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A QUALITATIVE CASE STUDY OF CRITICAL SUCCESS FACTORS IN IMPLEMENTING ERP AT INDUS HOSPITAL & HEALTH NETWORK

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Article Info

Abstract

The purpose of this research is to enlist a list of critical success factors in implementing ERP that are important to consider and provide additional insights in the context of ERP Implementation in the healthcare sector in resource-constrained institutes because ERP is an expensive software. The mono method approach of data collection was used by conducting face-to-face interviews with participants who had an active role in the implementation at Indus Hospital and Health Network, Karachi. The Nvivo14 was used for the thematic analysis of the data. Informed consent and a topic guide were provided to participants before the interview. Seven interviews were conducted with participants from different assigned roles, including IT Support officers, core committee members, end users, and module owners, to obtain in-depth data and add more value to the research for the Pakistani healthcare society. Eight critical success factors were identified, including Management Support, change management, training and knowledge, business plan and vision, data transferability, organization policy, logistic availability, and ERP team composition. This case study indicated that these factors were significantly important in implementing ERP at Indus Hospital & Health Network. The results emphasized Management Support and Change Management as the most important Critical Success Factors, and logistic availability as the least important factor.

Keywords:

Enterprise Resource Planning, Success Factors, Indus Hospital and Health Network, Qualitative Research.

Introduction

Background of Study

The health system is a complex socio-economic field that needs to be upgraded with changes in technology for uninterrupted healthcare facilities. To streamline, automate, and integrate with other connected sectors, such as medication suppliers, regulatory bodies, and hospitals, to trace patient records and even within the setup to coordinate effectively for effective decisions, the healthcare sector is transitioning its system on ERP. ERP is software that helps organizations integrate data from different departments to run processes effectively. ERP is a complex software system for institutions (Umble & Umble 2003).The basic concept of an ERP System is to utilize information systems and technology to improve organizational efficiency. Three major ERP vendors are known internationally which are Smart automated analytics(SAP), MICROSOFT DYNAMIC 365 and ORACLE NET SUITE (Sharma et al., 2020), and four well-known leading international cloud ERP vendors are available as per Gartner (2022): SAP (4HANA), Workday, oracle (Netsuite), and Oracle (Fusion Cloud ERP). The success of a project can take many forms, depending on the type of project governance, and its characteristics are more influential in achieving project success. Wang and Chen (2006) iterated that governance practices minimize the risk of project non-delivery. ERP is a complex and expensive so needs a lot of efforts for implementation so before implementation it is necessary to measure readiness of healthcare sector for ERP implementations. This is done by keeping a few critical factors (quality of system, data security, organizational culture, top management commitment, project management, user training, and education, which vary from sector to sector) in mind to prevent and minimize resource wastage and decrease the chances of failure in implementing ERP.

This study is being conducted in view of ERP implementation failure cases so that recommendations can be made to change failure into success. Additionally, this project will provide guidelines for implementing ERP in healthcare organizations, such as how to prioritize CSFs in their ERP implementation strategy to achieve successful implementation.

Problem Statement

ERP is a sophisticated system; its implementation is a complex and expensive process that requires a lot of effort, especially in hospital setups, because of complex legislative requirements and patient social responsibilities. According to Van Vuuren and Seymour (2013), ERP system adaptation failures are partly due to the poor fit between the information system (ISs) strategy and institutional background. Despite two decades of research, ERP Implementation may face failure and go beyond budget expectations and timelines. It is necessary to evaluate the factors to keep in mind while implementing it to minimize the risk of failure and reduce waste of resources. This study will help healthcare sector stakeholders in implementing ERP against possible factors they may encounter in the future, especially in Karachi, as there are limited or very few studies on ERP implementation in Pakistan ’s healthcare sector.

Research Aim

The research aim is a broad statement defining the general purpose of the research project. This study aimed to develop a concise list of critical parameters and their advantages that will help create an easy and smooth pathway for the successful implementation of ERP in the public and private healthcare sectors in Karachi, Pakistan.

Research Objectives

The study's objectives are to determine the critical success factors in implementing ERP in a tertiary healthcare setup and the relationship between user satisfaction and the successful implementation of ERP in the healthcare sector.

1. To identify the critical success factors that affect ERP implementation.
2. To suggest general advices for successful implementation of ERP in healthcare sector of Karachi

Research Statement

1. What are the critical success factors that impact ERP Implementation (a concise list)?
2. What are the general advices for the successful implementation of ERP in the healthcare sector of Karachi?

Scope of the Study

This study will be conducted at Indus Hospital and Health Network, Karachi, where ERP has already been implemented, either partially (limited module) or completely (in all departments of an institute with a fully functional module as per their departmental needs). During interviews user perspective will also be taken to known their satisfaction with ERP software implementation

Research Significances

This section explains my project contributions and their implications for the health sector's implementation of ERP. Many studies have proven ERP implementation failure (Malik 2020). On completion of this study, we will have a few strong and good recommendations for ERP Implementation, including how to determine whether a healthcare system is ready to implement ERP and how to manage the installation of this expensive system. This will guide organizations and installer facilities on the strategy to be followed to implement ERP, particularly in the healthcare sector.

Limitation of Study

Like every research study, this study has some limitations. As the title defines, this study is only in one healthcare sector, so in result, whatever CSFs are found, they will be specifically applicable to the healthcare sector.

Literature Review

In this section, we review a few available studies that relate to the gaps in our study and the limitations they defined in their studies and provide a detailed view of the importance of CSF for Successful ERP implementation in the healthcare sector.

Martin (1998) stated that ERP is over budget, then expectations, and becomes delayed in complete installation. There are studies that have compiled a list of CSFs, that is, IT structure, IT planning map, legacy system (Holland and light 1999, p. l), competitive edge, knowledge management (Nielsen 2002), cost, and schedule (Sun et al. 2005). Al-Mashari (2006) in his study said that top management commitment is needed to resolve conflicts among power holders and required for assigning budget and valuable resources. A comprehensive review will be conducted of several studies from search engines such as Google Scholar, Web of Science, and the USpace Institutional Repository web bank.

Review of Relevant Literature

There are studies which were quantitative and carried on CSFs that literature has concluded directly on other than health sectors

ERP Systems in Healthcare

ERP systems integrate and automate various business functions within an organization, including finance, human resources, supply chain management, and customer relationship management (Davenport, 2000). In healthcare, ERP systems can streamline administrative processes, improve patient record management, and facilitate communication between departments (Bergeron, 2008). Research suggests that successful ERP implementation in healthcare can lead to numerous benefits, such as

- Enhanced operational efficiency and productivity (Yildiz, 2013)
- Improved financial management and cost control (Yucel et al., 2010)
- Increased data accuracy and accessibility (Weng et al., 2006)
- Improved patient care coordination and communication (Yoon et al., 2010)
- Enhanced decision-making capabilities (Hitt et al., 2002)

Challenges of ERP Implementation in Healthcare

Despite their potential benefits, implementing ERP systems in healthcare is challenging. These challenges include the following:

- **Complexity of healthcare operations:** Healthcare organizations involve diverse stakeholders and complex workflows, making it difficult to configure and integrate ERP systems effectively (Premkumar et al., 2019).
- **Data migration and quality concerns:** Migrating existing healthcare data to a new system can be time-consuming and is prone to errors, compromising data integrity and system functionality (Weng et al., 2006).
- **Resistance to change:** Healthcare professionals may resist adopting new technologies due to concerns about workflow disruption, training requirements, and potential job displacement (Yoon et al., 2010).
- **Cost and resource constraints:** Implementing and maintaining ERP systems can be expensive, requiring significant financial and human resources (Yıldız, 2008).

Critical Success Factors for ERP Implementation

Several studies have identified various CSFs that contribute to successful ERP implementation across industries. This review focuses on CSFs specifically relevant to the healthcare sector, drawing insights from both general and Karachi-specific research.

Executive commitment and leadership: Strong leadership commitment from senior management is crucial for securing resources, promoting adoption, and navigating challenges during the implementation process (Premkumar et al., 2019).

- **Clear project management and planning:** A well-defined implementation plan with clear goals, timelines, and responsibilities ensures efficient project execution and minimizes management: Implementing robust data migration strategies and ensuring data accuracy throughout the system are critical for maintaining data integrity and enabling reliable decision-making (Weng et al., 2010).

- **Change management:** Developing effective change management strategies to address employee concerns, manage resistance, and facilitate a smooth transition to the new system is vital for successful implementation (Yoon et al., 2010).
- **Vendor selection and partnership:** Selecting a reliable ERP vendor with expertise in the healthcare sector and fostering a collaborative partnership are essential for successful system customization, implementation, and ongoing support (Yildiz, 2013).

Karachi-specific Considerations

While the general CSFs discussed above are applicable to healthcare organizations globally, specific considerations are relevant to the context of Karachi:

- **Cultural factors:** The influence of cultural norms and resistance to technology adoption in Karachi may require additional efforts to promote user buy-in and address concerns (Iqbal et al., 2012).
- **Infrastructure limitations:** Potential limitations in Karachi's technological infrastructure, such as internet connectivity or reliable IT support, may necessitate adjustments in implementation strategies (Ahmad et al., 2021).
- **Regulatory environment:** Understanding and adhering to relevant healthcare regulations and data privacy requirements in Pakistan is crucial during the implementation process (Ali et al., 2022).
- **User involvement and training:** Engaging stakeholders throughout the implementation process, providing comprehensive training, and addressing user concerns are essential for promoting system adoption and maximizing user satisfaction (Dwivedi et al., 2009).

From all these studies, critical factors are all are not of an equal important in studied sectors like in health care sector vs manufacturing sector or retail industry for implementing ERP and this literature review conclude that limited studies are available in health sector and none in Karachi, Pakistan, additionally these studies conclude that in each sectors critical success factors for implementing ERP are different i-e in education sector data quality mattes on priority and in banking sector data security is top priority, so specifically in healthcare sector of Karachi, Pakistan this study will provide clarity of CSFs with construction of highly important CSFs list.

Theoretical Framework

The successful implementation of Enterprise Resource Planning (ERP) systems in the healthcare sector of Karachi is a critical endeavor that requires a comprehensive understanding of the factors influencing its success. In this context, the Organization Information Processing (OIP) theory emerges as a robust framework to guide the exploration of critical success factors (CSFs) in the implementation of ERP systems.

Organization Information Processing Theory:

The Organization Information Processing (OIP) theory, developed by Daft and Lengel (1986), focuses on how organizations acquire, process, and utilize information for decision-making. This theory provides a lens through which the information processing capabilities of an organization can be examined, shedding light on how these capabilities impact the success or failure of complex initiatives such as ERP implementation.

Key Concepts of OIP Theory:

- **Information Processing Capacity:** OIP theory posits that organizations vary in their information processing capacities, influenced by factors such as technology, structure, and culture. In the context

of ERP implementation in the healthcare sector, understanding the existing information processing capacities within healthcare organizations in Karachi is crucial. This involves assessing the technological infrastructure, organizational structure, and the prevailing culture regarding information sharing and decision-making.

- **Environmental Uncertainty:** OIP theory recognizes the importance of considering environmental uncertainty. In the healthcare sector, where external factors such as regulatory changes and evolving medical practices are frequent, identifying and adapting to environmental uncertainties is vital. This includes anticipating changes in healthcare policies, technological advancements, and patient expectations that might impact ERP implementation.
- **Information Processing Modes:** OIP theory categorizes organizations into different information processing modes, ranging from routine to non-routine processing. ERP implementation involves both routine tasks (e.g., data entry) and non-routine tasks (e.g., adapting to new workflows). Understanding the balance and efficiency of these modes within healthcare organizations helps in tailoring ERP systems to fit seamlessly into existing processes.
- **Communication Channels:** OIP theory emphasizes the importance of communication channels for effective information processing. In the healthcare sector, effective communication is essential among various stakeholders, including clinicians, administrators, and IT professionals. Examining communication channels and patterns is crucial to identifying bottlenecks and ensuring a smooth flow of information during ERP implementation.

Application to the Study:

Applying OIP theory to the qualitative study on ERP implementation in the healthcare sector of Karachi enables a nuanced exploration of CSFs. The research can delve into the information processing capacities of healthcare organizations, assess their ability to handle environmental uncertainties, identify prevalent information processing modes, and evaluate the effectiveness of communication channels. By using OIP as the underpinning theory, the study aims to provide actionable insights for optimizing ERP implementation strategies in the unique context of Karachi's healthcare sector.

Methodology

The importance of this chapter is to tell readers that how this qualitative research will be carried using research onion model referenced by Saunders, Lewis and Thornhil (2016) shown in taken figure from reference. Research methodology is defined as methods and techniques performed to get a meaningful output from data collected.

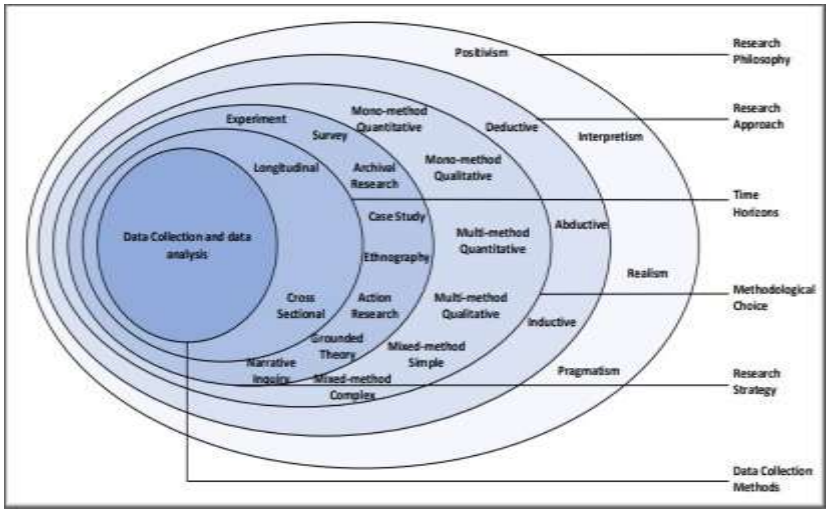


Figure 3.1 Research Onion

Research Philosophy

This study will be exploring factors which affecting ERP Implementation Research philosophy is a construct which describe scientific research rules which are followed to conduct research. These activities add new knowledge of phenomenon which

is called research output. To validate this output contribution Gregor and Hevner (2013) designed three questions that are: "Is it true?, Is it new? , Is it interesting?". Because reader scientist always searches for new, acceptable and answer to his question in research.

In Interpretivism paradigm interpretivism researchers assumes the nature of future, which is unpredictable, chain of knowledge. Approach of this qualitative study will be interpretivism. This approach is appropriate as it emphasizes understanding the subjective meanings and experiences of individuals involved in implementing ERP at IHHN.

Research Approach

Inductive approach is theory building approach where new theory is created by researcher's observation, patterns and measures, for qualitative researches inductive reasoning is used (Mayers, 2013). Other is Deductive approach which is a theory testing defined as researcher's observations and hypothesis developed on basis of literature review. This study will be adopting Inductive approach to dig down factors for successful implementation for allowing an in-depth examination of specific factors.

Strategy

A strategy defined in research onion layer for qualitative studies are Survey, Grounded theory, Action research, narrative inquiry and case study which is defined as recorded experience of a single person or small group (limited number), explaining the real experience or particular perspective of that parson, most of time primary through interview which are then saved and ordered into a chronological narrative so for exploring factors affecting ERP implementation will be case study.

Choice of Method for Research

The choice of research method will be Mono method qualitative approach, as one on one interviews will be conducted from employees who had active role in ERP implementation in IHHN Karachi. Mono method is when researchers decide to do research by single rule method for data collection and analysis.

Time Horizon

Time Horizon defined as the time frame in which research is conducted i-e Cross- Sectional or short-term study. This will be short term qualitative study in which data will be collected by interviews from user and stakeholders who had role in Implementation of ERP in Indus Hospital & health Network.

Data Collection and Data Analysis

For qualitative data collection researcher collect empirical data about phenomenon being studied, this collection methods entails understanding from images, words not from numbers. Images and words are difficult so it requires careful attention to clarify and define these (Saunders et al, 2016). Data collection for this project will be qualitative data interview will be conducted from team of ERP Implementation involving management level persons, IT staff and end users. Time frame will be from April 2024 to June 2024 and thematic analysis will be adopted as mode of analysis for identifying critical success factors by systematic coding to categorize data and identify key themes. Data will be collected using purposive

sampling method to ensure that data is in rich of relative information so interview will be from employees who had active role during implementation of ERP by audio recording face to face interviews. A topic guide & information leaflet will be developed based on literature review and research questions. Questions will be semi-structured. A face-to-face interview of participant will be audio recorded with consent and later on will be transcribed to obtain meaningful units from recorded data to formulate categories of critical success factors. Data will be analyzed using NVivo 14.

Rigor of the Study

Rigor ensures the trustworthiness and credibility of the findings in qualitative study. In this study several strategies will be applied to enhance rigor Face to face audio recorded interview will be conducted until the theoretical saturation of the data, which will be kept for 3 years after this study for verification in case of any discrepancies. Member checking will be done of findings with participant of study to ensure accuracy and alliance with their experience during implementing ERP at IHHN.

Ethical Consideration

It is important to maintain an ethical privacy of respondents so their information will be kept Secrete and consent will be taken for primary data which will be used in research (appendix ii), this research will adhere to all standards and guidelines in every

aspect of modern research ethical concerned. The secondary data will be acknowledged with appropriate reference and citation of parent author. This will be owned work no any plagiarized and coping material will be added as claiming author.

Results & Discussion

In this chapter we will analyze and present data, based on research design discussed in chapter 3. The participants were interviewed face- to face and their audio was recorded and that audio was transcribed for analysis. Thematic analysis was employed by researcher as guided by Braun and Clarke (2006)

Data Collection and Analysis

A total of 7 participants were interviewed for this study. This number arrived at saturation of Information and no new information was being collected. The demographic information in term of role and duration on that role is depicted in given table 4.1.

Table 4.1 Demographic data of respondents

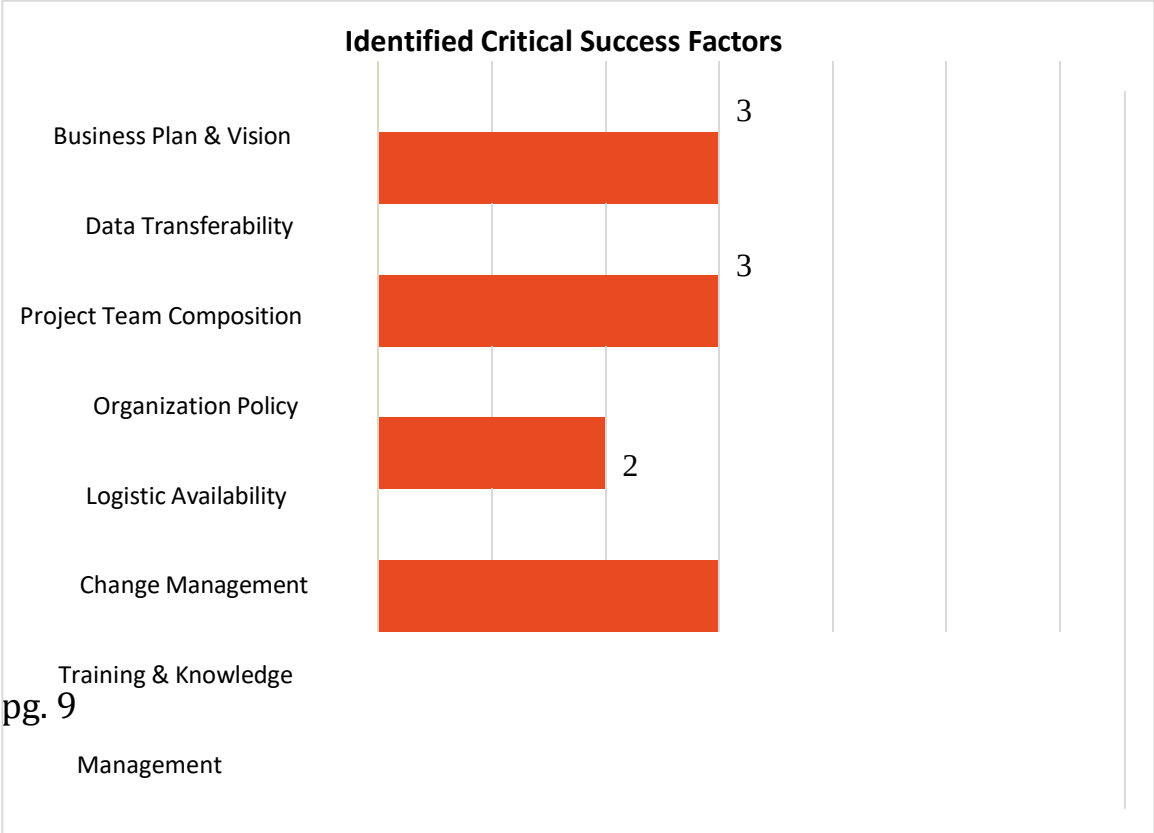
Role of Participant	Assigned code	Number of respondents	Combined year of experience
Core committee member	SP02, SP03, SP04, SP05	4	6 months
End User	SP01, SP07	2	6 months
IT Support Officer	SP06	1	6 months

Table show 7 participants SP01 & SP07 has role of End user in implementing ERP and 4 were core member of ERP implementing project team. Participants has 5-7 months role in ERP Implementing team. These participants were active employee of the organization and had management level professional role in organization. Due to confidentiality factor active role of participant's is not depicted subject wise but cumulative they were from supply chain team, IT team, ERP team & Medical Directorate and were module owner and end user of particular segment. These participants were also end users of ERP after implantation around 1 year.

Data is collected by face-to-face interviewing. Interview involved closed questions shared as topic guide before interview. Interview was audio recorded and transcribed later and all spoken words were transcribed in retrievable form. The interview was conducted in a way that no any intentional information could be collected; participant was free to express his review on question with 0% interruption during answering.

Total 7 interviews conducted all were face to face interviews. The unsetting transcription was done because of filler used by participant in local language to point out main points. Frequent play back was done to authenticate the transcribed data is same as expressed by participants so no any important data lapsed. Thematic analysis is performed as discussed in methodology to identify the insights & offering in meaning of themes from total data. Commonalties were picked from data set. Coding was done for analysis purpose which is useful way to tracking ideas of topic after thorough familiarizing with data. After coding theme were identified going through data provided by participant. Theme of data extracted which present critical success factor of implementing ERP in Indus hospital & health network. Critical success factors were enlisted as counting similar themes from data as of method citrated from study of Miles et al., 1994; Wilkinson, 2000). The analysis showed that most of information wasrepeated by participant and a little information of different ideas. This also can be good that under discussion critical factors are important indicators in ERP implementation.

Total 7 critical success factors identified from this analyses that are critical in implementing ERP in selected organization. These are Management Support, Training & knowledge, Change Management, logistic availability, Organizational Policy, Project Team Composition and Data Transferability. Shown in figure 4.1.



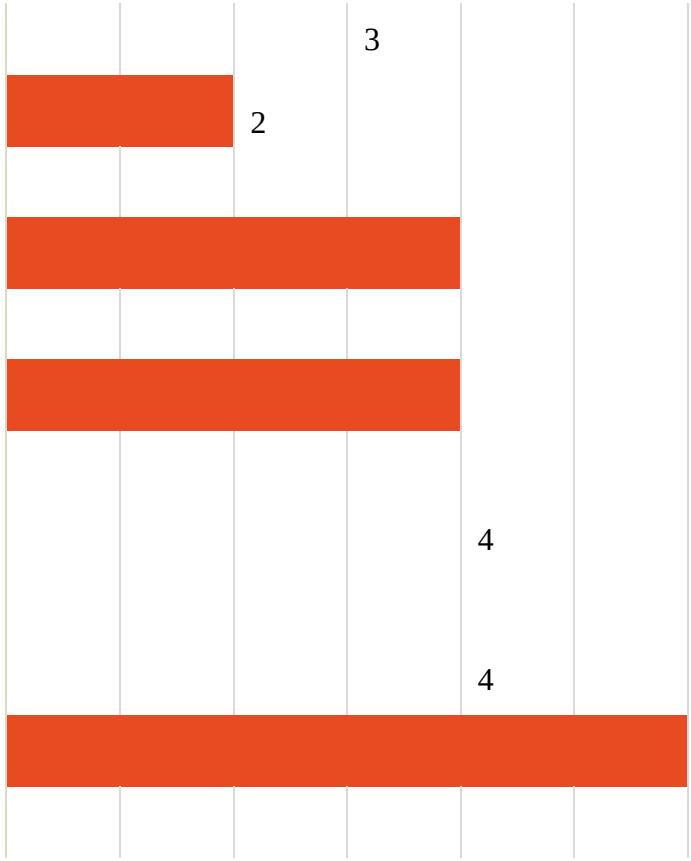


Figure 4.1 Identified Critical Success Factors

Management support was ranked top critical success factor and logistic availability and project team composition were ranked lowest CSFs. this ranking is on bias of frequency of repetition by responders. However, literature is abundant with other CSFs in ERP implementation but not specific in healthcare sector. Let's discuss each factor as per ranking by responders.

Management Support: 6 participants showed that Management support is main critical success factor for Implementing ERP. Subjects of study quoted that

SP001: Dynamic leadership and team work composition resulted in successful ERP implementation

SP002: Key factor of success was leadership commitment

SP003: Key factor to implement ERP was Management commitment and support.

Change Management : 4 participants commented regarding change management, comments are:

SP002: Team acceptance was another main key factor

SP004: It was very difficult to make staff agree for change to new software but Alhamdulillah we managed them acceptance of ERP.

Training & Knowledge: Four participant showed concerns of training & knowledge for ERP Implementation. Subject quoted that we trained our staff on ERP use so that they know why we are implementing ERP what ease it will creative for end users also.

Data Transferability: IHHN was using multiple software, but we managed to transfer data into one pool it was also our one factor which important for successfully Implementing ERP at IHHN SP002

Logistics Availability: If required IT related logistics are available which are very important for ERP implementation it was quoted by SP003.

Organization Policy: Organization policy was to implement ERP so we had to implement it successfully SP003

Business Plan & Vision: 3 participants of study pointed out that organization business plan and vision is also critical success factor for ERP implantation as organization need customized module of ERP according to business plans & vision so customization according to business can also be critical success factor in implementing ERP

Project Team Composition: 2 participants of study pointed that team composition who are implementing ERP also impact success or failure of ERP. As an implementing team, if they have good project management skills than as a team in better way, they can make decision on evaluation of project progress and successfully implement ERP.

Comparison with CriticalSuccess Factor Identified From Literature Review and Identified by this Study

Table 4.2 Comparison of CSF in literature

Research Findings	Business Plan and Vision	Change Management	ERP Team Composition	Management Support	Training & Knowledge	Organization policy	Logistics Availability	Data Transferability
Researcher								
Samuel et al. (2013)		□	□	□	□			
Pabedinskaitė (2010)	□	□		□	□			
Nah and Delgado (2006)	□	□		□				

Nah et al. (2003)	□	□	□	□				
Al-Mashari et al. (2003)	□	□		□	□			
Umble et al. (2003)		□	□	□				
Esteves and Pastor (2001)		□		□				
Nah et al. (2001)	□	□	□	□				
Shanks (2000)		□	□	□	□			
Shaio Yan Huang (2019)	□	□	□	□	□	□		□
T. S. Kiran (2019)		□		□			□	

After thorough review of literature table 4.2 describe the researcher who also identified these factors in their studies which were identified as critical success factor in different business sectors. Like shaio Yan Huang (2019) identified 7 CSF out of 8 similar as of this study and all study citated in table identified Management support and change management as critical success factor which also conform rigor of this study results. The chapter after this will present conclusion of finding and recommendation on basis of these findings.

Conclusion

In previous chapter we discussed the result of data with analysis insights so, in this chapter we will conclude our study with summery of findings and recommendation to healthcare sector specific to Pakistan because of similarity in organizational culture and recommendations for future studies with reflection to this study.

Aim of this quality case study was to identify critical success factor in implementing ERP at Indus Hospital and Health Network, Karachi

In order to identify critical success factor, we conducted in depth interview from participants who had active role during ERP implementation at Indus Hospital and health Network, Karachi with thematic analysis of transcribed data using Nvivo 14 to identify CSF after concept generation. By interviewing using semi-structured question this study identified 8 critical success factors which were also conformed

from literature for rigor of the study, 8 factors according to weightage by participant quote are management support, training and knowledge of staff, change management, organization policy, business plan & vision, data transferability, logistic availability and project team composition.

These finding can be used as guidelines for healthcare sector who are planning for the same project initiation.

Recommendation for Future

ERP is complex and expensive software which integrates data among different departments of organizations with help of departmental modules, ERP is complex and expensive so require careful consideration to critical success factors for successful ERP implementation. 8 critical factors should keep on priority in implementing ERP especially healthcare sector of Karachi, as beauty of case study is, it provide useful insight in particular case so healthcare sector must identify readiness through this study but this has limitations because of nature of organization and module customization to specific need of organization this can be opportunity for researchers to conduct research on this gap so, further multicenter studies should be carried out to identify more factors to decrease the chance of failure of very expensive Software.

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