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Factors Influencing the Implementation of Electronic Medical Records (EMR) Using the Human, Organization, and Technology Fit (HOT-Fit) Approach

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Abstract

Background: Hospitals as health care facilities have an obligation to patients to provide fast and precise services using complete facilities, one of the efforts of health services in improving service quality is to utilize health information technology. Major challenges are still faced by medical personnel as the main users of the system, especially in terms of ease of access, data interoperability, and time efficiency in medical records. The purpose of the study was to analyze the factors that influence the implementation of Electronic Medical Records (EMR) with the Human Organization Technology (HOT) FIT approach at Ahmad Dahlan Kediri Hospital. **Method :** Observational research design with a cross-sectional approach. The population of all health workers at Ahmad Dahlan Kediri Hospital is 382. The sample taken in this study was 192 respondents through the Krejcie and Morgan formula with purposive sampling technique. Independent variables are human resource aspects, organizational aspects and technological aspects. The dependent variable is the application of EMR. The research instrument used a questionnaire taken from previous research. The analysis used was univariate analysis, bivariate analysis and multivariate with linear regression using SPSS 23. **Results:** The linear regression test conducted shows that there is a relationship between family support (p=0.000) and government support (p=0.000) on the quality of life of the elderly, the most influential variable is family support with a significance level of p=0.000 and B=0.246. Then, the second analysis shows that there is a relationship between family support (p=0.000) and government support (p=0.018) on the health status of the elderly, the most influential variable is family support with a significance level of p=0.000 and B=0.447. **Conclusion:** In the early stages of using EMR, many medical personnel experience difficulties in adapting to the new system. Some of the obstacles that often occur are lack of adequate training, resistance to change, and limited infrastructure that supports the implementation of EMR. Therefore, a comprehensive strategy is needed to improve the skills of medical personnel in using the system, including continuous training and socialization.

Keywords: Human Organization Technology (HOT) FIT, Electronic Medical Records (EMR), hospital.

1. Introduction

A hospital is a health service institution that provides individual health services in a complete manner that provides inpatient, outpatient, and emergency services, based on (Undang-Undang RI Nomor 17, 2023). Hospitals as a means of health services have an obligation to patients to provide fast and appropriate services by using complete facilities, one of the efforts of health services in improving the quality of service is by utilizing health information technology (Sahambangung et al., 2021).

Communication and information technology is known as an important instrument in the provision of health and public health services internationally. Health communication and information technology refers to various tools such as electronic communication, processing, or information delivery facilities to improve hospital quality services (Javaid et al., 2024). Along with the development of digitalization in the healthcare sector, electronic medical records (EMRs) are becoming an important component in hospital information systems that aim to improve the efficiency and effectiveness of healthcare services.

Electronic medical records are very important to overcome various problems that often occur in hospitals such as the loss of medical records, long waiting times, large storage areas and related to the Minister of Health of the Republic of Indonesia Number 24 of 2022 concerning Medical Records, states that all health service facilities organize electronic medical records in accordance with the provisions of this ministerial regulation no later than December 31, 2023. With this regulation, hospitals in Indonesia must immediately adapt to the digital medical record system (PeEMRnkes No. 24, 2022).

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In the early 1990s in the United States, a trend of shifting from paper-based medical records to electronic medical records began; This is a response to technological advances as well as support from the Institute of Medicine in the United States (Nuansanong & Kiattisin, 2021). As the need for more efficient systems grows, electronic medical records continue to be developed and are expected to provide many benefits in the last 25 years. Over the past 25 years, the various names and terms used to represent the concept of electronic medical records have changed frequently, but the basic idea remains the same. Today, the term "electronic medical record" (EMR) is widely used for medical records adopted by clinicians. However, despite the widespread use of EMRs, its implementation still faces various challenges, especially in terms of the adaptation of medical personnel and the readiness of hospital infrastructure (Tsai et al., 2020).

While there have been significant advances in EMR implementation methods and usage, the benefits are still not fully realized as expected. Major challenges are still faced by medical personnel as the main users of the system, especially in terms of ease of access, data interoperability, and time efficiency in medical records (Idana et al., 2024). Oleh karena itu, penelitian lebih lanjut diperlukan untuk mengidentifikasi mekanisme kompleks dalam mengukur dampak EMR terhadap kualitas pelayanan pasien serta mencari solusi yang dapat meningkatkan efektivitas penerapannya di rumah sakit (de Kanter et al., 2023).

Kementerian Kesehatan Republik Indonesia terus mendorong rumah sakit di seluruh Indonesia untuk menerapkan rekam medis elektronik sesuai dengan rencana strategis bisnis Kementerian Kesehatan tahun 2020-2024 (Neng Sari Rubiyanti, 2023). In the field of health, technology and information systems are developing rapidly. This advancement is considered to make human tasks easier compared to manual processes that were previously carried out entirely by humans. Companies, including hospitals, are in dire need of developments in information systems. Competing hospitals use information systems to help carry out their tasks. The use of information technology and systems in hospitals is considered beneficial and facilitates the ability of officers to complete their duties (Mollart et al., 2020).

From the results of the interview with the Ahmad Dahlan Hospital in Kediri City, currently the problems related to the EMR implementation process, there are several obstacles faced by medical personnel and system users, one of which is adaptation to the new system. Most users who are not familiar with electronic recording have difficulty in data input. This is due to the significant difference between manual and digital record-keeping, which requires a change in habits and adjustments in the workflow in the hospital. Therefore, the right strategy is needed to support this transition so that the system can run optimally.

In addition to obstacles in adaptation, there are also several challenges in the implementation of EMR, such as monitoring and evaluating the use of EMR periodically, ensuring that the system used is user-friendly, and aligning the EMR system with the "Satu Sehat" format launched by the Ministry of Health. This challenge requires careful planning and support from various parties, including medical personnel, hospital management, and health information system developers.

In the early stages of EMR use, many medical personnel had difficulty adapting to the new system. Some of the obstacles that often occur are the lack of adequate training, resistance to change, and the limitations of the infrastructure that supports the implementation of EMR. Therefore, a comprehensive strategy is needed to improve the skills of medical personnel in the use of the system, including ongoing training and socialization.

Over time, the development of electronic medical record systems in hospitals continues to increase. The development of this system began in 2022 with the implementation of EMR in Emergency Installations (IGD), followed by the implementation of EMR in Outpatient Installations in 2023, and is currently in the implementation stage of EMR for Inpatient Installations in 2024. This development shows the hospital's commitment to implementing the digitalization of health services to improve the quality of services to patients.

Human resources (HR) and organizational factors play an important role in the success of technology acceptance, SIMRS is an innovation in the development of technology that is optimal for services. With this, the researcher conducts socialization in health services, especially in pharmaceutical installations in making SOPs and SIMRS process flows in the implementation of ERM in the Pharmacy Unit (Kau et al., 2024).

EMR implementation can also pose challenges and barriers, such as inadequate support from hospital management, lack of training and socialization for EMR users, and limited technology infrastructure in the hospital. Therefore, evaluating the implementation of EMR in hospitals is essential to ensure that the system is functioning properly and making a positive contribution to services in hospitals (Mulyana et al., 2023).

2. Materials and Methods

The research design is in the form of quantitative research with an analytical observational research method, while when viewed based on time, this study uses a cross sectional approach. This research will be carried out in March-April 2025 at RSM Ahmad Dahlan, Kediri City. The population in this study is all health workers at Ahmad Dahlan Kediri Hospital, namely 382 health workers. A total of 192 samples were obtained by purposive sampling technique. Independent variables are the human resource aspect, the organizational aspect and the technological aspect. While the dependent variable is the

implementation of EMR. The research instrument is in the form of a questionnaire. Data analysis uses univariate analysis, bivariate analysis with Spearman Rank, and multivariate analysis uses multiple linear regression analysis

3. Results

3.1 Univariate Analysis

Table 1. Frequency distribution of research subjects by age, gender, length of employment, last education, profession, employment status and EMR implementation

Characteristics	n	%
Age		
21-30 years old	64	33,3
31-40 years old	107	55,8
41-50 years old	21	10,9
51-60 years old	0	0,0
Gender		
Woman	139	72,4
Man	53	27,6
Length of work		
< 1 years	15	7,8
1-3 years	28	14,6
4-6 years	43	22,4
7-10 years	40	20,8
> 10 years	66	34,4
Final education		
Senior High School	1	0,5
Diploma I	2	1,0
Diploma III	78	40,6
S1 / DIV	58	30,2
S1 and Profession Programme	52	27,2
S2	6	0,5
Profession		
Doctor	18	9,4
Ners	11	5,7
Nurse	124	64,6
Midwife	24	12,5
Nutritionist	6	3,1
Pharmacist	5	2,6
Admin	4	2,1
Employment status		
Honor	2	1,0
Contract	105	54,7
Remain	85	44,3
EMR Implementation		
Fully implemented	130	67,7
Implemented incomplete	61	31,8
Absolutely never applied	1	0,5

Based on Table 1, the results of the characteristics of the research subjects are shown based on age, gender, length of employment, last education, profession, employment status and EMR implementation. In the age category, most of the respondents were 31-40 years old, namely 107 respondents (55.7%). The gender category of respondents was mostly female, namely 139 respondents (72.4%). The length of work of most respondents was more than 10 years, namely 66 respondents (34.4%). The last education of most respondents was DIII education, which was 78 respondents (40.6%). The employment status of the majority of respondents is contract employees, namely 85 respondents (44.3%). Most of the EMR implementations have been fully implemented, namely 130 respondents (67.7%).

Table 2. Characteristics of Research Variables

Variable	Mean	Median	Min	Max	SD
Human Resources Aspects	31,57	32,00	21	40	4,094
Organizational aspects	36,48	36,00	25	45	4,266
Technological aspects	67,04	68,00	35	85	9,996

Based on Table 2, the results of the characteristics of the research variables are the human resource aspect, the organizational aspect and the technological aspect (system quality, information quality, service quality). The mean value in the variables of the human resource aspect is 31.57, the organizational aspect is 36.48 and the technology aspect (system quality, information quality, service quality) is 67.04. The median score in the variables of the human resource aspect is 32.00, the organizational aspect is 36.00 and the technology aspect (system quality, information quality, service quality) is 68.00. The min value in the variables of the human resource aspect is 21, the organizational aspect is 25 and the technology aspect (system quality, information quality, service quality) is 35. The max value in the variables of the human resource aspect is 40, the organizational aspect is 45 and the technology aspect (system quality, information quality, service quality) is 85. The SD score in the variables of the human resource aspect is 4,094, the organizational aspect is 4,266 and the technology aspect (system quality, information quality, service quality) is 9,996.

3.2 Bivariate Analysis

Table 3. Factors Affecting the Implementation of Electronic Medical Records (EMR) with the Human Organization Technology (HOT) FIT Approach

Independent variables	Bound variables	p value	r value
Human Resources Aspects	EMR Implementation	0,000	0,468
Organizational aspects		0,001	0,237
Technological aspects		0,000	0,362

Based on Table 3 with the spearman rank test, the results show that there is an influence of the human resource aspect with a value of p = 0.000 and a value of r = 0.468, an organizational aspect with a value of p = 0.001 and a value of r = 0.237 and a technology aspect (system quality, information quality and service quality) with a value of p = 0.000 and a value of r = 0.362 on the implementation of Electronic Medical Records (EMR) with the Human Organization Technology (HOT) FIT approach.

3.3 Multivariate Analysis

Table 4. Results of Analysis of Factors Affecting the Implementation of Electronic Medical Records (EMR) with the Human Organization Technology (HOT) FIT Approach

Independent variables	Dependent variables	*Unstandardized Coefficient*		*Standardized Coefficient*	t	*Sig.*
		B	*Std.Error*	*Beta*		
Human Resources Aspects	EMR Implementation	0,048	0,281	0,411	4,036	0,000
Organizational aspects		0,023	0,012	0,203	2,006	0,046
Technological aspects		0,011	0,011	0,228	2,015	0,045
Coefficient of Determination (*R Square Value*) : 0,221						

Based on table 4, it shows that the results of linear regression analysis show an R Square determination coefficient of 0.221 which means that this study can explain 22.10% of the relationship of variables in the study, namely the human resource aspect, the organizational aspect and the technology aspect (system quality, information quality and service quality) affect the implementation of Electronic Medical Record (EMR) with the Human Organization Technology (HOT) FIT approach. The results of the p value showed that there was an influence of the human resource aspect with a value of p=0.000, the organizational aspect with a value of p=0.046 and the technology aspect (system quality, information quality and service quality) with a value of p=0.045 on the implementation of Electronic Medical Records (EMR) with the Human Organization Technology (HOT) FIT approach. Multivariate analysis showed that the most influential variable was the human resource aspect with a significance level of p=0.000 and B=0.048.

4. Discussion

4.1 The Influence of Human Resources on the Implementation of EMR

The results showed that the HR aspect had a very significant influence on the success of EMR implementation at Ahmad Dahlan Kediri Hospital, with a p = 0.000 and r = 0.468 value, which showed a moderate but significant relationship between the quality of human resources and the application of EMR technology.

Human resources have a crucial role to play in the adoption and implementation of EMR. Various factors related to human resources, such as age, gender, education, length of employment, and profession, turned out to play an important role in the process of implementing EMR (Menant et al., 2021). These individual characteristics determine the extent to which healthcare workers or hospital workers are able to adapt to the new system and use it effectively. In this study, younger age groups, i.e. between 31-40 years, were more adaptable to new technologies such as EMR. This age group, which tends to be more familiar

with digital technologies, shows better results in EMR implementation because they are more open to change and faster in understanding how the new system works. In contrast, older age groups often face challenges in adopting new technologies due to limited technology experience (Haluza & Wernhart, 2019). Gender in this study did not show a significant effect on the application of EMR. However, although no significant influence was found in this study, previous research has shown that gender does not play a major role in the adoption of technology in the health sector. However, other research has shown that women may be more likely to adopt technology if provided with stronger social support, such as support from colleagues and superiors (Lee et al., 2025b).

The latter education proved to be a significant factor in the successful implementation of EMR (Mulyana et al., 2023). Most of the respondents in this study had a DIII educational background (40.6%), which shows that health workers with higher education backgrounds are faster to understand the concept and how the EMR system works. According to Lee, Ramasamy and Subbarao (2025a), Higher education levels are directly related to a person's ability to adapt and operate medical technology.

Length of work also plays an important role in the implementation of EMR. Respondents with more than 10 years of experience in their jobs tend to be more skilled and more confident in operating new systems. Their previous experience in managing manual medical records allowed them to more easily adapt to the changes brought about by EMRs. Nonetheless, they may also face challenges related to the old habit of using manual systems, which can slow down the adoption process of new technologies. The medical officer profession and hospital administration also influence how they implement EMR. Healthcare workers who are more trained and used to working with medical information systems have an advantage in adopting this new technology. Administrative officers, on the other hand, are more directly involved in data input and EMR maintenance, so their understanding of the medical administration process is critical in ensuring the smooth implementation of the system (Benianto, 2020).

Ongoing education and training are key factors in ensuring that hospital human resources can adapt to the EMR system. The study also highlights the importance of ongoing training and education in ensuring the successful implementation of EMR. HR who are well-trained and informed about the benefits and how to use EMRs are more likely to adapt quickly and make optimal use of this technology. Research by Musa *et al.* (2023) shows that intensive training improves the technical ability of health workers to operate EMR systems more efficiently, which has a direct effect on the success of implementation.

Based on the *Human, Organization and Technology – Benefit* (HOT-Fit) Method, the competencies and skills of human resources have a direct effect on the success of the application of new technologies, especially in the health sector which relies heavily on technical expertise (Xu & Lu, 2022). In addition, research by Lelyana (2024) Demonstrated that continuous training and education in the use of health information technology increases the adoption of technology in hospitals and improves work efficiency and reduction of medical errors.

From the results of this study, it can be concluded that the success of the implementation of EMR is highly dependent on the quality of the human resources involved. Therefore, hospitals and other health institutions need to pay more attention to human resource education and training, especially in the use of health information technology. Additionally, also pay attention to individual characteristics, such as age, education, and work experience, which can affect the success rate of EMR implementation.

For this reason, it is important for hospitals to provide continuous training, both from the technical and non-technical sides, to prepare medical and administrative personnel to face this digital transformation.

4.2 The Influence of Organization Aspects on the Implementation of EMR

Based on the results of the regression test conducted, it was found that the organizational aspect had a significant influence on the implementation of EMR, with a value of p = 0.001 and a value of r = 0.237. Although the influence is smaller than the human resources (HR) aspect, the organizational aspect still shows a significant contribution to the success of EMR implementation, with a determination coefficient (R^2) of 22.1% indicating a positive relationship between organizational variables and EMR implementation.

In this study, factors related to organizational aspects include leadership support, officer support, budget, and coordination (Gunawan, 2023; Kau et al., 2024; Kurniawan et al., 2022; Wager et al., 2021). The success of EMR implementation depends not only on individual readiness (as described in the discussion of HR aspects), but also on the organizational structure that supports the adoption of new technologies. In an organization, the support from the leadership greatly influences how new technologies are applied. Without commitment from leadership, EMR implementation tends to be less effective, even though the technology is technically ready. Leaders and those in authority must give full support to the use of this technology, both in terms of budget, training, and the formulation of supportive policies (Kurniawan et al., 2022).

A clear and coordinated organizational structure facilitates EMR adoption. Hospitals that have a well-organized structure and a clear separation of duties between departments will find it easier to implement a medical information system such as EMR. Coordination between departments is essential in ensuring that every part of the hospital involved in the management of medical data can access and utilize the system optimally (Ludwick & Doucette, 2009).

Organizational policies that encourage the use of technology, as well as clear SOPs related to electronic medical record management, have a major influence on the implementation of EMR. Policies that support the consistent use of EMR systems

will ensure that every healthcare worker and administrative personnel has clear guidelines on how to manage patient medical data using this technology (Kurniawan et al., 2022).

Effective communication between departments is a key factor in the implementation of EMR. When departments have a good and open flow of information, it will be easier for them to understand the purpose of using EMRs, as well as be faster in adapting their work processes to the new system. Conversely, the lack of communication and synchronization between departments can lead to difficulties in the implementation of EMR, especially in integrating data between the departments involved, such as the pharmacy, diagnostics, and patient care departments (Laurenxius et al., 2025).

In the context of EMR, organizational factors such as supportive policies, clear structures, and effective communication between departments will help ensure that the EMR system is acceptable and well-operated by all parties.

Previous research by Maharani (2024) also shows that a supportive organizational structure and clear internal policies are essential to optimize the implementation of health information systems, including EMRs. They found that hospitals with more flexible structures and better communication between departments tended to be more successful in implementing information technology systems.

The researchers argue that organizational aspects have a significant influence on the implementation of EMR, with factors such as managerial support, organizational structure, internal policies, and communication between departments playing a role in ensuring successful implementation. Hospitals that have policies that support technology, as well as effective communication between departments, will be more successful in integrating EMR systems and improving the efficiency of medical services.

4.3 The Influence of Technology Aspects (System Quality, Information Quality, Service Quality) on the Implementation of EMR

Based on the results of the study, it was found that technological aspects such as System Quality, Information Quality, and Service Quality had a significant influence on the implementation of EMR, with a value of $p = 0.000$ and a value of $r = 0.631$. This shows that the higher the quality of technology, the better the implementation of EMR in healthcare institutions.

System Quality refers to the ease of use, performance, speed, and reliability of EMR systems implemented in hospitals. The results show that better system quality, such as user-friendly and reliable systems, is directly related to the rate of acceptance and more effective use by medical personnel and hospital administration. Understanding of ease of use is one of the important factors that allows the adoption of technology in hospitals. A system that is easily accessible, less complicated, and has a fast response time will encourage healthcare workers to use the system more often, rather than opting for manual methods (Pearlson et al., 2024). For example, research by Bhati, Deogade and Kanyal (2023) shows that a stable and responsive system is highly influential in ensuring its consistent use in hospitals. Users are more likely to use an EMR system if it is reliable and does not cause disruption in the administrative process.

The information quality aspect in EMR includes the accuracy, completeness, and consistency of the data recorded in the system. The results revealed that the quality of good information is directly related to better medical decision-making, as accurate and complete data allows doctors and other medical personnel to carry out diagnosis and treatment more effectively. The accuracy and reliability of data is crucial in an EMR system because the medical decisions made based on this data will affect the patient's treatment process. Complete and up-to-date information minimizes medical errors and improves the efficiency of patient data management (Jia et al., 2021). Penelitian oleh Adane, Gizachew and Kendie (2019) Demonstrate that accurate and timely information in the medical record system can assist doctors in understanding the patient's medical history and planning more appropriate treatment.

The quality service aspect refers to the technical support, training, and assistance provided by the hospital in supporting the use of EMR. The results of this study show that good service support, including ongoing training for medical personnel and hospital administration, strongly influences the use of more effective EMR systems. Service Quality also includes the provision of technical assistance in the event of problems or errors in the use of EMRs. Proper training on the use of the system ensures that healthcare workers and administrators can make optimal use of the technology without any confusion or frustration (Jia et al., 2021). In a study conducted by Utama et al. (2024), It was found that responsive and continuous service support has a positive influence on user satisfaction of hospital information systems, as well as accelerating technology adoption.

The results of this study are in line with Al-Adwan et al. (2022), which states that the success of information system implementation depends on three main factors, namely System Quality, Information Quality, and Service Quality. This model underscores that to ensure the success of health information systems such as EMRs, all such aspects must be carefully considered.

Research by Liu et al. (2021) also support these findings, where they show that system quality, information quality, and good service quality will improve the success of EMR implementation in hospitals. A high-quality EMR system, accurate information, and responsive service will lead to user satisfaction and system effectiveness (Astuti & Fahyudi, 2023).

The researcher argues that technological aspects that include System Quality, Information Quality, and Service Quality are proven to have a very significant influence on the implementation of Electronic Medical Records (EMR) in hospitals. To improve EMR implementation, it is important for hospitals to provide reliable systems, precise and accurate information, and adequate service support for users. Thus, the implementation of EMR in hospitals can run more effectively, reduce medical errors, and improve the quality of healthcare services.

5. Conclusions

The conclusion of this study is that both leadership and work motivation have a significant effect on employee work performance at Panasea Medika Madiun Clinic. This study recommends that the management of Panasea Medika Madiun Clinic increase efforts to improve work motivation and leadership quality to improve employee work performance. Further research can expand on the research variables and consider other factors that may affect job performance.

Conflict of Interest

There is no conflict of interest

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