Jurnal Rekam Medis dan Informasi Kesehatan Indonesia
Volume. 4 Nomor. 2, Juni 2025
e-ISSN : 2828-5867; p-ISSN : 2829-341X, Hal. 01-08
DOI: https://doi.org/10.62951/jurmiki.v4i2.95
Tersedia: https://jurmiki.org/index.php/Jurmiki

Analysis of Electronic Medical Record Implementation Based on *HOT- FIT* Factors at Ngebel Health Center, Ponorogo Regency

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Abstract. *The implementation of Electronic Medical Records (EMR) is a requirement in the digital transformation of healthcare services in accordance with the Indonesian Ministry of Health Regulation No. 24 of 2022. However, EMR implementation still faces several obstacles in healthcare facilities, including at the Ngebel Public Health Center in Ponorogo Regency. This study aims to analyze the implementation of EMR based on the HOT-FIT framework, which includes four components: Human resources (Human), Organization, Technology, and Net Benefits.This research uses a qualitative descriptive approach with analysis based on the HOT-FIT framework. Data collection techniques include observation, interviews, and documentation. The subjects of this study were seven EMR users.The results show that the EMR has been implemented at the Ngebel Public Health Center since April 2023. The implementation process has been fairly good, however, challenges remain, such as internet connectivity issues and limitations in system features.This study recommends improving internet infrastructure to optimize the benefits of health services, as well as adding a digital signature (TTE) feature to the EMR system at the Ngebel Public Health Center.*

Keywords*: Electronic; Healthcare Services; HOT-FIT; Implementation; Medical Record.*

1. INTRODUCTION

According to the Regulation of the Minister of Health Number 24 of 2022, Medical Records are documents containing data on patient identity, examination, treatment, actions, and other services that have been provided to patients. Medical record documents must contain complete and accurate information in accordance with applicable standards. Along with technological developments, medical records have undergone a transition from paper-based manual medical records to electronic-based medical records. Based on the Minister of Health Regulation Number 24 of 2022, it is explained that every health service facility is required to organize electronic-based medical records no later than December 31, 2023. However, in the implementation of electronic medical records in health care facilities there are still obstacles.

One of them is at the Ngebel Health Center, Ponorogo Regency. So, obstacles in the implementation of electronic medical records need to be analyzed and evaluated based on *HOT-Fit* factors *(Human, Organization, Technology, and Net-benefit)* because it can affect the quality of health services provided to patients. This study aims to analyze how the implementation of electronic medical records based on HOT-Fit factors that cover four aspects, namely, Human Resources *(Human)*, *Organization (Organization)*, Technology *(Technology)*, and Benefits *(Net-benefit).*

Naskah Masuk: 12 Mei 2025; Revisi: 30 Mei 2025; Diterima: 19 Juni 2025; Terbit: 30 Juni 2025

2. THEORETICAL STUDY

According to Permenkes No. 24 Th 2022, Puskesmas is a first-level health service facility that organizes and coordinates promotive, preventive, curative, rehabilitative, and/ or palliative health service efforts in its working area, is one of the health facilities that are required to organize medical records. According to the Minister of Health Regulation No. 24 of 2022, medical records are documents containing data on patient identity, examination, treatment, actions, and other services that have been provided to patients. However, along with the development of technology, medical records are transforming into electronic medical records. According to the Minister of Health Regulation No. 24 of 2022, Electronic Medical Records are Medical Records made using an electronic system intended for the implementation of Medical Records.

HOT Fit theory was proposed by yusof *et al* in 2006 at the 39th hawai science system international conference. This theory is made from two evaluation models for information systems, this model places important components in information systems namely human resources *(human), organization (organization)* technology *(technology)* and benefits *(net-benefit).* In this study, these 4 components were used to analyze the barriers and successes in the implementation of electronic medical records.

3. RESEARCH METHOD

This study uses a qualitative descriptive research design in the form of an analysis based on the *Human-Organization-Technology and Net-Benefit (HOT-Fit)* factors to analyze the performance of electronic medical records at the Ngebel Health Center, Ponorogo Regency. The population and sample in this study were all officers involved in electronic medical record users, namely 7 people with details of 1 medical record officer, 1 doctor, 1 nurse, 1 pharmaceutical worker, 1 registration officer, 1 cashier, and 1 Head of Puskesmas (Source Triangulation). Sampling by *purposive sampling*.

Data collection techniques in the study were carried out by observation, interview, triangulation and documentation with research instruments observation sheets and interview guideline sheets. Data analysis in this study was carried out descriptively based on the results obtained through observation, interviews, and documentation.

4. RESULTS AND DISCUSSION

The data collection process in this study was carried out in May 2025 at the Ngebel Health Center, Ponorogo Regency. With the results of observations, interviews, and documentation to 7 respondents using Electronic Medical Records as follows:

General Data

Characteristics of Respondents Based on Profession

Table 1. Characteristics of Respondents by Profession.

No.	Profession	Number	Percentage
1.	Medical Record Officer	1	14,3 %
2.	Doctor	1	14,3 %
3.	Nurse	1	14,3 %
4.	Pharmacy Worker	1	14,3 %
5.	Registration Officer	1	14,3 %
6.	Cashier	1	14,3 %
7.	Head of Health Center	1	14,3 %
	Total:	7	100 %

Source: Primary Data, 2025

Based on table 1, it is known for the research subjects in each profession of RME users, namely, the Medical Records Officer profession with a total of 1 respondent (14.30%), Doctors totaling 1 respondent (14.30%), Nurses 1 respondent (14.30%), Pharmaceutical Workers 1 respondent (14.30%), Registration Officer 1 respondent (14.30%), Cashier 1 respondent (14.30%), Head of Puskesmas 1 respondent (14.30%).

The involvement of the seven RME user professions shows that this study covers the viewpoints of all RME user professions in the implementation of electronic medical records. Of the total 7 respondents, the profession that most frequently uses the RME system is the medical record officer. This reflects that most of the opinions obtained came from the side of RME technical users. There was only 1 RME officer, so perceptions from other electronic medical record system users were limited. This is an important note that the profession of other RME users needs to be improved to obtain a more balanced perception in the implementation of electronic medical record implementation

According to Gagnon, M. P., *et al*. (2012), in the journal *Journal of the American Medical Informatics Association (JAMIA),* differences in the background of medical and non-medical professions greatly affect the acceptance and assessment of the implementation of electronic medical record implementation. Clinical professions assess based on the effect on direct work practice, while non- clinical professions assess in terms of data security and administrative efficiency.

Characteristics of Respondents Based on Gender

Table 2. Characteristics of Respondents Based on Gender.

No.	Gender	Number	Percentage
1.	Male	1	14,3 %
2.	Female	6	85,70 %
	Total:	7	100 %

Source: Primary Data, 2025

Based on Table 2, it is known that the research subject 1 respondent (14.30%) is male and 6 respondents (85.70%) are female. Based on the research data in the field, 85.70% of respondents are female. The researcher noted that most of the female respondents were quicker in providing opinions on the implementation of the RME system, although in practice it still requires equal training for all genders. No significant barriers were found based on gender in the use of the RME system.

According to Baumann *et al*. (2017), women tend to be more active in searching for health information online and using health applications to monitor their personal and family conditions. Meanwhile, men interact more with systems that are technical or analytical in nature. This shows that gender factors affect a person's motivation, preferences, and comfort level in using health technology.

Special Data

Analysis of Electronic Medical Record Implementation at Ngebel Health Center, Ponorogo Regency

e-Puskesmas (e-Pus Cluster) is an electronic medical record used at the Ngebel Health Center, Ponorogo Regency. e-puskesmas (e-pus cluster) is an electronic medical record that integrates all units at the Ngebel Health Center, Ponorogo Regency. The units at the Ngebel Health Center that have been integrated include the registration counter, outpatient unit (polyclinic), emergency room, inpatient unit, pharmacy, laboratory, and cashier. So that patient data can be integrated and produce accurate data, and speed up the process of health services to patients.

Analysis of Electronic Medical Record Implementation Based on Human Resources (Human) Factors at the Ngebel Health Center, Ponorogo Regency

From the results of the research analysis of the implementation of RME (e-Pus cluster) at the Ngebel Health Center, training has been carried out related to RME (e-Pus cluster) in 2023 in Yogyakarta specifically for PMIK which is then socialized to internal RME users of the Ngebel Health Center. With the existence of RME (e-Pus cluster), it is very helpful for the tasks or work of its users, among others, services become faster and more systemized, the history of recording disease and patient treatment is more structured, services to patients

become faster and not double-double in writing patient identity, facilitate pharmaceutical service management, make it easier to make transactions, and are very helpful when reporting. However, some users are not satisfied with the features in the RME (e-Pus cluster).

Analysis of Electronic Medical Record Implementation Based on Organizational Factors at the Ngebel Health Center, Ponorogo

Regency From the results of the research on the analysis of the implementation of RME (e-Pus cluster) at the Ngebel Health Center, users can feel the results of the purpose of implementing RME, namely, facilitating services, recording, and reporting patient medical history that is continuous between health facilities, making it easier to serve patients. To achieve the objectives of the RME implementation did not escape the support of coworkers who reminded each other regarding the consistency of recording patient examination results on the RME. As well as in its implementation, there is support by management or leadership in the form of infrastructure facilities, namely, internet networks, computers, printers and RME billing budgets (e-puskesmas).

Analysis of Electronic Medical Record Implementation Based on Technological Factors at the Ngebel Health Center, Ponorogo Regency

From the results of the research, the analysis of the implementation of RME (e-Pus cluster) at the Ngebel Health Center that for the availability of hardware is sufficient, although in the cashier's room the use of computers is still combined with pharmacy, for the response time of the RME system is very fast when the system is not down and also depends on the internet network, for the speed of the internet network is still lacking and there is a need to increase the speed of the internet network, sometimes it is also affected by the weather, so that it can affect the quality of information produced by RME to be inconsistent, and the system is often *down* when it is out of holiday. And at that time we can only complain to the 2nd party (vendor).

Analysis of Electronic Medical Record Implementation Based on Net-benefit Factors at Ngebel Health Center, Ponorogo Regency

Based on the results of observations and interviews from 7 respondents of RME (e-Pus cluster) users related to the benefit factor *(net-benefit)* carried out on the aspect of the effectiveness of the RME (e-Pus cluster) system.

From the results of the research analysis of the implementation of RME (e-Pus cluster) at the Ngebel Health Center, the performance of RME is quite effective, but it still needs improvement in data storage, and RME features are less simple.

Source Triangulation

Based on the results of interviews with the Head of the Ngebel Health Center, Ponorogo Regency in May 2025 at the Ngebel Health Center related to the Analysis of Electronic Medical Record Implementation Based on the *HOT- Fit* factor that the implementation of electronic Medical Records still has obstacles on the internet network, if the internet network is stable the response time of the RME system is fast, if the internet network is less stable the response time of the RME system is a little long. The availability of computer equipment is sufficient even though the cashier is still combined with the pharmacy. Internet network speed is sometimes slow, depending on the weather. In addition, there are problems related to *bridging* with Pcare. There are no features that need to be added, but improvements to the *bridging* feature with Pcare. The performance of the RME system is quite effective in helping to complete the work of RME users.

5. CONCLUSIONS AND SUGGESTIONS

Analysis of the implementation of RME performance (e-Pus cluster) at the Ngebel Health Center, Ponorogo Regency as a whole is considered good enough seen from the Human Resources *(Human)*, Organization (Organization), and *Net- benefit factors.* It's just that there are the biggest obstacles in the *Technological* factor that hinder the performance of RME (e-Pus cluster), namely problems with internet network speed and the system is often *down* when it is out of holiday. In addition, obstacles in its implementation, namely, the absence of SOPs related to the implementation of RME and hardware procurement in the cashier's room, the addition of RME features for TTE, the need for further improvement in data storage, and RME features that are less simple. It is suggested that the Ngebel Health Center of Ponorogo Regency needs to make improvements, especially in adding internet network speed, monitoring and evaluation related to internet network speed to support the use of the current RME, and adding TTE (Electronic Signature) features.

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