Jurnal Rumpun Ilmu Kesehatan
Volume. 5 Nomor. 3 November 2025
E-ISSN: 2827-9220; P-ISSN: 2827-9247, Hal. 258-266
DOI: https://doi.org/10.55606/jrik.v5i3.6606
Tersedia: https://ejurnal.politeknikpratama.ac.id/index.php/JRIK

Analysis of Readiness of Electronic Medical Record Implementation using Fishbone Diagram at Internal Poly at Dr. Harjono S. Ponorogo Hospital

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Abstract. Wahyu Dini Saputri, 2025. "Analysis of Readiness of Electronic Medical Record Implementation Using Fishbone Diagram at Internal Poly at Dr. Harjono S. Ponorogo Hospital." Scientific Paper. Advisor: Ria Fajar Nurhastuti, S.Pd., M.Pd. Study Program DIII Medical Records and Health Information STIKES Buana Husada Ponorogo. Implementation of Electronic Medical Records (RME) is a national obligation based on Permenkes No. 24 of 2022. RSUD Dr. Harjono S. Ponorogo has implemented this system, but the readiness in Internal Policies needs to be analyzed because technical obstacles are still found. This study aims to evaluate the readiness of RME implementation with a qualitative descriptive approach, through observation and interviews with five informants: doctors, nurses, administrative officers, head of IT, and head of medical records. The analysis was conducted using a Fishbone Diagram with five main aspects: Man, Machine, Method, Material, and Money.The results showed good readiness in all aspects. Officers have been trained, SOPs are in place, and financial support and IT teams are sufficient. However, further training and infrastructure improvements such as internet networks and additional devices are needed. These results are expected to be the basis for evaluation and improvement of RME implementation in other units.

Keywords: Electronic Medical Records; Fishbone Diagram; Health Information Systems; Implementation Readiness; Internal Medicine Clinic.

1. BACKGROUND

A general hospital is an institution that provides healthcare services ranging from basic to specialized care, in accordance with the Decree of the Minister of Health of the Republic of Indonesia No. 983/Menkes/SK/XI/1992. Hospitals serve as providers of medical services, centers for education, and research facilities, all of which require professional management across various sectors. Along with technological advancements, hospitals are increasingly required to improve service quality through digitalization, including in the area of medical documentation.

The implementation of Electronic Medical Records (EMR) is a strategic step to enhance efficiency, accuracy, and the security of patient information. This aligns with the Regulation of the Minister of Health No. 24 of 2022, which mandates all healthcare facilities to adopt EMR. The implementation of EMR is expected to reduce documentation errors, improve integration between service units, and support the operational efficiency of hospitals.

At the Internal Medicine Outpatient Clinic of RSUD Dr. Harjono S. Ponorogo, the implementation of the Electronic Medical Records (EMR) system faced challenges, particularly the unpreparedness of medical personnel in operating the digital system.

Naskah Masuk: 28 September 2025; Revisi: 28 Oktober 2025; Diterima: 28 November 2025; Terbit: 30 November 2025

Based on a preliminary study conducted in November 2024, delays in using the EMR system were attributed to this lack of readiness. In December 2024, the system began to be implemented following a period of technical assistance and support.

The implementation of EMR is also linked to the e-prescription system, which is directly integrated with the pharmacy unit to accelerate service delivery and prevent queue congestion. This is crucial considering that the maximum standard for outpatient service duration is 60 minutes, as stated in the Decree of the Minister of Health No. 129/Menkes/SK/II/2008.

To analyze this readiness, a Fishbone Diagram approach was used to identify various causes of delays and obstacles in the system's implementation. Therefore, this study aims to evaluate the readiness for EMR implementation at the Internal Medicine Outpatient Clinic of RSUD Dr. Harjono S. Ponorogo based on the elements of man, machine, method, material, and money.

2. THEORETICAL REVIEW

Hospitals are healthcare facilities that provide comprehensive individual health services. These services include inpatient care, outpatient care, and emergency care. In addition to being healthcare providers, hospitals also serve as centers for education and research in the medical field (Ministry of Health of the Republic of Indonesia, 2020). Hospitals play a strategic role in the healthcare referral system and contribute to achieving the Sustainable Development Goals (WHO, 2024). In Indonesia, hospitals are classified into several levels, from Class A to Class D, in accordance with Government Regulation No. 47 of 2021. Hospitals are also categorized into General Hospitals and Specialized Hospitals based on the scope of services they provide (Ministry of Health of the Republic of Indonesia, 2020).

Electronic Medical Records (EMR) are digital information systems that replace manual paper-based documentation, enabling healthcare professionals to access and record patient information quickly and efficiently. This system supports medical decision-making, speeds up service delivery, and enhances the security and integration of patient data (Simrscendana, 2024). The benefits of EMR include operational efficiency, flexibility in adapting to technology, and improved accuracy of medical data. Additionally, the system facilitates connectivity between healthcare facilities and can adapt to policy changes and evolving healthcare service needs (Tiorentap, 2020). The purpose of implementing Electronic Medical Records (EMR), as stated in the Regulation of the Minister of Health No. 24 of 2022, is to ensure the confidentiality, integrity, and availability of patient data.

This aligns with efforts to enhance the effectiveness and efficiency of healthcare services, supported by a secure information system (Agustina We'e, 2023). The Internal Medicine Outpatient Clinic is part of outpatient services that focus on treating systemic diseases in adults, such as hypertension, diabetes, and thyroid disorders. Services at the Internal Medicine Clinic are provided by specialist doctors and supported by diagnostic facilities such as laboratories, radiology, and follow-up consultations based on the patient's condition (RSUD Dr. Harjono, 2023).

The Fishbone Diagram, also known as the Ishikawa Diagram, is a systematic visual tool used to identify the root causes of a problem, particularly in the context of implementing Electronic Medical Records (EMR). This model categorizes the causes into five main factors, commonly referred to as the 5Ms: Man, Machine, Method, Material, and Money (Sulianta, 2024).

The Man factor focuses on the quality of human resources, such as the skills, training, and communication abilities of medical staff in operating the EMR system. A lack of readiness among personnel can be a major obstacle to the system's effectiveness (Rezeki, 2023).
Machine refers to the hardware and software used, including computers, networks, and the EMR application itself; the quality and maintenance of these systems are crucial to smooth operations (SoM, 2022)

Method relates to standard operating procedures (SOPs) that guide system usage, aiming to ensure medical data is recorded accurately and consistently (Putra, 2024).

Money refers to the budget or funding needed for procuring equipment, training, and system maintenance where financial limitations can hinder the EMR implementation process (Wahyuni, 2020).

Finally, Material includes supporting infrastructure such as internet connectivity, electrical installations, and adequate workspace, all of which must be optimally prepared to ensure the successful adoption of the EMR system (Agung Pamuji, 2024).

3. RESEARCH METHOD

This study employs a descriptive qualitative approach aimed at analyzing the readiness for implementing the Electronic Medical Records (EMR) system using the Fishbone Diagram at the Internal Medicine Outpatient Clinic of RSUD Dr. Harjono S. Ponorogo. This approach was chosen because it allows the researcher to gain an in-depth understanding of real-world phenomena through direct observation and interviews.

The research was conducted from March to June 2025 at RSUD Dr. Harjono S. Ponorogo, located at Jl. Laksamana Yos Sudarso, Segading, Pakunden, Ponorogo District, Ponorogo Regency, East Java 63419. The study population consisted of all healthcare workers involved in managing and using the EMR system in the Internal Medicine Clinic. The sample was selected using purposive sampling, with criteria focused on participants who are directly involved in the implementation of the system. The sample included one internal medicine doctor, two clinic staff members, one Head of Medical Records, and one Head of the hospital's IT department.

The sampling technique used in this study was non-probability purposive sampling, with inclusion criteria consisting of individuals directly involved in the use or management of the EMR system, those willing to participate by signing an informed consent form, and individuals aged 18 years or older. Exclusion criteria included individuals who declined or withdrew from participation, were unavailable during data collection, or faced communication barriers or time constraints during interviews. To strengthen data validity, the researcher employed source triangulation by involving the Head of Medical Records, the Head of IT, and the Internal Medicine physician as key informants. This triangulation aimed to obtain a comprehensive overview of system readiness from policy, technical, and operational perspectives.

The data collection techniques used in this study included semi-structured in-depth interviews and direct observation at the research site. The data collected consisted of primary data obtained from interviews and observations of key informants and secondary data in the form of internal hospital documents, journals, books, and relevant websites. This study focused on one main variable: the readiness for Electronic Medical Record (EMR) implementation, analyzed using the Fishbone Diagram approach, which includes five aspects: Man, Machine, Method, Material, and Money.

Data analysis was conducted using a descriptive qualitative method, which involved data reduction, the development of thematic categories based on the Fishbone Diagram factors, and inductive conclusion drawing to understand patterns and interrelationships among the aspects.

This study also adhered to research ethics principles, including informed consent, anonymity, and confidentiality. All informants were provided with a clear explanation of the study's objectives and procedures and signed a participation consent form. To protect privacy, respondents' identities were not disclosed in the published findings, and all data collected were kept confidential and used solely for academic purposes.

4. RESEARCH FINDINGS

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Man" Element of the Fishbone Diagram

Observations revealed that doctors, nurses, and administrative staff have received regular training on EMR usage. However, technical challenges were still encountered, particularly in the fast and accurate entry of data. The teams from the Electronic Data Management Unit (IPDE) and the Medical Records Department have been actively providing ongoing assistance and support.

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Machine" Element of the Fishbone Diagram

Computer, printer, and scanner facilities are available in the Internal Medicine service area. The EMR system in use is managed by the hospital's internal IT team; however, there have been complaints regarding the user interface, which is considered not user-friendly and overly complex.

From a technical standpoint, the hardware readiness is generally sufficient. Nonetheless, there is a need to simplify the EMR application's interface to make it more efficient and easier to use.

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Method" Element of the Fishbone Diagram

RSUD Dr. Harjono has established written Standard Operating Procedures (SOPs) for EMR usage. However, a revision of the SOPs is currently in progress due to recent system updates. Staff members have expressed the need for immediate dissemination of the updated SOPs to ensure that work procedures remain standardized and consistently applied.

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Material" Element of the Fishbone Diagram

The EMR system at RSUD Dr. Harjono includes comprehensive features such as patient identity records, examination history, and integration with the e-prescription system. Supporting infrastructure such as fiber optic networks and automated backup systems is also in place.

Data security is ensured through encryption protocols. With well-prepared software and robust technological infrastructure, the material aspect is considered highly ready to support the implementation of the EMR system.

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Money" Element of the Fishbone Diagram

The budget allocated for the development and operation of the EMR system is considered adequate. A dedicated IT staff is in place, along with a trouble-reporting system (open ticket) that enables prompt responses to technical issues. Hospital management continues to support ongoing system updates to ensure compliance with regulations set by the Ministry of Health.

Discussion

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Man" Element of the Fishbone Diagram

Readiness in terms of human resources is considered fairly good, as routine training sessions have been conducted. However, there is still a need to enhance the technical competencies of staff. Rezeki (2023) emphasizes that human resources are the key drivers of system performance. Weaknesses in system operation can have a negative impact on service quality and patient safety.

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Machine" Element of the Fishbone Diagram

The availability of hardware is adequate; however, the complexity of the EMR system interface poses a significant barrier. According to SoM (2022), the performance of both hardware and software greatly affects the speed and accuracy of healthcare services. Simplifying the EMR application interface is highly recommended to support work efficiency and improve user experience.

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Method" Element of the Fishbone Diagram

The ongoing revision of Standard Operating Procedures (SOPs) reflects an effort to adapt to system developments. According to Putra (2024), well-documented work methods help establish efficient and measurable service workflows. Re-socializing the updated SOPs is a crucial step to ensure that all staff members adhere to the same standardized procedures.

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Material" Element of the Fishbone Diagram

Supporting materials such as the application system, integrated documentation, network infrastructure, and data security are functioning well. SoM (2022) states that a secure and efficient storage system is crucial in managing medical information. This indicates that

RSUD Dr. Harjono has met the necessary standards for health information technology readiness.

Readiness for Electronic Medical Record Implementation in the Internal Medicine Outpatient Clinic Based on the "Money" Element of the Fishbone Diagram

Financial readiness at RSUD Dr. Harjono S. Ponorogo is one of the key strengths supporting the implementation of the EMR system. It also ensures sustainability through regular system maintenance and upgrades. Wahyuni (2020) emphasizes that the financial aspect plays a critical role in the continuity and long-term sustainability of the system, including the provision of facilities and ongoing technological development.

Data Triangulation

Triangulation of information from all informants indicates that the implementation of the Electronic Medical Record system at the Internal Medicine Outpatient Clinic of RSUD Dr. Harjono S. Ponorogo has demonstrated comprehensive readiness and is prepared for full execution. This conclusion is supported by the preparedness across all five aspects of the Fishbone Diagram: Man, Machine, Method, Material, and Money.

5. CONCLUSION AND RECOMMENDATIONS

The results of the study show that the Internal Medicine Outpatient Clinic at RSUD Dr. Harjono S. Ponorogo is ready to implement the Electronic Medical Record (EMR) system based on the Fishbone analysis using the 5M approach. The Man aspect reflects staff readiness through regularly attended training. Machine is considered adequate, although improvements in connectivity and server evaluation are still needed. Method is outlined in clear SOPs, supporting smooth operations. Material is sufficiently available, although further adjustments are needed to make it more user-friendly. Money has been allocated to support the continuous development and maintenance of the system.

The hospital is expected to continuously improve the quality of EMR implementation through the strengthening of human resource capacity, digital infrastructure, and regular system evaluations. For educational institutions, these findings can serve as a reference for learning in the field of healthcare digitalization. Future researchers are encouraged to explore the implementation of EMR in various healthcare facilities to gain a more comprehensive understanding.

ACKNOWLEDGEMENTS

The author would like to express sincere gratitude to the management and staff of RSUD Dr. Harjono S. Ponorogo for the permission and support provided throughout the data collection process and the completion of this research. Special thanks are also extended to the Head of the Medical Records Department, outpatient clinic staff, IT personnel, and all patient respondents who generously took the time and provided valuable information essential to the completeness of this study.

In addition, the author extends the highest appreciation and sincere gratitude to the academic advisor and all members of the academic community at STIKES Buana Husada Ponorogo for their guidance, direction, and motivation, which have greatly contributed to the completion of this scientific work.

It is hoped that the results of this study will provide a positive contribution to the development of healthcare service systems in Indonesia, particularly in optimizing the use of Electronic Medical Records (EMR) in healthcare facilities.

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