

Analysis of Readiness and Obstacles to the Implementation of Electronic Medical Records: A Case Study of Bandung City X Clinic

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Abstract. The era of digitalization in the health sector has driven fundamental transformation through the implementation of Electronic Medical Records (EMR), where the Indonesian government has set a mandate to adopt RME for all health care facilities by December 31, 2023, but more than 80% of health facilities in Indonesia are still untouched by digital technology. This study aims to analyze the readiness and obstacles to the implementation of Electronic Medical Records at Clinic X in Bandung City as a basis for developing an effective implementation strategy. The study used a qualitative design with an instrumental case study approach, involving three key respondents selected through purposive sampling with criterion sampling criteria, using semi-structured in-depth interview techniques and documentation studies, with data analysis using a thematic analysis approach. The level of readiness of Clinic X is still limited in terms of human resources who do not have direct experience using the RME system, inadequate technological infrastructure with only one low-spec computer unit, and organizations that do not have written policies and SOPs to support RME, with the main obstacles being limited technical skills, technological infrastructure, and finances. Clinic X shows potential commitment and readiness but requires intervention strategic through gradual human resource training, strengthening technological infrastructure, and the formulation of operational policies, with implementation that must be carried out gradually and participatory according to clinical capacity.

Keywords: *Digital, Electronic, Implementation, Readiness, Record*

Introduction

The era of digitalization in the healthcare sector has driven fundamental transformation in medical information management, especially through the implementation of Electronic Medical Records (EMR). The Government of Indonesia has mandated that all healthcare facilities adopt RME by December 31, 2023, but this transition faces complex technological, cultural, and infrastructural challenges (Hossain et al., 2025). The implementation of RME is an inevitable necessity in an effort to improve the quality of health services, operational efficiency, and patient data security. RME systems have the potential to improve diagnostic accuracy, reduce examination duplication, accelerate access to medical information, and support better clinical decision-making. However, the reality on the ground shows that more than 80% of health facilities in Indonesia are still untouched by digital technology, so special attention is needed in the implementation process. The readiness of the organization to adopt new technologies is a crucial factor that determines the success of the implementation of RME, considering that the change from manual to digital systems requires a comprehensive adaptation of various aspects of the organization.

Clinic X in the city of Bandung currently still relies on a manual recording system in the management of patient medical records, where all medical documentation is still done conventionally using paper media. The patient registration system also does not use an online platform, so the registration process is still carried out manually by filling out a physical form which takes longer and has the potential to cause recording errors. The storage of medical record files is carried out in storage racks arranged in order according to the order of medical record numbers using a straight numerical system, which although systematic, has limitations in terms of speed of access and data security. This condition reflects the urgent need to carry out digital transformation to improve operational efficiency and service quality. The use of manual systems not only has an impact on time efficiency, but also increases the risk of data loss, recording errors, and difficulties in conducting data analysis for the purpose of evaluating service quality. In addition, manual systems also hinder the clinic's ability to integrate data with broader health systems, such as health information exchanges or electronic referral systems.

The challenges of RME implementation that need special attention include three main dimensions, namely human resources, technology, and organizations, each of which has its own complexity in the context of digital transformation. From the human resource aspect, the initial identification shows that there are limitations in the understanding and skills of health workers related to the use of RME, which is a significant obstacle considering that the successful implementation is highly dependent on the adoption and utilization of the system by the end user (Jimma & Enyew, 2022). Limited technology skills and digital literacy among health workers are the main barriers to the adoption and optimal use of RME. User resistance to

changes from manual to digital systems is also a common phenomenon, especially in healthcare workers who have been working with conventional systems for a long time. This is in line with research findings that show that limited resources, inadequate training, and lack of technical support are the most common obstacles encountered in RME implementation (Tsai et al., 2020). In addition, varying levels of computer literacy among medical and non-medical staff require a training approach tailored to the needs and abilities of each user group.

The financial aspect is one of the main obstacles in the implementation of RME, where the budget needed for the implementation of RME is relatively large so that not all health service facilities can support the implementation of RME quickly. The initial investment required includes the cost of procuring hardware, software, network infrastructure, user training, and system maintenance, all of which require a long-term financial commitment. For small to medium-sized healthcare facilities, the cost of implementing RME is often a major obstacle that is difficult to overcome without external support (Raghupathi & Raghupathi, 2019). In addition to the initial costs, there are also ongoing operational costs such as license fees, system maintenance costs, technology upgrades, and ongoing training that must be taken into account in budget planning. This budget constraint often forces healthcare facilities to postpone the implementation of RME or opt for less optimal but more affordable technological solutions. Unclear return on investment (ROI) and relatively long payback periods are also important considerations in RME's investment decision-making.

The current conditions show that there is no training program related to RME at Clinic X, which indicates a lack of human resource preparation in the face of digital transformation. The absence of structured and continuous training can result in user resistance, decreased productivity during the transition period, and suboptimal system utilization. Effective training not only covers the technical aspects of using the system, but also includes an understanding of the benefits of RME, workflow changes, and the adaptation of organizational culture to digital technologies. A comprehensive training program should be designed with diverse user skill levels in mind, from basic computer training to specific training on the features of the RME to be implemented. Continuous evaluation of the effectiveness of training is also needed to ensure that learning objectives are achieved and that users are able to make optimal use of the system in daily practice.

The complexity of RME implementation requires a holistic approach that considers organizational readiness from various aspects, ranging from technology infrastructure, human resource capabilities, management support, to financial readiness. An in-depth case study on Clinic X in the city of Bandung is relevant considering the condition of the clinic that still uses manual systems and the various challenges faced in the digital transformation process. This research is expected to provide a comprehensive overview of the factors that affect the readiness of RME

implementation and identify obstacles that need to be overcome. An in-depth analysis of the readiness and barriers to implementation of RME at the clinic level can provide valuable insights for similar healthcare facilities in planning and implementing digital transformation. In addition, the findings of this study are expected to be input for the government and other stakeholders in developing more effective policies and support programs to accelerate the implementation of RME in Indonesia.

Based on the background that has been described, the formulation of the problem in this study is:

1. What is the level of readiness of Clinic X in the city of Bandung in implementing Electronic Medical Records in terms of human resources, technology, and organization?
2. What are the obstacles faced in the process of implementing Electronic Medical Records at Clinic X in the city of Bandung?
3. What are the strategies that can be developed to overcome the obstacles to the implementation of Electronic Medical Records at Clinic X in the city of Bandung?

The purpose of this study is to analyze the readiness and obstacles to the implementation of Electronic Medical Records at Clinic X Bandung City as the basis for developing an effective implementation strategy. As well as identifying and analyzing the level of readiness of Clinic X in implementing Electronic Medical Records from the aspects of human resources, technology, and organization, Identifying and analyzing obstacles faced in the process of implementing Electronic Medical Records at Clinic X, Formulating strategies that can be applied to overcome obstacles to the implementation of Electronic Medical Records at Clinic X.

This research is expected to contribute to the development of theories and concepts regarding the implementation of health information technology, especially Electronic Medical Records in the context of primary health facilities in Indonesia, Enrich the scientific literature on factors that affect organizational readiness in the adoption of digital technology in the health sector, Provide an analytical framework that can be used as a reference for similar research in the future. For Clinic X: Provide comprehensive information on internal readiness and RME implementation strategies that can be applied to increase the effectiveness of digital transformation, For Similar Health Facilities: Provide lessons learned and best practices that can be adapted in the RME implementation process in healthcare facilities with similar characteristics, For Governments and Policy Makers: Provide insights on the challenges of RME implementation at the grassroots level that can be considerations in the development of national RME implementation support policies and programs, For RME Vendors

and Solution Providers: Provide an understanding of end-user needs and challenges that can be input for the development of products and services that are more in line with conditions in Indonesia.

Methodology

Research Design

This study uses a qualitative research design with a case study approach (*Case Study*) to analyze the readiness and obstacles to the implementation of Electronic Medical Records at Clinic X Bandung City. The case study approach was chosen because of its ability to explore complex phenomena in depth in real-life contexts, especially when the boundaries between phenomena and context are not so clear (Sibbald et al., 2021). The qualitative method allows researchers to understand the experiences, perceptions, and behaviors of participants related to the implementation of health information technology, as well as answer the "how" and "why" questions that are the focus of this study. Instrumental case study design (*instrumental case study*) applied to provide *Insight* in-depth on the specific issues of RME implementation, where the case of Clinic X serves as a means to understand the broader phenomenon of digital transformation in primary healthcare facilities.

Population and Sample

The population in this study is all health workers and administrative staff at Bandung City X Clinic who are directly involved in the management of medical records and clinic information systems. The sampling techniques used are *purposive sampling* with strategy *Criterion Sampling*, i.e. the selection of participants based on certain criteria relevant to the research objectives (Campbell et al., 2020). The study participants consisted of three key respondents who were selected based on their role and involvement in the current medical record-keeping system as well as potential involvement in the implementation of RME. The first respondent is a general practitioner as the main user of medical records in clinical practice, the second respondent is an employee of the registration department who is concurrently in the administration of the clinic as a *Front-liner* in the management of patient data, and the third respondent is a pharmacist/drug officer who is responsible for recording and distributing drugs. The selection of these three respondents is based on their representation of various aspects of clinical operations that will be affected by the implementation of RME, ranging from clinical, administrative, to pharmaceutical aspects.

Data Collection Techniques

Data collection was carried out through two main methods, namely in-depth interviews (*in-depth interview*) and documentation studies. In-depth interviews are conducted using semi-structured interview guides that allow flexibility in topic exploration while maintaining a focus on the research objectives (Tenny et al., 2022). Each interview session is planned to last 45-60 minutes and will be recorded with the consent of the participants to ensure the accuracy of the data. Interviews will be conducted in a comfortable and private space in the clinic environment to create a conducive atmosphere for participants to convey their experiences and views. Documentation studies are carried out to complete the primary data through the analysis of organizational documents such as standard operational procedures (*Standard Operating Procedures*), organizational structure, clinical demographic data, existing record-keeping systems, and internal policy documents related to information technology. Data triangulation between interviews and documentation aims to increase the credibility and validity of research findings.

Research instruments

The main instrument in this study is the researcher himself as *a human instrument*, equipped with a semi-structured interview guide developed based on the theoretical framework and research objectives. The interview guide includes open-ended questions organized around several key themes: (1) current understanding and experience of medical record-keeping systems, (2) perceptions of technology and digitalization, (3) individual and organizational readiness for RME implementation, (4) identification of anticipated barriers and challenges, and (5) expectations and suggestions for the implementation process. Before use, the instrument will be validated through *expert judgment* and *pilot testing* to ensure the relevance and suitability of the questions to the research context. In addition to interview guides, *field notes are also used* to record contextual observations during the data collection process, as well as *checklists* for documentation studies that ensure the completeness of the required secondary data.

Data Analysis Techniques

Data analysis using a thematic analysis approach (*Thematic Analysis*) that enables the identification, analysis, and reporting of theme patterns in qualitative data (Ahmad & Wilkins, 2024). The analysis process was carried out iteratively through six stages: (1) familiarization with the data through repeated reading of interview transcripts, (2) initial coding (*Initial Coding*) on relevant data, (3) theme search by grouping similar codes, (4) theme review and refinement to ensure internal and external coherence,

(5) definition and naming of the final theme, and (6) production of final report with theme illustrations using data citations. The entire analysis process is carried out with the help of qualitative data analysis software to increase the systematicity and transparency of the analysis. To ensure the trustworthiness of the research, a strategy is applied *member checking* by verifying the results of the analysis to the participants, *Peer Debriefing* by involving other researchers in the discussion of findings, and *Audit trail* by systematically documenting the entire research process (Colorafi & Evans, 2017).

Results and Discussion

[Bold – Align Text Left - 12] [Other texts – 11]

The researcher/s must present their findings in this part. In most cases, the Results section merely presents the findings, with no explanation or critical interpretation. This part is also written in the past tense. Make sure that each table and figure has its labeling and numbering. Tables have captions above them, and figures have captions beneath them.

Subheadings may be used to subdivide this section. It should give a clear and succinct summary of the experimental findings, their interpretation, and valuable inferences.

Equations

To aid legibility, equations should be typed in the same word processor as the rest of the text, ideally without handwritten symbols. Equations must be numbered sequentially, with the numbers in parenthesis and justified to the right.

Tables and Figures [Italicizes – Align Text Left - 12]

Table and figure labels are centered, bold, and size 10. Table and figure titles should be formatted according to the APA 7th edition Publication Manual. Table label/titles must be placed above the table, while figure label/titles must be placed below the figure. The figure and label must be separated by 6 points. When referring to the Figure, the word Figure must be used instead of figure or fig.

Table 1.
Presence of Journals in the University

Responses	f	%
Yes	4	5.9
Yes	27	39.7

Maybe	37	54.4
Total	68	100.0

The table and table label must be separated by 6 points. The tables should be formatted according to the APA 7th edition Publication Manual. All tables in the text must be referenced. Table 1 should, for example, be referred to as Table 1 rather than table 1. In most cases, the font size for text within tables should be 10 pt. Tables can be left-aligned if the bulk of them are tiny in width, but this must be done consistently throughout the article.

Visual materials

Please consider the display of any graphic material carefully. Because the proceedings will be published in digital format, you will be able to include high-resolution color photos or other media assets that will aid in the presentation of your study and its context.

Please, if at all feasible, include images:

- Large enough to view clearly;
- High-resolution (200dpi);
- Optimized to be less than 350Kb
- Appropriately cropped

If you're utilizing diagrams, infographics, or other schematics, make sure to:

- Present information properly;
- Use Arial type; and
- Make sure all text is legible.

Results

Clinical X Readiness Level in the Implementation of Electronic Medical Records

1. Human Resources (HR) Aspect

From the results of the interview, it was found that human resources at Clinic X have a limited level of readiness in the use of technology, especially electronic medical record (RME) systems. Although most of the staff are familiar with basic technological devices such as computers and smartphones, they have not had any firsthand experience using the RME system. The doctor and the owner of the clinic stated, *"I can quite use the computer for simple things like typing or opening files, but for a system like RME, I've never tried. If there is training, I am ready to learn."* Meanwhile, the administrative officer stated the same thing, even though he had studied RME in college, the operational skills of the RME system directly were still not possessed. The pharmacist also said that he still felt less confident, but was ready to take part in training if provided. The unavailability of training so far has been one of the factors for low readiness. All informants admitted that information

technology training had never been carried out in the clinic. They agreed that direct and gradual training is needed to support effective technology adaptation.

2. Technology Aspects

In terms of infrastructure, Clinic X has only one computer unit which is used alternately by administrative and medical record officers. The specifications of the device are still relatively low and inadequate to run the RME system optimally. The condition of the internet is also not stable. *"Sometimes the Wi-Fi signal is weak when used by more than one person,"* said the administrative officer. The absence of a local network between rooms means that the flow of services is still very dependent on the physical transfer of documents. The clinic also does not have in-house technical resources; Technical issues are usually handled by outside technicians who are contacted when needed. This shows that from a technological perspective, the readiness of the clinic is still far from ideal and needs a thorough overhaul.

3. Organizational Aspects

Structurally, Clinic X has a simple organization with an owner who also plays the role of a doctor, supported by several officers with dual roles. The decision-making process is centralistic, but participatory. According to the informant, *"We usually discuss first if there is a change, then the owner decides."* Although there is no official team for the implementation of RME yet, the clinic's management expresses full support for digitalization, and plans for the formation of a small team are already in draft. The organization's culture is relatively open to new innovations, even though it has not been used to handling large digitalization projects. This flexibility is a positive potential in supporting gradual implementation.

Obstacles in the Implementation of Electronic Medical Records

1. HR barriers

The main obstacle in the HR field is the lack of technical skills and staff confidence in using the new system. *"At first it might be awkward and afraid of making mistakes, but we are ready to learn if there is guidance,"* said the pharmacist. Limited experience and lack of training make staff feel unprepared for complex computer-based systems. Another obstacle is resistance to change due to concerns about input errors and dependence on technology. Respondents revealed that technical problems such as power outages or system errors can greatly hinder service if there is no backup system.

2. Technological Barriers

Technology facilities are a real challenge. The available computer devices do not adequately support the performance of the RME system. Unstable internet networks and the absence of local networks between rooms are also serious obstacles. In addition, the clinic does not yet have a data backup system and UPS, which increases the risk of data loss in the event of a power outage. As the clinic owner said, *"Our electricity is quite stable, but if it goes out, all activities stop because there is no power reserve. This should be a concern if RME is implemented."*

3. Organizational and Financial Barriers

From an organizational point of view, obstacles arise due to the absence of written policies, SOPs, or technical guidelines that support the RME system. The

procedure still relies on old habits and informal communication. The clinic also does not have a specific budget for digitalization, despite a commitment to allocate funds of IDR 5-10 million in the initial stage. This limited funding is a factor that limits the choice of systems and devices. The financing plan is entirely sourced from the clinic's operating capital, and management is considering other alternatives such as grants from the government or cooperation with vendors.

RME Implementation Development Strategy

Based on the findings of the research, the strategy for developing the implementation of RME at Clinic X can be formulated as follows:

1. HR Training and Development Strategy

- Conduct hands-on training for all staff on the basic use of computers and RME systems.
- Provide intensive technical assistance during the transition period.
- Provide training modules in the form of guidebooks or video tutorials.
- Adopt a phased learning approach with simulation methods and hands-on practice.
- Appoint one staff as the internal coordinator of technology to be a local facilitator.

2. Technology Improvement Strategy

- Add computer units with adequate specifications for each work unit.
- Improve the quality of the internet network and set up a LAN network between rooms.
- Using a hardware-efficient, *cloud-based RME system*.
- Prepare an automatic backup system and manual backup.
- Budget for the purchase of UPS and additional equipment to mitigate the risk of power outages.

3. Organizational Strategy and Change Management

- Forming a small RME implementation team consisting of doctors, RM officers, and support staff.
- Develop new policies and SOPs related to digital workflows.
- Integrate the RME system gradually, starting from registration and basic medical records.
- Conduct a pilot project for 1-2 weeks with periodic evaluation.
- Provide an open communication channel for staff to convey any issues or ideas during the transition.

4. Financial Strategy and Sustainability

- Allocate special funds from the clinic's treasury in stages.
- Choose an RME application that is cheap, small-scale, and as needed (e.g. Clinic Driver's License).
- Seek support from outside parties, such as the Health Office or universities.
- Set aside regular funds for maintenance and system upgrades.
- Monitor the efficiency of using the system so that technology investments provide long-term benefits.

Interview Activity Documentation

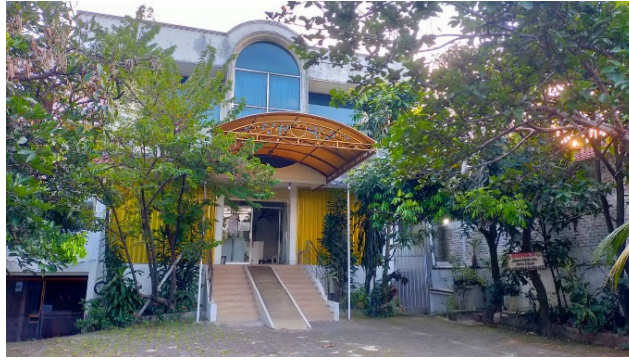


Figure 1. Location Overview

The interview activity was held on May 3, 2025 at Clinic X, Bandung City.



Figure 2. Interview Process

The main respondents were dr. J as the owner and main doctor at the clinic, as well as two support staff, namely medical records officers and pharmacy officers. The interview process lasted approximately 55 minutes per respondent, using a semi-structured guide. Interviews were recorded with permission and documentation was conducted in the form of field notes, voice recordings, and photo documentation of the service room (not attached to maintain the confidentiality of the clinic).



Figure 3. Archive of Clinic X Data

The data from the interview results were analyzed by categorizing the content based on three main aspects, namely human resources, technology, and organization. Triangulation was performed by matching statements between respondents and relating them to the physical conditions observed directly during the visit. Based on the results of the research, it can be concluded that Bandung City X Clinic showed commitment and initial readiness in adopting an electronic medical record system. However, this readiness is still potential and requires strategic intervention, especially in the aspects of human resource training, strengthening technological infrastructure, and operational policy formulation. The obstacles faced are quite complex, ranging from technical and financial limitations to a culture of manual work that has taken root. Therefore, the implementation strategy must be carried out gradually, participatorily, and adjusted to the capacity of the clinic. The success of digital transformation at Klinik X will depend heavily on collaboration between management, staff, system providers, and external parties such as the government and educational institutions. With the right approach, Klinik X has the potential to become a model for the implementation of RME in first-tier healthcare facilities in Indonesia.

Discussion

Readiness Level for the Implementation of Electronic Medical Records at Clinic X

The results of the study show that the level of readiness of Clinic X in implementing Electronic Medical Record (RME) is still at a level that requires significant improvement, especially in three main aspects, namely human resources, technology, and organization. These findings are in line with research (Risnawati & Purwaningsih, 2024) which identifies that not all officers are ready to switch to electronic medical records, and the absence of information technology officers is a

major obstacle. Similar conditions were also found in the study (Widayanti et al., 2023) at the Samigaluh I Health Center, where the Money and Method aspects are the main obstacles in implementing RME. From a human resource perspective, Clinic X shows quite good potential but still requires comprehensive development. Clinic staff already have basic skills in operating technological devices such as computers and smartphones, but do not have hands-on experience in using the RME system. This condition reflects the findings (Glenwright et al., 2023) which states that the user staff has knowledge of computer operation and is familiar with the hospital's information system, but still requires special training for the RME system. This limited experience is exacerbated by the absence of information technology training programs that have been implemented in the clinic, thus creating a gap between the technical capabilities possessed and the operational needs of the RME system. Research (Wartini et al., 2023) reinforcing these findings by stating that human resources in the service aspect are available, but still need training to support the effective implementation of RME.

The technological aspect shows the conditions that require the most serious attention in preparation for the implementation of RME at Clinic X. The available technological infrastructure is very limited, with only one computer unit used alternately by administrative and medical records officers. Low device specifications and unstable internet networks are the main obstacles that can hinder the optimal performance of the RME system. These findings are consistent with the results of the study (Risnawati & Purwaningsih, 2024) which identified slow internet networks, computers that did not meet electronic medical record specifications, and occasional problematic servers as major bottlenecks. The absence of a local network between rooms and a data backup system further worsens the condition of the clinic's technology infrastructure. Research (Damayanti et al., 2025) also confirmed that technical glitches that often disrupt patient services are a significant challenge in the implementation of RME, thus requiring a comprehensive upgrade of technology infrastructure. The organizational structure of Clinic X shows relatively simple characteristics but has the potential to support the implementation of RME. Although the decision-making process is centralistic, a participatory approach to discussion and openness to innovation creates an environment conducive to digital transformation. This condition is different from the findings (Lestari & Amalia, 2023) which shows that organizational/management factors have a significant influence on RME readiness, where improper organizational structure can hinder system implementation. The full support of the clinic management towards digitalization and the plan to establish an RME implementation team shows the organization's positive commitment. However, the absence of written policies, Standard Operating Procedures (SOPs), and technical guidelines supporting the RME system are structural weaknesses that need to be addressed immediately. Nurvita's Research (Agung et al., 2025) reinforcing this finding by stating that the absence of SOPs and roadmaps for the implementation of RME is one of the organizational aspects that affects implementation readiness.

Obstacles in the Implementation of Electronic Medical Records

Analysis of obstacles to the implementation of RME at Clinic X reveals the complexity of the problem which includes aspects of human resources, technology, organization, and finance. The main obstacles in the human resources aspect include the lack of technical skills and staff confidence in using the new system, which is in line with the

findings (Ahmed et al., 2020) about the unpreparedness of officers to switch to electronic medical records. Resistance to change arises from concerns about input errors and reliance on technology, which can disrupt service flows if not supported by an adequate backup system. This condition is reinforced by research (Damayanti et al., 2025) who identified limited internal training for staff and lack of understanding of RME regulations as significant barriers. The absence of internal information technology experts in the clinic is also a limiting factor in overcoming technical problems that may arise during implementation, according to the findings (Nurvita Wikansari & Febrianta, 2024) about the absence of information technology officers as an obstacle to implementation. Technological barriers are real challenges that require substantial investment to be effectively overcome. The limitations of computer devices with insufficient specifications to run an optimal RME system are the main obstacles, which are supported by the findings (Fariz & Sari, 2009) about technical obstacles in the application of SIMRS Khanza such as electronic signature barcodes that cannot be read and applications that are often closed by themselves. Unstable internet networks and the absence of local networks between rooms create a reliance on physical document transfers that hinder service efficiency. Research (Purwaningsih & Johan, 2024) confirming that limited infrastructure facilities are the main obstacle in the implementation of RME. The absence of a data backup system and Uninterruptible Power Supply (UPS) increases the risk of data loss during a power outage, which can have a fatal impact on the continuity of health services. This condition is in line with research (Pasaribu et al., 2024) which states the need for additional facilities to support the smooth implementation of RME.

Organizational and financial barriers point to structural and economic limitations that require specific strategies to overcome them. The absence of written policies, SOPs, and technical guidelines supporting the RME system creates operational uncertainty, which is in line with the findings (Lestari & Amalia, 2023) about the lack of standard operating procedures for electronic medical records. The reliance on old habits and informal communication indicates an organizational culture that is not yet ready for a comprehensive digital transformation. Research (Alzahrani et al., 2023) strengthen these findings by identifying the absence of SOPs and roadmaps for the implementation of RME as organizational obstacles. From the financial aspect, the limited budget specifically for digitalization is a significant limiting factor, despite the commitment to allocate initial funds of IDR 5-10 million. Research (Awol et al., 2020) confirmed that budget constraints for the use of electronic medical record systems and the absence of special funding from the Health Office are the main obstacles. A complete reliance on the clinic's operating capital limits the choice of systems and devices that can be implemented, necessitating exploring financing alternatives such as government grants or cooperation with vendors.

Development Strategies to Overcome Implementation Barriers

The development of a comprehensive strategy to overcome the barriers to RME implementation at Clinic X requires a multi-dimensional approach that includes aspects of human resource training, technology improvement, organizational change management, and financial sustainability. HR training and development strategies should be designed gradually and continuously, starting from basic training in the use of computers to the operation of complex RME systems. Research (Fitriyah et al., 2022) recommend training to doctors, midwives, and nurses who face difficulties using RME, as well as the addition of medical records officers and IT officers with

appropriate education. Intensive technical assistance during the transition period needs to be provided to ensure staff can adapt to the new system without disrupting patient service. The provision of training modules in the form of guidebooks and video tutorials will help the continuous self-paced learning process. Research (De Benedictis et al., 2020) emphasizing the importance of training for human resources in supporting the effective implementation of RMEs. The appointment of an internal technology coordinator as a local facilitator will ensure that technical support is easily accessible to all staff. Technology improvement strategies require planned and phased investments to ensure adequate infrastructure to support the implementation of RME. The addition of computer units with appropriate specifications for each work unit is a top priority, which is supported by recommendations (Risnawati & Purwaningsih, 2024) to update your computer to the latest specifications. Improving the quality of the internet network and preparing the inter-room LAN network will ensure stable and integrated connectivity. Research (Fitriyah et al., 2022) emphasizing the importance of conducting system security tests to support the reliability of electronic information systems. The use of cloud-based RME systems can be a cost-effective alternative in terms of hardware, while also providing better access flexibility. The preparation of automatic and manual backup systems, as well as the procurement of UPS and additional equipment to mitigate the risk of power outages, will ensure the continuity of system operations. Research (Purwaningsih & Johan, 2024) confirms the need for network maintenance and updates to support optimal RME implementation.

Organizational strategy and change management require a systematic approach that involves all elements of the organization in the transformation process. The establishment of an RME implementation team consisting of doctors, medical record officers, and support staff will ensure effective coordination throughout the implementation process. Research (Fariz & Sari, 2009) Recommend the formation of a special team that manages, maintains, and maintains applications so that obstacles can be fixed immediately and officers do not experience double workloads. The formulation of new policies and SOPs related to digital workflows is an important operational foundation, in line with the recommendations (Risnawati & Purwaningsih, 2024) to establish standard operating procedures regarding the implementation of RME. The gradual integration of the RME system, starting with registration and basic medical records, will reduce resistance and allow for easier adaptation. Research (Agung et al., 2025) Showing that hospitals that are ready to implement electronic medical records can be seen from the readiness of culture, organization, leadership, strategy, information management, clinical staff, accountability, and financial budgets that have been planned. A 1-2 week pilot project with periodic evaluation will allow for the identification and improvement of problems before full implementation. Financial and sustainability strategies require careful planning to ensure the implementation of RME does not disrupt the clinic's overall operations. The allocation of special funds from the clinic's cash will gradually reduce the financial burden while allowing for measurable investment. The selection of RME applications that are cheap, small-scale, and according to needs such as SIM Clinics will optimize the cost-effectiveness of implementation. Research (Nurvita Wikansari & Febrianta, 2024) identifying the absence of special funding from the Health Office as an obstacle, so that the exploration of support from external parties such as the Health Office or universities becomes an important strategy. Regular allocation of funds for maintenance and upgrade of the system will ensure long-term operational sustainability. Regular monitoring of the efficiency of using the system will allow for

the evaluation of return on investment and adjustments of strategies as needed. Research (Wartini et al., 2023) emphasizing the need for a needs analysis to prepare for the implementation of RME and compatible infrastructure and competent human resources. Collaboration with a variety of external stakeholders, including governments and educational institutions, will expand the available resources and reduce the financial burden of clinics in the long run.

Conclusion

This study succeeded in achieving the main goal of analyzing the level of readiness and identifying obstacles to the implementation of Electronic Medical Records (RME) at Clinic X Bandung City. The results show that clinics have potential readiness but still require significant improvements in human resources, technology, and organizational aspects. The main obstacles identified include limited technical skills of staff, inadequate technological infrastructure, lack of supportive operational policies, and financial limitations. The development strategy formulated includes a gradual training program, technological infrastructure upgrades, organizational change management, and ongoing financial planning. The usefulness of this research is very broad for the development of digital health systems in Indonesia. The results of the study provide a practical blueprint for similar clinics in preparing for digital transformation, as well as becoming an academic reference for the development of an RME implementation model in first-level health facilities. These findings can be used by policymakers in designing health digitalization support programs that are in accordance with real conditions on the ground. For sustainability, long-term commitments from all stakeholders are needed, including government support through training programs and technical assistance. Further research is recommended to examine the effectiveness of the implementation strategies that have been formulated, develop cost-effective RME models for small clinics, and evaluate the impact of RME implementation on the quality of service and operational efficiency of clinics.

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