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Evaluation of the Effectiveness of the PANGESTU Application Strategy in Optimizing Online Outpatient Reservations at Hospital X

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Abstract: The digitization of registration services is part of the modernization of healthcare services to speed up administrative processes and improve patient comfort. Hospital X developed the PANGESTU application as an online reservation system for outpatients. Assessing the effectiveness of the PANGESTU application strategy in optimizing the online reservation process and identifying supporting and inhibiting factors in its implementation. The research used a qualitative descriptive approach through observation, interviews with registration officers, security guards, and patients, as well as documentation over a period of six months. The application speeds up the registration process and makes it easier for patients who are familiar with technology. However, obstacles were encountered, such as digital literacy gaps, the illegibility of reservation data, and the lack of formal training for officers. The success rate of an application is highly dependent on the readiness of human resources and the adaptability of the system to user variations. Data integration and digital education are key factors for optimization. The PANGESTU application has successfully created service efficiency, but it is not yet fully inclusive. Technical optimization, improved digital literacy, and active involvement of human resources are necessary to ensure the sustainability of the system.

Keyword: Digital Health, Service Effectiveness, Online Registration

INTRODUCTION

According to Government Regulation of the Republic of Indonesia Number 47 of 2016, Health Care Facilities are facilities and places used to carry out various efforts in the field of health care. These efforts include promotive, preventive, curative, and rehabilitative activities, which are organized by the central government, local governments, and the community (Lestari, 2023; Supian et al., 2024). The application of technology in the field of health services is expected to improve the quality of health workers, including in the medical record administration process (Fachri, 2024). Technology enables medical record keepers to work faster, more accurately, and minimize errors, thereby minimizing various administrative obstacles (Agus & Murtiningsih, 2025). One of the common problems in medical record units,

particularly in outpatient services, is the lengthy registration process, which has the potential to cause long queues and inconvenience for patients (Amirotun & Citra, 2018).

As part of efforts to digitize healthcare services, the government has mandated that all healthcare facilities implement an Electronic Medical Record system in accordance with the provisions of this Ministerial Regulation, with a deadline for implementation no later than December 31, 2023 (Permenkes No. 24, 2022). One form of technology utilization in healthcare services is online registration, which is a mobile app-based registration method that allows patients to schedule their arrival time without having to wait for a long time at the hospital (Dewi et al., 2024).

Online outpatient registration is a registration system that utilizes web facilities, allowing patients to access information about the clinic, doctor schedules, office hours, and immediately obtain a queue number for examination (Wahyuni & Gunawan, 2024). With the implementation of the online registration system, the patient registration process will be faster, allowing patients to immediately receive the medical services they need (Irfansah & Sari, 2024). The use of this information system also provides convenience for patients to receive more efficient and timely services (Gunawan et al., 2025; Widianto et al., 2023). Patient registration is the first step for patients who require hospital care. The outpatient registration process is an important part of medical services, where hospitals are required to provide optimal services. The quality of hospital services is often measured from the patient registration stage, which serves as the first indicator of whether the services are running smoothly or not (Waworuntu et al., 2023).

The effectiveness of the patient registration process in hospitals must be managed properly to avoid negative impacts on patients. Proper management of registration data plays an important role in improving service quality. In addition, a well-organized registration system is one of the main components in building an effective hospital information system (Saputra & Gunawan, 2024). The use of SIMRS (Hospital Information Management System) is an example of software application that supports medical services in hospitals in the current digital era (Suntariyani et al., 2023; Wulan Anggela et al., 2022). To support these efforts, most hospitals have now launched new application services for online reservation services (Lai et al., 2014).

Currently, Hospital X has implemented an online reservation registration system that allows both new and existing patients to register via a website or a special registration application called PANGESTU. With online registration, patients are expected to avoid long waits at the registration desk. The registration process is quite simple, but in practice, some patients still find it difficult to understand the online outpatient registration process. This is primarily due to the fact that the majority of patients at Hospital X come from lower-middle-income households and the elderly, resulting in limited technological literacy among this population. The online reservation registration system was first implemented in September 2023 (Purnama & Wahab, 2024; Supriadi & Sari, 2024).

Recognizing the importance of evaluating this system, this study aims to analyze the effectiveness of the PANGESTU application in the outpatient reservation process. The evaluation was conducted to determine the extent to which the application achieved its objectives, the obstacles encountered in its implementation, and the level of user satisfaction from various perspectives. With the results of this evaluation, it is hoped that strategies can be identified to improve the quality of online reservation services to be more user-friendly and in line with the needs of the surrounding community.

This evaluation will include assessing the effectiveness of the PANGESTU application in simplifying the online reservation process for outpatients, identifying technical and non-technical obstacles faced by officers and patients, assessing user satisfaction levels (patients, officers, security guards), and identifying factors that influence the successful implementation

of the PANGESTU application in the online reservation system. The evaluation results are expected to provide a comprehensive overview of the quality of the implemented online reservation system, while also serving as a foundation for designing user-friendly, efficient, and patient-centric technology-based service improvement strategies for the future.

METHOD

This study uses a descriptive qualitative approach to determine the effectiveness of the PANGESTU application in optimizing the online registration process for outpatients at Hospital X. This method is suitable for answering complex research questions because it provides a comprehensive and meaningful description of the object being studied. The descriptive qualitative approach enables contextual understanding of phenomena in the field, including perceptions, experiences, and challenges faced by application users, both from the patients' perspective and that of hospital administrative staff. (Waruwu, 2024).

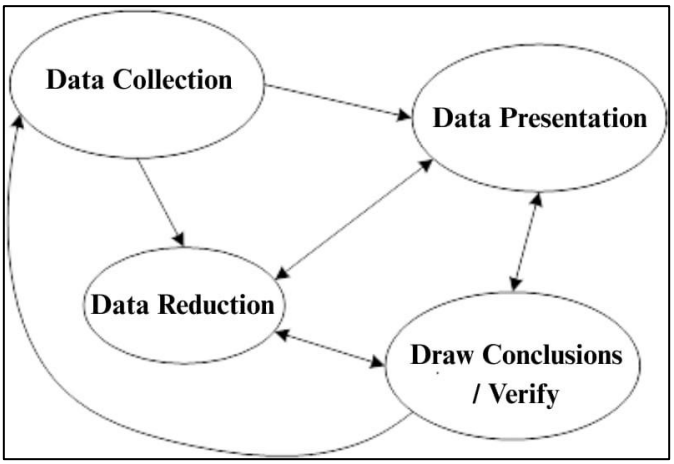
This study uses a qualitative descriptive approach. This approach was chosen because it is capable of describing in depth the phenomena occurring in the field, particularly in the context of using the PANGESTU application for online reservations for outpatients at Hospital X. According to (Fadli, 2021), a research method is a scientific approach used to obtain data with the aim of describing and explaining a particular phenomenon. The qualitative approach is highly suitable for comprehensively exploring the perceptions, experiences, and challenges faced by users of the online reservation system, both from the patients' perspective and that of hospital staff. (Rinekasari & Ulfah, 2024) emphasize that this method allows researchers to understand social activities and individual perceptions within a complex environment in a contextual manner.

This study was conducted at Hospital X located at [specify address if available], which has implemented the PANGESTU application since September 2023 as an effort to accelerate the outpatient registration process and reduce patient queues. The study was conducted over a six-month period, coinciding with the researcher's Field Work Practice (PKL) period, enabling intensive and continuous data collection through direct observation and in-depth interviews.

Informants in this study were selected purposively, namely individuals who were considered to have direct knowledge and experience related to the use of the PANGESTU application and the patient registration process. The main informants consisted of registration officers, administrative staff, and patients who had used the application. The selection of informants aimed to obtain relevant and varied information in describing the effectiveness of the application under study.

The types of data used in this study include:

1. Primary data, obtained through observation of the outpatient registration process and direct interviews with informants at the research site. Observations were conducted to record the registration flow, user responses, and potential technical or communication obstacles that occurred.
2. Secondary data, obtained from supporting documents such as internal hospital reports related to the implementation of the PANGESTU application, registration SOPs, and relevant literature or previous research results.



Source: (Miles et al., 2014)

Figure 1 Components in data analysis (Interactive model)

Data analysis was conducted using an interactive analysis model from (Miles et al., 2014), which involved three main components:

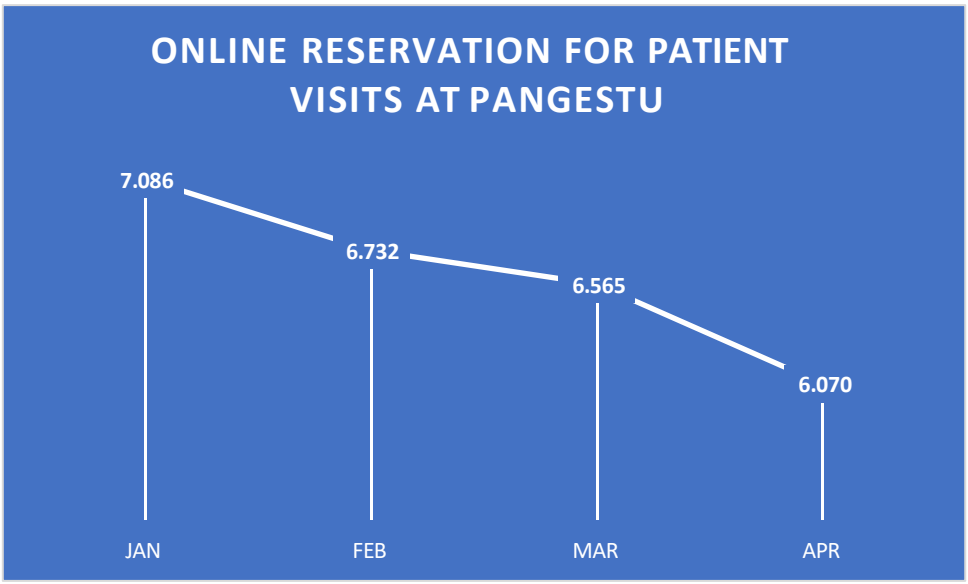
1. Data reduction, which is the process of selecting and simplifying data relevant to the research focus. Data from interviews and observations will be selected and validated using source triangulation.
2. Presentation of data in descriptive narratives, tables, and other visualizations that facilitate interpretation.
3. Drawing conclusion based on patterns and themes that emerge from the data, which will be reviewed repeatedly until saturation point is reached.

With this method, the study is expected to provide a comprehensive overview of the extent to which PANGESTU is effective in optimizing the online reservation process and how its implementation strategy can be refined in line with user characteristics and evolving healthcare needs.

RESULT AND DISCUSSION

a. Result

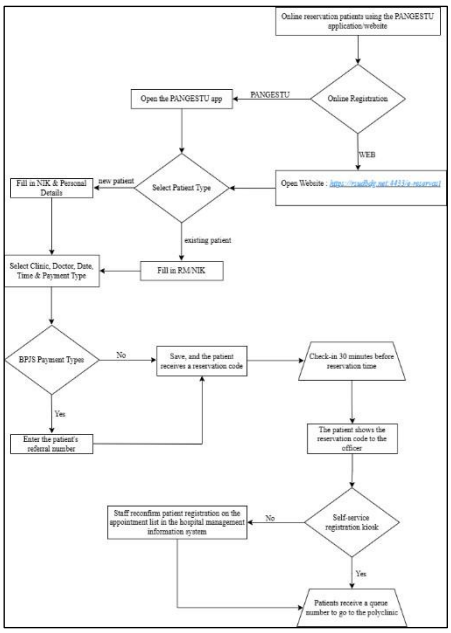
Based on the results of research conducted through interviews with 1 security guard, 2 patients, and 4 registration officers, as well as through documentation and direct observation at Hospital X, several problems were found that affect the effectiveness of the Pangestu application strategy. In terms of accountability, it was identified that patients still experience significant waiting times at the registration desk, particularly during peak hours between 7:00 AM and 10:00 AM. This is attributed to the high volume of patients arriving simultaneously and non-compliance with the rescheduling schedule set by the application system during online reservations. Additionally, in terms of participation, it was found that the level of enthusiasm among the public in utilizing the online reservation service remains inconsistent. This study also successfully mapped the registration process for outpatient services through the Pangestu application as a basis for evaluating the effectiveness of the implemented system.



Source: Observation Results, 2025

Figure 2 Patient Visit Data January – April

Based on data on outpatient visits using online reservation services at Hospital X during the period from January to April, a total of 26,453 visits were recorded. In January, the highest number of visits occurred with a total of 7,086 patients, followed by a gradual decrease each subsequent month, reaching 6,732 patients in February, 6,565 patients in March, and 6,070 patients in April. This decrease in the number of visits may indicate factors influencing patients' interest and participation in utilizing the online reservation service, whether through the Mobile JKN app or the Pangestu app owned by Hospital X. These factors may include technical issues, insufficient outreach, or discrepancies between user experience and patient expectations. This data serves as a crucial foundation for evaluating the effectiveness of the Pangestu app strategy in supporting the optimization of the online reservation process at Hospital X, complementing the services also provided by Mobile JKN.



Source: Observation Results, 2025

Figure 3 FlowChart Reservasi Online PANGESTU

The outpatient registration process involves patients registering independently via the web or an app until they visit the outpatient clinic. In the results of interviews with security officers, registration officers, and patients using the PANGESTU app at Hospital X, various findings were obtained regarding the effectiveness, technical aspects of the app, the role of human resources, and user satisfaction. In general, the PANGESTU app is considered effective in simplifying the outpatient registration process and reducing the need for patients to arrive early at the hospital. However, some challenges remain, particularly among elderly patients and new patients who face difficulties using the app and require assistance. From a technical perspective, issues such as unstable servers, data entry errors, and quota limitations in certain clinics also hinder service effectiveness. The role of human resources is also crucial, as staff must actively provide education, guidance, and technical solutions directly. Meanwhile, patient satisfaction levels vary; patients familiar with technology find the app helpful, while those without devices or lacking technological understanding face difficulties. Therefore, further education and improvements to the app's infrastructure are the primary recommendations for enhancing the effectiveness of the PANGESTU app implementation strategy.

b. Discussion

Implementation of Online Outpatient Registration at Hospital X

The implementation of an online reservation system for outpatient registration through the PANGESTU application at Hospital X is a significant digital transformation step to accelerate administrative services and reduce long queues. This system makes it easier for patients, both new and returning, to register independently from home, without having to arrive early at the hospital. Practically speaking, this system offers benefits in terms of time efficiency and flexibility, particularly for patients who are already accustomed to using technology.

However, observations and interviews indicate that the implementation of this system still faces various obstacles. Elderly people and patients from lower-middle economic backgrounds have difficulty using the application, mainly due to limited access to digital devices and a lack of understanding of how the application works. Additionally, several technical issues such as unstable servers, incorrect selection of patient status during registration, and unreadable reservation data during check-in have become significant challenges that disrupt the smooth operation of the system.

In practice, there are still many cases where patients require assistance when using the Self-Registration Kiosk. This indicates that the system, which is supposed to be automated and self-service, still relies heavily on direct assistance from staff. Unfortunately, formal training for staff is not provided systematically, under the assumption that the application is straightforward to understand. In reality, many staff members have had to learn on their own and provide intensive assistance to patients, which ultimately increases their workload.

However, tech-savvy patients found the app very helpful because it sped up the registration process. This indicates that the success of the app greatly depends on the digital capabilities of users. Therefore, it is important to consider user segmentation in the implementation strategy of digital services such as this. Intensive socialization, the creation of easily accessible user guides, and improvements to the system infrastructure are important steps to support wider and more equitable use of the app.

Overall, the implementation of online-based outpatient registration at Hospital X is a commendable advancement in the digitalization of healthcare services. However, its success is highly dependent on technological readiness, digital literacy among users, staff competence, and robust system support. Therefore, regular evaluations and active involvement of all stakeholders are key to ensuring that this system can truly deliver inclusive, effective, and sustainable healthcare services.

Effectiveness of Outpatient Registration at Hospital X

The effectiveness of the outpatient registration system based on an application at Hospital X has not been fully felt by all patient groups. There is still a significant gap between patients who are accustomed to using technology and those with limitations, such as the elderly and people with low digital access. Difficulties in understanding how to use the app, limitations in the devices they own, and a lack of digital assistance make it challenging for them to register independently. As a result, there has been a shift in queues from conventional counters to technical assistance queues at the hospital location, which has slowed down the process and reduced the efficiency expected from this digital system.

Technical issues were also a significant obstacle. Server disruptions, errors in patient data entry (e.g., existing patients selecting the new patient option), and reservation data that could not be read by the system even though patients had brought digital proof were recurring issues during the observation period. This situation not only disrupted the administrative process but also caused inconvenience and confusion among users, which ultimately affected their trust in the system.

On the other hand, the lack of specialized training for hospital staff means that they have to spontaneously and repeatedly assist patients who encounter problems. This increases their workload and has the potential to reduce the overall quality of service. In a digital-based system such as this, the readiness and capacity of human resources are essential to ensure that services run smoothly.

Based on observations of the number of visits, there has been a downward trend from month to month since the system was implemented, which could indicate dissatisfaction or obstacles in the adoption of the application by some patients. Additionally, from various interactions observed in the field, it is evident that the physical aspects and accessibility of the system are not yet fully optimized. For example, the application design is not yet fully user-friendly, there is a lack of clear information regarding the registration process, and responses to technical issues are slow, all of which require immediate attention and follow-up actions.

Other aspects of service such as system reliability in terms of arrival times and queues that are not in order, staff responsiveness to technical problems that is not optimal, and a lack of empathy towards patients who are confused are also obstacles. These things greatly affect the experience and comfort of patients when using this service.

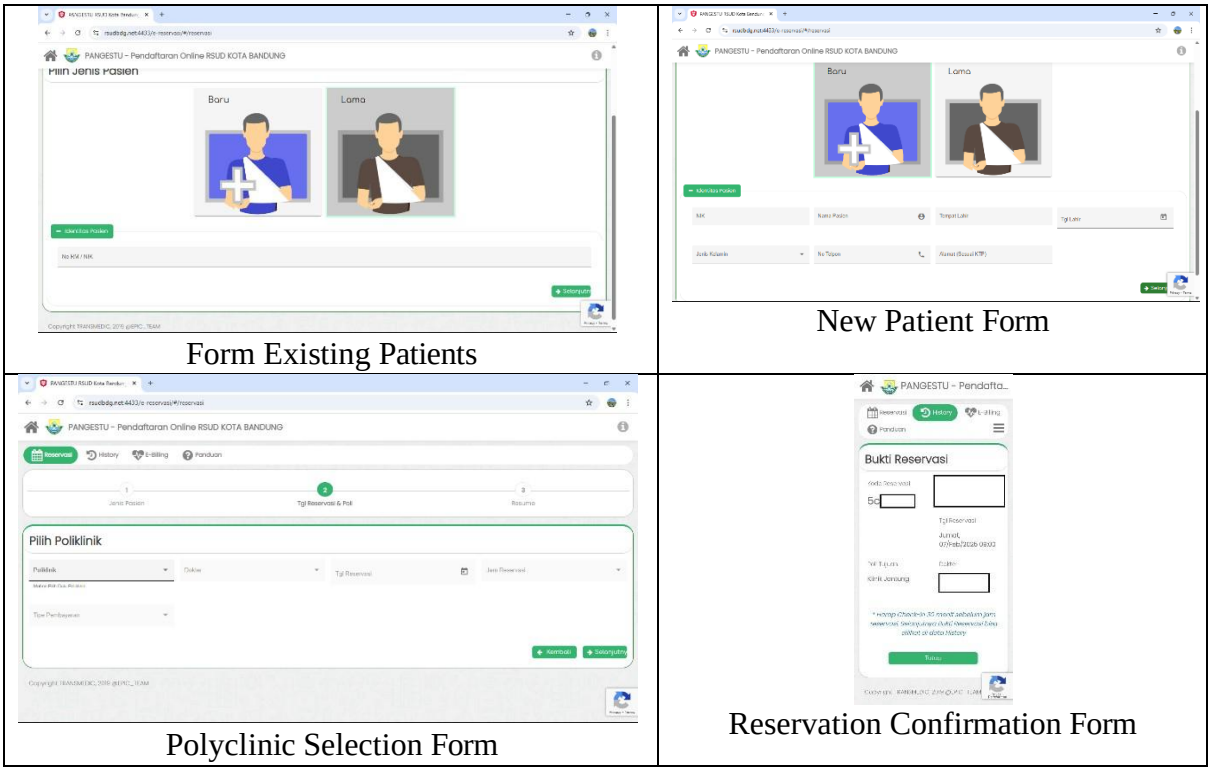
To that end, efforts to improve the effectiveness of this system must be carried out comprehensively, not only through technical improvements such as server stability and data integration, but also by providing digital education that is easy to understand for all groups. Additionally, it is important to develop tailored service policies for patients who are less familiar with technology, ensuring they can access services comfortably and equitably. As a result, this registration system will not only be time-efficient but also fair and inclusive for all users.

Optimization of PANGESTU Online Reservation Services

The effectiveness of services is a key indicator in assessing the success of the online reservation system through the PANGESTU application at Hospital X. This system has had a positive impact by reducing waiting times and minimizing manual queues, particularly for patients with good digital literacy. However, there are still groups of users, such as elderly patients and new patients, who experience difficulties in accessing the application, resulting in disparities in the utilization of this system. Additionally, several technical challenges have emerged, such as reservation data not appearing in the system and clinic quotas filling up quickly, indicating the need to align the system with available medical service capabilities. Special strategies are required to educate the public digitally, enhance app features, and conduct

regular system updates to ensure services become more responsive and can reach all segments of society fairly and effectively.

Optimizing the online reservation system from a technical standpoint is an important element in supporting digital health services. Observations show that one of the main strengths of this application lies in its clear interface, which guides patients step by step in filling in their data. The use of dropdown menus and data fields that correspond to patient identities indicates an effort to make the system easy to access. This facilitates the transition from a conventional registration system to a digital system. However, challenges remain, such as cases where patients have made reservations but their data is not readable, indicating issues with data integration or system synchronization. Other problems, such as internet connection disruptions, server instability during peak hours, and errors in selecting patient status, also lead to data duplication and slow down service processes. This indicates that while the application's interface is satisfactory, the back-end systems and data management still require significant improvements.



Form Existing Patients | New Patient Form

Polyclinic Selection Form | Reservation Confirmation Form

Source: Observation Results, 2025

Figure 4 Form Display in the PANGESTU application

System compatibility with user devices also plays a major role in the success of this service. Patients who do not have smartphones or only have limited internet access must rely on the assistance of officers. This poses a unique challenge as it adds an extra burden on staff who should no longer be required to provide intensive technical support. To address this issue, various measures need to be implemented, such as increasing server capacity, automating data validation, integrating the system with the national database in real time, and developing a lightweight version of the application that can be used on devices with low specifications. Interactive video guides should also be provided within the application to help users understand the steps without having to seek additional information outside the app.

Human resources play an important role in supporting the success of this application. The officers who must assist patients in using the application indicate that the system is not yet fully independent. The lack of formal technical training means that officers rely solely on field

experience, which is certainly not ideal for ensuring quality service. In addition, the communication skills of officers are also important in helping patients who feel confused, as quick responses and empathy can increase patient comfort and satisfaction with the system.

Patient satisfaction itself is a reflection of the success of the application's implementation. Patients who are familiar with technology feel greatly assisted, while those with limited access to technology tend to experience obstacles and even choose to return to the manual system. This highlights the importance of considering user diversity when designing digital services. Technical issues such as missing data and unstable networks reduce user satisfaction, making system reliability a top priority for improvement.

In addition to technical and human resource constraints, user factors also pose a challenge. Elderly patients and those from lower-middle economic groups are generally unfamiliar with digital applications and do not have stable internet access or devices, so they remain dependent on staff. This situation shows that even though the system is designed to be automated, in reality it still adds to the workload of staff and hinders service efficiency. Some patients also complain about limited quotas at certain clinics and an imbalance in the number of medical staff, leading to quick booking availability. Therefore, optimizing online booking services depends not only on the quality of the application but also on the hospital's ability to provide services that are balanced with the capacity of the implemented system.

Evaluation of the Effectiveness of the PANGESTU Application strategy in Optimizing the Online Reservation Process for Outpatients

An evaluation of the PANGESTU application strategy in optimizing the online reservation process for outpatients at Hospital X shows two contrasting sides. On the one hand, there has been significant progress in terms of time efficiency and ease of access to services. Patients no longer need to wait long at the registration desk because the registration process can be done independently from home using digital devices. This represents a major shift from the previous manual system, which was time-consuming and often resulted in long queues. The positive effects of this change are particularly felt by productive-age patients who are accustomed to using technology.

However, on the other hand, there are still real challenges that need to be addressed. Not all patients are able to adapt to this digital system. Elderly patients and new patients, in particular, show lower participation rates due to confusion in operating the application. Some of them even prefer to return to manual methods because they feel safer and more comfortable. Additionally, technical issues such as the absence of reservation data in the system, system disruptions during peak hours, and data entry errors like incorrect patient status selection still frequently occur and hinder the smooth operation of services overall.

The success of this application implementation strategy is highly dependent on the readiness of human resources and the digital education methods used. In practice, the lack of technical training for officers has resulted in them having to learn independently and deal with various patient issues on an ad hoc basis. This situation has an impact on the quality of assistance provided and has the potential to increase the daily workload. To ensure the effectiveness of this strategy, it is essential to enhance staff competencies, provide interactive guidelines for patients, and conduct regular updates to the application system to ensure it is faster, more stable, and minimizes disruptions.

Based on findings in the field, the implementation strategy for the PANGESTU application has established a strong foundation to support the digitization of registration services. However, for this strategy to be fully successful and sustainable, regular evaluations of various aspects are needed, ranging from technological readiness, human resource involvement, user experience, to infrastructure capacity. Some recommendations that can be made include increasing server capacity, providing intensive training for staff, socializing the

application to the wider community, and providing direct technical assistance to patients who encounter obstacles. This evaluation shows that this digital strategy has great potential, but its success is highly dependent on the ability of all parties involved to address challenges in the field in a coordinated and solution-oriented manner.

CONCLUSION

Based on the research findings, it can be concluded that the evaluation of the effectiveness of the PANGESTU application strategy in optimizing the online reservation process for outpatients at Hospital X has made a positive contribution to administrative service efficiency, particularly in reducing registration queues and speeding up patient visits. The advantages of this system are evident in its transparent interface design, easy navigation, and integration with the onsite registration system. However, the effectiveness of this strategy has not been evenly distributed across all user segments. Elderly patients and those who are unfamiliar with digital technology still face obstacles in using the application, requiring assistance from staff, which ultimately increases the workload of human resources. On the technical side, server problems, data input errors, and suboptimal data integration also hinder the full effectiveness of this system. Therefore, to achieve sustainable optimization, efforts are needed to strengthen human resource training, improve hospital information technology systems, and provide digital education for the public. This study indicates that in the field of industrial engineering, particularly in service system engineering, applications like PANGESTU can serve as a model for developing adaptive and inclusive healthcare systems, provided that their implementation strategies consider technical, human, and social dimensions in a balanced manner.

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