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Evaluation of the Implementation of Electronic Medical Records (EMR) in SIMRS Morbis at Hospital X Using HOT-Fit Method

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Abstract: Evaluation of the implementation of Electronic Medical Records (EMDR) in the Hospital Management Information System (SIMRS) is crucial to ensure the effectiveness of health services. This study examines the implementation of EMR in SIMRS MORBIS at Hospital X. The purpose of the study was to evaluate the success of the implementation using the HOT-Fit model by analyzing the Human, Organizational, Technology, and Net Benefit aspects. The research method used a quantitative approach by distributing HOT-Fit -based questionnaires to SIMRS MORBIS users, and the data was analyzed descriptively. The results showed a successful implementation of the human component (average score of 3.95) showing high adoption and satisfaction, the organizational component (3.85) was supportive but internal communication needed to be improved, the technology component (3.58) had good information quality, but system quality needed attention and significant Net Benefit (3.83-3.91) was achieved in efficiency and service quality. It was concluded that the implementation of EMR in SIMRS MORBIS at Hospital X was generally successful and had a positive impact, but optimization of the system quality and internal communication of the organization was needed to improve overall performance.

Keywords: RME, SIMRS, HOT-Fit, Implementation Evaluation

INTRODUCTION

In today's digital era, technological progress is very significant, so it is very important to develop an information system (Amri Handayani et al., 2023). In Indonesia, the information system that is developing is the application of Electronic Medical Records (EMR). EMR is an electronic information system that contains various information related to health, diagnosis results, disease history, actions, information on medical costs and other medical data (Neng Sari Rubiyanti, 2023).

However, there are still obstacles regarding the implementation of RME, namely inadequate facilities and infrastructure. For example, unstable networks and connections, not implementing a security system with full protection that only implements a basic security

system, and a lack of human resources or insight in the field of RME, guidelines and SOPs (Standard Operating Procedures) (Rosalinda et al., 2021).

Hospital X is one of the few hospitals that implements RME using the Morbis Hospital Management Information System (SIMRS). The implementation of RME at Hospital X shows that currently there are obstacles in implementing RME, both from humans, organizations, technology or *Net Benefit*.

The study (Amri Handayani et al., 2023) showed that the evaluation of the use of RME using the *HOT-FIT method* at the PKU Muhammadiyah Surakarta Hospital showed good results from individuals, organizations and benefits. However, there are obstacles in the technology component that still often experience network errors because the network is constantly busy, but the available network uses ISP *bandwidth* up to 300 Mbps.

According to the study (Ning Widyastuti et al., 2020), it is necessary to evaluate the performance and security of the RME system to protect data included in the RME application and the addition of computer tools to help users meet their needs while working. Based on the two research results, it was found that the obstacles to implementing SIMRS lie in the technological aspects that need to be considered to maximize the effectiveness of implementing SIMRS.

This study aims to identify the obstacles to the implementation of RME in SIMRS and analyses the influence of factors that affect the effectiveness of RME use. This study applies descriptive quantitative research with the *HOT-Fit method* to determine the five aspects of *Human, Organization, Technology, and Net Benefit and Fit* in the implementation of RME in Hospital X.

The results of this study are expected to provide recommendations for hospitals to improve the implementation of RME, as well as become a reference for other hospitals experiencing similar problems.

METHOD

This study applies to a descriptive quantitative method with a *cross-sectional design*. The selection of this method is based on the characteristics of the data in the form of questionnaire responses collected in a certain period. The study aims to assess the implementation of SIMRS MORBIS by measuring user perceptions based on the components in the *HOT-Fit model*, as well as describing the actual conditions of the implementation of the system at Hospital X.

The population in this study were all medical record employees at Hospital X who actively use the RME feature on SIMRS MORBIS and have worked for at least 6 months. The target population in this medical record department is 25 people. The research sample consisted of 17 (seventeen) medical record employees who met the inclusion criteria. The sampling technique used was *purposive sampling*, where researchers selected respondents who were considered most appropriate for the research objectives based on predetermined criteria (Arif Rachman et al., 2024). Given the specific population size and clear criteria, this approach also approximates the total sampling effort for the most relevant subgroups.

The research instrument used is a structured questionnaire developed and adapted based on the parameters and dimensions in the *HOT-Fit model*. This questionnaire consists of several sections that represent specific dimensions, including Human (system usage, user satisfaction, user knowledge and skills), Organization (management support and organizational structure, resources, policies and procedures, work culture and communication), Technology (system quality, information quality), and question items designed to measure user perceptions of the system's *Fit and the Net Benefit obtained*. (Prih Diantono Abdi's, 2018) Most of the question items use a *Likert scale* with a score range of 1 (for example, Strongly Disagree/Very Low) to 5 (Strongly Agree/Very High).

Data collection was carried out after obtaining approval from Hospital X and *informed consent* from prospective respondents. The questionnaire was distributed to predetermined samples online via the *Google Forms platform*, where the link was shared directly with the respondents. Respondents were explained the purpose of the study and were guaranteed the confidentiality of their identities and answers. The questionnaire was filled out independently by respondents during the period of May 2025.

Microsoft Excel software. The analysis steps include (1) Data cleaning and tabulation, (2) Calculation of the average score (mean) for each indicator and each main component of *HOT-Fit*, (3) Percentages are used to describe the demographic characteristics of respondents or the distribution of certain answers if relevant. Furthermore, the average score of each *HOT-Fit component* is categorized to determine the assessment level. The class interval is calculated using the following formula (I):

$$\text{Interval Kelas} = \frac{(\text{Highest Likert Scale Score} - \text{Lowest Likert Scale Score})}{\text{Number of Assessment Categories}}(I)$$

With a Likert scale of 1-5 and 5 (five) assessment categories used (Very Low, Low, Sufficient, High, Very High), the class interval is $(5 - 1) / 5 = 0.8$. The assessment categories used are 1.00 – 1.80 which means very low, 1.81 – 2.60 which means low, 2.61 – 3.40 which means sufficient and 3.41 – 4.20 which means High, 4.21 – 5.00 which means very high.

This study has obtained ethical approval from Hospital X, especially the medical records department before implementation. Official permission to conduct the study has also been obtained from the management of Hospital X. Each respondent was given a complete explanation of the purpose of the study, procedures, benefits, potential risks, and the voluntary nature of participation. *Informed consent* was obtained from all respondents before filling out the questionnaire. The confidentiality of the respondents' identities and all data provided is well maintained and is only used for the purposes of this study.

RESULT AND DISCUSSION

Results

In this study, SIMRS Morbis users were used as respondents, especially in the medical records section. The characteristics of respondents in this study include gender, position and length of service as SIMRS MORBIS users. The distribution of respondent characteristics can be seen in table 1 below.

Table 1. Respondent Characteristics

Characteristics Respondents	Frequency	Percentage
Gender		
Man	9	53%
Woman	8	47%
Position		
Head of Medical Records	1	6%
Admission	2	12%
IT Staff	1	6%
Medical Records Staff	13	76%
Length of work		
< 6 years	15	88%
> 6 years	2	12%
Duration of Use System		
< 1 year	5	29%
> 1 year	12	71%

Based on table 1, the gender, most are male (53%). Judging from the position, most respondents are medical record staff (76%). Judging from the length of service, most respondents have a service period of <6 years (88%) while in terms of the length of use of the system, most respondents use the system > 1 year (71%). The results of the SIMRS Morbis evaluation using the *HOT-Fit method* at Hospital X can be seen in table 2 below.

Table 2. Evaluation of SIMRS MORBIS with the *HOT-Fit Method*

Component	Subcomponents	Score	Overall Score	Information
Man	Use system	4.14	3.95	Tall
	User Satisfaction	3.94		
	Knowledge and Skills Users	3.78		
Organization	Management Support and Organizational Structure	3.82	3.85	Tall
	Resource	3.82		
	Policies and Procedures	3.82		
	Culture and Communication	3.94		
Technology	Quality system	3.38	3.58	Tall
	Quality Information	3.77		
Compliance		3.83	3.83	Tall
Net Benefits		3.91	3.91	Tall

Based on table 2, overall based on the *HOT-Fit method*, all components obtained are high. This shows that SIMRS Morbis has shown optimal performance in assisting the performance of the medical records department in providing health services at Hospital X. The human component recorded the highest score (3.95), driven by high system usage (4.14) and user satisfaction (3.94), which indicates ideal system adoption and interface design that suits user needs. The organizational component obtained a score (3.85) with strong work culture support (3.94) and adequate resource allocation (3.82). However, internal communication is a sub-component that needs to be strengthened because it recorded the lowest score in this component. Meanwhile, the technology component with a score (3.58) shows a gap between good information quality (3.77) and system quality that still needs to be improved (3.38), especially in terms of system reliability and speed. The Suitability and *Net Benefit components* scored (3.83) and (3.91), indicating a positive impact on operational efficiency and quality of medical records services. The *Net Benefit* component contributes to the optimization of workflow and improvement of the quality of medical record services. Although the implementation of SIMRS MORBIS has succeeded in achieving strategic objectives, improvements in system quality are a priority to improve overall performance.

Discussion

SIMRS evaluation is an important effort to understand the actual conditions of the implementation of the system, which is the backbone of clinical operations and services (Karma et al., 2022). This fundamental evaluation is important to measure the success of the system, improve service quality, ensure regulatory compliance, and identify areas of improvement (Ning Widyastuti et al., 2020). The *HOT-Fit method*, with its holistic approach to the Human, Organization, Technology *components*, and the fit between the three that leads to *Net Benefit*, provides a comprehensive framework for evaluating information systems in the health sector (Prih Diantono Abda'u, 2018). This framework is relevant because it considers the core components of the information system and crucial organizational elements. In general, the findings of this study indicate that the implementation of SIMRS MORBIS has achieved a satisfactory level of success, with all major components in the *HOT-Fit framework* showing strong performance.

The human component is a central element in the successful adoption of information systems, considering the role of users and information providers in the system ecosystem (Karma et al., 2022). In this evaluation, the human component showed the most superior results among other *HOT-Fit components*. High scores on the sub-components of system use and user satisfaction indicate an optimal level of adoption and positive acceptance of SIMRS MORBIS by users. High scores on the system use indicator indicate that users are not only motivated to interact with the system regularly but also utilize its features to support their work activities (Angela Floresta et al., 2025). Meanwhile, high user satisfaction implies that users feel comfortable and helped by the interface design and functionality of the system (Cintiya Febrianti et al., 2020). User satisfaction and *perceived ease of use* are known to be positively correlated with the intention and level of system use (Angela Floresta et al., 2025). A study (Karma et al., 2022) at Andi Makkasau Hospital in Pare-pare found very good or high results on the human component in the evaluation of SIMRS or RME using *HOT-Fit*. Adequate training for users is also an important factor that is reported to contribute to knowledge and positive attitudes towards system use, which in turn can increase satisfaction and perceived benefits (Amri Handayani et al., 2023). However, it must be acknowledged that, in contrast to the positive experiences here, other studies have found challenges in the human aspect, such as user resistance, adaptation difficulties especially among senior doctors who find typing slower than writing (Fenilho & Ilyas, 2023), or the need for ongoing personal monitoring and assistance to overcome the obstacles faced by users in the field (Dimas Aji Saputra, 2024).

Organizational components, including work structure and environment, play a crucial role in supporting information system implementation (Dimas Aji Saputra, 2024). This evaluation shows that, in general, the organizational components in the implementation of SIMRS MORBIS have been running strongly. High scores on work culture support and resource availability indicate a supportive environment from management and colleagues, as well as adequate allocation of budget and system support facilities (Situmorang & Fatikasari, 2023). Strong support from management, often manifested through formal policies, is a determining factor in the success of information system implementation. This finding is in line with the SIMRS (Dimas Aji Saputra, 2024) *HOT-Fit* evaluation study at RSD Mangusada which also reported very good results for the organizational component (Karma et al., 2022). However, it should be noted that internal communication is the only indicator in this component that shows a relatively lower score, although still in the high category. This suggests that, although overall organizational support is strong, the delivery of information related to the system (eg updates, changes in procedures) may still need improvement (Dimas Aji Saputra, 2024). The study (Dimas Aji Saputra, 2024) identified organizational components, including staffing structures and interdepartmental communication, as areas that require improvement due to the lack of regular socialization and fulfillment of IT human resources.

The technology component in the *HOT-Fit model* evaluates the quality of the information system, including system quality, information quality, and service quality (Hasibuan et al., 2024). The results of the SIMRS MORBIS evaluation show that the overall technology component is in the high category. However, a deeper analysis reveals a difference between the assessment of good information quality and system quality which, although still high, scores lower. Information quality that is assessed as good indicates that the data processed and presented by SIMRS MORBIS is considered accurate, relevant, timely, complete, and easy to understand by users. This good information quality is very important because it contributes to user satisfaction (Hasibuan et al., 2024). However, system quality that scores lower indicates that there is a need for improvements in the basic technical performance of the system, especially related to reliability (system reliability, minimal *error/downtime*) and response speed (Situmorang & Fatikasari, 2023). The study (Ning Widyastuti et al., 2020) reported that at Primasatya Husada Citra Hospital Surabaya there were issues related to system slowness,

slow response, or sporadic *errors*. This study also noted obstacles such as unstable networks and security, and at Panti Wilasa Citarum Hospital where the quality of technical services related to system implementation was reported to have not been fully met and still needed adjustments to improve the system and fulfill infrastructure facilities (Dimas Aji Saputra, 2024). On the other hand, a study (Fenilho & Ilyas, 2023) at X Hospital, North Bengkulu, found in contrast that the implementation of RME was not optimal because the system was considered to be limited to moving from paper to screen, with various functional limitations such as limited access on gadgets, the absence of auto-duplication features, *checklists*, or images, and still using paper medical records for some parts, which showed an assessment of the technology component that was not as good as the findings in SIMRS MORBIS. Security issues were also raised as an area that needed to be tested and improved in several studies (Rosalinda et al., 2021). Although the overall quality of the SIMRS MORBIS system is still in the high category, improvements in the aspects of reliability and speed are very strategic to significantly improve operational efficiency and user experience. The quality of support services, such as the availability of special staff to help users deal with technical problems, is also important to ensure smooth use of the system (Cintiya Febrianti et al., 2020).

Net Benefit measures the overall impact of system use on individual users, teams, and organizations (Amri Handayani et al., 2023). The results of the SIMRS MORBIS evaluation show a very high *Net Benefit achievement*, which confirms the positive contribution of the system at various levels. The highest assessments on business process support and clinical impact clearly confirm that system implementation contributes to increasing hospital operational efficiency, optimizing workflows, and improving the quality of health services for patients (Setiatin et al., 2024). The benefits felt by users can include accelerated task completion, increased productivity, better data accuracy (Cintiya Febrianti et al., 2020), ease of data access, and support in the clinical decision-making process (Coelestina Astri Bhoko, 2024). This high *Net Benefit is consistent with the findings of the SIMRS HOT-Fit evaluation* at RSD Mangusada which also reported very high benefits (Karma et al., 2022). The use of RME is generally expected to minimize medical errors and improve the quality of claim files (Kamal & Mardi, 2024). However, in contrast, research conducted (Fenilho & Ilyas, 2023) at RS X Bengkulu Utara reported no improvement in the quality of BPJS claims after the implementation of RME, with the percentage of pending claims (disputes) increasing, especially related to the selection of the main diagnosis. These findings suggest that the impact of RME on *Net Benefit*, particularly in areas such as claims quality, may vary across institutions and may not necessarily be positive without adequate system development and adaptation (Dimas Aji Saputra, 2024). Despite these contrasts, the overall high *Net Benefit score* in this MORBIS SIMRS evaluation indicates that the system is not only being adopted and used but is also effectively supporting the achievement of the hospital's strategic goals and providing positive impacts.

Overall, the implementation of SIMRS MORBIS showed success with strong performance in the human, organizational, and *Net Benefit components* generated. However, the evaluation results also highlighted the need for priority on improving the quality of the system in the technology component to ensure more optimal reliability and speed in the future, as well as the need for continuous monitoring and evaluation to maintain and maximize system performance to support excellent health services.

CONCLUSION

Evaluation of the implementation of RME in SIMRS MORBIS using a model such as *HOT-Fit* is important to identify the conditions, obstacles, and benefits of the system. Various studies have shown that the human component is generally positive with good acceptance and use, although adaptation and further training are sometimes required. However, the technology

component is often a major challenge due to performance constraints, lack of essential features and integration, infrastructure needs, and data accuracy and security issues. While organizational support through policies and training is often considered good, the fulfillment of IT human resources, system communication, and coordination between units still need improvement. As a result, the great potential of SIMRS MORBIS for improving efficiency and service quality is often not optimally achieved. Therefore, the main recommendations include improving the quality of the system and infrastructure, improving IT training and support, optimizing data input, and routine system evaluation and testing. Further research is recommended to explore other factors, combine evaluation methods, and expand perspectives beyond single users for a more comprehensive understanding.

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