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Evaluation of Electronic Medical Records with the Hot-Fit Model: A Qualitative Study at RSGM Iik Bhakti Wiyata Kediri

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Abstract

Medical records are essential documents that capture a patient's medical history, including diagnoses, treatments, medications, and other clinical data. Advances in technology have transitioned medical records from paper to electronic formats, becoming a key component of Hospital Management Information Systems (SIMRS). This study aims to evaluate the application of the electronic medical record system (RME) at the Dental and Oral Hospital (RSGM) IIK Bhakti Wiyata Kediri using the HOT-Fit framework. The approach used is qualitative descriptive with case studies, conducted through in-depth interviews with a number of selected informants. The results of the evaluation show that aspects of organizational structure, organizational culture, technological infrastructure, and user understanding still need further attention and development. In addition, the sustainability and effectiveness of the system are also influenced by other supporting factors. Based on these findings, there is a suggested need for comprehensive strategic planning and infrastructure improvements to ensure that the system can run optimally and meet the needs of users on a sustainable basis.

Keywords: Electronic Medical Record, HOT-Fit, medical history

INTRODUCTION

Medical records are important documents that record a patient's medical history, including diagnosis, therapy, medications, and other clinical information (Alhur, 2024; He et al., 2021; Janett & Yeracaris, 2020; Lorkowski & Pokorski, 2022; Nguyen et al., 2017; Sanjaya et al., 2023). Technological developments have driven the transformation of medical records from paper to electronic medical records (*Rekam Medis Elektronik* or RME), which are now an integral part of Hospital Management Information Systems (*Sistem Informasi Manajemen Rumah Sakit* or SIMRS) (Lorkowski & Pokorski, 2022; Kaufhold & Markus Bayer, 2020). The implementation of RME in Indonesia has further accelerated following the issuance of the Minister of Health Regulation No. 24 of 2022, which requires all health service facilities to switch to electronic systems (Savitri, et al., 2024).

RME functions not only as a documentation tool but also as a subsystem that supports patient data management, operational efficiency, and interdepartmental integration within hospitals (Arora & Ikbal, 2023; Darwis et al., 2023; Hertin & Al-Sanjary, 2018; Leng et al., 2021; Makalesi et al., 2021). The success of RME implementation depends heavily on system

readiness, ongoing training, and organizational and technical support for users (Erlirianto, et al., 2015).

The IIK Bhakti Wiyata Kediri Dental and Oral Hospital (Rumah Sakit Gigi dan Mulut or RSGM) has become a pioneer in the implementation of SIMRS in Kediri City. However, preliminary study results show that the implementation of SIMRS at RSGM IIK Bhakti Wiyata still faces various obstacles, such as the low level of data input by several service units and the preference of some users for manual methods (Suryandari, et al., 2024). As a result, integration and completeness of medical record data are often not optimal.

Internal data show that the average incompleteness of patient medical records at RSGM IIK Bhakti Wiyata is expected to reach 99% in 2024, far below the minimum standard set (Medical Record Data, 2024). This incompleteness has the potential to hinder the quality of service and patient safety, considering that medical record completeness is an important indicator in the Minimum Service Standards for Hospitals (Permenkes No. 269 of 2008; Ministry of Health No. 129 of 2008).

Therefore, to identify the factors affecting the completeness of RME documentation, a thorough evaluation using the HOT-Fit framework is required. This framework includes the human, organizational, technological, and net benefit aspects of the system (Yusof, et al., 2008). This model can provide a deeper understanding of the obstacles and potential improvements in the implementation of RME at RSGM IIK Bhakti Wiyata Kediri.

Previous studies have explored the implementation of electronic medical records (EMR) in hospitals. Lorkowski & Pokorski (2022) and Kaufhold & Markus Bayer (2020) highlighted the benefits of EMR in enhancing operational efficiency and interdepartmental integration. However, while these studies provided insights into the potential of EMR, they primarily focused on technical aspects and did not address implementation barriers such as system readiness, ongoing training, and organizational support. Meanwhile, Yusof et al. (2008) used the HOT-Fit framework to evaluate factors affecting hospital information system success, but this research did not specifically address challenges faced by hospitals in Indonesia, such as those at RSGM IIK Bhakti Wiyata Kediri, which encounters significant issues with incomplete data entry and user preference for manual methods.

This study aims to evaluate the completeness of RME documentation based on the HOT-Fit model at RSGM IIK Bhakti Wiyata Kediri, to provide recommendations for improving service quality and developing hospital information systems in the future. The benefits of this research are expected to enhance service quality and patient safety by ensuring EMR completeness in line with established standards.

RESEARCH METHOD

The method applied in this study was a qualitative descriptive approach with a case study design, aiming to gain an in-depth understanding of the evaluation of electronic medical records (RME) using the HOT-Fit model. Data collection was carried out through in-depth interviews with four informants who were purposively selected, consisting of dentists who used outpatient RMEs, outpatient medical record officers (Rekam Medis Rawat Jalan or RJ), IT officers, and representatives from top management. The selection of these informants was based on specific criteria to ensure diversity of experience and the depth of data required. The data obtained were then analyzed using a thematic analysis approach, following stages of data

reduction, data presentation in narrative and tabulated forms, and the extraction of the main themes in accordance with the HOT-Fit framework. In addition, the entire research process adhered to ethical provisions, including obtaining permission from relevant parties and securing consent from the informants prior to conducting the interviews, to ensure the ethical integrity and validity of the data.

RESULTS AND DISCUSSION

Evaluation of RME with the HOT-Fit model

1. Human Component

   The results of interviews aimed at dentists as RME users showed that most users of the Electronic Hospital Management Information System (RME) felt that they lacked adequate knowledge about the features contained in the system. They admitted that they did not fully understand the function and procedure of using these features optimally, which affected the quality of filling in medical record data. In addition, the management admitted that socialization and training on the use of RME have not been carried out effectively, so the level of understanding of staff is still limited. In terms of user satisfaction, some informants stated that they were dissatisfied with the appearance of the RME interface which was considered too complex and full of features that had to be filled, thus causing a lack of motivation in filling in the data completely and accurately.

2. Organization Components

   The results of interviews addressed to RSGM management representatives show that in terms of organizational structure, there is no system of rewards and punishments that are consistently applied to staff in order to encourage complete and accurate RME filling. The management has conducted periodic evaluations of the use of the system, but the implementation of the evaluation is considered to have not obtained maximum results. In addition, the follow-up plan for the results of the evaluation has not shown significant developments, is still hampered and has not yet taken concrete steps from the hospital foundation or hospital management regarding improving the quality of data filling. This condition shows that aspects of organizational support, especially in terms of incentives and monitoring, still need to be strengthened to increase the motivation and performance of staff in filling RME.

3. Technology Component

   The results of interviews with IT officers show that in terms of system quality, there are a number of obstacles that affect the effectiveness of using RME. One of the main problems is the speed of internet access which is often disrupted, such as slow and slow, thus hindering the process of input and data collection efficiently. In addition, the limited number of computer units in each room is another inhibiting factor, considering that so far the use of RME has been mostly done through tablets. The use of tablets is considered less ergonomic because it is not equipped with a keyboard and the touch screen is less sensitive, making it difficult for users to fill in data quickly and accurately.

   From the aspect of information quality, the results of the interviews revealed that the completeness and timeliness of data filling is still the main challenge. Many informants stated that the data input was often incomplete and late due to limited facilities and technical

constraints. This makes the resulting information less relevant and less reliable for clinical and administrative decision-making.

Meanwhile, in terms of service quality, there are obstacles related to the development of RME features that still use old features and have not undergone significant updates. The development team from IT hospitals in Surabaya is often difficult to contact directly because they rarely meet face-to-face, and communication is only done through zoom which sometimes has to wait for a repair queue from the center. This condition causes slow handling of technical issues and the development of new features, so the system is unable to adapt to the evolving needs of users.

Overall, the technological aspect at RSGM IIK Bhakti Wiyata shows that the quality of systems and services still needs to be improved in order to support complete, accurate, and timely data filling. Improved technology infrastructure and more effective communication between the development team and users is necessary to improve the performance and sustainability of the system.

4. Benefit Component

Based on the results of the interview, the results were obtained that although the implementation of the electronic medical record system (RME) in the RSGM environment has provided significant benefits, the level of incompleteness in filling in medical record data which is still quite high shows that users still face various obstacles in accessing and utilizing the system optimally. This condition indicates that users, both health workers and administrative officers, still find it difficult to operate RME, both due to a lack of understanding of the available features and due to technical obstacles faced during the data filling process. As a result, the full potential of the benefits of this system has not been realized to the maximum, so the development and improvement of user competencies and continuous system improvements are needed so that the benefits of RME can be felt more optimally and have a positive impact on the quality of service and operational efficiency of hospitals.

In the context of the evaluation of information systems in the hospital environment, the HOT-Fit model is seen as very relevant because it not only assesses the technological aspect as an auxiliary tool, but also takes into account the role of humans and the support of organizations that interact with each other. This approach is considered to be able to provide a comprehensive picture of the net benefits obtained from the use of RME. Therefore, the researcher chose to use the HOT-Fit framework as the basis for evaluation, in order to comprehensively understand how the implementation of RME can provide optimal and sustainable benefits in the RSGM IIK Bhakti Wiyata Kediri environment

Quotation Informant

Table 1. Quotation Informant

Theme	Quotations
Stuttgar **a. System Use**	"There are some doctors who have not filled in the data completely, while some others have filled in but the data has not been recorded in the system. This condition occurs most often during the service of professional education students"
	"The staff felt that they did not understand how to fill the RME, this was due to the lack of socialization carried out by the management to improve their understanding and competence in using the system"

Theme	Quotations
Stuttgar **b. User Satisfaction**	"In general, RME does make it easier to make reports or pull data. However, the large number of menus and features that must be filled in makes the filling process quite time-consuming and sometimes confusing."
	"The process of filling in data is sometimes quite complicated, especially when the number of patients is large"
Organization **a. Organizational structure**	"Until now, the training process related to the use of RME for all staff still needs to be improved. Although the guidebook has been provided, some of the staff have not shown enough interest in reading."
	"There are guidelines, guidelines, and SOPs related to the RME filling process"
	"There is no reward and punishment system for officers related to the completeness of filling out medical records"
Organization **b. Organizational environment**	"System evaluations are carried out regularly, but because the development of the RME is carried out internally, we are currently still waiting for the turn of the repair from the central IT team."
	"The lack of PC units in service polys. RME uses tablets which are not comfortable to use. The lack of typing on the tablet screen makes RME charging impossible."
Technology **a. System quality**	"Overall the system runs quite well, but it is not uncommon to experience problems such as slow connections so that sometimes errors arise and interfere with the service process"
	"The drawback is that if there is a downtime, there is no data backup system so medical records are made manually"
Technology **b. Quality of information**	"RME is very helpful in the reporting process and facilitates communication between units and across sectors"
Technology **c. Quality of service**	"Our IT team is divided into two parts, namely the internal IT team at RSGM and the IT team from the foundation headquartered in Surabaya. When facing problems, our team will inform the central IT team in Surabaya, but the handling and repair process usually takes a long waiting time."
Benefit **Net Benefit**	"The benefits are still not optimal; many features must be developed and further evaluated"

Human Component

The human component assesses the user's experience in using the information system which includes system usage and system satisfaction. System use: System *use* is seen how users interact with the system, including aspects of knowledge, motivation for use, attitude of accepting or rejecting the system (Yusof et, al. 2008). The human factor is a very crucial element, because without the presence of competent officers, the process of managing and filling out electronic medical records (RME) cannot run optimally. Based on this research and supported by a study from Indasah et al. (2023), the main obstacles from the human aspect include the lack of adequate training and socialization. This causes the level of user understanding of the features in the RME system to be low, resulting in incomplete and inaccurate data filling quality. From the results of the interview, the staff revealed that they felt that they did not understand the various features in the RME system, which caused a sense of difficulty and distrust of the system. This condition shows that continuous improvement of socialization and training is needed to improve the competence and understanding of users, so as to support the success of the implementation of RME within the IIK Bhakti Wiyata RSGM.

User satisfaction: User satisfaction is seen by evaluating whether users are satisfied or not when using the system (Yusof, et.al. 2008). The use of the electronic medical record information system (RME) at RSGM IIK Bhakti Wiyata Kediri is considered very useful, especially in improving data accuracy, reducing operational costs, and providing information

sources that can be accessed by patients, doctors, and management. Although there were initially concerns from users about the complexity of the feature and the possibility of slowing down work, the general acceptance of the system was quite positive. After a few months of use and users get used to it, rejection of the system tends to decrease, and they start to feel helped in the process of managing medical record data. However, the results of interviews at RSGM IIK Bhakti Wiyata show that although users feel helped by the existence of RME, they have difficulty in understanding some of the existing features, so they need to develop and improve the system to be more user-friendly. In addition, network constraints that are often slow are also obstacles that interfere with the smooth running of services and data filling, so there is a need to improve technology infrastructure and training so that the system can run more optimally and meet user needs.

Organization Components

Organizational components assess information systems in terms of organizational structure and environment. Organizational Structure: The organizational structure consisting of cooperation in the organization, strategy, leadership, support from top management and staff support is an important part in measuring the success of the system (Yusof, et al. 2008). The management of RSGM IIK Bhakti Wiyata has conducted periodic RME evaluations by conducting quality evaluations, but because the development of RME is carried out internally, it takes a long time so that there have been no improvement results for the management of the electronic medical record information system (RME). Nevertheless, operational guidelines and standard procedures (SOPs) have been prepared that govern the implementation and management of electronic medical record equipment. However, the existence of these guidelines and SOPs has not been supported by periodic evaluations and the establishment of a formal organizational structure that is able to coordinate all aspects related to the systematic implementation and maintenance of the system. In addition, there is no official and consistent reward and punishment system implemented by the leadership as an effort to motivate and hold staff accountable in managing medical record data. This condition causes the implementation of the information system to run partially and is not optimal. To ensure the long-term success and sustainability of the system, careful strategic planning, establishment of a formal organizational structure, and the implementation of an incentive system that can increase staff motivation and discipline are needed. This is important so that the management of the RME system can run effectively and efficiently within the RSGM IIK Bhakti Wiyata.

Organizational Environment: Management plays an important role in the implementation of RME. In addition to the lack of socialization provided from hospital leaders/management in providing communication, training on understanding RME filling for all staff in the hospital, another shortcoming is the lack of infrastructure in the hospital to support the implementation of RME. The lack of PC units in the service poly makes it difficult for officers to load data. RME at RSGM uses tablets which are not comfortable to use. Typing on the tablet screen makes RME charging impossible to fast. In addition, the use of tablets must alternate with other staff so if there are many patients, they have to queue for data input to the RME. Infrastructure improvements in the form of equipment that support RME are urgently needed at RSGM IIK Bhakti Wiyata because it can help ease daily work and increase the use of RME in documenting nursing care (Sugiharto, et al. 2022).

Technology Component

The technology component evaluates information systems from system quality, *information quality*, and service *quality*.

System quality refers to the characteristics of system performance such as reliability, stability, and ease of the system (Yusof et.al, 2008). System quality is related to the capabilities of the system which are reviewed from user-friendliness, ease of learning, reliability, security, and availability (Tawar et.al., 2011). A quality system will produce quality information if it is accurate, timely, complete, and safe, so that to get quality information, it is necessary to improve the quality of the system (Khotimah, 2021). The quality of the system at RSGM IIK Bhakti Wiyata as a whole is running quite well, but it is not uncommon to experience problems such as slow connections so that sometimes errors appear and interfere with the service process. There is an obstacle in network connectivity, namely, if the system experiences a server down, medical records are created manually and no data is backed up.

Information quality focuses on the information generated through information systems. The criteria used in assessing the quality of information include completeness, timeliness, availability, relevance, consistency and data input (Yusof et.al, 2008). Reliable and timely information will help the decision-making process (Nastiti & Santoso, 2022). The suitability of information, accuracy, and suitability of the information produced directly affect the quality of hospitals in the decision-making process (Usman et.al, 2023). Based on the results of the interviews, most of the informants stated that RME was able to accelerate the presentation of data and information related to hospital activities, thereby supporting the decision-making process more efficiently. In addition, this system also provides useful information and can be used across sectors in supporting various management and service activities. However, in terms of the quality of the information produced, most respondents assessed that the data produced was not completely complete and detailed, so improvements were still needed so that the information presented could be more accurate and comprehensive to support the needs of users optimally.

The last component, namely service quality, is the quality of service providers, both from the team, programmers, and hospital management in convincing and making it easier for information system users (Tawar et.al, 2022). The aspects assessed include, speed of response, empathy, and follow-up. The RSGM IT team is divided into two parts, namely the internal IT team at RSGM and the IT team from the foundation headquartered in Surabaya. When facing obstacles, the internal IT team at RSGM IIK Bhakti Wiyata showed quick and responsive responsiveness to obstacles that arose related to the use of RME. They are able to solve problems faced by users effectively and efficiently, thus supporting the smooth operation of the system. However, related to the development of features and improvements to the RME system, the internal IT team will inform the central IT team in Surabaya, obstacles arise from external developers, namely IT developers from foundations located outside the city of Kediri, so the handling and repair process usually requires a long waiting time. This condition caused delays in handling technical problems and developing new features, thus having an impact on the process of improving the quality of electronic medical record information system services within RSGM IIK Bhakti Wiyata.

Benefit Component

The implementation of the electronic medical record (RME) system in the RSGM environment has provided benefits to its users, although the level of incompleteness in filling in medical record data still shows a fairly high number. This condition indicates that there are obstacles faced by users in accessing and utilizing the system optimally. One of the main factors that causes this is the lack of understanding of the features available in the system, which makes it difficult for users to operate the RME effectively and efficiently. In addition, technical constraints such as slow networks, inadequate devices, and a less user-friendly interface also exacerbate this condition.

These constraints not only have an impact on the quality of data filling, but also hinder the potential for maximum benefits of the RME system in supporting clinical and administrative decision-making. As a result, the expected benefits of this system, such as increased efficiency, reduced recording errors, and improved service quality, have not been fully realized. This situation shows that the implementation of the system, although already underway, still requires continuous improvement efforts. These efforts include improving user competence and understanding through regular training, as well as improving the system to be more user-friendly and able to adapt to user needs in the field.

In addition to technical aspects and user competence, another factor that plays a role is the lack of adequate socialization and training from the management to all staff regarding the use of RME. Without effective socialization, it is likely that users do not feel confident and lack understanding of the importance of filling in complete and accurate data. Therefore, the development of a continuous training program and the strengthening of support systems such as user guidelines and clear SOPs are urgently needed. Thus, it is hoped that the RME system can be used optimally, so that the benefits can be felt more widely and have a positive impact on improving service quality and operational efficiency in the hospital environment.

CONCLUSION

The electronic medical record (RME) system implemented at RSGM IIK Bhakti Wiyata since 2023 still requires further development and additional features to maximize benefits for all users. Continuous socialization efforts, along with the implementation of an incentive system and sanctions by management, are essential to enhance user motivation and discipline in the data entry process. These measures are expected to improve the sustainability and effectiveness of the RME system, thereby supporting better service quality and data management within the hospital. Future research could explore the impact of these interventions on user engagement and data completeness, as well as investigate the integration of advanced technological features to further optimize the RME system.

REFERENCES

Alhur, A. (2024). Overcoming electronic medical records adoption challenges in Saudi Arabia. *Cureus, 16*(2), e53827.

Arora, L., & Ikbal, F. (2023). Experiences of implementing hospital management information system (HMIS) at a tertiary care hospital, India. *Vilakshan - XIMB Journal of Management, 20*(1). https://doi.org/10.1108/xjm-09-2020-0111

Darwis, M., Soraya, S., Nawangwulan, K., Ekawaty, D., Imran, A., & Yusfik, Y. (2023). Hospital Management Information System. *International Journal of Health Sciences, 1*(4). https://doi.org/10.59585/ijhs.v1i4.174

Erlirianto, L. M., Ali, A. H. N., & Herdiyanti, A. (2015). The implementation of the human, organization, and technology–fit (HOT–fit) framework to evaluate the electronic medical record (EMR) system in a hospital. *Procedia Computer Science, 72*, 580–587. https://doi.org/10.1016/j.procs.2015.12.166

He, X., Cai, L., Huang, S., Ma, X., & Zhou, X. (2021). The design of electronic medical records for patients of continuous care. *Journal of Infection and Public Health, 14*(1). https://doi.org/10.1016/j.jiph.2019.07.013

Hertin, R. D., & Al-Sanjary, O. I. (2018). Performance of hospital information system in Malaysian public hospital: A review. *International Journal of Engineering and Technology (UAE), 7*(4). https://doi.org/10.14419/ijet.v7i4.11.20682

Janett, R. S., & Yeracaris, P. P. (2020). Electronic medical records in the American health system: Challenges and lessons learned. *Ciência & Saúde Coletiva, 25*(4), 1293–1304.

Khotimah, A. (2021). Evaluasi sistem informasi manajemen rumah sakit Rajawali Citra Yogyakarta menggunakan model human organization technology fit (HOT-fit). *Journal of Information Systems for Public Health, 5*(1), 19–26.

Leng, Z., Tan, Z., & Wang, K. (2021). Application of Hyperledger in the hospital information systems: A survey. *IEEE Access, 9*. https://doi.org/10.1109/ACCESS.2021.3112608

Lorkowski, J., & Pokorski, M. (2022). Medical records: A historical narrative. *Biomedicines, 10*(10), 2594. https://doi.org/10.3390/biomedicines10102594

Makalesi, A., Türkmen, A. İ., & Özkara, B. (2021). Evaluation of hospital information management system with information systems success model. *Journal of Information Technologies, 14*(4).

Ministry of Health Indonesia. (2008a). Regulation of the Minister of Health of the Republic of Indonesia Number 129 of 2008 [Peraturan Menteri Kesehatan Republik Indonesia Nomor 129 Tahun 2008].

Ministry of Health Indonesia. (2008b). Regulation of the Minister of Health of the Republic of Indonesia Number 269 of 2008 concerning Medical Records [Peraturan Menteri Kesehatan Republik Indonesia Nomor 269 Tahun 2008 tentang Rekam Medis].

Nastiti, I., & Santoso, D. B. (2022). Evaluasi penerapan sistem informasi manajemen rumah sakit di RSUD SLG Kediri dengan menggunakan metode HOT-fit. *Jurnal Kesehatan Vokasional, 7*(2), 85. https://doi.org/10.22146/jkesvo.72357

Nguyen, P., Tran, T., Wickramasinghe, N., & Venkatesh, S. (2017). Deepr: A convolutional net for medical records. *IEEE Journal of Biomedical and Health Informatics, 21*(1). https://doi.org/10.1109/JBHI.2016.2633963

Sanjaya, G. Y., Istiono, W., Ricki, A. V., Devi, E. R., Luckyarno, M. A., Arief Darmawan, M., & Afirda Prastika, N. (2023). Analytical data for electronic medical records in primary health care. *BIO Web of Conferences, 75*. https://doi.org/10.1051/bioconf/20237505003

Savitri, D. A., Husni, A. R., & Ferdianto, A. (2024). Pendampingan alih media rekam medis (paper based) menuju rekam medis elektronik. *Journal of Community Engagement in Health and Nursing, 2*(1).

Suryandari, P. I., et al. (2024). Strategi implementasi sistem informasi untuk meningkatkan animo pengguna di rumah sakit. *Jurnal Kesehatan Tambusai, 5*(2), 3634–3644.

Tawar, Santoso, A. F., & Salma, Y. S. (2022). Model HOT FIT dalam manajemen sistem informasi. *Bincang Sains dan Teknologi, 1*(02), 76–82. https://doi.org/10.56741/bst.v1i02.144

Yusof, M. M., Papazafeiropoulou, A., Paul, R. J., & Stergioulas, L. K. (2008). Investigating evaluation frameworks for health information systems. *International Journal of Medical Informatics, 77*(6), 377–385.