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Evaluation of Electronic-Based Government System Using The E-Government Maturity Model: Case Study of Bekasi City

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ABSTRACT

Since the primary purpose of government is to serve the community, providing high-quality public services is the primary outcome that is expected. As a result, the public sector must make adjustments for digitalization in light of recent technological advancements. An evaluation of the maturity of adopting an electronic-based government system must be done as part of the application for an electronic-based government system. The e-government maturity model framework, which comprises five stages, is used to evaluate the 4 domains, 8 aspects, and 47 indicators present in an electronic-based government system to determine the technological function's capabilities. 44 agencies that use an electronic-based government system were interviewed as part of the research technique, which also included a survey of the Bekasi City government environment. With a total index value obtained of 2.78 in 2022—a lower value than in the previous year—the city of Bekasi receives a Good predicate. In this study's measurement results, 16 indicators had the lowest index values, making them candidates for improvement suggestions for the Bekasi city government.

Keywords: *Evaluation, Public Services, Maturity System, Information Technology, E-Government Maturity Model*

INTRODUCTION

The rapid development of technology and information systems, as well as the public's strong desire for effective, efficient, transparent, and accountable public services, necessitate that the government increase its technological capabilities to support the delivery of public services (Wulandari, 2020). The Indonesian government has changed the technological scenery by introducing a new model for digital public services. The government is required to enhance public services to make them more effective and efficient. As mandated by Law No. 25 of 2009. In 2018 the Indonesian president demanded government officials to create new regulations regarding public services and integrating government data into information systems to make it easier to control and monitor data by creating an Electronic-Based Government System as stipulated in presidential regulation number 95 of 2018. Information and communication technology is used by government management to provide services to users of electronic-based government platforms (Putri & Nugraha, 2021). Concerning Public Services, the government's role is primarily one of service to the community, and the primary outcomes expected of government administration are the provision of quality public services. According to statutory rules for goods, services, and/or administrative services given by public service providers, public service is an activity, or a series of activities, in the context of meeting the service needs of every citizen and resident.

Community service is one of the complex and dynamic issues because public service is a basic societal need that must be met by state administrators (Wulandari, 2020). On the other hand, people demand easy access to public services because, as is well-known, public services in Indonesia appear sluggish and convoluted due to the large number of existing procedures; therefore, the application of technology to public services is the solution to this issue. Population administration service is one of the many government-provided services where the public continues to have many

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complaints and problems, such as slow service, many brokers, long lines, complicated administration, limited availability of document blanks, limited time and Human Resources, and a lack of community understanding (Bouty, 2019).

In order to regulate it effectively and efficiently, the government must issue a directive known as the Electronic-Based Government System (Shiwi, 2009). The administration of the Electronic-Based Government System and the provision of services to its users are both done by the government using information and communication technology. The Electronic-Based Government Systems Presidential Regulation No. 95 of 2018[6] outlines this. The administration of government that makes use of information and communication technology to deliver public services is governed by the electronic-based government system.

The use of SPBE by the government involves more than just using technology to streamline antiquated administrative procedures. It is anticipated that the SPBE will bring about reforms in governmental administration. The reform of government administration is carried out through the use of information and communication technology by integrating existing systems in ministries/agencies, the central government, and local governments in order to decrease the amount of money spent and increase the quality, effectiveness, and efficiency of public services (Dony et al, 2022).

The process of evaluating the use of information technology has not been implemented optimally, particularly in local government circles. Local governments continue to face challenges in maximizing their use of information technology due to issues with policy, governance, services, management, and infrastructure, necessitating an assessment of an electronic-based government system to ascertain the maturity of implementing an electronic-based government system (Nangameka, 2022).

Bekasi City has been rated "Good" by the Ministry of Administrative Reform and Bureaucratic Reform. DBsed on an index value of 2.94, which is the result of 47 indicators, making it one of the cities in the West Java Province that implements an electronic-based government system that is driven by the development of information system technology.

With this assessment, Bekasi City intends to make modifications to the existing system in order to increase the index value in the future. Therefore, Bekasi City must coordinate with each agency and department within its jurisdiction. Bekasi City must take on a number of risks and hurdles, including lowering the incidence of abuse of power manifested in collusion, corruption, and nepotism by putting in place a monitoring system and taking complaints from the general public.

This study attempts to assess the effectiveness of the regional government of Bekasi City's electronic-based governance system in light of the numerous issues and challenges that it ran into during deployment. An evaluation must be done in order to gauge how the community feels about or provides comments on the electronic-based government system.

The method of assessing electronic-based government systems will be covered in this study using the E-Government Maturity Model. There will be evaluations of 4 domains, 8 aspects, and 47 SPBE indicators. This evaluation is conducted to measure the Electronic-Based Government System implementation's maturity level and produce an index value describing the maturity level.

LITERATURE REVIEW

The following theories are used as a foundation for research on the issues raised in this study:

Electronic-Based Government System

In order to ensure the implementation of regulation, direction, and control of the implementation of an electronic-based government system within the central, provincial, or regional government within the territory of the Unitary State of the Republic of Indonesia, a framework called the Electronic-Based Government System was created. The goal of the electronic-based government system is to provide the community with transparent, ethical, efficient, and responsible government. Additionally, it is anticipated that the implementation of the Electronic-Based Government System by the government administration will become more efficient and consistent. Making the Electronic-Based Government System Master Plan is the first

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stage in implementing the system. The 20-year governance of information technology users inside the government is intended to be guided by the national Electronic-Based Government System master plan.

The architecture is described as a fundamental framework in the Electronic-Based Government System master plan. It describes business processes, data and information, Electronic-Based Government System infrastructure, Electronic-Based Government System applications, and security aspects of Electronic-Based Government System in order to produce integrated Electronic-Based Government System services that will be reviewed every five years.

E-Government Maturity Model

The E-Government Maturity Model is a model created with the goal of measuring the maturity of e-government. The maturity of e-government can be measured by several factors, including technology, organizational operations, resource capabilities, and organizational processes.

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Previous Study

In making this research, it is necessary to conduct a study of previous studies to explain the differences from other studies and as a comparison with previous studies.

The use of ICT can assist in the reform and transformation of e-government so that it dominates from a technological standpoint because one of the challenges in e-government implementation is the lack of funding, technology, and human resources, which makes it less successful (Joshi, 2018).

Assessment of E-Government Maturity Models in Indonesian Sub-District Public Services In accordance with the PATEN service used in the SPBE evaluation and receiving an index value of 2.00 with the Enough predicate (Sukarsa et al., 2020), the SPBE Framework by I Made Sukarsa and Friend in 2020 with the study's results in the form of SPBE Evaluation in sub-district public services revealed that there were four indicators and two domains.

Next, Hujran and colleagues conducted a study named "Analyzing E-Government Maturity Models in 2023" with the aim of comparing various e-government maturity models as they advance annually (Hujran et al., 2023).

The city of Bekasi received a score of 2.94 in the "Good" category at its 2021 evaluation from the Ministry of State Apparatus Empowerment and Bureaucratic Reform based on 4 domains, 8 aspects, and 47 indicators. Excellence in the SPBE service domain was judged as exceeding expectations with an evaluation score of 3.45 for the SPBE service domain and 1.64 for the SPBE management domain[9].

METHOD

This study's data analysis was conducted by processing data from observations, interviews, and the literature in depth. Analyzing qualitative data involves planning, implementation, and reporting. The method for evaluating electronic-based government systems is based on the Lee and Kwak maturity model (Fath-Allah et al., 2014), which measures the level of maturity of process capabilities across five stages on table 1.

Table 1. Maturity Level on Process Capability

Level	*Characteristics*
Initial Conditions	This is a one-way static exchange with the citizen. It is only used to broadcast information to the public.
Data Transparency	At this point, the use of social media is restricted. The public provides feedback on the utility and

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	quality of the data.
Open Participation	This level includes social media tools to encourage more open participation. Public feedback is encouraged and used in policy choices. This stage also involves e-Voting and e-Petitioning.
Open Collaboration	This level emphasizes interagency collaboration through data sharing and public feedback. Public competitions are held, and data is analyzed to gain new insights and improve decision-making.
Ubiquitous Engagement	At this point, mobile devices and tablets can readily obtain data. Data is merged vertically and horizontally. Aside from that, data analytics is used in decision-making procedures. The agencies are working to make continuous enhancements possible.

The development level of the SPBE service domain is determined by the function capability maturity level. The function capability maturity level is divided into five categories. [7] including the information, interaction, transaction, collaboration, and optimization levels on table 2.

Table 2. Maturity Level on Function Capability Technique

Level	Criteria
1. Information	One-way information is the form that SPBE services are offered in.
2. Interaction	SPBE services are provided through reciprocal communication.
3. Transaction	Through the interchange of information and services, SPBE services are made available.
4. Collaboration	Collaboration with other SPBE services is used to deliver SPBE services.
5. Optimization	The requirements of the internal and external environments can change and be

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Level	Criteria
	accommodated by SPBE services.

Planning Stages

In this study using a framework as a planning stage in assessing the maturity level of SPBE Bekasi city as shown in figure 1

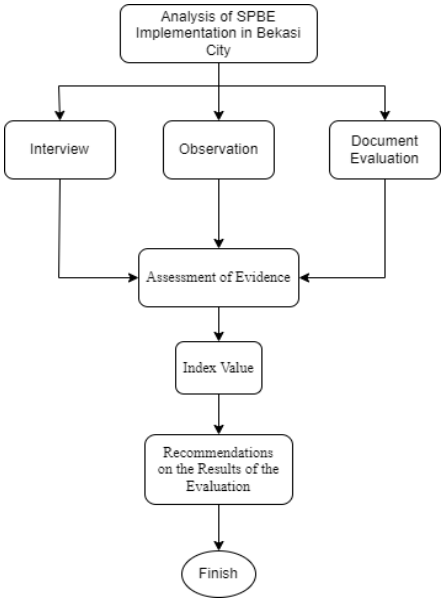

Figure 1. Framework Study

Implementation Stages

This stage involves data collection and evaluation such as through document analysis, interviews, or field observations.

a. Document evaluation, or assessing the level of development based on documents containing answers, explanations, and supporting evidence
b. Interview, specifically evaluating maturity based on question and answer.
c. Observation, specifically evaluating the level of maturity based on direct observation.

Reporting Stages

This stage involves of compiling an assessment of results based on the Electronic-Based Government System index value obtained, as shown in Table 3, and then making recommendations for improvement.

Table 3. Index Value

NO.	INDEX VALUE	PREDICATE
1.	. 4.2 – 5.0	EXCELLENT
2.	3.5 – < 4.2	VERY GOOD
3.	. 2.6 – < 3.5	2. GOOD
4.	. 1.8 – < 2.6	15. FAIR
5.	17. < 1.8	18. POOR

RESULT AND DISCUSSION

The value of the existing index was derived from the study's findings as follows:

Maturity Level Assessment

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The results of the evaluation are based on an evaluation of the measurement of maturity levels using the e-government maturity model, which refers to four domains, eight aspects, and forty-seven indicators in detail, obtaining an index score that can be seen in table 4, table 5, table 6 and table 7.

Table 4. Value Index Domain 1

Domain/ Aspect/Indicator	Description	Indicator Value	Index
Domain 1 : Policy of SBPE (Score 13%) 0.39			
Aspect 1 : SPBE Internal Governance Policy (Score 13%) 0.39			
Indicator 1	SPBE Architecture Policy Maturity Level	2	0.02
Indicator 2	SPBE Plan Map Policy Maturity Level	3	0.03
Indicator 3	Data Management Policy Maturity Level	3	0.03
Indicator 4	SPBE Application Development Policy Maturity Level	4	0.03
Indicator 5	Data Center Service Policy Maturity Level	3	0.03
Indicator 6	Intra Network Service Policy Maturity Level	3	0.03
Indicator 7	Service Liaison System Use Policy Maturity Level	3	0.03
Indicator 8	Information Security Management Policy Maturity Level	3	0.03
Indicator 9	ICT Audit Policy Maturity Level	4	0.04
Indicator 10	SPBE Coordination Team Policy Maturity Level	2	0.03

Table 5. Value Index Domain 2

Domain/ Aspect/Indicator	Description	Indicator Value	Index
Domain 2 : SPBE Governance (Score 25%) 0.575			
Aspect 2 : SPBE Strategic Planning (Score 10%) 0.2			
Indicator 11	SPBE Architecture Maturity Level	2	0.05
Indicator 12	SPBE Plan Maturity Level	2	0.05
Indicator 13	Maturity Level of SPBE Plan and Budget Integration	1	0.025
Indicator 14	SPBE Business Process Innovation Maturity Level	3	0.075
Aspect 3 : Information and Communication Technology (Score 10%) 0.25			
Indicator 15	SPBE Application Development Maturity Level	1	0.025
Indicator 16	Data Center Service Maturity Level	3	0.075
Indicator 17	Intra Network Service Maturity Level	3	0.075
Indicator 18	Maturity Level of Use of the Service Liaison System	3	0.075

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Domain/ Aspect/Indicator	Description	Indicator Value	Index
Aspect 4 : SPBE Executant (Score 5%) 0.125			
Indicator 19	SPBE Coordination Team Maturity Level	2	0.05
Indicator 20	SPBE Implementation Collaboration Maturity Level	3	0.075

Table 6. Value Index Domain 3

Domain/ Aspect/Indicator	Description	Indicator Value	Index
Domain 3 : SPBE Management (Score 16.5%) 0.165			
Aspect 5 : Implementation of SPBE Management (Score 12%) 0.12			
Indicator 21	SPBE Risk Management Implementation Maturity Level	1	0.015
Indicator 22	Information Security Management Implementation Maturity Level	1	0.015
Indicator 23	Data Management Implementation Maturity Level	1	0.015
Indicator 24	Maturity Level of Implementation of ICT Asset Management	1	0.015
Indicator 25	Maturity Level of Implementation of Human Resource Management	1	0.015
Indicator 26	Knowledge Management Application Maturity Level	1	0.015
Indicator 27	Maturity Level of Implementation of Change Management	1	0.015
Indicator 28	SPBE Service Management Implementation Maturity Level	1	0.015
Aspect 6 : Information and Communication Technology Audit (Score 4.5%) 0.045			
Indicator 29	SPBE Infrastructure Audit Maturity Level	1	0.015
Indicator 30	SPBE Application Audit Maturity Level	1	0.015
Indicator 31	SPBE Security Audit Maturity Level	1	0.015

Table 7. Value Index Domain 4

Domain/ Aspect/Indicator	Description	Indicator Value	Index
Domain 4 : SPBE Services (Score 45.5%) 1.65			
Aspect 7 : Electronic Based Government Services (Score 27.5%) 0.99			
Indicator 32	Maturity Level of Electronic-Based Planning Services	1	0.0275

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Indicator 33	Maturity Level of Electronic-Based Budgeting Services	4	0.11
Indicator 34	Maturity Level of Electronic-Based Financial Services	4	0.11
Indicator 35	Maturity Level of Procurement Services for Electronic-Based Products and Services	4	0.11
Indicator 36	Maturity Level of Electronic-Based Personnel Services	5	0.1375
Indicator 37	Maturity Level of Electronic-Based Archive Services	1	0.0275
Indicator 38	Maturity Level of Electronic-Based State Property Management Services	4	0.11
Indicator 39	Maturity Level of Electronic-Based Government Internal Oversight Services	3	0.0825
Indicator 40	Maturity Level of Electronic Based Performance Accountability Services	5	0.1375
Indicator 41	Maturity Level of Electronic-Based Employee Performance Services	5	0.1375
Aspect 8 : Electronic-Based Public Services (Score 18%) 0.66			
Indicator 42	Public Service Complaint Service	4	0.12
Indicator 43	Open Data Services	3	0.09
Indicator 44	Legal Documentation and Information Services	4	0.12
Indicator 45	Sector Public Services 1	5	0.15
Indicator 46	Sector Public Services 2	5	0.15
Indicator 47	Sector Public Services 3	1	0.03

Graphically of Assessment

Graphically the acquisition of index values in each domain can be seen in the Figure 2, Figure 3, Figure 4, and Figure 5.

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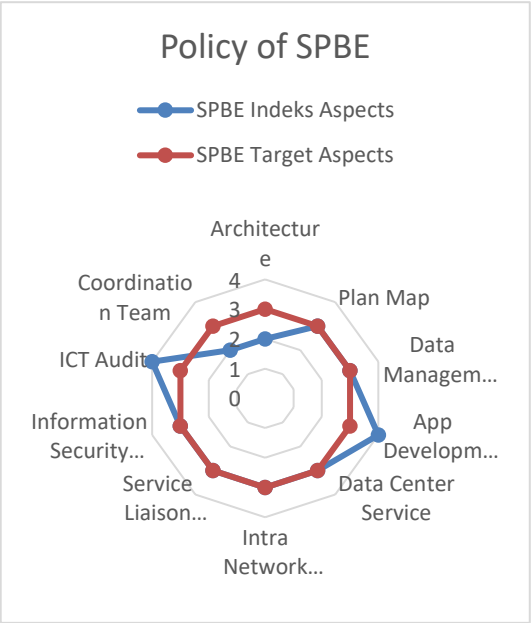

Figure 2. SPBE Policy Index Chart

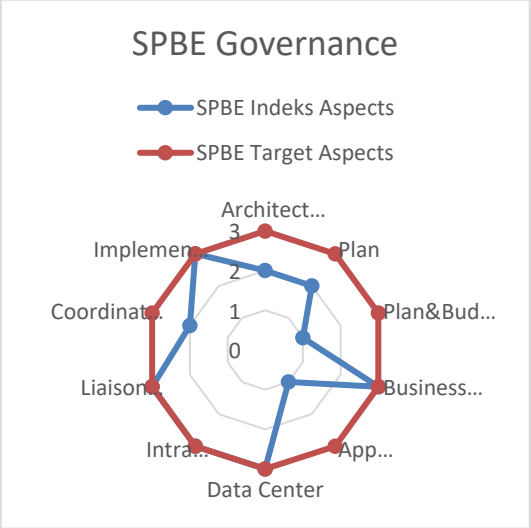

Figure 3. SPBE Governance Index Chart

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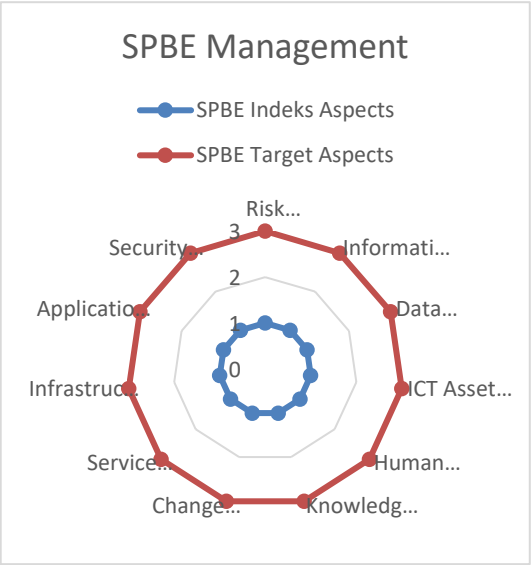

Figure 4. SPBE Management Index Chart

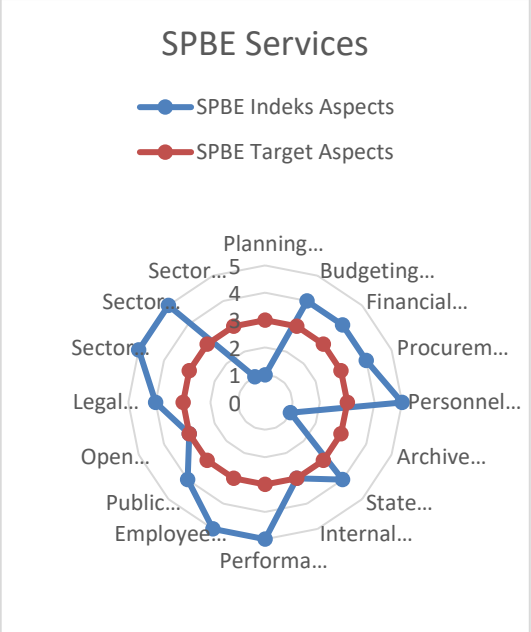

Figure 5. SPBE Services Index Chart

The average Bekasi city SPBE index values for the four domains : policy, governance, management, and services are presented in Table 8 and Figure 6.

Table 8. Domain Index Value

DOMAIN	INDEX VALUE
POLICY OF SPBE	0.39
SPBE GOVERNANCE	0.575
SPBE MANAGEMENT	0.165
SPBE SERVICES	1.65
TOTAL INDEX VALUE	2.78

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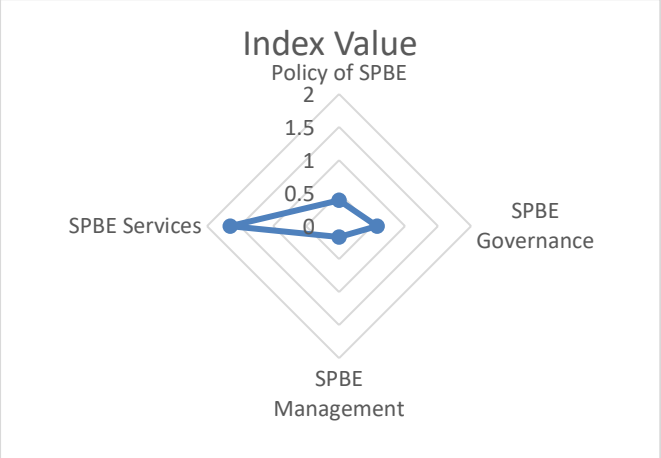

Figure 6. Domain Index Value Chart

The acquisition of SPBE index values for 4 domains, 8 aspects, and 47 indicators presented in tables and graphs results in an overall SPBE index value of 2.78 and earns the SPBE maturity level in Bekasi City the GOOD designation based on the SPBE index value (Table 3)
The city of Bekasi has strengths in the SPBE service domain, which has a value index of 1.65, followed by the SPBE governance domain, which has a value index of 0.575, and the SPBE policy domain, which has a value index of 0.39. Nonetheless, Bekasi City's implementation of SPBE still has weaknesses in the SPBE Management domain, as indicated by an index value of 0.165.

Based on the acquisition of the maturity value index, it is evident that Bekasi City still has 16 indicators with the lowest scores, indicating that these indicators require improvement.
Based on these findings, this study makes recommendations for improving the evaluation of the Bekasi city government in order to improve the process of implementing a better electronic-based government system.

Recommendation and Improvement Strategies

Techniques for enhancing company operations that don't have index categories are offered as recommendations for improvement, allowing for breakthroughs to be made to raise the caliber of public services. The next parts will describe how the recommendations are broken up into distinct sections.

Recommendation for Domain Policy of SPBE

In implementing the SPBE in the Bekasi city policy domain, the 'Transaction' predicate was rated as average because the Bekasi city met the criteria for exchanging information and services when establishing its policies. Existing policies must be evaluated and developed in order for the city of Bekasi to optimize its SPBE policy.

Recommendation for Domain SPBE Governance

In the SPBE governance domain, there are two indicators with a value of 1, that is integration of plans and budgets and Application Development solutions that can be provided by consulting with ICT managers regarding plans, budgets, and procedures for developing SPBE applications and by encouraging the use of national data centers for application development.

Recommendation for Domain SPBE Management

Bekasi city must make changes and improvements in the management domain because all indicators in this domain continue to receive a value of 1, necessitating an evaluation of the city's management practices. These are some recommendations that can be made: Providing users with transaction services related to dynamic archiving, such as workflow automation, database transactions, data validation, approval mechanisms, and data analytics, as part of the performance

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of electronic-based dynamic archiving services, Implement risk management in accordance with PERMEN PANRB No. 5 of 2020 risk management guidelines, Implement Data Management in accordance with the National Development Planning Minister/Bappenas No. 16 of 2020, Conduct at least one internal ICT audit every two years, Include Information Security controls, asset management, knowledge management, change management, and SPBE service management in a plan map, and then implement them across all work units.

Recommendation for Domain SPBE Services

In the service domain, the city of Bekasi has issues with population services in sector 3 of public services. In response to changes in the environment, laws and regulations, technology, and the Regional Government's needs, the city government of Bekasi can solve the problem by implementing Electronic-Based Sectoral Public Services.

CONCLUSION

The evaluation of Bekasi City's electronic-based government system, also known as SPBE, that was conducted in this study went quite well. By mapping the SPBE framework, the assessment procedure obtains the SPBE indicators used in Bekasi. The results indicated that the implementation of an electronic-based government system in Bekasi City resulted in an SPBE maturity level with a total index value of 2.78 and the designation "Good," which is lower than the assessment result in 2021, which was 2.94. There are 16 out of 47 indicators in the Initial Conditions category that have an evaluation result value of 1. The domain that is a strength in the city of Bekasi is the Policy Domain, which has an average score of 3 and falls under the category of open participation in policymaking. Nevertheless, the city of Bekasi must improve in the management domain, as its average score in the initial conditions category is 1. As a result, the city government of Bekasi can prioritize strengthening the SPBE management sector.

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