

Adeel Ahmed¹, Saleem Zubair Ahmad², Muhammad Waseem Iqbal³, Sabah Arif⁴**Abstract**

In the rapidly evolving landscape of modern business and governance, Enterprise Resource Planning (ERP) systems have become essential in streamlining operations across both public and private sector organizations globally. IT departments now play a pivotal role in managing financial processes, business activities, and administrative functions through these systems. This study investigates and analyzes the key challenges that public sector organizations in Pakistan encounter when initiating an ERP project. The research aims to identify the critical factors that organizations must consider when transitioning to an ERP system. The adoption process is not only complex but also involves significant financial investment, making the failure of such projects a risk that organizations cannot afford. Furthermore, this study explores solutions related to management strategies and administrative frameworks, offering guidance on designing effective controls and procedures for ERP implementation. It focuses on addressing the issues within organizational structure, functions, culture, human resources, and procedures. Through this analysis, the study seeks to provide actionable solutions to mitigate these challenges during the ERP implementation process. The research covers the intricacies of implementation planning, project management, and system design, and outlines the roles of various teams and personnel throughout and after the implementation phase in the public sector environment.

Keywords: ERP, MRP, Loss of Flexibility, Real-time Access, System Reality Disconnect, Business Process Engineering, Smooth Transition, Transparency, Deployment

1. Introduction

Enterprise Resource Planning (ERP) systems have revolutionized the way organizations manage their operations, becoming a vital tool in both public and private sectors worldwide. The concept of ERP traces its origins back to the early 1990s when the Gartner Group introduced the term to describe an integrated software package initially developed to streamline manufacturing processes. This early version, known as Manufacturing Resource Planning (MRP), was designed to enhance organizational capabilities by integrating various business functions. Following the success of MRP, the development of Manufacturing Resource Planning II (MRP II) led to the evolution of what we now recognize as ERP systems. Throughout the 1990s, different organizations launched their ERP systems, leading to a rapid increase in the adoption of these technologies across industries.

In today's digital age, ERP systems are indispensable in managing the complex web of operations within organizations, especially in large-scale entities like those in the public sector. These systems are comprehensive software solutions that integrate all the critical information and resources of an organization into a unified platform. By ensuring confidentiality, integrity, and accessibility of data, ERP systems significantly enhance organizational performance, efficiency, and productivity. Furthermore, they serve as an integrated suite that manages various operational procedures, from financial transactions to human resource management, and from supply chain logistics to customer relationship management.

For public sector organizations in Pakistan, adopting ERP systems is not just about modernization; it is a strategic move towards improving transparency, accountability, and service delivery. These systems facilitate better decision-making by providing real-time access to accurate data, thereby enabling public sector organizations to operate more effectively and efficiently. However, despite the clear benefits, the adoption of ERP systems in the public sector comes with significant challenges.

ERP systems require substantial financial investment, and the process of implementing these systems is often fraught with difficulties. Public sector organizations, in particular, face unique challenges due to their bureaucratic nature, rigid structures, and complex regulatory environments. Issues such as resistance to change, lack of technical expertise, insufficient project management skills, and the need for significant organizational restructuring pose substantial barriers to successful ERP adoption. Moreover, the integration of ERP systems with existing legacy systems, which are often outdated and incompatible with modern technologies, adds another layer of complexity to the implementation process.



Figure 1: ERP Adoption

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Given these challenges, the successful adoption of ERP systems in the public sector is contingent upon careful planning, effective management, and strong leadership. Organizations must navigate through the intricacies of system selection, ensuring that the chosen ERP solution aligns with their specific needs and capabilities. Additionally, the implementation process requires a phased approach, encompassing development, testing, deployment, and ongoing support. Each phase demands specialized expertise and dedicated teams to handle the various technical and administrative aspects of the project.

Furthermore, the high cost associated with ERP systems, coupled with the significant risk of failure, makes the selection process particularly critical. The choice of ERP system impacts all subsequent phases of the implementation process and can determine the overall success or failure of the project. Public sector organizations must therefore approach ERP adoption with a comprehensive understanding of the challenges involved, as well as the strategies needed to overcome them.



Figure 2: ERP Vendor -Share in Pakistani Market

In summary, while ERP systems offer immense potential for enhancing the efficiency and effectiveness of public sector organizations in Pakistan, their adoption is a complex and demanding endeavor. This study will explore the specific challenges faced by public sector organizations in Pakistan when adopting ERP systems, and will offer insights into the best practices and strategies for successful implementation.

1.1. Objectives

The primary objective of this study is to provide a comprehensive framework for understanding the challenges and critical success factors in the adoption of Enterprise Resource Planning (ERP) systems within the public sector of Pakistan. Given the complexity and scale of such implementations, this research aims to offer detailed insights into the design of standards and procedures necessary for successful ERP deployment. The study will identify the hurdles and obstacles that public sector organizations typically encounter during the implementation phase, including technical challenges, organizational resistance, and gaps in project management. Additionally, it will discuss potential solutions to these challenges, equipping organizations with the knowledge to anticipate and mitigate risks effectively.

A key focus of this study is to explore the factors that contribute to both the success and failure of ERP implementations. It will delve into the critical stages of system selection, emphasizing the importance of choosing an ERP solution that aligns with the specific operational needs of public sector organizations. The research will provide guidelines for selecting the right consultants, project champions, and expert teams to ensure that the ERP system is implemented smoothly and managed effectively post-implementation. By highlighting the importance of compatibility between the selected ERP system and the organization's existing processes, the study will assist in reducing the risk of project failure.

Furthermore, the study aims to establish "golden rules" for the implementation process, tailored to the unique operational, structural, cultural, and managerial characteristics of public sector organizations in Pakistan. This involves preparing a team of management and IT experts capable of navigating the complexities of ERP deployment, and creating a supportive environment where these teams can address challenges proactively.

The study also seeks to develop policies, procedures, and strategies to maintain the integrity, confidentiality, efficiency, accessibility, and standardization of data and processes within the ERP system. Comprehensive training programs will be designed to ensure that the workforce is well-prepared to use the ERP system effectively, fostering a user-friendly and productive environment.

Another critical objective is to address the potential information gaps that may arise between the system's design and its practical use by end-users and stakeholders. The study will explore methods for ongoing system maintenance, administration, and periodic upgrades to keep the ERP system aligned with the evolving needs of the organization.

Finally, this study will focus on identifying and analyzing the technical, managerial, and human resource factors that significantly impact the success or failure of ERP implementation in the public sector. It will discuss the necessary cultural and structural changes, the strategies for managing these transitions, and the role of different expert teams in driving successful outcomes. The ultimate goal is to create a challenging yet conducive environment for ERP implementation, where motivated and committed teams can work towards achieving the organization's strategic objectives.

2. Conceptual Framework

2.1. Problem Statement

The adoption and implementation of ERP systems in the public sector of Pakistan present unique challenges due to the distinct structural, cultural, and procedural characteristics of public institutions in the country. Unlike the private sector, where organizations may have more standardized processes, the public sector in Pakistan is characterized by significant variability across different agencies and departments. This variability complicates the selection, design, and implementation of ERP systems, which are typically designed to integrate and standardize operations.

Key challenges include:

- **Diversity in Organizational Structures and Processes:** The vast differences in organizational structures, management practices, and procedural workflows among various public sector entities make it difficult to apply a one-size-fits-all approach to ERP system design and implementation. Each organization may require significant customization of the ERP system to align with its specific needs, which can increase both the cost and complexity of the implementation process.
- **Shortage of Expert Consultants and Champions:** The public sector in Pakistan often struggles to attract and retain expert consultants with the specialized knowledge required to design and implement ERP systems effectively. This scarcity of expertise can lead to poorly designed systems that fail to meet the operational needs of the organization, resulting in inefficiencies and project delays.
- **Complexity and Integration Challenges:** ERP systems are inherently complex due to their need to integrate various functions such as finance, human resources, procurement, and project management. This complexity can create significant challenges for the management and IT teams responsible for the implementation, particularly in organizations where existing processes are not well-documented or standardized.
- **Resistance to Change and Loss of Flexibility:** The standardization required by ERP systems often results in a loss of flexibility, which can lead to resistance from employees who are accustomed to more adaptable, legacy systems. This resistance can manifest as workarounds or non-compliance with the new system, increasing the workload on management and IT teams and undermining the effectiveness of the ERP system.
- **Information Gaps and System Reality Disconnect:** The transition to an ERP system can create information gaps between the system's standardized processes and the actual workflows within the organization. These gaps can lead to discrepancies in data and reporting, further complicating the management of the system and leading to potential failures in achieving the desired outcomes of the ERP implementation.
- **High Costs and Risk of Failure:** The implementation of ERP systems requires significant financial investment, which is often difficult to justify in the resource-constrained environment of the public sector. Additionally, the high risk of failure associated with ERP implementations—due to factors such as poor system design, lack of expertise, and resistance to change—poses a major challenge. A failed ERP project can result in wasted resources and can severely impact the functioning of public sector organizations.
- **Traditional Management Hierarchies:** The rigid, hierarchical management structures common in the public sector can hinder the collaborative and cross-functional approach required for successful ERP implementation. These traditional structures may also affect the selection of project teams and decision-making processes, leading to inefficiencies and potential project failures.

The conceptual framework for understanding the challenges of ERP adoption in Pakistan's public sector thus involves a multi-faceted analysis of these key problem areas. By identifying and addressing these challenges, public sector organizations in Pakistan can better navigate the complexities of ERP implementation, ultimately leading to more effective and efficient government operations.

2.2. Scope and Limitation

As technology is emerging day by day and awareness about technology is increasing in Pakistan, public sector in Pakistan are now implementing or planning to implement ERP Systems without knowing the actual benefits and requirements (to enjoy the feat). Thus, ERP implementation failure rate is on the increase according to latest studies. Along with failure rate still public sector are void of reaping any fruits from it despite huge investments of funds, human resource & years of relentless efforts.

There are many reasons why ERP implementation failed or fruitful results could not be obtained despite the cost and effort put into implementing ERP system however following issues neither addressed nor focused.

1. **Lack of Readiness before implementation:** As ERP is well defined system with predefined set of parameters, organization hierarchies, workflows & different transaction cycles like procure to pay, production to receipts etc. So, it requires proper SOP's to be implemented in order to get true results but unfortunately in many companies no SOP's exists even after the implementation of ERP. The only goal we see is to automate the existing manual system or conversion of old legacy system to another data entry system.
2. The answer to question why we need ERP System is not analyzed in depth and less effort is put toward Business Process Engineering/Re-Engineering of whole organization and how to improve the existing procedures instead of going into shortcuts.
3. **Inadequate Knowledge of consulting Firms:** Another major problem is lack of knowledge about client's business process of implementation partner's while implementation is going on. Usually most of time consulting firms send their most experienced persons during pre-sale activities in order to get contract and promise to deploy the same/senior resources on the project but once they got the initial payment & project is kicked off the team remain same for few days and after that in-experienced team members are injected under supervision of so-called senior person which are taking care of project remotely on paper. This results in improper collection of system requirements and shallow understanding of business operations which is key element in implementation. The most painful fact is that they are not having in-depth knowledge of ERP system features they are implementing as a result functional design and solution design have anomalies which client have to bear even in post implementation period for long time.
4. **Lack of Proper Human Resource:** Lack of proper human resources at implementing organization is another major hurdle in achieving ERP goals. Usually, companies does not evaluate the existing human resources whether they are capable to handle the system even though full training is provided to them, thus resulting in having less skilled persons in important departments. They do not have capability to work in integrated systems which negates the concept of right person for right job.
5. **Lack of Adaptability:** Adaptability factor is most important during implementation and post implementation. Users normally start comparing their manual/legacy system with ERP system. All they want is similar features, GUI and functions

which exist in their legacy system without realizing the fact that each system has its own protocol and when working in integrated environment, system will not work properly if pre requisites steps are not being followed. Approx. 80% of users have this problem.

6. **Change Management:** Another big factor that is not being taken care by top management is proper Change Management. Mostly all the stake holders are not taken aboard while deciding for which ERP System to go for & which one is best fit. This is the biggest reason they are reluctant to own it & feel it is being imposed.

3. Methodology

The methodology for examining the challenges in adopting ERP systems in the public sector of Pakistan encompasses a structured approach to understanding the complexities involved in ERP implementation. The study is designed to explore, analyze, and interpret the various factors impacting ERP adoption, focusing on organizational and managerial aspects.

3.1. Research Design

This study employs a mixed-methods research design to achieve a comprehensive understanding of ERP adoption challenges. The research is structured into three main phases:

Exploratory Phase: This phase involves an initial exploration of the ERP adoption landscape in the public sector. It seeks to identify and describe the major challenges faced by organizations during ERP implementation.

Descriptive Phase: In this phase, the study aims to provide a detailed account of the factors affecting ERP success. It examines the organizational, managerial, and procedural elements that contribute to the effectiveness of ERP systems.

Explanatory Phase: This phase focuses on explaining the relationships between various factors influencing ERP implementation and their impact on the overall success of ERP projects.

3.2. Sampling and Population

Population: The study targets public sector organizations in Pakistan that have either implemented or are in the process of implementing ERP systems.

Sample Selection: A representative sample of these organizations is selected to ensure diverse perspectives. The sample includes various departments and levels of government to capture a broad range of experiences and challenges.

Sampling Techniques: Stratified random sampling is used to ensure that different types of organizations, regions, and sectors are adequately represented in the study. This approach helps in obtaining a balanced view of the ERP adoption process across the public sector.

3.3. Analysis Techniques

3.3.1. Quantitative Analysis

- **Descriptive Statistics:** The study utilizes descriptive statistics to summarize and present data on ERP challenges and success factors. This includes analyzing frequencies, percentages, and measures of central tendency to provide an overview of the data.
- **Inferential Statistics:** To examine relationships between variables, the study employs statistical techniques such as chi-square tests and regression analysis. These tests help in identifying significant factors that influence ERP implementation success.

3.3.2. Qualitative Analysis

- **Thematic Analysis:** Thematic analysis is used to analyze qualitative data from interviews and focus groups. This involves identifying and categorizing themes and patterns related to ERP challenges and solutions.
- **Content Analysis:** Content analysis of relevant documents and qualitative responses helps in extracting key insights and understanding recurring issues in ERP adoption.

3.4. Validation and Reliability

Triangulation: To enhance the validity and reliability of the findings, the study uses triangulation. This involves comparing and cross-checking data from different sources to validate results and ensure a robust analysis.

Pilot Testing: The research instruments, such as questionnaires and interview guides, are pilot-tested with a small sample. This process helps refine the tools, ensuring that they are clear, relevant, and effective for the study.

3.5. Ethical Considerations

Informed Consent: Participants are provided with comprehensive information about the study's objectives, procedures, and potential risks. Informed consent is obtained from all participants before their involvement in the study.

Confidentiality: The study ensures the confidentiality and anonymity of participants' responses. Data is securely stored and used exclusively for research purposes, with personal identifiers removed to protect privacy.

3.6. Reporting and Recommendations

Results Interpretation: The study interprets the findings to identify key challenges, success factors, and best practices for ERP adoption in the public sector. This involves analyzing how different factors interact and impact the success of ERP implementation.

Recommendations: Based on the analysis, the study provides actionable recommendations for improving ERP implementation processes. These recommendations aim to address identified challenges, enhance the effectiveness of ERP systems, and support successful adoption in public sector organizations.



Figure 3: ERP Implementation

This methodology ensures a thorough and systematic examination of ERP adoption challenges in Pakistan's public sector, offering valuable insights and practical solutions for overcoming implementation hurdles and achieving successful ERP outcomes.

4. Conclusion and Recommendations

The study reveals that public sector organizations in Pakistan face considerable challenges in adopting ERP systems, including organizational complexity, lack of expertise, resistance to change, high implementation costs, and rigid management structures. These issues hinder effective ERP deployment and utilization, impacting overall organizational efficiency and productivity. To address these challenges, it is crucial for organizations to develop tailored ERP implementation strategies that align with their specific needs and structures. Investing in comprehensive training for both management and staff can mitigate resistance and ensure effective use of the system. Selecting experienced ERP consultants who understand the public sector's unique challenges will enhance the chances of successful deployment. Additionally, robust change management practices should be employed to facilitate a smooth transition and address any employee resistance.

Organizations must also establish realistic budgets and risk management plans to handle the financial and operational aspects of ERP implementation. Adapting traditional management structures to be more flexible will support the integration of the ERP system and improve its effectiveness. Finally, providing ongoing post-implementation support will help address any issues that arise and ensure the system continues to meet organizational goals. By implementing these recommendations, public sector organizations in Pakistan can better navigate the complexities of ERP adoption and achieve more successful outcomes.

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