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Navigating the journey of healthcare ERP adoption: Insights from the end users' lens

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Abstract

Enterprise Resource Planning (ERP) systems have become increasingly important in the healthcare industry for streamlining operations and improving patient care. However, the successful implementation of these systems in healthcare settings remains a challenge. This study aimed to explore the factors contributing to the successful implementation of ERP systems in the Malaysian public healthcare sector from the end user's perspective. Based on a qualitative study, utilizing thematic analysis, semi-structured interviews were conducted with twelve healthcare professionals in the Klang Valley area. The study identified user involvement, top management commitment, business process reengineering, and user acceptance as crucial factors for successful ERP implementation. Conversely, user resistance, ineffective communication, lack of training and development, technical issues, and poor integration were highlighted as significant challenges. The findings emphasize the importance of end-user engagement, organizational support, and process alignment in ensuring the effective adoption of ERP systems in healthcare. A potential limitation of this study is the focus on end users' perspectives, which may not capture the views of other stakeholders, such as healthcare administrators or IT professionals.

Keywords: Enterprise resource planning, Healthcare, Qualitative research, Thematic analysis.

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1. Introduction

Enterprise Resource Planning (ERP) is an integrated, flexible, and adjustable information system that streamlines business operations and centralizes data throughout the firm [1]. It is a complete business solution bundle that is more flexible, responsive to evolving company needs, and addresses critical business areas [1]. Information technology can fundamentally change how companies operate, so numerous organizations use ERP systems to improve competitiveness

[2]. The demand for ERP applications has grown significantly. Companies have invested significant resources in implementation due to its benefits, including faster and more accurate decision-making, improved efficiency, streamlined processes, and promotion of a collaborative culture within the organization [2, 3].

Healthcare can be described as the service provided by healthcare providers such as hospitals and clinics to people or groups to promote, maintain, monitor, or restore health. Internationally, the healthcare crisis is well foreseeable since it will continue to grow indefinitely due to tangible factors such as projected demographic shifts among the ageing population, life expectancy, and lifestyle illnesses [4]. The global market for healthcare ERP (HERP) was worth USD 6.2 billion in 2020 and is projected to grow at a compound annual growth rate (CAGR) of 6.6% between 2021 and 2028 [5]. The market is being driven by increased healthcare spending, the need for effective hospital service management, workforce shortages, and a growing patient population. Clinicians realize the advantages of using advanced technological solutions, such as improved patient care quality and reduced operational costs. The HERP market grew by 3.9% from 2019 to 2020. The pandemic has played a significant role in this growth, as the adoption of advanced digital technologies like remote patient monitoring and telehealth has increased, resulting in improved financial and operational outcomes in healthcare systems [5].

Centralized patient data systems are a powerful tool for enhancing patient acquisition and management. These systems allow for remote access and merge information from multiple sources, including human resources, manufacturing, inventory, supply chain cycles, and finances. They help streamline back-end processes such as payroll, accounts, and inventory management in pharmaceuticals and laboratories. Key global HERP market players include McKesson Corporation, Oracle, SAP, Microsoft, Infor, and Aptean. Moreover, the deployment of ERP systems has been validated for several reasons, including improved company performance, preparedness for growth, reduced working capital, and enhanced consumer service [5, 6].

Malaysia's healthcare system is separated into two major pathways, which are public and private. Malaysia's Ministry of Health primarily provides healthcare services (MOH). Besides the MOH, other ministries provide healthcare services, such as the Ministry of Education with its university hospitals and the Ministry of Defense with its army hospitals [7]. Although the public sector can provide services to around 65% of the country, it is only served by 45% of registered medical practitioners and even fewer specialists [8]. For 2019, Malaysia's total health expenditure was RM 64.3 billion, or 4.3% of the Gross Domestic Product (GDP) [9]. According to Ministry of Health Malaysia [9] the public sector health spending covers 52.5% of the total cost, while the private sector covers the remaining 47.5%. MOH is the primary source of finance for this health expenditure, accounting for 45% of the total cost, followed by private household out-of-pocket spending of 35% [9]. In Malaysia, there are about 146 public hospitals, 2880 health clinics, and 165 mobile health clinics were reported and registered, while 209 private hospitals, 34 maternity nursing homes, 36 ambulatory care centres, and 6442 medical clinics were reported and registered in the private sector [4, 10].

In 2019, the Malaysian Ministry of Health initiated a national implementation plan for Electronic Medical Record (EMR) systems, marking a significant shift towards digital healthcare [10]. ERP systems can support this digitization endeavor by effectively organizing and integrating patient records, providing healthcare providers with easy access across departments. This ensures that patient records are kept up to date, healthcare providers have rapid access to information, and healthcare processes are optimized.

In recent years, ERP has been implemented in public healthcare to improve healthcare process management. However, implementing ERP projects is not as common as in the private sector [3]. Over the last few decades, the potential benefits of an ERP system have been studied. In the last five years, the adoption of ERP systems in healthcare projects has shown a success rate of 27% to 31%, a challenge rate of 49% to 56%, and a failure rate of 17% to 22% Siang [11] ERP installations fail to meet expectations despite high prices and extended durations. This is due, in part, to a lack of understanding about how to solve crucial difficulties during implementations, as well as post-implementation, which can result in cancellations, significant cost overruns, and project failure [2, 11]. Several noteworthy studies have explored the diverse aspects of healthcare technology implementation. The post-implementation success of HERP focuses on a case study involving the Cordlife Group by Siang [11].

Furthermore, healthcare providers face typical challenges during ERP implementation by Kunduru [12]. In addition, the investigation of the decision-making processes related to cloud-based Health Electronic Record Platforms in various healthcare organizations [13] the adoption of AI-integrated Customer Relationship Management (CRM) systems within the healthcare domain [14] are few to mention in the recent studies on Health care ERP (HERP). These studies shed light on the different aspects of the implementation of HERP. While there has been considerable research on adopting healthcare technology, there remains a significant gap in understanding the factors contributing to the success and challenges of ERP implementation in the healthcare industry. Although the existing studies offer valuable insights, a comprehensive analysis of ERP implementation in public-sector healthcare settings is crucial.

Healthcare is a significant industry in Malaysia, and there are concerns that challenges in implementing ERP systems may impact it. In 2020, the Malaysian Ministry of Health was allocated RM 30.6 billion, recording revenues of RM 964 million [9]. As the healthcare industry significantly impacts the well-being of people, it is crucial to investigate the challenges that ERP implementation may pose in this context. 180 healthcare organizations implementing an ERP system reported that they chose to deploy an ERP system for three reasons: commercial, clinical, and institutional [3].

Despite the growing interest in ERP systems in the healthcare industry, there remains a significant gap in understanding the factors contributing to the success and challenges of these systems from the perspective of end users, particularly in the Malaysian public healthcare sector. This study aims to bridge this gap by engaging with healthcare professionals and exploring their experiences and insights to inform strategies for optimizing ERP implementation in

healthcare settings. The researcher developed the following research questions for this study: a) How do various factors contribute to the successful implementation of ERP in healthcare? b) Why do HERP system users encounter challenges? Moreover, c) how can the current HERP system be improved to enhance its functionality?

The study's findings will be valuable for healthcare institutions and policymakers in successfully implementing ERP systems. By identifying challenges, successes, and refinement factors, healthcare organizations can develop more effective strategies, reduce implementation costs, and improve patient outcomes. This holistic perspective would help inform decision-making and improve outcomes in the rapidly evolving healthcare technology landscape.

2. Literature Review

Hospitals use ERP technologies to streamline operations and improve customer service. These systems, which are complex and time-consuming, help healthcare providers adapt to evolving medical technology and maintain quality services [12]. By integrating services and processes, ERP systems can improve patient care efficiency, finance, human resources, capacity limits, revenue, and admission resources, ultimately altering the healthcare industry [12]. A study involving 279 medical professionals from various healthcare centers in Pakistan revealed that ERP positively impacts individuals and organizations. Well-implemented ERPs can lead to the provision of improved healthcare services [15]. Another recent study of 107 public hospitals in Greece found that the adoption of ERPS depends on public policies, hospital size, and organizational readiness, and it can lead to a decrease in the operating costs of the hospitals [16]. However, Proper deployment is essential for ERP to improve productivity. Otherwise, it can be detrimental to the organization [6].

ERP implementations can be categorized into Comprehensive, Middle Road, and Vanilla. Comprehensive implementations involve significant customization, adapting the ERP package's business processes to the organization’s real-time processes [17]. Middle Road implementations involve minimal customization and adoption of market benchmarked procedures with some adaptations. Vanilla implements aligning organizational processes with the ERP, saving costs [18] and resolving mistakes after implementation is costly and complex. Therefore, active organizational engagement is crucial for successful implementation. The following part discusses the different success and challenge factors of ERP implementation in different sectors.

2.1. Theoretical background

Change Management Theory is a critical approach for successful HERP implementation. This theory focuses on the principles and methodologies used to facilitate organizational transitions. It emphasizes the importance of understanding the need for change, effectively communicating, and involving stakeholders [19]. HERP implementation requires a thorough understanding of unique challenges like regulatory compliance, patient care continuity, and data security. Successful HERP integration relies on creating urgency, forming a guiding coalition, communicating the vision, empowering action, generating short-term wins, anchoring changes, and aligning the system with organizational objectives [20]. Applying Change Management Theory principles effectively during ERP implementation can help navigate resistance, foster user acceptance, and align the technology with strategic goals [21]. Therefore, this theory is a guiding framework for the present study to analyze the smooth transition and successful adoption of ERP systems, ultimately improving operational efficiency and patient care delivery.

2.2. Success and Critical Factors in ERP Implementation

Existing studies on ERP observed that user involvement and participation are crucial factors in successful ERP implementation [22] as they help to develop a relationship with the new system and allow users to feel welcomed and included [12]. User involvement reduces resistance and increases the quality of the system. It involves users at all levels in identifying their functional unit needs and making decisions related to implementation [23]. This involvement can improve the system's quality by thoroughly evaluating user information needs, providing expertise about the organization, preventing unwanted features, and enhancing user understanding. Training is another essential success factor, requiring correct human resource management and applying it to users' day-to-day activities [24]. Understanding the benefits of user engagement leads to a successful project. Hence, in the healthcare industry, healthcare personnel should be involved in the implementation phase and training, as they will use the ERP system in their daily activities [22].

Top management's commitment to ERP implementation is crucial for successful implementation [25]. ERP implementation requires extensive training, which can cost between 10% and 20% of an organization’s staff. Top management must be willing to participate and provide resources to improve the fit between ERP packages and business processes [24]. Top management's support measures, such as training and technical assistance, can influence individual adoption and boost ERP effectiveness. Therefore, top management's commitment to ERP implementation is imperative, as it influences individual adoption of innovations, enhances ERP effectiveness, and influences the overall workplace atmosphere [26].

Business process reengineering (BPR) in HERP implementation is crucial for transitioning from function-based to process-based operations. BPR involves defining, executing, monitoring, improving, and optimizing business processes to improve performance indicators such as cost, quality, service, and time. ERP systems can support BPR by facilitating seamless integration across functional domains [27]. BPR has been proven to decrease personnel size and short-term cost savings, while IT and BPR have a cyclical relationship [28]. ERP systems can be suitable for BPR as they facilitate seamless integration. BPR can increase revenue, enhance customer service, lower costs, increase staff retention, and shorten processing time. In healthcare, BPR focuses on clinical processes to redesign processes, removing redundant

components and improving clinical performance, staff empowerment, and employee happiness [6]. Therefore, BPR is crucial for successful ERP implementation, re-aligning strategy, operations, and systems, improving financial performance, customer satisfaction, and delivering superior products or services in time, speed, quality, and cost [27].

ERP implementation in healthcare faces challenges such as resistance, ineffective communication, and lack of training and development. The system alters business processes, making the transition a protracted and unpleasant experience for many organizations. User resistance is a common issue in organizations, especially when implementing new systems like ERP [29, 30]. It can stem from laziness, fear of losing power, or inability to keep up with technology. Proper planning and training are crucial to gain user support and reduce difficulties [3]. ERP systems often face strict processes, leading to a lack of flexibility and alternatives [29]. Internal reasons, bad system design, and employee resistance can also contribute to resistance [31]. User resistance can be influenced by technological characteristics, individual or group characteristics, and perceived social losses. Therefore, top management should teach different user groups and develop the necessary computer skills [30].

Another challenging issue is effective communication. It is crucial for successful ERP system implementation in healthcare, as it ensures data sharing and access across multiple platforms [3]. Ineffective communication can lead to misunderstandings and employee motivation concerns [30]. Organizations should create strategic strategies and communicate effectively with top management to overcome opposition and demonstrate benefits. A team of communication experts, including ICT, healthcare personnel, and SAP consultants, should communicate on ERP system mapping and analysis [3].

Moreover, implementing ERP systems is challenging due to the complexity and specialized training required, which can be difficult for non-IT-savvy users [12]. Change resistance and difficulty in implementing ERP systems can also hinder the process [26]. Employees may need adequate training to operate the system, leading to potential failures [12]. ERP systems require significant storage and networking, making skill development and education crucial. Users face challenges like time-consuming technical work and the need for support for routine job obligations. Top management must focus on staff development and training-related issues to successfully execute and sustain business ERP activities [6].

3. Method

The research philosophy used in this research is interpretivism because it recognizes that people might have different opinions and points of view based on their upbringing [32]. Relating to this philosophy, the present study aids in obtaining various viewpoints on the system from ERP users with various backgrounds in the healthcare industry. In terms of research design, this research employed a qualitative method. Researchers use this method as an exploratory and interpretive research strategy to undertake in-depth discussions with respondents to obtain input on issues that cannot be measured using technology. It is an effort to comprehend circumstances as part of the specific context and the interactions that make them unique [33]. As a result, this study uses semi-structured interviews as research methods. Figure 1 presents the methodology of the study.

3.1. Participants and instruments

A purposive sampling approach was used [34]. The researcher contacted potential participants through email and the messaging app "WhatsApp" to request interviews. The main selection criteria for participants were ERP users in the public healthcare sector with at least five years of experience in Malaysia. Initially, 30 emails were sent to invite end users of the ERP system who work in the public healthcare sector. Out of the 30, 13 agreed to participate in the study. Due to the busy schedules of the respondents, only 12 of them were available for interviews. To meet the healthcare sector's requirements, interviews were conducted virtually via Google Meet or WhatsApp calls with participants' explicit consent. The interviews were recorded for transcription and had an average duration of 40 minutes, ranging from 35 to 50 minutes. The study obtained approval from the appropriate authority before interviewing the health personnel.

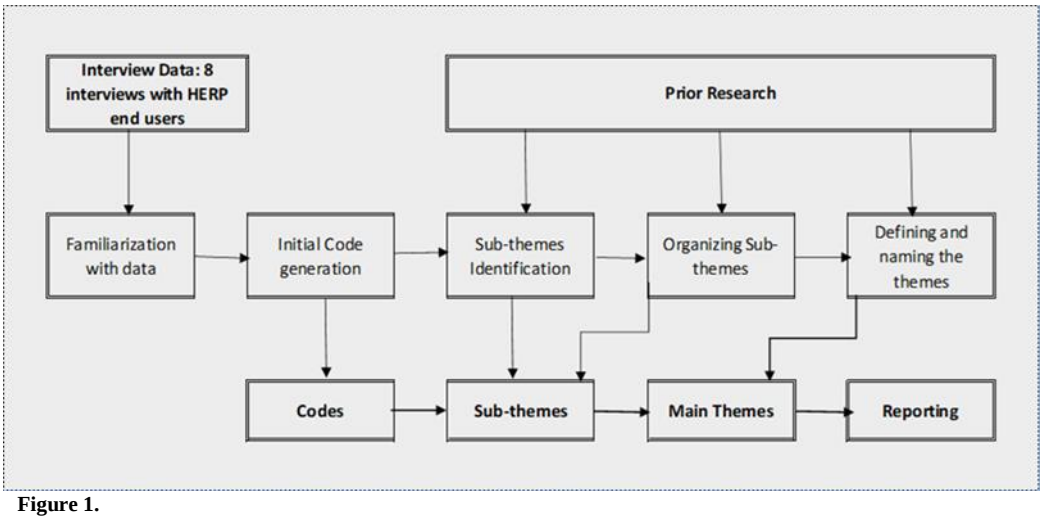

Figure 1.
The thematic analysis Flowchart.
Source: Adapted from Braun and Clarke [35].

The literature review provided several themes that were relevant to the study. For instance, the challenges of ERP included User Resistance [30] Ineffective Communication [6] and Training and Development [6]. On the other hand, successful factors included user involvement [12, 22] Top Management Commitment [24, 25] and Business Process Reengineering [27]. Based on these themes, a semi-structured and open-ended interview instrument was developed for the study. The initial interview instrument was used to conduct a pilot interview with an end user of ERP in the public healthcare sector. The instrument was then amended to enhance the possible outcome of the interviews. Table 1 presents the demographic profile of the study respondents.

Table 1.
Demographic Information of the respondents.

Particulars	No of respondents
Gender	
Female	5
Male	7
Types of Health Service Providers	
General Hospital	6
Primary Health Care Clinic	6
Experience	
5-10 years	5
11-15 years	5
15+ years	2

3.2. Procedure

During the interview, the responses of all participants were recorded, transcribed, and compiled for analysis. Before the interview, the respondent obtained verbal consent to record their responses. To analyze the comments provided by the respondents, the study used thematic analysis, a qualitative research method that identifies, analyzes, and reports patterns in data [35]. The thematic analysis process followed in this study involved six steps: 1) becoming familiar with the data; 2) creating initial codes; 3) identifying themes; 4) reviewing the themes; 5) defining and naming the themes; and 6) producing a report [35]. Figure 1 presents the methodology of the study.

The study systematically confirmed the accuracy and coherence of the data and narrative accounts. Each data transcript was reviewed by the respondents to validate the credibility of their statements during the interviews, ensuring that their comments were accurately interpreted. Every piece of evidence from the audit trail was meticulously preserved throughout the study, aiming to establish the trustworthiness of the findings.

4. Results

The interview outcomes are analyzed to assess the responses to the research questions. Thematic analysis has proven helpful in identifying the crucial elements for successful ERP implementation in healthcare and the challenges and necessary improvements [36]. The analysis has also identified respondent indicators to enhance the process further. The present study used an inductive analysis to generate codes, a list of themes, and a thematic analysis to encode the collected qualitative data [35]. The following sections present the successful, challenging, and refining factors and their themes observed from the study.

4.1. Successful factor

The study found that the implementation of ERP in the healthcare industry is reliant on four key themes, namely user involvement, top management commitment, business process reengineering, and user acceptance. End users frequently cited these as successful elements of ERP implementation. Figure 2 presents the word cloud for the sub-themes of the successful factor HERP.

Figure 2.
Word Cloud for the Sub-themes of the successful factor of HERP.

4.1.1. User Involvement

To ensure a successful implementation of an ERP system, users must embrace and utilize the new technology. User involvement and participation during the implementation process were the critical factors influencing the project's outcome. When users actively participate in the implementation of ERP systems, it results in better outcomes such as the ability to identify system needs, a more positive attitude toward the ERP system, and increased chances of success. According to the respondents, all users, regardless of their level, should be involved in identifying the requirements of their functional unit. The respondents expressed:

"User involvement is important and with user involvement, it can make the work faster by involvement in training."

The respondents highlighted that user involvement significantly improves the system's quality by assessing user needs, providing expertise, eliminating unwanted features, and enhancing comprehension of the system. Users who participate in the decision-making process and receive guidance on how to adapt to changes and unexpected events are more likely to be invested in the system's triumph.

4.1.2. Top Management Commitment

This study viewed the critical role of top management commitment and support in achieving successful ERP implementation. All respondents agreed that top management's contribution is essential for successful ERP implementation in healthcare. To them, organizational leadership must be the driving force behind ERP implementation, with the full support of top management. A user of the ERP system stated the following:

"I think for the system to be used by the end user, top management has to listen to the input from the end user itself rather than other people because, in the end, we are using it."

Employees' positive experience is essential to achieving desired results in ERP efforts, and this requires careful consideration of organizational leadership, direction, and top management commitment. Healthcare businesses should prioritize the implementation of the best ERP system, regardless of their routines or processes. One of the respondents mentioned:

"If the top management, before they design the ERP, take into account the end user feedback, how they are going to improve the end user, and what type of system they want. They get their information and their feedback."

4.1.3. Business Process Reengineering (BPR)

BPR is a technique that involves defining, executing, monitoring, improving, and optimizing business processes to make an organization run smoothly. The healthcare industry can benefit from BPR by implementing it to reduce waste, simplify processes, improve compliance, and provide superior patient care. In the present study, it is observed as a significant factor following the remarks of one of the users, who stated that:

"With BPR it is easier to align the business process with the system". Another respondent supported this by stating that "with BPR, it does help to ensure the system suits the workflow of the end user and everything can be centralized if BPR is done properly."

4.1.4. User Acceptance

User acceptance plays a huge role in the successful implementation of HERP from the end user's perspective. The suitability of a system to an organization's workflow is a critical factor in determining user acceptance. When a system is aligned with the organization's workflow, it can increase the end user's satisfaction and adoption of the system. Therefore, ensuring that a system meets the organization's needs and workflow is essential to maximize user acceptance. User

acceptance is observed as vital for the HERP system because it facilitates easy use and understanding of the system. One of the respondents expressed:

"Factors that can contribute to user involvement is the user willingness to accept the system. It is important to accept the new system so that we can easily trace old notes of patients coming for a second visit, digitization of documents, we are also able to view, encounter time, patient treatment time and patient discharge time".

The study observed that when users have a good understanding of the system, they can easily navigate through it and perform tasks efficiently. This is especially crucial in fields such as healthcare, where tasks such as patient management and medication need to be performed accurately and efficiently. By having everything in the system, users can easily access the necessary information, resulting in improved patient care and overall system performance. Therefore, user acceptance is crucial to ensure that systems function optimally and deliver the desired outcomes.

4.2. Challenges

HERP systems play a critical role in managing healthcare operations effectively. However, implementing and utilizing a HERP system can be challenging. Five themes have been identified that require immediate attention: (1) User resistance, (2) Ineffective communication, (3) Lack of training and development, (4) Technical issues with the system, and (5) Poor integration. From the study, it is observed that it is important to address these issues to ensure that ERP systems can be leveraged to their fullest potential in the healthcare sector. Table 2 presents the responses on the key themes regarding the challenges in HERP implementation.

Table 2.
Key Themes for Challenges of HERP Implementation.

Sub-themes/ Elements	Key Themes	No of respondents
No option to resist the system	User resistance	8
Unsatisfied with the system		
Flawed system design		
Lack of system expertise		
Lacking information/ uninformed	Ineffective communication	7
Lack of communication		
Absence of retraining	Lack of training and development	7
Lack of system usage proficiency		
Lack of understanding		
System is slow	System technical issues	8
Internet connection dependent		
In adequate features		
Easy input and record system		
User interface		
Individualized hospital systems.	Poor integration (New findings from interview)	5
Lack of data integration		

4.2.1. User Resistance

User resistance to a system can be a significant challenge, especially when users have no choice but to use it. The respondents pointed out that this can lead to reduced efficiency, productivity, and overall system performance.

"They don't want to use the system because they are unhappy with the system."

Organizations must address user resistance by providing training, addressing concerns, and improving the system to meet user needs. In healthcare, the use of systems is crucial for effective patient care and system performance. However, some users may resist the system due to a lack of awareness and knowledge about its importance. Poorly designed systems can also lead to user resistance, as they are difficult to navigate, understand, and use, leading to frustration and resistance. Poor system design can lead to decreased productivity, increased errors, and poorer system performance. One specialist expressed:

"The user may be unsatisfied with the system due to bad system design that also poses challenges for the implementation of the system."

4.2.2. Ineffective Communication

Effective communication is crucial for successful system implementation, especially in healthcare. However, the study observed that ineffective communication can lead to a lack of knowledge and understanding of the system's advantages, causing users to feel uninformed, frustrated, and resistant. Insufficient information about the system's choice, training schedule, and other details can also hinder its adoption, leading to reduced efficiency, productivity, and performance. One of the users shared his thoughts on the matter. Hence, in the healthcare industry, poor communication between top management and end-users can result in insufficient information sharing, leading to feelings of misinformation and frustration.

4.2.3. Lack of Training and Development

Based on the study, it was observed that providing sufficient training to users is crucial for successfully implementing an ERP system in healthcare and achieving improvement. The proper use and successful implementation of a new system in healthcare relies significantly on the end-user's ability to use the system correctly. However, in some instances, end-users may not receive sufficient training on how to use the new system. One respondent who is a specialist in a general hospital expressed that in some instances, end-users may only be provided with basic training at the introduction of the system, which may not be enough for them to use the system effectively. Consequently, end-users may have to figure out how to use the system independently, leading to frustration and reluctance to adopt the system.

4.2.4. System Technical Issues

Healthcare systems are essential for efficient patient care delivery, but technical issues like slowness can hinder their effectiveness. The digital age has revolutionized healthcare with electronic health records and telemedicine, but there are risks associated with relying on the Internet. In hospitals, interruptions can cause delays and potentially harm patient health. During their interviews, all of the participants emphasized the issue with the system. The system should facilitate easy entry and tracking of clerking data for referred patients, ensuring accurate and complete documentation. Improving the clerking process is crucial to ensure accurate and complete documentation of patient information, regardless of the medical team involved in their care.

4.2.5. Poor Integration

One challenge that the findings point to is the lack of standardization in using patient records; every hospital has its system for managing them. The lack of standardized patient record management systems in hospitals results in communication and coordination issues, leading to errors, delays, and gaps in patient care. Patient data are crucial for diagnosis, treatment, and management, but its seamless integration across different systems is challenging. The study observed a need for more data integration and individualized hospital systems. This can lead to duplication of efforts, delays in treatment, and errors in diagnosis or medication management. Integrating the systems would enhance the usability and acceptability of HERP. Figure 3 presents the share of key challenges in HERP implementation.

5. Discussion

This study found that involving end-users is crucial for successfully implementing HERP systems [37]. User acceptance is crucial in this industry, which has various stakeholders with unique needs. Involving end-users in the design, testing, and training phases can ensure a user-friendly system that meets specific user group needs [22]. This approach also promotes user adoption and reduces resistance to change, resulting in a smoother implementation process [38].

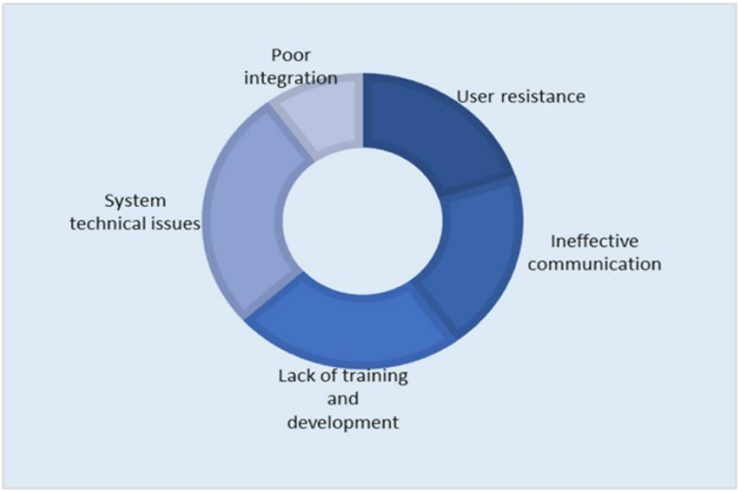

Figure 3.
Challenges Factor in HERP Implementation.

Top management commitment is another crucial issue for the successful implementation of HERP systems. They must be actively involved in planning, execution, and monitoring [39] communicating the project's importance to the entire organization and stakeholders through town hall meetings, newsletters, and training sessions. Top management should also support the project team by providing necessary resources and ensuring they have the authority to make critical decisions, aligning with the findings of Elkhani, et al. [40]. Top management commitment is crucial to overcome opposition from interest groups within the organization. Without the complete support of the top management team, changes will inevitably be met with resistance. To ensure the successful implementation of ERP systems that fit the company's processes, top management must provide the necessary resources.

ERP implementation in healthcare necessitates a thorough evaluation of existing processes and workflows. Business process reengineering involves identifying inefficient processes and redesigning them to improve efficiency, reduce cost, and enhance patient care [28]. The success of this process depends on the involvement of end-users and top management

commitment, with end-users providing insights and suggestions, and top management providing resources and aligning with the organization's strategy [6]. Successful BPR implementation requires ERP systems, which seamlessly integrate information across all functional domains. IT and BPR are inextricably linked in a cyclical relationship, meaning that any improvement in one lead to an improvement in the other. After BPR projects are completed, organizations can work more effectively when employees become familiar with new process designs, and implementation concerns are addressed.

Moreover, user acceptance is the degree to which end-users perceive an ERP system as useful and easy to use [41]. User acceptance is critical to the success of ERP implementation in healthcare because end-users are the primary users of the system. Resistance to change is a common barrier to user acceptance [42] and healthcare organizations must address this by involving end-users in the design and testing of the system. Organizations can also ensure user acceptance by making the ERP system user-friendly and intuitive. This can be achieved by providing adequate training, clear instructions, and guidance to users. The system should also have a simple user interface, clear navigation, and interactive features.

ERP systems are crucial for healthcare organizations to manage operations efficiently [37]. However, implementing ERP systems can present challenges such as user resistance, ineffective communication, lack of training and development, system technical issues, and poor integration. Employees may resist change due to job security concerns, lack of familiarity, or uncertainty about benefits. Resistance to change can lead to delays in implementation, reduced productivity, and increased costs.

The lack of clear communication can discourage users from embracing and integrating the new system. To address user resistance, healthcare organizations should involve end-users in the ERP implementation process, communicate system benefits [30] and provide adequate training and support. This can help reduce user resistance and promote system adoption. Ineffective communication is another challenge that healthcare organizations may face when implementing ERP systems. Communication breakdowns between project teams, end-users, and other stakeholders can lead to misunderstandings, delays, and a lack of accountability. Previous studies also observed that to counter communication challenges, healthcare organizations must establish clear communication channels and ensure that all stakeholders are informed and involved in the implementation process [6]. Therefore, it is essential to explore the impact of ineffective communication on user resistance to overcome it and promote the effective use of systems in healthcare. This can be achieved through regular meetings, progress reports, and open communication channels between project teams and end users. Additionally, organizations can appoint a communication officer to oversee and manage communication between stakeholders.

Proper training and development are crucial for the successful implementation and use of ERP systems in healthcare [6]. End-users need to receive sufficient training to comprehend how the system functions and how it can enhance their work processes [43]. Insufficient training can lead to frustration among users, low adoption rates of the system, and increased errors. To address this, comprehensive and customized training programs should be provided at various stages of implementation, with ongoing support to ensure competency.

Healthcare organizations may encounter technical challenges when implementing ERP systems, such as system downtime, slow response times, and software glitches. These issues can cause frustration among users and create doubts about the system's reliability [6]. To address technical issues, healthcare organizations must establish efficient system maintenance procedures and provide accessible technical support [23]. Poor integration is another potential issue that can result in data inconsistencies, duplication, and errors. To avoid this, healthcare organizations must ensure that the ERP system is fully integrated with other systems in the organization. To achieve this, they should conduct an assessment of existing systems and processes, identify areas that require integration, and implement integration strategies that promote data consistency and accuracy that is consistent with the findings of Yen, et al. [44]. Addressing the integration between systems and hospitals requires collaboration between healthcare providers, policymakers, and technology vendors to establish standards and protocols for seamless data integration across different systems and disciplines.

6. Limitations and Future Research Agenda

The research faced several limitations, including limited literature on ERP in healthcare and a need for user perspectives. Finding interviewees was challenging due to busy schedules, and some candidates did not respond. Additionally, arranging interviews was difficult because most respondents were medical officers working in hospitals and were forced to conduct online interviews.

A potential limitation of this study is the focus on end users' perspectives, which may not capture the views of other stakeholders, such as healthcare administrators or IT professionals. Future research could incorporate the perspectives of these stakeholders to provide a more comprehensive understanding of the challenges and success factors in ERP implementation.

Future research in HERP implementation can focus on long-term impact assessment, interoperability and integration strategies, and cost-benefit analyses. To enhance the implementation of HERP systems, future research could examine the effects of HERP implementation on patient outcomes and quality of care. Studies could include investigating the potential benefits and challenges of integrating various healthcare information systems, such as electronic health records and hospital information systems, with HERP systems to improve data interoperability and information sharing across different levels of care. Moreover, the present study observed that system design affects the implementation of the ERP system. Therefore, it is essential to investigate how system design affects user resistance to promote efficient application of systems in healthcare. Such studies could help healthcare professionals gain a deeper understanding of HERP implementation practices and improve them accordingly, resulting in reduced medication errors, improved patient safety, and increased patient satisfaction.

7. Conclusion

The implementation of ERP systems in the healthcare industry is essential for improving operational efficiency and enhancing patient care. However, there is a significant gap in understanding the success factors and challenges of ERP in public-sector healthcare, particularly in Malaysia. Therefore, the present study aims to find the factors in the public healthcare sectors of Malaysia from the user perspective. The study identified key themes for successful ERP implementation, including user involvement, top management commitment, and user acceptance. It is imperative to address user resistance, communication issues, training deficiencies, technical challenges, and poor integration. To ensure the success of ERP systems, it is crucial to involve end-users more in the implementation phase and consider their feedback for future ERP implementation in healthcare.

The findings of this study have practical implications for healthcare organizations and policymakers. By addressing the identified challenges and implementing strategies to promote user involvement, top management commitment, and business process reengineering, healthcare organizations can optimize the effectiveness and efficiency of ERP implementation, leading to improved patient care and operational excellence.

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