

Evaluation of the Use of the E-Puskesmas System Using the Pieces Approach to Assess Staff Satisfaction at the Katobengke Community Health Center in 2025

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A B S T R A C T

The implementation of electronic health information systems is a strategic step toward improving service quality at primary healthcare facilities. This study aims to evaluate the use of the e-Puskesmas system at Puskesmas Katobengke in 2025 using the PIECES framework (Performance, Information, Economy, Control, Efficiency, and Service). This approach is utilized to assess staff satisfaction with the system's performance in supporting healthcare services. A descriptive quantitative method was applied, involving 17 staff members selected through total sampling. Data were collected using a structured questionnaire and analyzed descriptively by calculating average scores for each PIECES aspect. The results revealed that overall staff satisfaction with the e-Puskesmas system was high, with the highest scores in Efficiency (94.70%) and Service (92.85%), and the lowest in Control (84.70%). Challenges identified include internet connectivity issues and limited system integration with BPJS applications. Nevertheless, the system was considered effective in facilitating data entry, accelerating services, and improving the quality of health information. The study concludes that the e-Puskesmas system has had a positive impact on staff performance and satisfaction. The findings are expected to serve as a reference for further improvement of electronic health information systems, particularly in enhancing service quality at primary healthcare levels such as Puskesmas.

INTRODUCTION

A Community Health Center, also known as a Puskesmas, is a health service that provides promotive, preventive, curative, and rehabilitative services. Puskesmas organizes Individual Health Services (UKP) and Community Health Services (UKM) at the primary level. Health service management encompasses the evaluation, planning, implementation, and monitoring stages. In addition, Puskesmas also conducts registration and reporting activities related to health data and information (Wahyuni 2023).

This is reflected in the use of the Community Health Center's management information system. Patient information and the management of registration or enrollment data, research activities (diagnosis), and patient care are integrated into the Community Health Center's management information system application (Fikri, 2019). Information obtained from patients is then classified according to accountability reporting needs, such as daily visit reports, reports of the most common illnesses, and other reports required for patient care (Wahyuni 2023).

Based on the results of previous research studies (Annisa Wahyuni 2023) conducted at Community Health Center X, e-Puskesmas has been used since 2019, but its implementation is still not optimal. Ideally, human resources, data, technology, and processing are contained in the physical components of the management information system. This component supports the production of appropriate, accurate, and responsible information and assists in decision-making (Subektianto et al., 2018). Community Health Center X is one of the outpatient health centers in Padang City that already has good accreditation. The implementation of the health center management information system through e-Puskesmas, but currently there are still several obstacles such as the network and not all units in the health center are integrated. Regarding monitoring and evaluation, it is carried out directly to the center, while the evaluation of the use of the e-Puskesmas system is used as input and improvement material. It is hoped that the implementation of the Health Information Management System at the community health center can be implemented well and contribute to the community to improve the effectiveness and efficiency of health services. Based on the background description, the aim of the research is to evaluate the implementation of the e-Puskesmas system using the PIECES framework approach to assess officer satisfaction.

Based on initial observations conducted at the Katobengke Community Health Center on February 28, 2025, researchers obtained information through questionnaires and observations. It can be seen that the Health Service has implemented e-Puskesmas since 2023 but was only used in 2024. However, in its implementation there are obstacles that can hinder the process of health services, especially at the Katobengke Community Health Center Registration Counter, one of which is internet network disruption and bridging disruption with the BPJS Pcare application so that users or officers are hampered in inputting patient data and can also disrupt health service activities at each Polyclinic. Therefore, an evaluation of e-Puskesmas users is necessary to determine how satisfied registration counter users are with using e-Puskesmas in carrying out their duties. One method that can be used to evaluate this is the PIECES (Performance, Information, Economic, Control, Efficiency, Service) method.

METHOD

This study used a quantitative method with a descriptive design through the PIECES approach. Data were collected through direct observation of the work mechanisms at the Katobengke Community Health Center, interviews with relevant parties, and documentation. The study population included all officers using the e-Puskesmas system, namely 17 people consisting of officers from the Dental Clinic, KIA Clinic, MTBS/Elderly/General Clinic, and Laboratory, with a total sampling technique so that the entire population became respondents. The study was conducted in February 2025. The data processing process included editing, coding, transformation, and tabulation stages, then analyzed using descriptive techniques with a univariate approach to describe the distribution of variables and bivariate with the Spearman correlation test to see the relationship between variables. The results of the analysis are presented in tabular form to facilitate interpretation according to the research objectives.

RESULTS & DISCUSSION

The characteristics of respondents in this study were analyzed based on age, gender, occupation, and education level to understand the background of E-Puskesmas application users. The results showed that respondents were aged between 23 and 46 years, with the majority being in the 20–30 age group (9 people (52.9%), followed by 41–50 years old (5 people (29.4%), and 31–40 years old (17.6%). All respondents were female (100%). In terms of occupation, the majority of respondents were honorary, namely 11 people (64.7%), followed by ASN (4 people (23.5%), and PTT (2 people (11.8%). Meanwhile, based on education level, the majority of respondents had a Diploma (D3) education (9 people (52.9%), then a Bachelor's degree (S1) (7 people (41.2%), and 1 person (5.9%) with a final education of high school.

Officer satisfaction with the E-Puskesmas application at the Katobengke Community Health Center was analyzed using the **PIECES** approach which includes six main dimensions, namely performance, information, economics, control, efficiency, and service.

Table 1. Summary Table of Officer Satisfaction Scores Based on Performance Aspects in the 2025 E-Puskesmas System

No	Statement	Total Score	Maximum Score	Percentage Score (%)
1	A1	81	85	95,30
2	A2	77	85	92,90
3	A3	71	85	83,50
4	A4	72	85	84,70
Average				89,10%

Source: Primary Data, 2025.

In terms of performance, the study results showed a satisfaction level of 89.10%. Performance is understood as the system's ability to complete tasks quickly, reliably, and interactively, thus facilitating staff in processing information and handling disruptions. This finding aligns with Hanif Al Fatta's theory, which places performance as the primary indicator of system speed and reliability, and is consistent with the findings of Wahyuni (2023). Compared to Aliyani et al.'s (2023) research, the

results in Katobengke were higher, confirming that the implementation of E-Puskesmas in this region has been more optimal in supporting staff productivity.

Table 2. Summary of Staff Satisfaction Scores Based on the Information Aspect in the E-Puskesmas System in 2025

No	Statement	Total Score	Maximum Score	Percentage Score (%)
1	B1	79	85	92,90
2	B2	80	85	94,10
3	B3	79	85	92,90
4	B4	74	85	87,10
Average				91,25

Source: Primary Data, 2025.

The information dimension achieved the highest satisfaction level, at 91.25%. Accurate, relevant, complete, and easy-to-understand information is key to ensuring smooth service delivery. This finding is supported by research by Fitriana et al. (2024), which showed an 85% satisfaction level for the information variable, and by Salma Karami Andrea Puspa et al. (2024), which emphasized the importance of human resource competency in producing reliable information. Thus, Katobengke's findings confirm that timely, high-quality information supported by trained personnel significantly contributes to increased officer satisfaction.

Table 3. Summary of Staff Satisfaction Scores Based on Economic Aspects in the E-Puskesmas System in 2025

No	Statement	Total Score	Maximum Score	Percentage Score (%)
1	C1	73	85	85,90
2	C2	74	85	87,10
3	C3	71	85	83,50
4	C4	76	85	89,40
Average				86,50

Source: Primary Data, 2025.

In terms of economics, the staff satisfaction rate was recorded at 86.50%. This aspect relates to operational cost efficiency, time savings, and comparable benefits from system use. This research aligns with Collins et al. (2021), who demonstrated that SIMPUS was able to minimize expenses despite facing software maintenance costs. The findings of Flora et al. (2022) also support the importance of balancing costs and benefits, both financial and non-financial. These results indicate that the e-Puskesmas in Katobengke has had a positive economic impact, although ongoing evaluation is still needed to ensure the system's long-term benefits.

Table 4. Summary of Staff Satisfaction Scores Based on Control Aspects in the E-Puskesmas System in 2025

No	Code Statement	Total Score	Maximum Score	Percentage Score (%)
1	D1	76	85	89,40
2	D2	67	85	78,80
3	D3	59	85	69,40
4	D4	76	85	89,40
Average				81,75

Source: Primary Data, 2025.

The control dimension showed a satisfaction level of 81.75%. Good control is essential for maintaining data security, detecting errors, and preventing system misuse. This finding aligns with the theory of Hanif Al Fatta (2007) and the research of Flora et al. (2022), which emphasizes the importance of control mechanisms. Compared with the results of Fitriana et al. (2024), which only achieved 50.44%, Katobengke's achievement is better, indicating network stability and the implementation of more effective monitoring procedures.

Table 5. Summary of Staff Satisfaction Scores Based on Efficiency in the E-Puskesmas System in 2025

No	Statement	Total Score	Maximum Score	Percentage Score (%)
1	E1	83	85	97,60
2	E2	81	85	95,30
3	E3	76	85	89,40
4	E4	80	85	94,10
Average				94,10

Source: Primary Data, 2025.

Pada dimensi **efisiensi (efficiency)**, tingkat kepuasan petugas mencapai 94,10%, tertinggi di antara semua dimensi. Efisiensi dinilai dari kemampuan sistem dalam mengoptimalkan sumber daya tanpa pemborosan serta mempercepat pelayanan. Hasil ini sejalan dengan teori Hanif Al Fatta (2007) dan penelitian Fitriana et al. (2024) dengan capaian 87,11%. Sebaliknya, hasil Flora et al. (2022) yang menunjukkan rendahnya efisiensi di beberapa puskesmas menegaskan bahwa keterbatasan sumber daya dapat menghambat optimalisasi sistem. Dengan demikian, integrasi sistem yang baik dan dukungan sumber daya menjadi faktor penting untuk mencapai efisiensi tinggi.

Table 6. Summary of Staff Satisfaction Scores Based on Service Aspects in the E-Puskesmas System in 2025

No	Statement	Total Score	Maximum Score	Percentage Score (%)
1	F1	80	85	94,10
2	F2	79	85	92,90
3	F3	73	85	85,90
4	F4	69	85	81,20
Average				88,53

Source: Primary Data, 2025.

The final dimension, service, achieved a satisfaction rating of 88.53%. Service indicators include ease of use, technical support, and general user satisfaction. These results align with research by Muliansah et al. (2020) and Flora et al. (2022), which emphasizes the importance of accuracy, reliability, and simplicity in enhancing user satisfaction. The emphasis on user-friendliness in Katobengke indicates that responsive service support significantly contributes to staff satisfaction.

Overall, correlation analysis using the Spearman Rank test showed that all PIECES dimensions had a positive and significant relationship with officer satisfaction. Information ($\rho = 0.843$) and service ($\rho = 0.836$) aspects had the strongest relationship strength, followed by efficiency ($\rho = 0.764$). The performance ($\rho = 0.719$), economy ($\rho = 0.655$), and control ($\rho = 0.604$) dimensions also showed a strong relationship. This indicates that the better the officer's perception of the PIECES dimensions, the higher their satisfaction with the E-Puskesmas system. This finding is consistent with Spearman's correlation theory according to Sugiyono (2017) and research by Ferdiana & Pramono (2024), although there are differences in dominant aspects between Puskesmas and hospitals.

Thus, it can be concluded that in the context of community health centers, staff satisfaction is more influenced by the quality of information and service support, while in hospitals, control and performance factors are more dominant. This confirms that the successful implementation of a health information system must be tailored to the organizational context and user needs.

CONCLUSION

The results of this study indicate that the level of staff satisfaction with the E-Puskesmas system at Katobengke Community Health Center is high across all PIECES aspects, with the highest scores for efficiency (94.10%) and information (91.25%), and the lowest for control (81%). These findings confirm that the E-Puskesmas system is capable of improving performance, accelerating work processes, supporting time and cost efficiency, and providing excellent service for staff. The Spearman correlation test also showed that all PIECES aspects were positively and significantly related to staff satisfaction, with information and service aspects showing the strongest relationship. Therefore, the better the implementation of PIECES aspects, the higher the level of staff satisfaction with the E-Puskesmas system.

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