Evaluation of SAPA WARGA Application System and User Satisfaction: Public Service Technology Management Perspective Based on PIECES Framework

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ABSTRACT

The utilization of technology in public services continues to evolve to enhance efficiency, transparency, and service quality for society. However, the implementation of technology in the public sector still faces various challenges, such as human resource readiness, infrastructure, and resistance to change. This study aims to evaluate the SAPA WARGA application using the PIECES framework, which includes aspects of Performance, Information, Economy, Control, Efficiency, and Service. The application is used by the West Java Provincial Government to improve public services by providing convenience for the public in reporting complaints, conveying aspirations, and accessing information related to public services. The survey results showed that the majority of respondents were satisfied with the application's performance, customer support, and vehicle tax due reminder feature. However, several areas still require improvement, such as application speed, information consistency, and response to user complaints.

1. Introduction

In recent years, the West Java Provincial Government has been striving to leverage information technology to improve the quality of public services. One such effort is the launch of the SAPA WARGA application, which aims to strengthen the relationship between the government and the public while making it easier for citizens to express their aspirations, submit complaints, and access information about public services. This application was introduced with the hope of creating a more responsive and transparent public service system. The use of information technology in public services has become an increasingly relevant global trend in the digital era. Digitalizing public services can enhance accessibility and improve government service efficiency [1].

Since its launch, SAPA WARGA has undergone several development phases to refine its features and user interface based on user needs. Various features have been added, including complaint reporting, public service information provision, and an interactive space for citizens. However, despite periodic updates, the application still receives complaints from users. One of the biggest challenges in developing public service applications is meeting public expectations regarding service speed and information accuracy. Some common complaints include slow loading times, data inconsistencies or inaccuracies, and a reporting mechanism that is considered ineffective and does not always receive a prompt response from relevant authorities. These issues have led to user dissatisfaction and raised doubts about the application's effectiveness as an optimal public service tool [2].

This study references previous research that applied the PIECES framework in information system audits over the past seven years. Sumiati et al in 2023 assessed the gap between user expectations and the performance of the GAIS V.4 Academic Information System, finding improvements but also identifying areas needing enhancement [3]. Suroso et al. in 2024 examined the impact of customer satisfaction on Tokopedia's information system among Politeknik STMI Jakarta students, concluding that performance and efficiency had the most significant influence [4]. Agustina in 2018 evaluated ERP system implementation at PT. HK Realtindo Jakarta, highlighting the critical role of performance, information, economy, control, efficiency, and service variables [5]. Malioy et al. in 2024 analyzed the Southwest Maluku Regency government website, emphasizing the need for improvements in information and service quality [2]. Risky Febriyata & Yunita in 2024 investigated user satisfaction with the Indragiri Hilir Regional Library's E-Book service, stressing the importance of performance and efficiency [6]. Lastly, Rochman et al. in 2022 evaluated the Global Institute's

Academic Information System, similarly identifying the need for enhancements in information and service aspects to improve user satisfaction [7].

Using the PIECES framework, this study aims to identify existing weaknesses and formulate improvement recommendations to enhance the quality of the SAPA WARGA application. It is expected that this evaluation will generate relevant solutions, enabling the application to more effectively meet public needs and serve as a reliable public service platform in West Java.

2. Method

2.1 PIECES Framework Concepts and Components

Performance Components: According to research conducted by Muliansah & Budihartanti in 2020, the performance component in the PIECES framework assesses the extent to which the information system can process data and produce information according to the expected goals. The aspects evaluated include the system's ability to execute commands without hindrance and the speed of response to user requests [8].

Information Components (Information and Data): The study by Agustina in 2018 explains that the information component in PIECES focuses on the quality of data generated by the information system. The evaluation includes output, input, and stored data, with the aim of ensuring that the information generated is accurate and relevant for decision making [5].

Economy Components: Research published by Pangri et al., in 2021 states that the economic aspect in the PIECES framework assesses whether the costs incurred for implementing an information system are commensurate with the benefits obtained. This evaluation considers the operational costs and benefits generated from using the system [9].

Control and Security Components: According to a study by Aisah et al. in 2025, this component emphasizes the importance of control and security in information systems. The evaluation focuses on the system's ability to detect and prevent errors or fraud, as well as ensuring that the system has adequate security mechanisms [10].

Efficiency Components: Research published by Nadhiva et al. in 2022 identifies that efficiency in the PIECES framework relates to how resources are optimally utilized in the operation of an information system. This evaluation considers whether the system can minimize time and resource wastage while enhancing overall productivity [11].

Service Components: According to a study by Aritonang in Rochman et al., at 2022, the service component in the PIECES framework assesses how services are provided by the information system and identifies issues related to these services. This

evaluation includes an analysis of the quality of service delivered to users, including aspects such as speed, reliability, and user satisfaction [7].

2.2 Data Collection Method

In this study, data was collected using several relevant methods to obtain in-depth information about the SAPA WARGA application and its performance. The methods used are as follows:

Interviews: Interviews were conducted with government officials involved in managing the SAPA WARGA application, as well as several users who have utilized the application. The interviews were conducted either in person or via telephone to explore their understanding of the application's strengths and weaknesses, as well as the challenges they faced while using it.

Questionnaires: Questionnaires were distributed to SAPA WARGA application users to collect quantitative data related to user satisfaction, system effectiveness, and their experience interacting with the application. The questionnaire was designed to gain insights into system performance, security, efficiency, and the services provided by the application.

Observations: Researchers conducted direct observations of the application's use in the field, monitoring user interactions with the system and the processes within the application. This observation aimed to provide a clearer picture of how the application is used and whether it supports the intended tasks.

Document Analysis: Relevant documents, such as system usage reports, development records, and documentation related to the SAPA WARGA application, were analyzed. This was done to understand the technical and operational aspects of the application.

2.3 Research Design

This research was conducted through the following steps:

Problem Identification [12]**:** This study focuses on the SAPA WARGA application used by the community in West Java Province. The research subjects include:

1. Application users, consisting of the public who access and use the application to report complaints or seek information.

2. Application managers, consisting of local government officials responsible for managing and maintaining the application.

Data Collection [13]**:** Data was collected using two main techniques:

1. In-depth Interviews: Conducted with application users and managers to explore their experiences,

perceptions, and complaints regarding the performance of the SAPA WARGA application. These interviews focused on aspects within the PIECES framework.

2. Observation and Documentation [14]: Researchers conducted direct observations of the application's usage and analyzed documentation related to the management of the SAPA WARGA application, such as performance reports, annual evaluations, and user feedback.
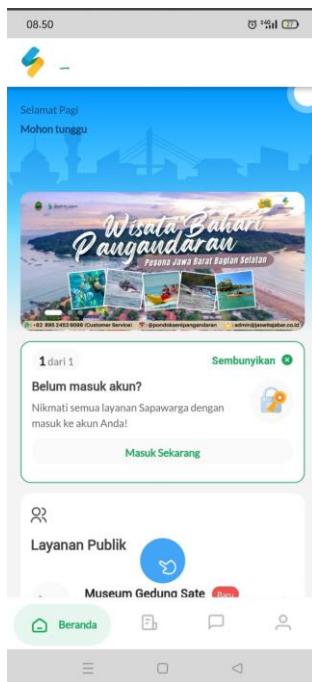

Figure 1. Homepage of the SAPA WARGA

Data Analysis: Data obtained from interviews and observations was analyzed using a thematic analysis approach [15]. Each collected data point was categorized based on elements within the PIECES framework:

1. Performance: Evaluation of the application's speed, stability, and responsiveness.

2. Information: Assessment of the accuracy, relevance, and completeness of the information provided by the application.

3. Economy: Analysis of costs related to the management and operation of the application.

4. Control: Evaluation of the system's security and user data control.

5. Efficiency: Assessment of resource utilization (time, effort, and costs) in the application's operations.

6. Service: Evaluation of the quality of services provided by the application, including response speed and accessibility.

Interpretation and Evaluation: To enhance the validity of the research findings, comparisons were made between data obtained from interviews, observations, and documentation.

Recommendation and Report Preparation: Based on the analysis results, the researcher provided recommendations to improve the performance quality of the SAPA WARGA application. These recommendations aimed to optimize aspects that were found to be less effective, based on the PIECES framework evaluation.
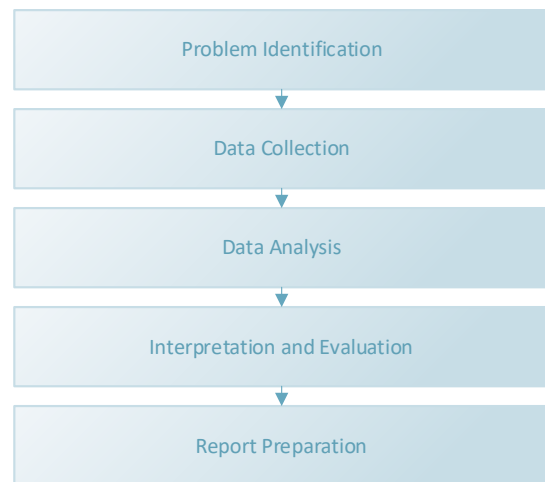

Figure 2. Research Design

3. Result and Discussion

This study collected sample data from 100 respondents who completed the questionnaire. Based on the respondent profile analysis, 68% of the respondents were male, while 32% were female. Additionally, the respondents' occupations were categorized as follows: 33% worked as government employees (ASN), state-owned enterprise employees (BUMN/BUMD), or military/police personnel (TNI/POLRI), 53% were private sector employees, and the remaining 14% were entrepreneurs.

Next, the researcher conducted an analysis of the respondents' responses regarding the performance of the statement: "The SAPA WARGA application, in the Motor Vehicle Tax feature, can process data quickly." The results can be seen in Table 1 below.

Table 1. Result of "The SAPA WARGA application, in the Motor Vehicle Tax feature, can process data quickly" question.

	Frequency	Percent	Valid Percent	Cumulative Percent

		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Disagree	1	1.0	1.0	1.0
	Neutral	23	23.0	23.0	24.0
Valid	Agree	63	63.0	63.0	87.0
	Strongly Agree	13	13.0	13.0	100.0
	Total	100	100.0	100.0	

Based on Table 1, 63% of respondents agreed and 13% strongly agreed with the statement that the SAPA WARGA application, in the Motor Vehicle Tax feature, can process data quickly. Meanwhile, 23% of respondents were neutral, and 1% strongly disagreed with the statement.

Next, the researcher conducted an analysis of the respondents' responses regarding the performance of the statement: "Some features of the SAPA WARGA application have experienced delays when used." The results can be seen in Table 2 below.

Table 2. Result of "Some features of the SAPA WARGA application have experienced delays when used." question.

	Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Strongly Disagree	4	4.0	4.0	4.0
Disagree	25	25.0	25.0	29.0
Neutral	42	42.0	42.0	71.0
Agree	26	26.0	26.0	97.0
Strongly Agree	3	3.0	3.0	100.0
Total	100	100.0	100.0	

Based on Table 2, 4% of respondents strongly disagreed with this statement, while 25% disagreed and 42% remained neutral. Meanwhile, 26% of respondents agreed, and 3% strongly agreed that the application experienced delays when used.

Table 3. Result of "The SAPA WARGA application can be relied on to process your vehicle tax payments."

	Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Strongly Disagree	1	1.0	1.0	1.0
Disagree	3	3.0	3.0	4.0
Neutral	23	23.0	23.0	27.0
Agree	57	57.0	57.0	84.0
Strongly Agree	16	16.0	16.0	100.0
Total	100	100.0	100.0	

Reliability, 57% of respondents agree with the statement that "SAPA WARGA Application is reliable in processing your vehicle tax payments". 16% Strongly Agree, 23% Neutral. And the remaining 3% Disagree and 1% Strongly Disagree.

Table 4. Result of "Information related to Motor Vehicle Tax is easy to understand in the SAPA WARGA application"

	Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Strongly Disagree	2	2.0	2.0	2.0
Neutral	23	23.0	23.0	25.0

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	59	59.0	59.0	84.0
Strongly Agree	16	16.0	16.0	100.0
Total	100	100.0	100.0	

Based on the data, the majority of respondents stated that the information related to Motor Vehicle Tax in the SAPA WARGA application was easy to understand. As many as 59% of respondents chose Agree, and 16% stated Strongly Agree, so that the total respondents who gave positive responses reached 75%.

As many as 23% of respondents were Neutral, indicating that some users are still not completely sure about the ease of understanding the information presented.

However, only 2% of respondents gave a negative response by choosing Strongly Disagree. This indicates that overall, the SAPA WARGA application is quite effective in conveying information related to Motor Vehicle Tax to users.

Table 5. Result of "The information provided by the application is always updated regularly."

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.0	1.0	1.0
Disagree	3	3.0	3.0	4.0
Neutral	28	28.0	28.0	32.0
Agree	59	59.0	59.0	91.0
Strongly Agree	9	9.0	9.0	100.0
Total	100	100.0	100.0	

Based on the survey results, the majority of respondents stated that the information provided by the SAPA WARGA application is always updated regularly. As many as 59% of respondents chose Agree, and 9% stated Strongly Agree. This shows that 68% of users gave a positive response to information updates in the application.

As many as 28% of respondents were Neutral, indicating that some users felt unsure or did not have enough experience regarding information updates.

Meanwhile, only 3% of respondents Disagree and 1% Strongly Disagree with this statement. Overall, this data reflects that the SAPA WARGA application is quite good at ensuring that the information provided remains updated regularly.

Table 6. Result of "Using the SAPA WARGA application saves you time compared to other methods."

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	1	1.0	1.0	1.0
Disagree	1	1.0	1.0	2.0
Neutral	16	16.0	16.0	18.0
Agree	60	60.0	60.0	78.0
Strongly Agree	22	22.0	22.0	100.0
Total	100	100.0	100.0	

The survey results show that the majority of respondents feel that using the SAPA WARGA application saves more time than other methods. As many as 60% of respondents stated Agree, and 22% stated Strongly Agree. Thus, 82% of respondents gave a positive response to the time efficiency offered by this application.

As many as 16% of respondents were Neutral, indicating that some users do not yet have full confidence in the time efficiency benefits of using the application.

Only 1% of respondents stated Disagree and 1% stated Strongly Disagree. This reflects that a small

number of users feel that the application does not provide significant benefits in terms of time savings.

Overall, this data confirms that the SAPA WARGA application has succeeded in helping the majority of users save time compared to other available methods.

Discussion

Based on several examples of previous audit results, there are several discussions regarding these audit results.

First one is about **Performance**. Most respondents gave a positive response to the data processing speed of the Motor Vehicle Tax feature. As many as 63% of respondents stated Agree and 13% Strongly Agree that this application is able to process data quickly. However, there were 23% of respondents who were Neutral and 1% stated Strongly Disagree. Regarding the slowness of the application, 26% of respondents Agree and 3% Strongly Agree that the application is sometimes slow when used. As many as 42% of respondents chose to be Neutral, while 25% Disagree and 4% Strongly Disagree with this statement. The majority of respondents considered the SAPA WARGA application reliable for processing vehicle tax payments. As many as 57% of respondents Agree and 16% Strongly Agree with the reliability of the application. Meanwhile, 23% were Neutral, with only 3% Disagree and 1% Strongly Disagree.

Second is about **Information**. The results of the analysis show that the SAPA WARGA application as a whole has succeeded in presenting information that is easy to understand, accurate, and updated regularly. As many as 75% of respondents gave a positive response (Agree and Strongly Agree) that information related to Motor Vehicle Tax in the SAPA WARGA application is easy to understand. This indicates that the majority of users feel that this application has clear and simple information management. As many as 79% of respondents gave a positive assessment of the accuracy of the information presented by the application, with only 1% stating Strongly Disagree. This finding reflects that the information in the application is considered reliable and in accordance with user needs. As many as 68% of respondents felt that the information in the application was updated regularly. However, there were 28% of respondents who were Neutral, indicating that there is room for improvement in ensuring that updated information is better communicated to users.

Third is about **Economy**. The survey results show that the majority of respondents consider the SAPA WARGA application superior in terms of time and economic efficiency compared to other methods or alternatives. A total of 82% of respondents gave a positive response (Agree and Strongly Agree) that the SAPA WARGA application saves time compared to other methods. Only a small number of respondents

(2%) gave a negative response, while 16% were Neutral. A total of 80% of respondents gave a positive response to the economic aspect of this application, indicating that the majority of users feel that the SAPA WARGA application is more efficient than other vehicle tax payment alternatives. Only 2% of respondents gave a negative response, and 18% were Neutral.

Fouth is about **Control**. The survey results show that the SAPA WARGA application is generally considered effective in providing control to its users regarding security and transaction confirmation. A total of 68% of respondents felt that this application could protect their personal data well during transactions, with 54% Agreeing and 14% Strongly Agreeing. Meanwhile, 30% of respondents were Neutral, indicating uncertainty or lack of experience regarding personal data security. Only 2% of respondents disagreed with this statement. As many as 73% of respondents felt safe in making payments through this application, with 55% Agreeing and 18% Strongly Agreeing. Meanwhile, 26% were Neutral, reflecting uncertainty among some users. Only 1% of respondents felt unsafe when making payments. The majority of respondents, namely 75%, felt that the application provided confirmation after each transaction. 58% of respondents Agree and 17% Strongly Agree. As many as 24% were Neutral, while only 1% felt that the application did not provide adequate confirmation.

Fifth is about Efficiency. The survey results show that the SAPA WARGA application is generally considered efficient by the majority of users in various aspects related to the ease and efficiency of the process. As many as 79% of respondents felt that the Motor Vehicle Tax feature was easy to find, with 62% Agreeing and 17% Strongly Agreeing. As many as 16% were Neutral, indicating uncertainty or lack of experience regarding the convenience. Only 5% of respondents gave a negative response, consisting of 4% Disagreeing and 1% Strongly Disagreeing. As many as 77% of respondents felt that the vehicle tax payment process was easy to do through this application, with 60% Agreeing and 17% Strongly Agreeing. As many as 20% were Neutral, indicating that some users did not have enough experience to assess this convenience. Only 3% of respondents gave a negative response, consisting of 2% Disagreeing and 1% Strongly Disagreeing. As many as 58% of respondents felt that this application requires efficient steps to complete transactions, with 45% Agreeing and 13% Strongly Agreeing. As many as 28% were Neutral, while 14% gave negative responses, consisting of 12% Disagreeing and 2% Strongly Disagreeing.

Sixth is about **Security**. The survey results show that the SAPA WARGA application is considered quite good by the majority of respondents in terms of service security, customer support, and vehicle tax due date reminder features. As many as 79% of respondents

were satisfied with the services provided by this application, with details of 62% Agreeing and 17% Strongly Agreeing. As many as 20% were Neutral, while only 1% stated Strongly Disagreeing. The majority of respondents (62%) were satisfied with the customer support provided, with 47% Agreeing and 15% Strongly Agreeing. As many as 36% were Neutral, while only 2% gave a negative response. As many as 68% of respondents gave a positive response to Vehicle Tax Due Date Notification Feature, with 54% Agreeing and 14% Strongly Agreeing. As many as 27% were Neutral, and only 5% gave a negative response.

4. Conclusions

Based on the survey results, the SAPA WARGA application generally provides adequate services, particularly in terms of security, customer support, and vehicle tax due date reminders, with the majority of users expressing satisfaction. The application's performance is considered good in terms of speed and reliability, though improvements are needed, especially in handling system load. The provided information is relevant, but enhancements in personalized notifications are necessary. The application is also deemed efficient in saving users time and costs, with a satisfactory level of security, although further reinforcement is required. Recommendations include strengthening security features, enhancing customer support, optimizing tax reminder notifications, and increasing user education. The findings of this study can serve as a reference for application developers, policymakers, and future research to improve similar digital services.

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