frontline public service units because they are directly involved in delivering administrative services to citizens. Preliminary research in the Cibinong and Caringin Subdistricts indicates that both have implemented the Siloka system for online queue numbering. In addition, Cibinong Subdistrict has developed the "Kopi Seduh" innovation, while Caringin Subdistrict has developed "Silat Caringin" as a digital-based service innovation. Nevertheless, the utilization of digital services differs between the two subdistricts. Cibinong Subdistrict has implemented digital services for a longer period, while Caringin Subdistrict only began implementing its digital system in 2026. Preliminary observations indicate that Caringin continues to face challenges related to human resources and residents' ability to use digital services. These conditions may affect the accessibility, timeliness, and effectiveness of service delivery, as well as citizens' experiences with the services provided. These local findings are used in this study as empirical grounds for comparing the implementation of digital public service innovation between the two subdistricts.

Service effectiveness is important because the implementation of digitalization should ultimately contribute to achieving public service objectives rather than merely introducing new technological tools. The assessment of citizen satisfaction is also closely related to how citizens perceive the performance of public services in relation to their expectations. A meta-analysis by Zhang et al. (2022) found broad support for the expectancy-disconfirmation model, in which citizen satisfaction is associated with perceived service performance relative to citizens' expectations. Similarly with Noda (2020), performance information affects citizens' evaluations of public services and found that providing concrete

information about service performance altered the relationship between perceived performance and satisfaction. This suggests that citizens' understanding and evaluation of service performance are important in shaping their satisfaction.

Previous literature has therefore established important relationships between digital government, public service innovation, service performance, and citizen satisfaction. Janowski (2015) conceptualizes digital government as an evolving process in which technological innovation can transform government practices, while Lestari et al. (2021) document both the potential and the implementation challenges of digitally based public services in Indonesia. However, a comparative examination of how digital public service innovation is implemented at the subdistrict level, particularly regarding service effectiveness and public satisfaction, remains important. Therefore, this study aims to analyze the role of digitalization as a form of social innovation in improving the effectiveness of civil registration services and its relationship with public satisfaction by comparing its implementation in the Cibinong and Caringin Subdistricts of Bogor Regency.

REVIEW OF LITERATURE

Social innovation is one approach the government can use to improve the delivery of public services by developing new ideas, approaches, and practices that deliver social benefits more effectively. Social innovation entails creating and executing novel concepts to fulfill societal demands more effectively than existing approaches (Mulgan et al., 2007). In the context of public services, social innovation is not only about the use of new technologies but also encompasses changes in service mechanisms, process streamlining, enhanced interaction between the government and the public, and more efficient use of resources. Therefore, the implementation of innovation in civil registration services can be viewed as the government's effort to adapt service processes to the needs of the public, who increasingly require fast, easy, and accessible services.

Advances in information technology have subsequently driven social innovation through the digitization of public services. Digital Government is not merely about the use of technology in government activities but has evolved into a process of transforming how the government operates and interacts with the public. The maturation of Digital Government progresses through four distinct stages: digitization, transformation, engagement, and contextualization (Janowski, 2015). This paradigm underscores that sustainable digital adoption extends beyond mere technical implementation, necessitating concurrent organizational restructuring and a redefined dynamic in state–citizen interactions. Thus, the existence of digital systems in civil registration services should be understood as part of efforts to improve the quality of service delivery, not merely as the provision of applications or technological tools.

The implementation of social innovation and digitization is further linked to service effectiveness. Service effectiveness reflects a government organization's ability to achieve service objectives and meet public needs through appropriate and optimal processes. In this study, service effectiveness is reflected in the service's ability to deliver services that are fast, accurate, easily accessible, and transparent, all supported by the competence of government officials and the appropriate use of technology. Effectiveness, therefore, is determined not solely by the availability of digital systems but also by the extent to which these systems can

be used optimally to support the achievement of service objectives. This aligns with the evolving concept of *Digital Government*, which situates technological transformation within the context of organizational change and public service delivery.

Service effectiveness is also linked to public satisfaction as service users. From the *New Public Service* perspective, public services must view citizens as individuals with needs and interests that must be served, not merely as customers. (Denhardt & Denhardt, 2015) emphasize the importance of services oriented toward the public interest, citizenship, and the values of public service. From this perspective, service effectiveness can be understood not only in terms of achieving organizational goals but also in terms of the government's ability to provide services that align with public needs. In this study, public satisfaction is viewed as the result of citizens' experiences while accessing civil registration services. Services that are fast, accurate, easily accessible, transparent, and responsive have the potential to provide a better service experience, thereby increasing public satisfaction. Conversely, if service processes still face obstacles such as delays, cumbersome procedures, limited access, or inadequate support from personnel and technology, the public's experience with these services may be adversely affected. Therefore, improving service effectiveness is a crucial component of efforts to enhance public satisfaction.

The structural nexus among social innovation, service effectiveness, and citizen satisfaction is situated at the core of digital governance evolution. Contemporary public sector modernization increasingly leverages digital mechanisms to augment institutional responsiveness and streamline service provision at subnational levels (United Nations, 2022). The development of digital services is ultimately aimed at enhancing the government's capacity to provide more accessible, responsive services to the public. Based on this discussion, it is clear that social innovation can drive improvements in service effectiveness, particularly when it enhances service processes and aligns technology use with the needs of both the organization and the public. Consequently, enhanced operational efficacy serves as a critical determinant of citizen satisfaction.

RESEARCH METHOD

Time and Location of the Study

This study was conducted in Bogor Regency, West Java Province, focusing on two subdistricts: Cibinong and Caringin. The study is scheduled to take place from May through July 2026.

Research Population and Sample

The research population comprises residents who used digital civil registration services in Cibinong and Caringin Subdistricts during the study period. The sample was selected using accidental sampling, in which respondents are selected based on their availability at the research location and their fulfillment of the predetermined respondent criteria (Sugiyono, 2023). The inclusion criteria were residents aged at least 17 years who had practical experience using digital civil registration services and were willing to complete the questionnaire. Data collection was conducted over 30 days, yielding a total of 151 respondents, comprising 91 from Cibinong Subdistrict and 60 from Caringin Subdistrict.

Data Processing and Analysis

Data processing was performed using *Microsoft Excel* 2021 and *IBM SPSS Version 26.0.* The data analysis consisted of descriptive analysis to characterize the respondents and the trends in their responses to each research variable. Validity and reliability tests were conducted to ensure the research instrument was suitable for use. Hypothesis testing was performed using simple linear regression analysis. The first model was used to analyze the effect of social innovation on the effectiveness of digital-based civil registration services, while the second model was used to analyze the effect of service effectiveness on public satisfaction, with a significance level of $p < 0.05$. The *Mann-Whitney U Test* was used for non-normally distributed data, with a significance level of $p < 0.05$. As a basis for formulating policy recommendations, this study also employed a SWOT analysis to identify internal and external factors influencing the digitization of civil registration services. Furthermore, the *Quantitative Strategic Planning Matrix* (QSPM) was used to determine priority strategies based on the *Strenghts, Weakness, Opportunities, and Threats* (SWOT) analysis results.

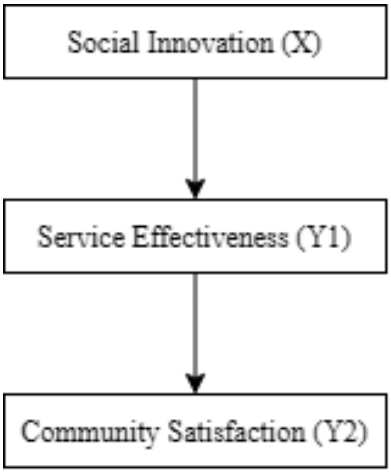
Research Hypothesis

Based on the theoretical framework, previous research, research gaps, and the conceptual framework that has been developed, the hypotheses in this study are as follows:

- H1: Social innovation has a positive and significant effect on the effectiveness of civil registration services.
- H2: The effectiveness of civil registration services has a positive and significant effect on public satisfaction.
- H3: There is a difference in the level of effectiveness of digital-based civil registration services between Cibinong Subdistrict and Caringin Subdistrict.
- H4: There is a difference in the level of public satisfaction with digital-based civil registration services between Cibinong Subdistrict and Caringin Subdistrict.

Research Model

This research model illustrates the relationship between the independent variable, social innovation (X), and the intermediate dependent variable, service effectiveness (Y1), with community satisfaction (Y2) as the outcome variable. The relationships among the variables in this study can be illustrated as follows:



The conceptual framework of this study indicates that social innovation (X), defined as the application of innovation in digital-based civil registration services, is expected to improve service effectiveness (Y1). Furthermore, improved service effectiveness, as demonstrated by services that are fast, accurate, convenient, and tailored to the community's needs, is expected to increase public satisfaction (Y2). Thus, this study examines the relationships among social innovation, service effectiveness, and public satisfaction.

RESULTS AND DISCUSSION

Respondent Characteristics

Respondent characteristics are presented to provide an overview of the study sample's population profile. This study involved 151 respondents, all users of digital population administration services in the Cibinong and Caringin subdistricts. Respondent characteristics include gender, age, highest level of education, subdistrict of residence, and the type of population administration service used.

Tabel 1.
Respondent Characteristics

Characteristics	Category	Cibinong n (%)	Caringin n (%)	Total n (%)
Gender	Male	56 (61,5)	22 (36,7)	78 (51,7)
	Female	35 (38,5)	38 (63,3)	73 (48,3)
Age	< 20 years	10 (11,0)	0 (0,0)	10 (6,6)
	21–30 years	43 (47,3)	31 (51,7)	74 (49,0)
	31–40 years	16 (17,6)	22 (36,7)	38 (25,2)
	41–50 years	11 (12,1)	7 (11,7)	18 (11,9)
	> 50 years	11 (12,1)	0 (0,0)	11 (7,3)
Level of Education	Elementary School	5 (5,5)	1 (1,7)	6 (4,0)
	Junior High School	6 (6,6)	6 (10,0)	12 (7,9)
	High School	40 (44,0)	12 (20,0)	52 (34,4)
	Diploma	15 (16,5)	13 (21,7)	28 (18,5)
	Bachelor's Degree	24 (26,4)	26 (43,3)	50 (33,1)
	Graduate Degree	1 (1,1)	2 (3,3)	3 (2,0)
Types of Services Used	KTP-el	24 (26,4)	30 (50,0)	54 (35,8)
	Others	67 (73,6)	30 (50,0)	97 (64,2)
Total	**Amount**	91 (100,0)	**60 (100,0)**	**151 (100,0)**

The characteristics of the respondents indicate that the study included 151 users of digital population administration services, comprising 78 males (51.7%) and 73 females (48.3%). By age, the majority of respondents were in the 21–30 age group (49.0%), followed by the 31–40 age group (25.2%), indicating that most service users are of working age. In terms of educational attainment, respondents were predominantly high school graduates (34.4%), meaning that most possess adequate skills to utilize digital civil registration services. Based on place of residence, 91 respondents (60.3%) were from Cibinong Subdistrict and 60 respondents (39.7%) were from Caringin Subdistrict. Meanwhile, based

on the type of service used, the majority of respondents (64.2%) used the e-ID card service alongside other civil registration services. These findings indicate that the respondents have sufficient experience using various digital-based civil registration services, enabling them to provide representative assessments of the variables of social innovation, service effectiveness, and public satisfaction.

Research Instrument Validation

Before analyzing the research hypotheses, the research instrument was validated to ensure that each item accurately and consistently measured the variables under study. The instrument testing included validity and reliability analyses using IBM SPSS. The validity test was conducted using the Corrected Item-Total Correlation, Based on the test results, all items under the variables of Social Innovation, Service Effectiveness, and Community Satisfaction met the criteria for validity and reliability and were therefore suitable for use as research instruments.

Tabel 2.
Summary of Instrument Research Results

Variable	Corrected Item-Total Correlation	r Tabel	Validity Results	Cronbach's Alpha	Description
Social Innovation	0,676 - 0,857	0,159	Valid	0,912	Reliable
Service Effectiveness	0,805 – 0,838	0,159	Valid	0,935	Reliable
Community Satisfaction	0,837 – 0,879	0,159	Valid	0,901	Reliable

Based on Table 2, all items for each variable were deemed valid because their Corrected Item-Total Correlation values were greater than the critical value of 0.159. In addition, all variables had Cronbach's Alpha values greater than 0.70, so the research instrument was deemed reliable. Thus, all items were deemed valid, reliable, and suitable for data collection and further analysis.

The Effect of Social Innovation on the Effectiveness of Digital-Based Population Administration Services

The results of the *simple linear regression* analysis indicate that social innovation has a positive and significant effect on the effectiveness of digitally based population administration services in the Cibinong and Caringin Subdistricts, with a significance level of 0.000 ($p < 0.05$). Thus, the first hypothesis is accepted. The regression coefficient of 0.856 indicates that each increase in social innovation is associated with an increase in the effectiveness of digitally based civil registration services. The analysis results show a coefficient of determination (R^2) of 0.762, indicating that 76.2% of the variation in the effectiveness of digital-based civil registration services is explained by social innovation, while the remaining 23.8% is attributable to other factors outside the research model.

The research results show that the better the innovations implemented by the government through the development of service systems, the simplification of procedures, the utilization of information technology, and the enhancement of interaction between government officials and the public, the higher the perceived effectiveness of services. These results align with the Social Innovation theory proposed by Mulgan et al. (2007), which holds

that social innovation entails developing new ideas and approaches to enhance organizational effectiveness, emphasizing the optimization of resource utilization to achieve organizational goals. Digital innovation positively impacts the effectiveness of public services by improving efficiency, quality, and ease of access (Lestari et al., 2021; Nasution & Kusumawati, 2022).

The Effect of Service Effectiveness on Public Satisfaction

The results of the *simple linear regression* test indicate that service effectiveness has a positive and significant effect on public satisfaction with digital-based civil registration services in the Cibinong and Caringin subdistricts of Bogor Regency, with a significance level of 0.0001. Thus, the second hypothesis is accepted. The regression coefficient of 0.932 indicates that each increase in service effectiveness is associated with an increase in public satisfaction. The analysis results show a coefficient of determination (R^2) of 0.727, indicating that 72.7% of the variation in public satisfaction is explained by service effectiveness, with the remaining 27.3% attributable to other factors outside the research model.

The The findings show that more effective services, as reflected in speed, timeliness, ease of procedures, clarity of information, and the competence of civil servants, are associated with higher levels of public satisfaction. These findings are consistent with the *New Public Service* perspective proposed by Denhardt & Denhardt (2015), which emphasizes democracy and citizenship as important foundations of public administration. From this perspective, public services should respond to citizens' needs and place citizens at the center of public administration. In the context of digital public services, Lestari et al. (2021) highlight the role of digital-based public service innovation in addressing limitations associated with conventional face-to-face service delivery.

Digital transformation in government involves using digital technologies to transform government processes and relationships with citizens, moving beyond basic digitization toward more contextualized forms of digital government (Janowski, 2015). Furthermore, a systematic review by Haug et al. (2024) found that digitally induced changes can improve information provision and service delivery, alter organizational processes, and strengthen interactions between citizens and public organizations. These findings support the present study by demonstrating that service effectiveness is an important factor associated with public satisfaction in the implementation of digitally based civil registration services in Cibinong and Caringin Subdistricts.

A Comparison of Service Effectiveness and Public Satisfaction Between Cibinong Subdistrict and Caringin Subdistrict

The results of the *Mann–Whitney U test* indicate a significant difference between Cibinong Subdistrict and Caringin Subdistrict in service effectiveness and public satisfaction. This difference is indicated by *p-value* of < 0.001, which is smaller than the significance level of 0.05. Thus, the third and fourth hypotheses in this study are accepted. According to Field (2018), the *Mann–Whitney test* is used to determine whether there is a significant difference between two independent groups based on rank distribution, particularly when the data do not meet the assumptions required for parametric tests. Based on the test results, Cibinong Subdistrict obtained a higher Mean Rank than Caringin Subdistrict for both research variables. For the service effectiveness variable, Cibinong Subdistrict had a Mean Rank of 89.75, while Caringin Subdistrict had a Mean Rank of 55.15. Similarly, for the community satisfaction variable, Cibinong Subdistrict had a Mean Rank of 86.75, higher than Caringin Subdistrict's 59.69. A higher Mean Rank indicates that respondents' assessments of service

effectiveness and community satisfaction in Cibinong Subdistrict were higher than those in Caringin Subdistrict. The test results show that residents in Cibinong Subdistrict gave higher ratings for service effectiveness and public satisfaction compared to those in Caringin Subdistrict. These findings indicate that the implementation of digitalization in civil registration services in Bogor Regency has not been uniform. These differences are influenced by organizational readiness, civil servant competence, the quality of information technology infrastructure, and the level of utilization of service innovations.

These research results align with the *New Public Service*, which emphasizes that public services must be oriented toward community needs (Denhardt & Denhardt, 2015). In the context of this study, the higher service effectiveness in Cibinong Subdistrict indicates that more effective and responsive services can lead to higher satisfaction ratings from the public. Furthermore, the concept of *Digital Government* explains that the success of service digitization depends not only on technology but also on organizational readiness, human resources, and infrastructure support (Janowski, 2015). The results of this study are also consistent with previous research showing that the digitization and innovation of public services can improve service effectiveness and public satisfaction (Lestari et al., 2021; Nasution & Kusumawati, 2022). However, the results of the preliminary study indicate that the implementation of digitization is also related to organizational readiness, civil servant competencies, technological infrastructure, and the public's ability to utilize digital services. These conditions may explain the differences in public assessments between Cibinong Subdistrict and Caringin Subdistrict.

SWOT Analysis and Setting Priority Strategies

A SWOT analysis was used to identify the internal and external factors influencing the implementation of digital-based civil registration services in Cibinong and Caringin Subdistricts. Rahayu et al. (2022) explain that SWOT analysis is used to examine an organization's internal environment through strengths and weaknesses and its external environment through opportunities and threats, and then combine these to formulate strategic alternatives. In this study, the SWOT factors were identified through quantitative analysis of social innovation, service effectiveness, and public satisfaction, supplemented by interviews, field observations, and document reviews.

Tabel 3.
Analysis SWOT Results

Strengths (S)	Weaknesses (W)
The implementation of digital civil registration services has improved their effectiveness.	The competence of civil servants in managing digital services is not yet uniform.
The availability of digital service innovations (Siloka, Kopi Seduh, and Silat Caringin).	The public's digital literacy remains low, particularly in Caringin Subdistrict.
Local government support for digital transformation.	Technology infrastructure and internet connectivity are not yet optimal.
Opportunities (O)	**Threats (T)**
Government policies regarding the digital transformation of public services.	The accelerating pace of technological development.

Opportunities (O)	Threats (T)
Advances in information technology and the increasing use of digital services.	Internet connectivity issues and data security concerns.
Support from the central government's digitization programs.	Disparities in the public's ability to utilize digital services.

Based on the results of the identification of internal and external factors, several strategic alternatives were identified using the SWOT Matrix, including SO (Strength–Opportunity), WO (Weakness–Opportunity), ST (Strength–Threat), and WT (Weakness–Threat) strategies.

Tabel 4.
Matriks SWOT

	Opportunities (O)	Threats (T)
	Strategy SO	**Strategy ST**
Strengths (S)	- Develop a more integrated digital service system. - Leverage government policy support to expand service innovations.	- Enhance information system security. - Develop service innovations that adapt to technological advancements.
	Strategy WO	**Strategy WT**
Weaknesses (W)	- Improve civil servants' competencies through digital training. - Improving public digital literacy through outreach. - Strengthening service technology infrastructure.	- Conducting periodic evaluations of digital service systems. - Refining digital service standard operating procedures (SOPs). - Strengthening coordination among service units.

The prioritization of the four strategic alternatives resulting from the SWOT analysis (SO, WO, ST, and WT) was conducted using the *Quantitative Strategic Planning Matrix* (QSPM). David et al. (2017) explain that QSPM is a quantitative tool for assessing the relative attractiveness of alternative strategies based on identified internal and external strategic factors. In this study, QSPM was used to compare the relative attractiveness of the four alternative strategies generated from the SWOT analysis. The Total Attractiveness Score (TAS) was calculated by multiplying each strategic factor's weight by its attractiveness score, with higher TAS values indicating greater relative attractiveness and, consequently, a higher priority for strategy implementation. The results of the QSPM analysis are presented in Table 5.

Tabel 5.
Establishing Priority Strategies Based on QSPM

No.	Alternative Strategies	TAS value	Priority
1	Enhancing the competence of civil servants through digital training, strengthening technology infrastructure, and improving the public's digital literacy.	6,82	I
2	Developing an integrated civil registration system that is easily accessible to the public.	6,47	II
3	Strengthening information system security and conducting periodic evaluations of digital services.	6,15	III
4	Refining standard operating procedures (SOPs) and strengthening coordination among service units.	5,91	IV

Based on Table 5, the strategies with the highest *Total Attractive Score* (TAS) are enhancing civil servant competencies through digital training, strengthening technology infrastructure, and improving public digital literacy. These strategies are top priorities because they address ongoing internal weaknesses, particularly limited civil servant competencies, inadequate technology infrastructure, and low public digital literacy, while capitalizing on opportunities such as government policy support for digital transformation and advancements in information technology.

This priority strategy is also consistent with the results of quantitative analysis, which show that social innovation positively affects service effectiveness and that service effectiveness influences public satisfaction. Thus, enhancing human resource capacity, developing a more integrated digital service system, and educating the public are expected to improve the effectiveness of digital-based civil registration services and drive a sustainable increase in public satisfaction.

CONCLUSION

Social innovation has a positive and significant impact on the effectiveness of digitally based civil registration services in the Cibinong and Caringin subdistricts. Service effectiveness has a positive and significant impact on public satisfaction, indicating that services that are fast, accurate, easily accessible, transparent, and responsive can increase public satisfaction with digital-based civil registration services in Cibinong and Caringin subdistricts. There are significant differences in service effectiveness and public satisfaction between the Cibinong and Caringin Subdistricts. Cibinong Subdistrict has higher levels of service effectiveness and public satisfaction compared to Caringin Subdistrict, which is influenced by the readiness of information technology infrastructure, the competence of civil servants, and the level of utilization of digital service innovations.

Recommended policy development strategies include enhancing civil servant competencies, strengthening information technology infrastructure, developing an integrated digital service system, improving public digital literacy, and implementing continuous monitoring and evaluation. These strategies are expected to improve the effectiveness of digital-based civil registration services, expand the use of digital services, and deliver higher-quality, more efficient, transparent, and community-oriented public services in Bogor Regency.

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