

Online Queue-Based Patient Registration in Hospital Services: A Qualitative Evaluation of Effectiveness at Kartika Husada Tk II Pontianak Hospital

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Abstract

This study examined the effectiveness of online queue-based patient registration at Kartika Husada Tk II Pontianak Hospital. The study, originally a master's thesis, was converted into a journal-style qualitative article and focused on three objectives: describing the implementation of the online queue system, identifying obstacles to its effectiveness, and explaining hospital efforts to improve service performance. Data were collected through interviews, observation, and documentation involving hospital leadership, administrative staff, IT staff, health information officers, and patients. The findings showed that the online queue system had been implemented through a web-based registration platform, but its use remained lower than that of offline registration. During the April-September observation period, offline registration totaled 31,192 patients, while online registration totaled 8,864 patients. The study found four major constraints: uneven digital literacy among patients, limited functional readiness among staff, technical disruptions and incomplete system integration, and insufficient coordination and standard operating procedures. Although the hospital had conducted socialization through banners, website information, information boards, and direct explanation by officers, these efforts had not yet substantially changed patient behavior. The study concludes that effectiveness is shaped not only by system availability but also by human resource readiness, patient adaptability, continuous socialization, and organizational capacity to integrate digital services into routine hospital operations.

Keywords: Online Queue System, Service Effectiveness, Public Service, Hospital Management, Digital Health Service

JEL Codes: I11, I18, O33

1. Introduction

1.1 Background and Research Problem

Hospital management is a coordinated process that integrates planning, organizing, service

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control, and resource utilization to achieve healthcare goals. In the Indonesian healthcare context, hospitals are expected to maintain service quality while responding to technological change, growing patient expectations, and the increasing need for efficient public services. Hospital management therefore cannot be separated from digital transformation because patient access, administrative accuracy, and queue management are now part of the perceived quality of care ([Latuconsina et al., 2023](#)).

The shift toward digital health services is also supported by national policy directions. The Indonesian health system emphasizes the use of information technology, data integration, and better access to health services, while electronic medical records and hospital information systems have encouraged healthcare facilities to redesign administrative processes. In this context, online patient registration and online queues represent an operational expression of digital health transformation. They are expected to reduce physical congestion, shorten waiting time, and increase the predictability of service flow ([Kementerian Kesehatan Republik Indonesia, 2013](#); [Latuconsina et al., 2023](#)).

Despite these expectations, the implementation of digital registration systems often creates a managerial paradox. A system may be technically available but remain underutilized because patients are unfamiliar with digital procedures, officers still rely on manual verification, or organizational routines have not fully adapted to the new service model. Prior studies have shown that online registration can improve administrative efficiency and facilitate access to health services ([Prasetyowati, 2021](#); [Rahmadhani, 2022](#)), yet these benefits depend on the readiness of technology, human resources, and users.

Kartika Husada Tk II Pontianak Hospital has introduced a web-based online queue registration system. The system allows patients to enter identity data, select the destination polyclinic, and choose a visit schedule. However, secondary data from the hospital indicate that offline registration continues to dominate. During the April-September observation period, 31,192 patients used offline registration, while 8,864 patients used online registration. In the same period, 28 website-based queue complaints were recorded. This empirical gap indicates that the availability of a digital queue system has not automatically produced optimal service effectiveness.

This study is important because the problem is not merely technological. It concerns service effectiveness, public service behavior, hospital organizational adaptation, and the readiness of patients to accept a digital service model. The research therefore uses the organizational effectiveness perspective, particularly the dimensions of goal achievement and adaptation, to evaluate why the online queue system has not yet become the main registration channel and what managerial strategies are needed to improve its effectiveness.

1.2 Research Objectives and Contribution

The study was guided by three research objectives. First, it aimed to describe the implementation of online queue-based patient registration at Kartika Husada Tk II Pontianak Hospital. Second, it identified the factors that hindered effective implementation. Third, it described the hospital's efforts to improve the effectiveness of the online queue system.

The study contributes to the literature on hospital management and public service effectiveness by showing that digital service innovation must be evaluated through both goal achievement and adaptation. Practically, it provides recommendations for strengthening socialization, human resource capacity, system integration, standard operating procedures, and continuous

monitoring of digital registration services.

2. Literature Review

2.1 Service Effectiveness and Public Service

Effectiveness is commonly understood as an organization's ability to achieve predetermined objectives through the optimal use of resources. In public service organizations, effectiveness is not only measured by final outputs but also by process quality, target achievement, responsiveness, and user satisfaction. Effectiveness reflects the relationship between organizational outputs and predetermined objectives; the stronger the contribution of outputs to goal achievement, the more effective the organization or program becomes ([Mahmudi, 2015](#); [Steers, 1977](#)). [Halim \(2021\)](#) similarly emphasizes that effectiveness reflects the degree to which expected goals are achieved through relevant performance indicators.

In the public sector, service effectiveness is closely related to transparency, accountability, conditionality, participation, equality of rights, and balance between rights and obligations. Public service quality is also reflected in responsiveness, responsibility, and accountability, because service users judge not only whether the service is provided but also whether the process is understandable, fair, and responsive to their needs ([Halim, 2021](#); [Mahmudi, 2015](#)). For hospital services, effectiveness therefore requires a balance between speed, accuracy, accessibility, staff competence, and patient comfort.

The theoretical lens used in this article aligns with the effectiveness framework adopted in the thesis, particularly the dimensions of goal achievement and adaptation. Goal achievement refers to the extent to which the online queue system fulfills its stated purposes, such as reducing offline queues, accelerating registration, and improving service order. Adaptation refers to the ability of the hospital, its staff, and its patients to adjust to digital service procedures. This framework is suitable because a digital service can exist formally while remaining ineffective if users and organizational routines do not adapt to it.

2.2 Hospital Services and Digital Queue Systems

Hospital services include clinical, administrative, and supporting services that jointly shape the patient experience. Administrative services are the entry point to hospital care, as patients must register before receiving clinical services. In this sense, registration is not a secondary function; it influences patient flow, waiting times, staff workload, and perceptions of professionalism. Hospital service quality is also associated with patient satisfaction and loyalty, as patients who perceive service as accessible and reliable are more likely to return and recommend the facility ([Puteri et al., 2024](#); [Wijaya et al., 2024](#)).

Queue systems are used to organize service flow when demand exceeds immediate service capacity. In healthcare facilities, poorly managed queues may create long waiting times, patient dissatisfaction, crowding, and reduced administrative efficiency. Studies on queue management suggest that structured queue systems improve service order and user satisfaction ([Kurniati & Jaroji, 2018](#); [Nengsih & Yustanti, 2019](#)), while optimized queue models can reduce patient waiting time and increase operational efficiency ([Findari & Nugroho, 2019](#)).

Online queue systems are a development of conventional queuing. They allow patients to register remotely through a website or application, complete administrative information, select services, and receive a queue number before arriving at the hospital. This model supports e-health because it can reduce on-site crowding, provide real-time information, and help staff

manage schedules. Previous research has shown that web-based patient registration can improve administrative efficiency ([Kurniati & Jaroji, 2018](#)) and that online outpatient registration can be faster than direct registration ([Prasetyowati, 2021](#)). However, implementation problems frequently occur when digital literacy is low, information is not updated, system access is unstable, and officers do not have uniform procedures.

2.3 Research Gap and Theoretical Position

Previous studies have mostly emphasized the positive influence of online registration on service speed, patient convenience, and administrative efficiency. [Rahmadhani \(2022\)](#) and [Prasetyowati \(2021\)](#) show that online registration can facilitate access to health services and reduce waiting time for registration. [Sahadewa et al. \(2024\)](#) further demonstrate that digital health service management can improve the effectiveness of outpatient information. [Putri et al. \(2025\)](#) also emphasize that service efficiency depends on human resource readiness, infrastructure, and health information systems.

Nevertheless, the literature still leaves room for a qualitative analysis of why online queue systems remain underutilized even when they are already available. Most prior studies measured service efficiency or user satisfaction, whereas fewer studies explored implementation obstacles from multiple stakeholder perspectives. This article addresses that gap by examining the experiences of hospital leadership, administrative staff, IT staff, health information officers, and patients in a military hospital setting.

3. Research Method

3.1 Research Design

This study used a qualitative descriptive approach. The qualitative approach was chosen because the study sought to understand the process, meaning, and contextual conditions behind the implementation of the online queue system. Qualitative research is appropriate when the researcher needs to explore perceptions, experiences, behavior, and organizational routines in natural settings ([Abdussamad, 2021](#); [Moleong, 2017](#)).

The study was conducted at Kartika Husada Tk II Pontianak Hospital. The empirical focus was the implementation of online queue-based patient registration and its relationship to service effectiveness. The observation period for the secondary registration and complaint data spanned April to September, while qualitative insights were gathered through interviews, observations, and documentation.

3.1.1 Participants

Participants were selected purposively because the study required informants who understood or directly experienced the online registration process. The thesis involved 11 informants: the head of the medical committee, the head of IT, the head of administration, the head of health information, and seven randomly selected patients. These informants represented both service providers and service users, allowing the study to compare managerial, technical, administrative, informational, and patient perspectives.

3.1.2 Data Collection

Data were collected through semi-structured interviews, observation, and documentation. Interviews explored the implementation process, socialization activities, service hours, duration of offline and online registration, constraints in offline and online queues, BPJS integration, available alternatives for patients without smartphones, and perceptions of

effectiveness. Observation was used to understand queue conditions and patient behavior, while documentation included hospital queue data, complaint data, and screenshots of the online registration website.

3.2 Data Analysis and Trustworthiness

The data were analyzed using interactive qualitative analysis, comprising data reduction, data display, and conclusion drawing/verification. Interview and documentation data were reduced to relevant themes, displayed in matrices and narrative descriptions, and interpreted in accordance with the study objectives. Trustworthiness was supported through source triangulation by comparing interview data, observation notes, documentation, and literature. This procedure is consistent with qualitative research principles, which hold that credibility is strengthened by checking information across different sources and methods ([Abdussamad, 2021](#); [Moleong, 2017](#)).

4. Findings and Discussions

The findings are organized into three research objectives: implementation of the online queue system, obstacles to effectiveness, and hospital efforts to improve the system. The discussion then interprets these findings in terms of the dimensions of goal achievement and adaptation.

4.1 Implementation of Online Queue-Based Patient Registration

The online queue system at Kartika Husada Tk II Pontianak Hospital has been implemented through a web-based platform that allows patients to register without coming directly to the hospital only to obtain a queue number. Patients can enter their identity information, select the destination polyclinic, and choose a visit schedule. In principle, this system supports the hospital's goal of reducing administrative crowding and improving service order.

The implementation has produced several positive effects. Informants indicated that online registration can be completed in approximately 5 to 10 minutes when patients understand the procedure and no technical disruption occurs. This is faster than offline registration, which usually takes approximately 15 to 30 minutes and can be longer during peak hours. The online system, therefore, has the potential to improve efficiency, particularly for patients who are digitally literate and already have complete data.

However, the system has not yet become the dominant registration channel. Many patients still come directly to the registration counter because they consider it easier, more certain, and more reassuring. Some patients prefer face-to-face explanation from officers, especially when they are unsure about filling in data, choosing schedules, or verifying BPJS-related requirements. This indicates that the system has been implemented technically but not yet fully adopted socially.

4.2 Utilization Trends and Service Effectiveness

The registration data show that offline registration remained the dominant channel throughout the observation period. As displayed in Table 1, offline registration accounted for 31,192 patients, while online registration accounted for 8,864 patients. In total, only about 22.1% of registrations used the online channel. This finding is important because the principal purpose of online registration was to reduce physical queues and improve administrative efficiency. The data, therefore, indicate partial rather than full achievement of objectives.

Table 1. Offline and online patient registration during the observation period

Month	Offline registration	Online registration	Total registration	Online share
April	3,385	865	4,250	20.4%
May	5,832	1,381	7,213	19.1%
June	5,103	1,234	6,337	19.5%
July	6,125	1,776	7,901	22.5%
August	6,021	2,108	8,129	25.9%
September	4,726	1,500	6,226	24.1%

Source: Processed by the author from hospital documentation in the thesis, 2026

The online share increased from 20.4% in April to 25.9% in August before declining to 24.1% in September. Although this movement shows some progress, the gap between offline and online registration remained large. The fluctuation suggests that online utilization was still unstable and sensitive to patient habits, system reliability, and the effectiveness of socialization.

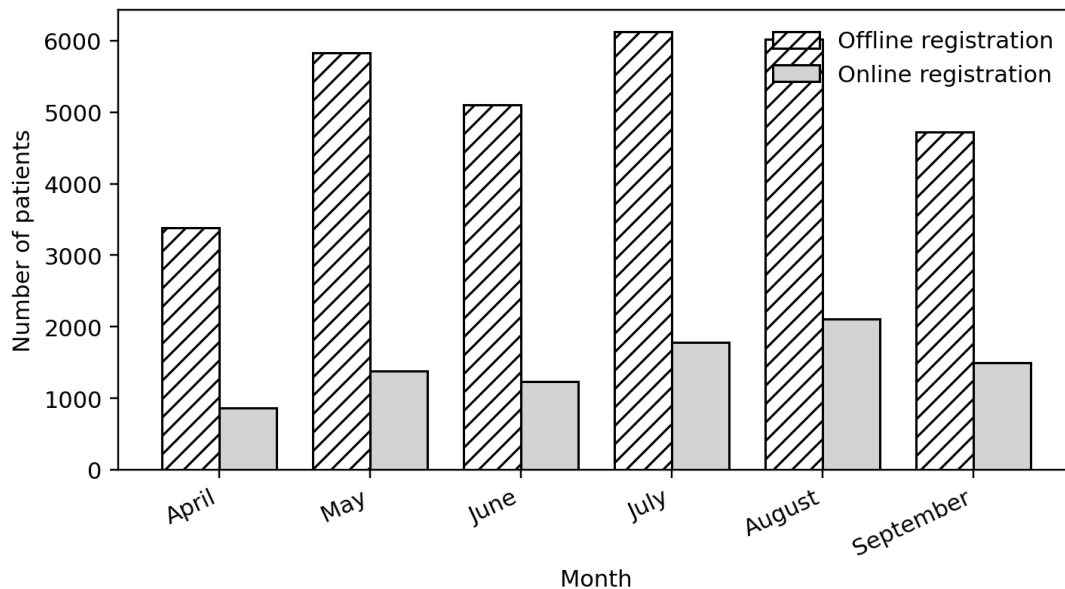


Figure 1. Comparison of offline and online patient registration

Source: Processed by the author from hospital documentation in the thesis, 2026

Website complaint data also support the conclusion that effectiveness was not yet optimal. Table 2 shows that 28 complaints were recorded during the observation period, with the highest number in June. The number decreased in the following months, suggesting some corrective action, but complaints persisted. The presence of complaints indicates that users still experience problems accessing or trusting the online queue process.

Table 2. Website queue complaints during the observation period

Month	Website queue complaints	Interpretation
April	3	Complaint recorded
May	3	Complaint recorded
June	11	Peak complaint month
July	6	Complaint recorded

August	3	Complaint recorded
September	2	Complaint recorded

Source: Processed by the author from hospital documentation in the thesis, 2026

4.3 Obstacles to Online Queue Implementation

The qualitative findings show that the obstacles were multidimensional. They involved human resources, technology and information systems, organizational management, and user characteristics. These obstacles were interrelated; for example, weak socialization affected patients' understanding, which in turn increased reliance on offline registration and added to officers' workload.

First, human resource readiness was not fully optimal. From the hospital side, some officers still needed a stronger understanding of the online service flow, data input, verification, schedule adjustment, and patient assistance. From the patient side, digital literacy varied considerably. Elderly patients and those with limited smartphone access were more likely to avoid the online system. These conditions limited the system's effectiveness, even though the technology was available.

Second, technical and information system constraints reduced patient confidence. Informants reported system errors, slow website performance, unstable network conditions, and incomplete real-time updates to doctor schedules. One recurring problem was that patients who selected a schedule online sometimes still had to confirm or adjust the schedule at the counter because service information had changed. This weakened the perceived reliability of the online system.

Third, organizational and management factors constrained implementation. The online system required coordination among administration, IT, health information, and clinical units. However, coordination was not yet fully integrated, and a specific standard operating procedure for online registration had not yet been established. The simultaneous operation of online and offline registration also increased staff workload, especially during peak service hours.

Fourth, patient characteristics shaped adoption. Some patients preferred offline registration because direct contact with officers provided certainty. Others were afraid of entering incorrect data or choosing the wrong schedule. These findings imply that digital health service implementation is not only a matter of software design but also a behavioral and communicative process.

Table 3. Thematic matrix of implementation obstacles

Theme	Observed condition	Effect on implementation	Managerial implication
Human resource readiness	Officers and patients had different levels of digital understanding.	Patients still required direct guidance and manual confirmation.	Provide continuous training and patient assistance.
Technology integration and	System errors, slow access, unstable network, and schedule mismatch occurred.	Trust in online registration declined.	Improve system maintenance and real-time data integration.

Organizational coordination	Online and offline services ran simultaneously with limited specific SOPs.	Workload increased and service flow became inconsistent.	Develop clear SOPs and inter-unit coordination mechanisms.
Patient behavior	Patients preferred direct registration because it felt simpler and more certain.	Online registration remained underutilized.	Strengthen socialization and simplify user instructions.

Source: Synthesized from interviews, observation, and documentation in the thesis

4.4 Hospital Efforts to Improve Effectiveness

The hospital had undertaken several efforts to increase the effectiveness of the online queue system. The first effort was socialization. Information about online registration was delivered through banners, information boards, the hospital website, and direct explanations by officers. These efforts were necessary because many patients did not know the procedure until they arrived at the hospital. However, the findings indicate that socialization must be more intensive, repeated, and adapted to patient characteristics.

The second effort was strengthening human resource readiness. Administrative officers were directed to understand the online service flow so they could assist patients who experienced difficulties. The IT unit was responsible for maintaining system accessibility, while health information officers functioned as a communication bridge between the hospital and patients. This division of roles shows organizational commitment, but the study suggests that regular training and clearer coordination are still needed.

The third effort was system maintenance and service development. The IT unit attempted to respond to system disruptions and maintain website access. From a management perspective, system maintenance is essential because repeated technical problems reduce patient trust and discourage future online use. The study also found that integration with BPJS-related verification remained incomplete, requiring continued manual verification at the counter. Therefore, system development should prioritize data integration, schedule accuracy, and patient-friendly interfaces.

The fourth effort was service assistance. Direct explanation from officers remained important because not all patients were able to independently use online registration. This finding indicates that digital transformation in hospitals should not eliminate human assistance. Instead, effective digital service requires hybrid support in which technology improves efficiency while officers ensure inclusion for patients with low digital literacy.

4.5 Discussion Through the Perspective of Effectiveness

The findings can be interpreted through two dimensions of effectiveness: goal achievement and adaptation. From the perspective of goal achievement, the online queue system has achieved part of its purpose. It provides an alternative registration channel, shortens registration time for capable users, and supports a more orderly administrative process. Nevertheless, the goal of significantly reducing offline queues has not yet been achieved because offline registration still dominates the total registration volume.

From the perspective of adaptation, the hospital has begun adapting to digital service demands by providing a web-based queue system. However, organizational adaptation remains incomplete. Officers still require uniform procedures, inter-unit coordination, and stronger technical capacity. Patients also require more education and assistance before online registration becomes a normalized behavior. This confirms that the effectiveness of digital service innovation depends on sociotechnical alignment: technology, staff capability, organizational rules, and patient behavior must develop together.

The findings are consistent with prior studies that emphasize the importance of technology, human resources, and service systems in digital healthcare efficiency (Putri et al., 2025; Sahadewa et al., 2024). They also support research showing that online registration can improve service speed and convenience when users understand and trust the system (Prasetyowati, 2021; Rahmadhani, 2022). However, this study extends prior work by showing that underutilization may continue even after a system is available, especially when socialization, integration, and patient digital literacy are insufficient.

5. Conclusion

This study concludes that the online queue-based patient registration system at Kartika Husada Tk II Pontianak Hospital has been implemented but has not yet reached optimal effectiveness. The system supports digital transformation and offers faster patient registration, but offline registration remains dominant. This indicates that the system has achieved part of its goal but has not yet fully transformed patient registration behavior.

The main obstacles include limited digital literacy among patients, uneven readiness of human resources, technical disruptions and incomplete system integration, insufficient coordination among hospital units, and the absence of fully structured online registration procedures. These obstacles show that digital service effectiveness is shaped by the interaction between technology, people, organization, and users.

The hospital has attempted to improve effectiveness through socialization, staff guidance, IT maintenance, and direct assistance to patients. However, these efforts need to be strengthened through continuous education, a dedicated help desk for online registration, clearer standard operating procedures, stronger inter-unit coordination, real-time schedule integration, and periodic monitoring and evaluation. For future research, a mixed-method design is recommended to measure waiting time, patient satisfaction, technology acceptance, and service performance quantitatively across multiple hospitals.

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