



Analysis Of Outpatient Registration Efficiency Through The Implementation Of Electronic Medical Records At RSAU DR. M. Salamun

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Abstract

This study aims to analyze the efficiency of outpatient registration services through the implementation of Electronic Medical Records (EMR) at RSAU dr. M. Salamun Hospital. A descriptive qualitative method was employed using the HOT-Fit framework, which comprises the Human, Organization, Technology, and Net Benefit dimensions. Data were collected through observation and interviews with outpatient registration staff. The results show that EMR implementation improves service efficiency by accelerating the registration process, facilitating patient data management, reducing queues, and supporting registration through the Mobile JKN application. In addition, EMR implementation reduces paper consumption and operational costs. However, several challenges remain, including unstable internet connectivity, disruptions to the registration and BPJS systems, and patients' lack of readiness in completing administrative requirements. Therefore, improvements in technological infrastructure, system development, staff training, and patient education are needed to optimize EMR implementation.

Keywords: Electronic Medical Record, Service Efficiency, Outpatient Registration, HOT-Fit.

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1. Introduction

The advancement of science and technology has contributed significantly to the era of modernization. Its impact offers convenience, effectiveness, and efficiency in carrying out daily activities. Modernization has reached various fields of life, including the health sector (Auliyaur, 2023). A hospital is one form of health service, alongside community health centers (puskesmas) and private clinics, that provides comprehensive improvement of health care (Pramadhandi, 2022). One service that greatly influences patient satisfaction is the outpatient registration process. Outpatient registration is the first service encountered and serves as the gateway of the hospital; it is also part of the medical service that interacts directly with patients, thereby shaping the patient's overall impression of service quality. Patients perceive quality and effective service as one that is comfortable, pleasant, and delivered by friendly staff, all of which create an overall impression of patient satisfaction (Annisa et al., 2025). The manual patient registration process often causes various problems, such as long queues, duplication of





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medical record numbers, difficulty in locating patient data, and less efficient service time. Therefore, the implementation of Electronic Medical Records (EMR) is expected to improve service quality. EMR is an important technology in health services that modernizes the management of medical information and contributes to high-quality patient care and efficient management (Rahmayuli, 2025).

According to the Regulation of the Minister of Health on medical records No. 24 of 2022, all health service facilities are required to organize medical records, whether conventional or electronic, with the aim of improving service quality, ensuring the security of patient data, and supporting the digital transformation of health care in Indonesia (Kemenkes RI, 2022). This regulation set a target for the implementation of EMR in all health service facilities no later than December 31, 2023. It also affirms that electronic medical records must be integrated with the health service information system (Burhan, 2023). With the implementation of EMR in the outpatient registration unit, it is expected that service efficiency will improve through a faster, more accurate registration process that is integrated with other service units. The implementation of EMR is considered capable of accelerating administrative processes, reducing data duplication, minimizing recording errors, improving coordination among health workers, and speeding up clinical decision-making (Ali & Dhamanti, 2026).

A study conducted by Apriliyani (2021) on the use of EMR to support the effectiveness of outpatient registration at Dr. Ranny Clinic showed that EMR implementation was able to improve the effectiveness of registration services. The implementation of EMR made it easier for staff to access patient data and history, accelerated the data search process, improved the completeness of medical information, and reduced the risk of document loss. The findings confirmed that EMR has a positive impact on the efficiency of administrative services and the quality of patient care.

Furthermore, a study by Diastri et al. (2025) analyzed the utilization of EMR based on the HOT-Fit method at the Outpatient Installation of the Tanjungpinang City Regional Hospital. The study found that the Human, Organization, Technology, and Visual dimensions influenced the benefits of EMR implementation. The results showed that the success of EMR implementation was not only influenced by the technology used, but also by the readiness of human resources, organizational support, and system display, all of which were able to increase the benefits of using EMR in hospital services.

Both studies consistently show that the implementation of EMR provides benefits in improving the effectiveness and quality of outpatient registration services. However, Apriliyani's study (2021) focused more on the effectiveness of registration services at primary health care facilities without thoroughly examining implementation challenges, whereas the study by Diastri et al. (2025) focused more on analyzing the relationship between HOT-Fit method components and the benefits of EMR implementation, without elaborating in depth on how such implementation affects the efficiency of the patient registration process in daily service practice.





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In contrast to previous studies, this research analyzes the efficiency of outpatient registration through the implementation of EMR at RSAU dr. M. Salamun, identifying both the benefits and obstacles of implementation based on the Human, Organization, Technology, and Net Benefit aspects at RSAU dr. M. Salamun. Therefore, an analysis of outpatient registration efficiency through EMR implementation is important to determine the extent to which the system is able to improve the quality and efficiency of services based on the Human, Organization, Technology, and Net Benefit aspects. This research was conducted to fill a research gap by providing an overview of registration service efficiency and identifying the factors that support and hinder EMR implementation as a basis for improvement, evaluation, and development of hospital service systems.

2. Research Method

This study employed a descriptive qualitative research method with an evaluation approach based on the HOT-Fit method. Qualitative research seeks to construct meaning about a phenomenon based on the participants' perspectives (Creswell, 2023). The descriptive method aims to examine data by summarizing and describing it as it is, without intending to draw conclusions or make generalizations applicable to the general public (Sugiyono, 2023). Descriptive qualitative research is grounded in postpositivist philosophy and is used to study the natural condition of an object, in which the researcher serves as the key instrument (Sugiyono, 2022). This method aims to describe the implementation of outpatient registration through EMR and to analyze the resulting service efficiency at RSAU dr. M. Salamun.

The stages of descriptive qualitative research consist of preparation, implementation, data analysis, and conclusion drawing. In the preparation stage, the researchers identified the problem, conducted a literature review, developed the research instruments, and determined the research location and informants. The implementation stage involved field data collection using observation and interview techniques. The data obtained were then analyzed through data reduction, data presentation, and conclusion drawing, producing a systematic depiction of the phenomenon under study. The final stage was the preparation of the research report based on the results of the analysis.

This research was conducted over a period of two months, from March 2 to April 30, 2026, covering the stages of preparation, data collection, data processing, and report preparation. Data collection was carried out through observation and interviews. Observation was used to examine the outpatient registration service flow following EMR implementation, while interviews were conducted with registration staff to obtain information on system effectiveness, obstacles, and the benefits of using EMR in outpatient services. The data obtained were then analyzed descriptively by relating the research findings to the components of the HOT-Fit method, making it possible to determine the level of outpatient registration service efficiency achieved through EMR implementation. The HOT-Fit model (Human, Organization, Technology, and Net Benefit) was used to assess the compatibility between human, organizational, and technological aspects and the benefits of the information system.





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This model is considered capable of evaluating information systems comprehensively, not only in terms of technology but also human and organizational factors (Franki, 2024).

3. Results and Discussion

a. Results

The patient registration unit at RSAU dr. M. Salamun operates every Monday to Friday from 07:00 to 14:00 WIB. The registration staff at RSAU dr. M. Salamun consists of 7 registration officers and 2 APM (self-service kiosk) officers: 1 officer for general, insurance, and geriatric patients; 3 officers for patients using BPJS Kesehatan (the national health insurance scheme); and 1 officer for the registration of active military (TNI) personnel, civil servants (PNS) on duty, their family members, and retirees. In addition, 1 officer handles registration for the rehabilitation clinic and 1 officer handles registration for the cardiology clinic. The APM kiosks serve patients who have already registered online through the Mobile JKN application. RSAU dr. M. Salamun has used Electronic Medical Records since January 1, 2026. This article discusses the service flow and procedures, system disruptions, and a comparison between the manual and electronic systems. The factors affecting the duration of the registration process, as well as the obstacles and efforts to improve service efficiency, are presented below based on interviews conducted with registration staff.

1. Human

No	Question	Answer
1	What is the flow and procedure for patient registration services in the outpatient registration unit?	The patient registration flow begins when the patient takes a queue number and waits to be called by staff. Once called, the patient submits a referral letter or a follow-up letter (for returning patients). For new patients, staff request identification documents such as an ID card (KTP) or BPJS card. Staff then verify the data, enter the patient's data into the system, and print the SEP (Eligibility Certificate, specifically for patients using BPJS) before the patient proceeds to the intended clinic.
2	What are the duties of registration staff in the patient service process?	The duties of registration staff include: 1. Registering and verifying patient identity. 2. Entering data for both new and returning patients. 3. Operating the electronic registration system. 4. Providing information to patients. 5. 5. Printing the SEP (specifically for patients using BPJS).





No	Question	Answer
3	Is the current number of staff sufficient to support smooth service delivery?	The current number of staff is considered sufficient, although workload increases during certain service hours. When a staff member is on leave, off duty, or has finished a shift, they are usually immediately replaced by another staff member.

2. Organization

No	Question	Answer
1	Do long queues frequently occur during registration services?	Long queues rarely occur now because services have been well organized and distributed. The Mobile JKN application also helps prevent a buildup of patient queues at the registration desk.
2	How does the hospital handle system disruptions or technical problems?	If a system disruption occurs, registration staff report it to the Hospital Management Information System (SIMRS) unit so that the issue can be resolved promptly and services can resume smoothly.
3	What efforts has the hospital made to improve the efficiency of registration services?	The hospital's efforts include: 1. Improving features of the Morbis application, which previously experienced slow loading times. 2. Better organizing service distribution to reduce patient buildup. 3. Providing training for staff.
4	What suggestions are there for future improvement of the registration service system?	Suggestions for future improvement include: 1. Improving internet network quality. 2. Modifying or simplifying the display of Morbis application features that are not used in registration services.

3. Technology

No	Question	Answer
1	What is the difference between manual and electronic registration?	In the manual system, staff directly enter patient data to register them at the intended clinic, request a referral or follow-up letter, perform fingerprint or facial verification, and then print the clinic queue number and the SEP (specifically for patients using BPJS). In the electronic system using the APM application, patients first check in through the Mobile JKN application. Staff then only need to enter the booking code and print the SEP (specifically for patients using BPJS), since the





No	Question	Answer
		patient's data is already automatically registered at the intended clinic.
2	How does service time compare between the manual and electronic systems?	Service using the electronic system is considered faster than the manual system, since staff only need to enter the booking code and print the SEP (specifically for patients using BPJS).
3	What technical problems are frequently encountered during registration services?	The technical problems frequently faced by registration staff include: 1. Unstable or down internet connectivity. 2. BPJS system maintenance. 3. Computer malfunctions or freezing. 4. 4. Difficulty in fingerprint or FRISTA (Face Recognition Integrated System Hospital) verification for patients.

4. Net Benefit

No	Question	Answer
1	What is the procedure when patient data is incomplete or inconsistent?	If patient data is incomplete or inconsistent, staff confirm the information directly with the patient by asking for the required details again and adding any missing data.
2	What are the benefits of implementing the electronic registration system for patient registration services?	The implementation of the electronic registration system provides faster and more efficient services compared with the manual system. Patient data is automatically entered into the system, so staff no longer need to re-enter patient data.
3	What effect does the electronic system have on queues and service efficiency?	The electronic system helps reduce patient queue buildup because the service process is faster and better organized. In addition, services become more efficient because staff can print the SEP (specifically for patients using BPJS) directly after entering the patient's booking code.

b. Discussion

1. *Human* (Human Resources)

Based on the research findings, registration staff have a fairly good understanding of the electronic registration service flow. Staff are able to verify patient identity, enter patient data into the system, operate the system, print the SEP (specifically for patients using BPJS), and cancel patient visits when necessary. Registration staff have also received socialization and training related to the system used at RSAU dr. M. Salamun. This indicates that the available human resources adequately support the implementation of EMR-based services.





2. *Organization (Organization)*

From an organizational perspective, RSAU dr. M. Salamun already has clear standard operating procedures (SOPs) and service flows for outpatient registration, for both manual registration and registration via the APM kiosk. This indicates that the hospital manages its services in a structured manner to support EMR implementation. The hospital has provided socialization and training for staff to ensure they understand how to use the Morbis system. The hospital has also made efforts to improve service efficiency, such as improving the internet network and developing the Morbis application to make the system faster to use. Nevertheless, periodic evaluation and development are still needed for the service system to operate more optimally.

3. *Technology (Technology)*

The implementation of EMR brought about significant changes compared with the manual system. In the manual system, staff still had to re-enter patient data and perform verification directly before printing the SEP (specifically for patients using BPJS) and the clinic queue number. In the electronic system, patients who have registered through the Mobile JKN application only need to check in and provide their booking code to staff. The electronic system is considered more efficient because it accelerates the service process compared with the manual system. This occurs because patient data is automatically stored in the system, so staff no longer need to re-enter patient data.

4. *Net Benefit (Benefits)*

The implementation of EMR provides benefits in improving the efficiency of outpatient registration services at RSAU dr. M. Salamun. The electronic system helps accelerate the service process, simplifies patient data management, and reduces long queues at the registration desk. The use of the Mobile JKN application also benefits patients, as they can register independently before arriving at the hospital. This helps reduce patient waiting time, since the Mobile JKN application provides an estimated service time and speeds up the administrative process at the registration desk. In addition, EMR implementation helps improve service efficiency because patient data is stored automatically and integrated within the hospital system. As a result, the hospital no longer needs to provide paper for patient services, and staff no longer need to search for the medical record books of all patients scheduled for service that day.

4. Conclusion

Based on the research findings, the implementation of Electronic Medical Records (EMR) in outpatient registration services at RSAU dr. M. Salamun still faces several obstacles that affect the optimization of its implementation. From the Technology aspect, the obstacles





identified include internet network disruptions, system disruptions, and difficulties in the patient validation process through fingerprint scanning or the Face Recognition Integrated System Hospital (FRISTA). In addition, from the Human aspect, some patients are still not ready to complete administrative requirements, causing the service process to be less than optimal. From the Organization aspect, although the hospital already has clear Standard Operating Procedures (SOPs) and service flows, and provides socialization and training for staff, technical guidelines specifically governing the use of the EMR application are not yet available as a reference for staff. This condition has the potential to create differences in understanding when using the system's features and indicates that periodic evaluation and system development are still needed.

Nevertheless, the implementation of EMR has had a positive impact on the efficiency of outpatient registration services. From the Human aspect, registration staff already have good ability and understanding in operating the system, allowing the service process to run smoothly. From the Technology aspect, the system is able to accelerate the registration process because patient data is stored in an integrated manner and supports registration through the Mobile JKN application. Meanwhile, from the Net Benefit aspect, EMR implementation provides benefits such as faster administrative processes, easier patient data management, reduced queues, and improved hospital operational efficiency through decreased use of paper-based documents. Thus, the implementation of EMR at RSAU dr. M. Salamun has supported improved efficiency in outpatient registration services. Therefore, the hospital needs to continue improving the quality of its technological infrastructure, conduct periodic evaluation and system development, prepare technical guidelines for the use of the EMR application, and enhance patient education on the use of Mobile JKN and the completion of administrative requirements, so that services can be delivered more quickly, effectively, efficiently, and with higher quality.

5. Compliance with Ethical Standards

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Disclosure of Conflict of Interest

The authors declare that they have no conflict of interest with respect to this research.

Statement of Informed Consent

Informed consent was obtained from all individual participants included in this study.

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