

RESEARCH PAPER

Challenges of implementing Enterprise Resource Planning (ERP) systems in Bangladesh

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ABSTRACT

Goal: This study examines why Bangladeshi companies struggle to adopt ERP systems, looking at organizational, technical, and human hurdles. By combining the Technology Acceptance Model (TAM) and Critical Success Factors (CSF) frameworks, it shows how user acceptance and organizational readiness directly drive ERP success.

Methodology: A sequential exploratory mixed-method design was used. First, a PRISMA-guided literature review mapped out key ERP challenges to shape the survey. Questionnaires were then gathered from 30 professionals across multiple Bangladeshi sectors with hands-on ERP experience. Finally, the data was analyzed using descriptive statistics, Cronbach's alpha, one-sample t-tests, and Cohen's d to evaluate reliability, significance, and practical effect size.

Results: Cronbach's alpha was 0.560, indicating moderate internal consistency. All seven ERP challenges were statistical significant. Budget limitations, lack of training and support, shortage of skilled personnel and maintenance costs demonstrated strong practical effects, whereas data migration, employee resistance and weak top management support also emerged as significant barriers.

Limitations: The study is exploratory, cross-sectional, and based on a small sample.

Practical implications: Organizations should focus on training, budgeting, skilled teams, leadership support, change management, and data governance.

Originality/Value: The study adds Bangladesh-based ERP evidence using an integrated TAM-CSF perspective.

Keywords: ERP; TAM; CSF; PRISMA; Digital transformation.

1 INTRODUCTION

Every kind of commercial enterprise is battling new difficulties as advanced information technology from modern civilization enters corporate operations. Though economic instability spreads over the world, there is less enthusiasm to put information systems in place. SMEs, or Small and medium-sized businesses, on the other hand, are concentrating their efforts on immediate outcomes. The Enterprise Resource Planning (ERP) System is a crucial technological tool utilized to facilitate organizational operations (Saimagambetova and Imashova, 2017). It is a software program that facilitates and streamlines corporate operations by giving decision-makers fast, accurate access to enterprise-wide data (Seethamraju, 2015). Bangladesh is a developing nation that has witnessed an increase in industrial development. Over the past few decades, the country's industrial development index has been steadily rising (Hasan, Hoq and Thollander, 2018).

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A key component of digital transformation, enterprise resource planning (ERP) systems allow businesses to combine essential operations like supply chain management, finance, and human resources into a single platform. According to recent studies, ERP systems promote operational efficiency, improve decision-making, and provide competitive advantages in dynamic marketplaces (Ruivo *et al.*, 2020; Jayeola *et al.*, 2022). ERP installation is still difficult and resource-intensive, frequently necessitating large financial outlays, organizational reorganization, and cultural adjustment (Menon *et al.*, 2019).

While previous studies mainly focus on the technical aspect of ERP implementation, this study conceptualises ERP implementation as a socio-technical change process. In such a process, the success of the implementation relies on both software functionality and user acceptance, managerial commitment, financial readiness, data quality, and organisational learning. The Technology Acceptance Model (TAM) helps explain user-related conditions such as perceived usefulness, perceived ease of use, training adequacy and resistance to change. The Critical Success Factors (CSF) perspective complements TAM by highlighting the project-level and organizational enablers such as top management support, budget sufficiency, skilled personnel, maintenance capability, and data migration readiness.

The Bangladeshi context is an important one to explore this integrated perspective. ERP adoption has risen in manufacturing, garments, pharmaceuticals, retail, consulting and service organisations but a few companies are still operating under resource constraints, limited ERP expertise, uneven digital maturity and legacy data problems. Therefore, factors that are well recognised in ERP literature worldwide may have different intensity in Bangladesh. Therefore, the present study asks: What implementation challenges are perceived to be the most significant by ERP-experienced respondents in Bangladeshi organisations and how can these challenges be explained through an integrated TAM-CSF lens?

The study offers three contributions. First, it offers empirical evidence from Bangladesh, a context that continues to be under-represented in ERP implementation research and across different sectors. Secondly, it makes a contribution to theory in that it couples TAM-based user acceptance mechanisms with CSF-based organisational readiness conditions. Thirdly, it provides practical guidance for managers and policy makers by identifying priority intervention areas for the implementation of ERP in resource-constrained environments.

2 LITERATURE

2.1 Previous research

Table 1 - Listed journal articles and textbooks

Authors & Year	Title	Source	Review
(AboAbdo, Aldhoiena and Al-Amrib, 2019)	Implementing ERP in a Large Construction Company in KSA	Procedia Computer Science	Case study highlighting ERP implementation challenges in construction sector; emphasizes top management support and training.
(Akinbamini <i>et al.</i> , 2025)	Critical Analysis of Technologies Enhancing Supply Chain Collaboration in the Food Industry: A Nigerian Survey	Logistics	Explores ERP role in supply chain collaboration; relevant for emerging economies and food industry context.
(Akrong, Shao and Owusu, 2022)	Overcoming the Challenges of ERP: A Systematic Review Approach	International Journal of Enterprise Information Systems	Systematic review identifying major ERP challenges and mitigation strategies; provides global perspective.
(AlBar, Hddas and Hoque, 2014)	ERP Systems: Emergence, Importance and Challenges	International Technology Management Review	Foundational paper on ERP evolution and key adoption challenges; useful for historical context.
(Alzahmi <i>et al.</i> , 2025)	Towards Sustainable ERP Systems: Emerging Trends, Challenges, and Future Pathways	Management Systems in Production Engineering	Discusses sustainability in ERP systems and future trends; integrates environmental considerations.

(Amouzegar, Hajipour and Jalali, 2020)	An Enterprise Solution in Practice: Issues and Challenges	Journal of Applied Intelligent Systems and Information Sciences	Examines ERP architecture and practical implementation issues; offers design insights.
(Azad Chowdhury <i>et al.</i> , 2021)	Implementation of ERP in Bangladesh Opportunities and Challenges	International Journal of Business and Management	Focuses on ERP adoption in Bangladesh; highlights infrastructure and skill gaps.
(Chen, 2024)	Innovative Strategies for SCM in Textile Enterprises Under Digital Transformation	Journal of World Economy	Analyzes ERP role in textile industry digital transformation; relevant for RMG sector.
(Chofreh, Goni and Klemeš, 2018)	Sustainable ERP Systems Implementation: A Framework Development	Journal of Cleaner Production	Proposed a framework for sustainable ERP implementation; integrates green practices.
(Feng and Ali, 2024)	Leveraging Digital Transformation and ERP for Enhanced Operational Efficiency in Manufacturing Enterprises	Journal of Law and Sustainable Development	Explores ERP's role in operational efficiency during digital transformation.
(Haji Sadeeq, 2024)	Advanced AI/ML Techniques for BI in IoT-Driven Manufacturing with ERP Cloud Integration	ResearchGate DOI assignment	Conceptual paper linking ERP cloud with AI/ML for business intelligence.
(Hasan, Hoq and Thollander, 2018)	Energy management practices in Bangladesh's iron and steel industries	Energy Strategy Reviews	Discusses ERP's potential in energy management for industrial efficiency.
(Heizer, Render and Munson, 2017)	Principles of Operations Management: Sustainability and Supply Chain Management	Pearson	Textbook reference for ERP integration in operations and supply chain.
(Jayeola <i>et al.</i> , 2022)	The Mediating and Moderating Effects of TMS on Cloud ERP–Financial Performance	Sustainability	Empirical study showing top management support moderates ERP success.
(Jhurani, 2024)	Enhancing Customer Relationship Management in ERP Systems through AI	International Journal of Science and Research	Explores AI integration in ERP CRM modules for personalization.
(Khatri, 2024)	SAP FICO for US GAAP and IFRS Compliance	IRJMETS	Discusses ERP financial compliance capabilities.
(Mahmood, Khan and Bokhari, 2019)	ERP issues and challenges: A research synthesis	Kybernetes	Synthesized ERP challenges including change management and data migration.
(Menon <i>et al.</i> , 2019)	Critical Challenges in ERP Implementation	International Journal of Business and Management	Lists major ERP challenges across organizational roles.
(Mirhosseini <i>et al.</i> , 2021)	Exploring and analysing ERP risks via Critical System Thinking	International Journal of Information Systems and Change Management	Introduces systemic approach to ERP risk analysis.
(Mohapatra, Mohapatra and Mohapatra, 2023)	ERP as Business Process Automation Tool	Emerald Book Chapter	Positions ERP as a key enabler of process automation.

(Naidenova and Smirnov, 2025)	ERP systems and operational efficiency: Comparison of foreign and domestic systems	Industrial Management & Data Systems	Compares ERP performance between domestic and foreign systems.
(O'Leary, 2000)	ERP Systems: Life Cycle, E-Commerce, and Risk	Cambridge University Press	Classic ERP lifecycle and risk management reference.
(Roy, Ajith and Vaishnavi, 2024)	A Systematic Review on ERP and Supply Chain Management	IGI Global Chapter	Reviews ERP's role in supply chain integration.
(Ruivo <i>et al.</i> , 2020)	The relationship between ERP capabilities, use, and value	Computers in Industry	Links ERP usage intensity to value realization; TAM relevance.
(Syreyshchikova <i>et al.</i> , 2020)	Automation of Production Activities via ERP	Procedia Manufacturing	Shows ERP's role in industrial automation and integration.
(Swaminathan, 2011)	Critical Success Factors of ERP Implementation	OhioLINK Thesis	Catalogs CSFs across ERP lifecycle stages.
(Turban <i>et al.</i> , 2013)	Information Technology for Management	Wiley	Positions ERP within IT governance and sustainability.
(Venkatraman and Fahd, 2016)	Challenges and Success Factors of ERP Systems in Australian SMEs	Systems	Examines ERP adoption challenges in SMEs; leadership and cost issues.
(Yavuz and Gelişen, 2024)	Expectations of Headquarters Employees from ERP Systems in Turkish Construction	European Journal of Research and Development	Explores ERP expectations and regulatory compliance in construction.
(Kouriati <i>et al.</i> , 2020)	Critical Success Factors on ERP Implementation: Building a Theoretical Framework	IJACSA	Identifies CSFs and categorizes them by ERP lifecycle phases.
(Stone and Zhang, 2021)	Understanding success factors for ERP implementation: Integration of literature and experience	Issues in Information Systems	Combines literature and practitioner insights to define ERP success factors.
(Mahraz, Benabbou and Berrado, 2020)	Compilation and Analysis of CSFs for ERP Implementation	International Journal of Enterprise Information Systems	Systematic compilation of CSFs for ERP projects.
(Leyh <i>et al.</i> , 2024)	Critical Success Factors for ERP Projects Revisited	FedCSIS Proceedings	Updates CSF literature review; emphasizes organizational fitness and training.
(Cheung <i>et al.</i> , 2023)	Cloud ERP Adoption using TOE & DOI: Systematic Review	Springer LNBIP	Identifies factors influencing cloud ERP adoption; conceptual framework provided.
(Awan <i>et al.</i> , 2021)	Challenges of Cloud-Based ERP Adoption in Pakistani SMEs	Scientific Programming	Qualitative study on cloud ERP adoption challenges in SMEs.
(Karim <i>et al.</i> , 2025)	ERP in Bangladesh Healthcare: Current scenario, challenges, and future directions	Work (SAGE)	Scoping review of ERP in healthcare; highlights infrastructure and policy gaps.
(Samad <i>et al.</i> , 2023)	Enhancing Organizational Performance in Bangladeshi Industries: Role of ERP Systems	Asian Review of Mechanical Engineering	Empirical study linking ERP adoption to performance improvements.
(Iqbal, Shafi and Kabir, 2024)	ERP Implementation in Bangladesh Garments Industry for Effective Chain Management	IJISRT	Discusses ERP benefits and prerequisites in RMG sector; emphasizes data quality and training.

Source: The Authors Themselves.

2.2 Enterprise resource planning (ERP)

ERP systems are umbrella systems that connect several specialized systems; however, this goal is rarely met. A centralized database is used to facilitate the information flow between corporate activities to achieve this. Each situation is unique in terms of what is connected and how. ERP systems often offer information on financial and human resource (HR) management in addition to the conventional elements of MRP. (Heizer, Render and Munson, 2017).

These systems may also have:

- Software for supply-chain management (SCM) to facilitate advanced vendor contact, online shopping, and other tasks required for effective logistics and warehousing. Providing the resources required for efficient administration of all four areas, the goal is to link procurement, materials management, suppliers, and operations (MRP). (Chopra, 2020) In this software, there are vendor communications, including scheduling, EDI or Electronic Data Interchange, advanced shipping notice, e-commerce, etc., as shown in Figure 1.
- Software for customer relationship management (CRM) on the inbound side of the company. CRM is made to help with sales analysis, find the most lucrative clients, and oversee the sales team. (Jhurani, 2024) There are shipping process that integrates distribution, retailers, and end users. Also, it incorporates sales orders and invoices, as shown in Figure 1.
- Software for sustainability that links health and safety procedures, energy use and efficiency, emissions (carbon footprint, greenhouse gases), environmental compliance, and sustainable workforce difficulties and provides transparency for supply-chain sustainability challenges. (Chofreh, Goni and Klemeš, 2018).

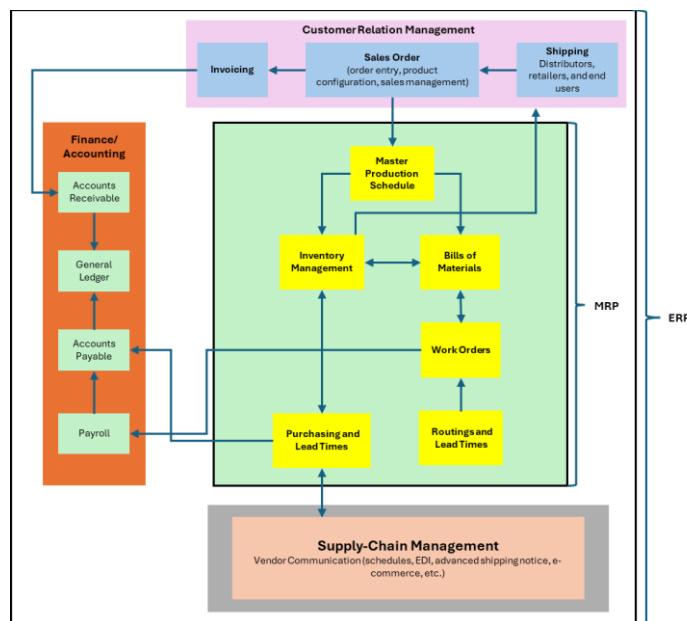


Figure 1 - Integration of Elements within the ERP System.

Source: Heizer et al. (2017).

2.3 Global ERP adoption and significance

Research shows that the real value of ERP doesn't just come from its technical features, but from how well organizations use them. This underscores the critical need to align technology with daily operational processes (Ruivo *et al.*, 2020). Beyond merely driving efficiency, ERP systems act as catalysts for cross-functional collaboration and improved financial performance. These benefits are maximized when leadership actively supports the rollout and aligns it with broader digital strategies like cloud adoption and data analytics (Jayeola *et al.*, 2022). In industries such as manufacturing and apparel, research demonstrates that ERP systems offer the real-time visibility, data-driven decision-making, and standardized workflows essential to Industry 4.0 initiatives (Syreyshchikova *et al.*, 2020; Chen, 2024). Broadly speaking, global research conceptualizes ERP as both a technological asset and an agent of organizational change. Its successful deployment, however, hinges on strong

governance, high-quality training, reliable data, and unwavering management commitment (Turban *et al.*, 2013; Heizer, Render and Munson, 2017).

2.4 ERP implementation challenges worldwide

While ERP systems offer significant strategic advantages, their deployment remains a notoriously complex, costly, and high-risk endeavor. Early research highlights that long timelines, intense financial investments, and systemic mismatches between business processes and software architecture frequently jeopardize project success (O'Leary, 2000). Investigations into ERP failures consistently trace these setbacks to a combination of weak project governance, poor change management, over-customization, flawed data integration, and end-user resistance (Mahmood, Khan and Bokhari, 2019; Menon *et al.*, 2019). In a comprehensive systematic review, Akrong, Shao and Owusu (2022) classify these impediments into organizational, technical, and managerial domains, noting that the literature's current preoccupation with success factors over failure modes deprives practitioners of practical mitigation frameworks. This limitation highlights the socio-technical nature of ERP systems, where human dimensions including skill readiness, ongoing training, and active stakeholder participation dictate post-implementation longevity (AboAbdo, Aldhoiena and Al-Amrib, 2019; Ruivo *et al.*, 2020). Consequently, cross-industry evidence warns that neglecting change management or permitting unmanaged customization heavily penalizes organizations through budget overruns, delayed schedules, and depressed user adoption rates.

2.5 ERP in emerging economies and Bangladesh

Literature from South Asia and similar developing economies demonstrates that ERP adoption is accelerating as SMEs increasingly leverage these systems for process integration and regulatory compliance. Yet, these enterprises frequently encounter unique systemic barriers, including unreliable digital infrastructure, fragmented legacy data, and a shortage of qualified implementers (Venkatraman and Fahd, 2016; Syreyschikova *et al.*, 2020). This trend is highly evident in Bangladesh, where growing interest across manufacturing and service activities correlates with positive preliminary performance metrics (Azad Chowdhury *et al.*, 2021). Despite these gains, the execution phase is rarely seamless. Organizations regularly struggle with severe technical skills gaps, budgetary limitations, and significant operational downtime during data migration and process re-engineering. Given localized market features namely labor-intensive operations, highly diverse vendor networks, and rapidly evolving SME structures success hinges on adopting targeted strategies such as phased rollouts, conservative project boundaries, and multi-tiered digital literacy training (Jayeola *et al.*, 2022). Ultimately, these findings reveal that the structural hurdles facing Bangladeshi firms are not generic technical anomalies, but context-bound challenges requiring deeply localized operational strategies.

2.6 Theoretical frameworks for ERP success

Extant literature identifies three dominant theoretical lenses that explain the variances in ERP implementation outcomes:

Technology Acceptance Model (TAM): This perspective isolates user perceptions—specifically perceived usefulness and perceived ease of use—as the primary drivers of technology adoption. Sustained day-to-day utilization depends heavily on interface design, training efficacy, and workflow alignment. In cloud-based ERP environments, research demonstrates that executive sponsorship and structured communication optimize user acceptance, translating deeper system utilization into enhanced financial performance (Ruivo *et al.*, 2020; Jayeola *et al.*, 2022).

Change Management Theory: This framework conceptualizes ERP implementation as an intensive socio-technical transformation rather than a basic software installation. Successful deployments require harmonized leadership visions, robust stakeholder buy-in, and systematic communication frameworks. When structural readiness is low, user involvement is weak, or expectations are misaligned, implementations regularly face severe operational resistance and eventual failure (Mahmood, Khan and Bokhari, 2019; Menon *et al.*, 2019).

Critical Success Factors (CSF): This approach provides empirical checkpoints spanning the entire ERP lifecycle from vendor selection and blueprinting to go-live stabilization. Meta-analyses consistently validate that strong executive governance, expert project teams, targeted training, realistic budgeting, rigorous system testing, and strict data governance are essential to mitigate deployment risks (Swaminathan, 2011; AboAbdo, Aldhoiena and Al-Amrib, 2019).

2.7 Research gaps

Despite the extensive body of literature exploring Enterprise Resource Planning (ERP) implementations, several critical gaps remain unaddressed. First, a distinct geographical and institutional imbalance persists; the majority of empirical evidence originates from developed economies or large-scale corporations characterized by substantial financial, technical, and managerial capacity. Consequently, the operational nuances of ERP deployment within resource-constrained, developing economies such as Bangladesh remain under-researched, particularly regarding how firms navigate capital limitations, acute deficits in skilled personnel, compromised legacy data, and uneven digital maturity. Second, the current literature exhibits a notable theoretical fragmentation. While previous studies frequently isolate specific barriers like training deficiencies, weak executive support, or user resistance, they rarely explicate the dynamic interplay between user-centric and organization-centric variables. To bridge this theoretical divide, this study integrates the Technology Acceptance Model (TAM) which maps individual behavioral factors such as perceived usefulness and resistance to change with the Critical Success Factors (CSF) framework, which captures organizational readiness indicators including leadership governance, budget optimization, and data management. Third, contemporary Bangladesh-focused ERP research is largely constrained by methodological limitations, often relying on descriptive insights rather than rigorous empirical validation across multi-dimensional challenge vectors. This study addresses this deficit by utilizing primary survey data subjected to robust reliability assessments, one-sample t-tests, and Cohen's d effect size metrics to statistically evaluate the perceived significance of seven key implementation hurdles among experienced practitioners. Finally, this research contributes to the field by re-conceptualizing ERP adoption as a complex socio-technical phenomenon rather than an isolated software installation. By synthesizing TAM and CSF dimensions, the study provides a holistic framework demonstrating how user acceptance, financial capability, leadership support, and data governance jointly govern ERP trajectories within an emerging economy.

2.8 Implementation challenges of ERP

After conducting a literature review of the recent studies we assumed the following implementation challenges of ERP,

- **Regular Maintenance Costs:** People in the research mentioned that the ongoing costs for maintaining the ERP system are a bit challenging. Upgradation and software updates are very important for making the ERP system updated, secure, and efficient. Updates are, however, accompanied by cost implications of testing, training, as well as possible system downtime while the update is being implemented.
- **Shortage of Qualified Personnel:** It is evident from the research that shortage of qualified personnel is another difficulty faced while executing ERP. ERP software is complicated, requiring expertise for a range of domains such as system configuration, customization, and integration. It may prove difficult to get the right kind of technical capabilities to work with these types of systems, creating the risk of slowdowns and inefficiencies in the implementation.
- **Top Management Support:** Top management support is emphasized by research. Top management is charged with the key responsibility of making organizational change management possible. Adoption of a new ERP system often requires significant changes to business processes and workflows. Top leaders are responsible for spearheading such changes, encouraging a proactive attitude towards adaptation and innovation within the organization. Their support minimizes resistance from the employees while smoothing the transition into a new ERP-based operational setup.
- **Budget Constraints:** Budget constraints are a major problem while successfully implementing and running an ERP system. To begin with, the cost of ERP implementation involves licensing fees, software customization, hardware setup, training courses, as well as consultancy. Limited budget can compel organizations to compromise on these crucial components, which can affect the effectiveness as well as quality of the ERP system.
- **Challenges of Data Migration and Integration:** Handling the intricacies of data migration and integration was viewed as a challenge. Migrating current data from the legacy system to the new ERP platform can be a complicated process. Differences in data formats, structure, and naming conventions can result in data integrity issues, leading to inaccuracies in the migrated data. Varied technologies, data formats, and protocols of communication can pose hindrances for seamless integration.
- **Employee Resistance to Change:** Much of the common problem of resistance to change was employee resistance to change. From a change management perspective, personnel

regularly view new enterprise software as a threat to their existing workflows and daily operational habits. This resistance is typically driven by a natural fear of the unknown and an inability to visualize the post-implementation state, leaving users anxious about how the ERP system will alter their specific professional roles and job characteristics. Learning their new processes and adjusting to the new ERP system can take a while.

- **Lack of Proper Training and Support:** Insufficient training and support are major issues while implementing the ERP system. Without thorough training sessions, employees can find it hard to transition to the new system, resulting in inefficiency, mistakes, and a possible drop in productivity.

2.9 Benefits and importance of ERP

Enterprise Resource Planning (ERP) is indispensable for contemporary businesses as it facilitates real-time, integral management of core business processes. It makes business functions more efficient, aids decision-making, and improves organizational performance. Following is a comprehensive discussion of what constitutes the benefits and significance of ERP, as substantiated with recent scholarly research. Some benefits of ERP systems are as follows,

- **Improved Business Efficiency:** ERP systems increase operational efficiency by automating and integrating company processes, which decreases manual labor. According to a recent study, using ERP improves resource allocation and workflow management. (Mohapatra, Mohapatra and Mohapatra, 2023)
- **Enhanced Data Accuracy and Real-time Insights:** ERP systems reduce errors and redundancy by centralizing data. According to research, companies that use ERP report better decision-making because of precise real-time data. (Feng and Ali, 2024)
- **Cost Reduction and Financial Optimization:** By automating financial procedures and reducing operational inefficiencies, ERP systems assist businesses in cost optimization. An analysis of SAP FICO's example shows how ERP lowers financial risks by ensuring adherence to financial rules like US GAAP and IFRS. (Khatri, 2024)
- **Better Collaboration and Integration Across Departments:** ERP promotes improved cooperation between businesses by combining many departments, including supply chain, finance, human resources, and customer management. Research on ERP use in SMEs revealed notable gains in cooperation and internal communication. (Jayeola *et al.*, 2022)
- **Scalability and Business Growth:** ERP solutions, especially cloud-based ones, allow businesses to scale efficiently. Modern ERP systems provide customizable solutions that adapt to a company's growing needs. (Syreyshchikova *et al.*, 2020)

Compliance and Risk Management: ERP ensures compliance with industry regulations and standards. A study on ERP in the construction sector emphasized its role in improving regulatory adherence and minimizing legal risks. (Yavuz and Gelişen, 2024)

2.10 Customer Relationship Management (CRM) Integration

ERP systems enhance response times and provide more individualized service by combining CRM technologies. According to research, businesses that use ERP for CRM see an increase in customer satisfaction. (Naidenova and Smirnov, 2025).

- **Sustainability and Future-Readiness:** Environmental impact reduction and energy efficiency are the main goals of sustainable ERP (S-ERP) systems. According to emerging trends, companies that implement S-ERP can satisfy sustainability objectives and remain competitive over the long run. (Alzahmi *et al.*, 2025).

The importance of ERP Systems in modern businesses is:

- **Strategic Decision-Making:** ERP provides data-driven insights, helping managers and executives make informed decisions. Recent findings highlight its importance in strategic planning (Akinbamini *et al.*, 2025).
- **Digital Transformation and Industry 4.0:** ERP plays a key role in digital transformation by integrating AI, IoT, and machine learning technologies (Haji Sadeeq, 2024).
- **Competitive Advantage:** Due to data transparency and efficient operations, businesses utilizing ERP systems perform better than their rivals. ERP's importance in obtaining a competitive edge was proved by research conducted in the textile and apparel industry. (Chen, 2024).
- **Adaptation to Global Markets:** ERP systems assist companies in effectively managing global operations because of globalization. Research indicates that implementing ERP helps international firms improve collaboration. (Roy, Ajith and Vaishnavi, 2024).

3 METHODOLOGY

3.1 Research design

This study adopts a sequential exploratory mixed-methods research design to comprehensively investigate the phenomenon. The initial phase comprised a systematic literature review executed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. This foundational phase systematically isolated recurring ERP implementation challenges, which subsequently informed the structural development of the empirical research instrument. The second phase deployed a quantitative survey to statistically evaluate the perceived significance of these identified challenges among organizational practitioners possessing direct ERP implementation and operational experience. Methodological integration occurred at two distinct interfaces: first, during the development stage, where the literature-derived constructs were operationalized into specific questionnaire items; and second, during the interpretive stage, where the quantitative empirical findings were contextualized and synthesized through the integrated TAM-CSF theoretical framework.

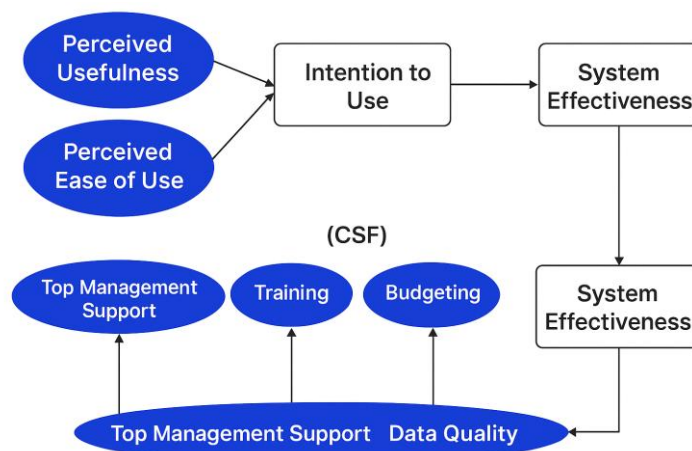


Figure 2 - Integration TAM and CSF Model

Source: The Authors Themselves.

3.2 Literature review process

A systematic literature review was carried out following PRISMA guidelines to ensure rigor and transparency. The process included:

- Databases searched: Scopus, Web of Science, IEEE Xplore, SpringerLink, and ScienceDirect.
- Keywords used: 'ERP' AND 'implementation challenges' AND ('Bangladesh' OR 'developing countries').
- Inclusion criteria: Peer-reviewed journal articles published between 2015 and 2025, written in English, and focused on ERP implementation.
- Exclusion criteria: Conference papers, non-peer-reviewed sources, and studies unrelated to ERP implementation.

The initial search returned 312 articles. After screening and applying eligibility checks, 38 articles were included for synthesis. These studies informed the identification of seven challenge constructs, which were mapped to TAM and CSF dimensions for hypothesis development.

3.3 Questionnaire development and validation

Questionnaire items were developed based on the extant literature and structurally aligned with the TAM-CSF framework to capture seven distinct dimensions of ERP implementation hurdles: (1) regular maintenance costs, (2) shortages of skilled personnel, (3) lack of top management support, (4) insufficient budget allocation, (5) data migration and integration issues, (6) employee resistance to change, and (7) inadequate user training and support. Reliability analysis yielded a Cronbach's alpha of 0.560, representing a moderate internal consistency. While this value falls below traditional thresholds for strictly homogenous scales, it is conceptually justified given that the items measure highly distinct, multidimensional operational challenges rather than a singular,

unidimensional trait. To prevent the loss of granular operational insights that typically occurs when aggregating heterogeneous factors, subsequent statistical evaluations are executed at the individual item level rather than relying on a combined scale index.

3.4 Data collection and sampling

The target population for this study comprised organizational professionals and end-users with direct experience in ERP implementation and utilization within Bangladeshi enterprises. The respondent profile encompassed a diverse cross-section of organizational roles—including project managers, IT specialists, and operational personnel—across key economic sectors such as manufacturing, ready-made garments (RMG), pharmaceuticals, electronics, retail, and management consulting. While the data collection framework initially captured participants representing 36 distinct organizations, the final analytical sample was restricted to 30 fully completed, valid responses after screening for and excluding incomplete instruments. This data-cleaning process accounts for the variance between the initial institutional scope detailed in the methodology and the final number of valid observations utilized in the empirical analysis.

3.5 Hypotheses development

Based on the integrated TAM-CSF theoretical framework, the following hypotheses are proposed:

H1: Regular maintenance cost is perceived as a significant challenge to ERP implementation effectiveness.

H2: A shortage of skilled personnel is perceived as a significant challenge to ERP implementation effectiveness.

H3: A lack of top management support is perceived as a significant challenge to ERP implementation effectiveness.

H4: Insufficient budget allocation is perceived as a significant challenge to ERP implementation effectiveness.

H5: Data migration and integration issues are perceived as a significant challenge to ERP implementation effectiveness.

H6: Employee resistance to change is perceived as a significant challenge to ERP implementation effectiveness.

H7: Inadequate user training and support is perceived as a significant challenge to ERP implementation effectiveness.

Figures 03 and 04 illustrate the PRISMA approach to synthesize the literature the TAM & CSF framework along with the developed hypothesis.

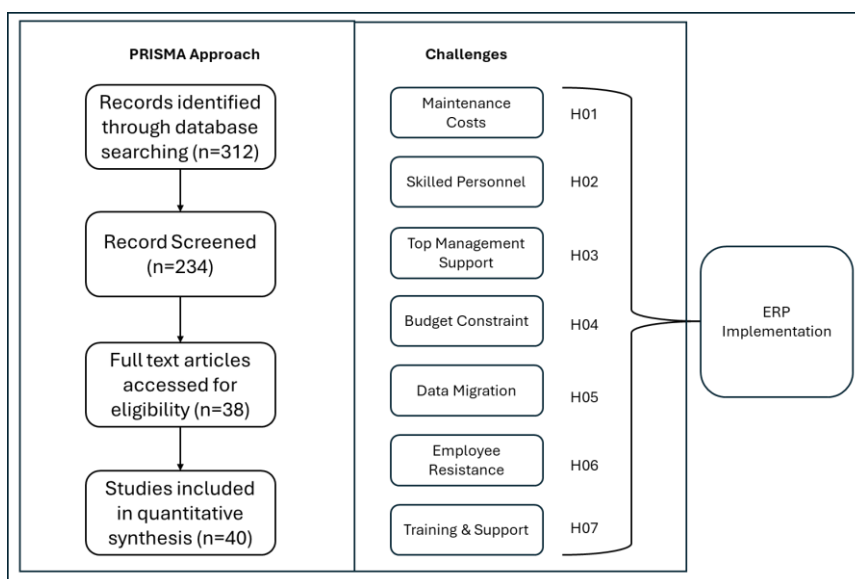


Figure 3 - Literature search with PRISMA guidelines

Source: The Authors Themselves.

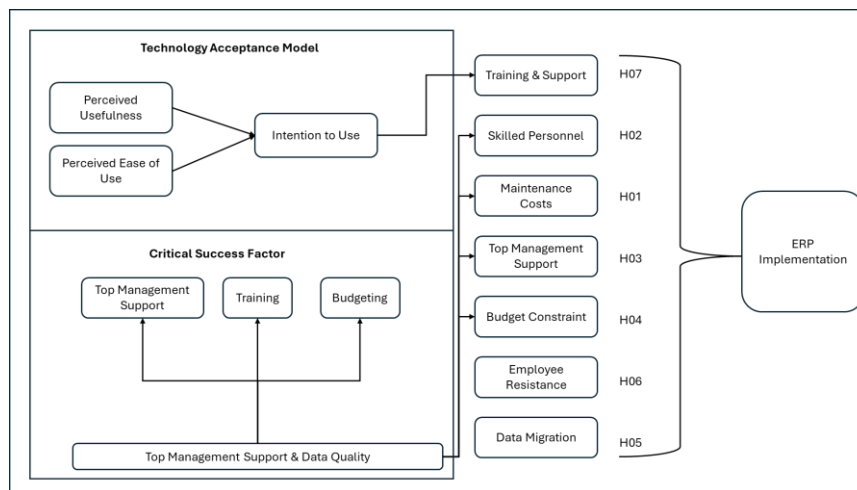


Figure 4 - TAM and CSF framework for this study

Source: The Authors Themselves.

3.6 Data analysis

The quantitative data were evaluated using descriptive statistics, scale reliability metrics, one-sample t-tests, and effect-size analysis. Perceptual trends were summarized using means, standard deviations, and modes, while the instrument's overall internal consistency was verified via Cronbach's alpha. To account for the small sample size and unknown population variance, a one-sample t-test was selected over a Z-test. The hypothesized population mean was set at the neutral midpoint of the five-point Likert instrument ($\mu_0 = 3$). Consequently, a sample mean significantly above 3 demonstrates that the factor constitutes a statistically verified ERP implementation challenge. Finally, the practical magnitude of each challenge was quantified using Cohen's d statistics, where values greater than 0.80 were interpreted as large effect sizes.

3.7 Ethical considerations

Participation in the study was entirely voluntary, and respondents were informed about the purpose of the research before completing the survey. Confidentiality of organizational data was strictly maintained, and all participants were assured of anonymity throughout the process.

4 RESULT

After entering the respondent data into IBM SPSS 23, the descriptive analysis was assessed. Tables 2 and 3 provide the analysis's summary.

Table 2 - Descriptive statistics of ERP implementation challenge items

Statements	Mean	SD	Mode
Regular maintenance cost is perceived as a significant challenge to ERP implementation effectiveness.	4.333	0.802	5
A shortage of skilled personnel is perceived as a significant challenge to ERP implementation effectiveness.	4.4	0.724	5
A lack of top management support is perceived as a significant challenge to ERP implementation effectiveness.	4.367	0.89	5
Insufficient budget allocation is perceived as a significant challenge to ERP implementation effectiveness.	4.3	0.596	4
Data migration and integration issues are perceived as a significant challenge to ERP implementation effectiveness.	4.233	0.898	4
Employee resistance to change is perceived as a significant challenge to ERP implementation effectiveness.	4.2	0.887	5
Inadequate user training and support is perceived as a significant challenge to ERP implementation effectiveness.	4.367	0.669	5

Source: The Authors Themselves.

The final dataset yielded 30 valid observations across the seven designated ERP challenge metrics. Descriptive statistics indicated that the mean scores for all items consistently fell above the neutral baseline of 3, showing that practitioners broadly recognize these variables as prominent implementation barriers in the Bangladeshi corporate sector. As a preliminary validation step, scale reliability was assessed; the resulting Cronbach's alpha of 0.560 reflects a moderate internal consistency. Because these items evaluate a diverse array of distinct operational challenges rather than a unidimensional trait, this coefficient was treated cautiously, confirming the appropriateness of item-level statistical testing. To evaluate the hypotheses, individual one-sample t-tests were executed against the neutral test value of 3. The results confirmed that all seven challenge dimensions reached statistical significance at the $p < 0.001$ threshold.

The strongest practical effect was found for insufficient budget allocation ($M = 4.300$, $SD = 0.596$, $t(29) = 11.948$, $p < .001$, $d = 2.181$). This suggests that budget-related issues are a highly influential barrier to ERP implementation effectiveness.

Inadequate user training and support also showed a very large effect ($M = 4.367$, $SD = 0.669$, $t(29) = 11.195$, $p < .001$, $d = 2.044$), indicating the importance of user preparation and post-implementation assistance.

Table 3 - One-sample t-test and Cohen's d effect-size results for $n=30$ & $df=29$

H ₀	Statement	Mean	SD	t	P-value	Cohen's d
H 1	Regular maintenance cost is perceived as a significant challenge to ERP implementation effectiveness.	4.333	0.802	9.103	<.001	1.662
H 2	A shortage of skilled personnel is perceived as a significant challenge to ERP implementation effectiveness.	4.4	0.724	10.592	<.001	1.934
H 3	A lack of top management support is perceived as a significant challenge to ERP implementation effectiveness.	4.367	0.89	8.411	<.001	1.536
H 4	Insufficient budget allocation is perceived as a significant challenge to ERP implementation effectiveness.	4.3	0.596	11.948	<.001	2.181
H 5	Data migration and integration issues are perceived as a significant challenge to ERP implementation effectiveness.	4.233	0.898	7.526	<.001	1.374
H 6	Employee resistance to change is perceived as a significant challenge to ERP implementation effectiveness.	4.2	0.887	7.413	<.001	1.353
H 7	Inadequate user training and support is perceived as a significant challenge to ERP implementation effectiveness.	4.367	0.669	11.195	<.001	2.044

Note: The test value was 3, the neutral midpoint of the five-point Likert scale. Cohen's d was calculated as $(\text{Mean} - 3) / \text{SD}$. All hypotheses are supported at $p < .001$.

Source: The Authors Themselves.

The shortage of skilled personnel was another major challenge ($M = 4.400$, $SD = 0.724$, $t(29) = 10.592$, $p < .001$, $d = 1.934$).

Regular maintenance cost also showed a large practical effect ($M = 4.333$, $SD = 0.802$, $t(29) = 9.103$, $p < .001$, $d = 1.662$). These findings indicate that ERP implementation in Bangladesh is strongly affected by both human capability and resource-related constraints.

Lack of top management support was also significant ($M = 4.367$, $SD = 0.890$, $t(29) = 8.411$, $p < .001$, $d = 1.536$).

Data migration and integration issues ($M = 4.233$, $SD = 0.898$, $t(29) = 7.526$, $p < .001$, $d = 1.374$).

Employee resistance to change ($M = 4.200$, $SD = 0.887$, $t(29) = 7.413$, $p < .001$, $d = 1.353$) also showed large practical effects.

These results confirm that ERP implementation challenges are not limited to technical issues but involve organizational, managerial, and behavioral dimensions. Overall, the findings show that all seven ERP implementation challenges are statistically and practically significant.

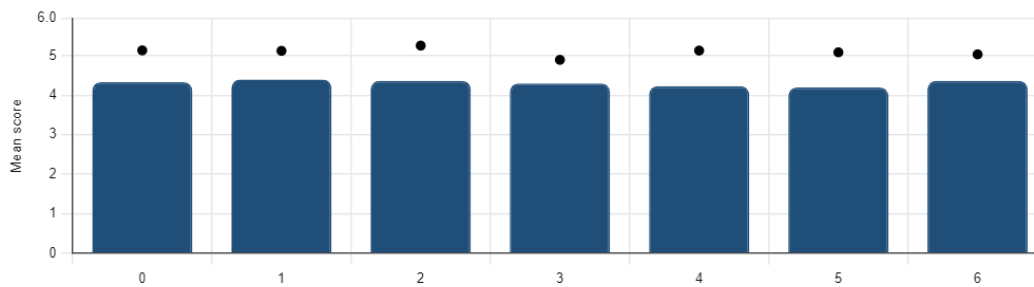


Figure 5 - Mean with SD error bars

Source: The Authors Themselves.

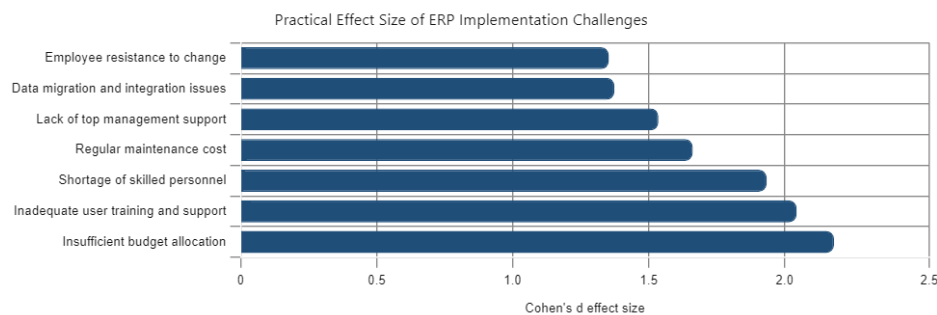


Figure 6 - Practical effect size of ERP implementation challenges

Source: The Authors Themselves.

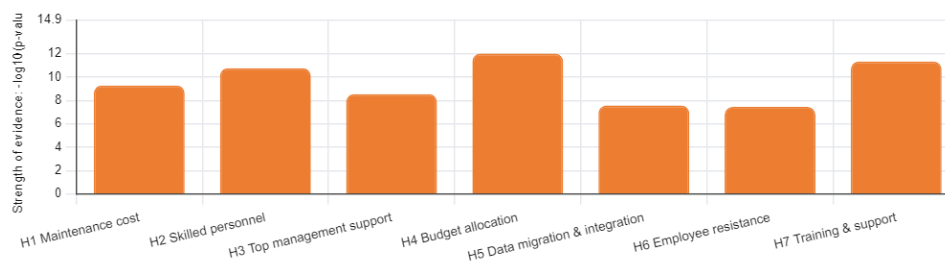


Figure 7 - Strength of evidence by hypothesis

Source: The Authors Themselves.

All seven challenge constructs had mean scores above 4.00, indicating strong agreement among respondents. Based on the updated 30-sample dataset, the strongest practical effect was observed for insufficient budget allocation ($d = 2.18$), followed by inadequate user training and support ($d = 2.04$), shortage of skilled personnel ($d = 1.93$), and regular maintenance cost ($d = 1.66$). These results indicate that ERP execution in Bangladesh faces critical bottlenecks primarily driven by resource constraints and human-centric factors. Specifically, a deficit in executive sponsorship ($d = 1.54$), data migration and system integration difficulties ($d = 1.37$), and user resistance to change ($d = 1.35$) demonstrated large practical impacts. This clustering of high effect sizes confirms that the barriers to successful ERP adoption are deeply multi-layered, spanning financial, organizational, and technological domains. Consequently, these insights underscore that enterprise software deployment transcends basic IT execution, demanding robust managerial strategies to address the complex socio-technical and structural hurdles unique to developing-economy environments.

Table 4 - Result with Interpretation

H ₀	Statement	Outcome	Practical implication
H1	Regular maintenance cost is perceived as a significant challenge to ERP implementation effectiveness.	Supported	Plan ERP maintenance as a recurring lifecycle cost, not a one-time expense.
H2	A shortage of skilled personnel is perceived as a significant challenge to ERP implementation effectiveness.	Supported	Develop internal ERP capability and reduce overdependence on external consultants.
H3	A lack of top management support is perceived as a significant challenge to ERP implementation effectiveness.	Supported	Ensure visible senior leadership support for budget, communication, and change management.
H4	Insufficient budget allocation is perceived as a significant challenge to ERP implementation effectiveness.	Supported	Prepare realistic total-cost-of-ownership budgets covering training, migration, support, and maintenance.
H5	Data migration and integration issues are perceived as a significant challenge to ERP implementation effectiveness.	Supported	Conduct data cleansing, validation, ownership assignment, and integration testing before go-live.
H6	Employee resistance to change is perceived as a significant challenge to ERP implementation effectiveness.	Supported	Use early communication, user participation, and training to reduce resistance.
H7	Inadequate user training and support is perceived as a significant challenge to ERP implementation effectiveness.	Supported	Prioritize role-based training and continuous post-go-live support.

Source: The Authors Themselves.

The following points summarize the significant findings, and their implications are shown in table 4.

5 DISCUSSION

Collectively, this study demonstrates that Enterprise Resource Planning (ERP) implementation within the Bangladeshi corporate landscape transcends the scope of a conventional technical project. Rather, it constitutes a profound socio-technical transformation that is fundamentally governed by the complex interplay of human behavior, leadership governance, financial readiness, data integrity, and systemic organizational capabilities. Based on the dataset of 30 valid responses, the findings indicate that ERP implementation challenges in Bangladesh remain strongly linked to financial readiness, user capability, leadership commitment, and data governance. The findings support the combined use of TAM and CSF perspectives. TAM explains how user-related issues such as training, skills, support, and resistance influence system acceptance, while CSF explains how budget, leadership, maintenance, and data governance shape implementation readiness and long-term ERP success (Ruivo *et al.*, 2020; Jayeola *et al.*, 2022).

The most influential challenge was insufficient budget allocation. ERP implementation requires investment not only in software but also in customization, infrastructure, training, data migration, vendor support, maintenance, and post-go-live stabilization. Inadequate budgets may force organizations to reduce training, skip data cleansing, limit testing, or weaken support, thereby reducing ERP effectiveness. This finding is consistent with ERP lifecycle literature, which emphasizes that ERP costs and risks continue beyond initial implementation (O'Leary, 2000), and with studies identifying cost pressure as a major challenge in resource-constrained organizations (Venkatraman and Fahd, 2016; Menon *et al.*, 2019).

Inadequate user training and support emerged as a prominent impediment to successful deployment. Because ERP configurations introduce fundamentally restructured workflows, novel reporting modalities, and realigned operational responsibilities, comprehensive training is critical to mitigate user friction and illustrate systemic benefits. Viewed through the lens of the Technology Acceptance Model (TAM), targeted training directly augments perceived ease of use and perceived usefulness. This finding strongly aligns with extant literature positioning user training, system exploitation, and active engagement as pivotal drivers of enterprise value creation (AboAbdo, Aldhoiena and Al-Amrib, 2019; Ruivo *et al.*, 2020). Concurrently, the pronounced shortage of skilled personnel underscores an acute deficit in the technical, functional, and process-specific ERP competencies within the local workforce. This scarcity of internal expertise escalates reliance on

external vendors, inflates operational expenditures, protracts deployment schedules, and compromises long-term knowledge transfer—structural constraints that mirror empirical evidence from other developing-economy contexts (Mahmood, Khan and Bokhari, 2019; Menon *et al.*, 2019; Azad Chowdhury *et al.*, 2021). Furthermore, challenges related to maintenance costs, executive sponsorship, data migration, and employee resistance achieved notable statistical significance. Ongoing ERP maintenance encompassing iterative updates, technical troubleshooting, and continuous security monitoring—constitutes a substantial component of the system's total cost of ownership (O'Leary, 2000). To navigate these overheads, resolute top management support is indispensable for optimized resource allocation, transparent communication, and conflict mitigation (Kouriati *et al.*, 2020; Leyh *et al.*, 2024). Similarly, data migration complexities frequently compromise system reliability and erode user trust, a vulnerability compounded by the fragmented legacy data environments typical in emerging markets (Mirhosseini *et al.*, 2021; Akrong, Shao and Owusu, 2022). Consequently, behavioral resistance must be proactively managed through iterative communication, end-user involvement, and ongoing institutional support (Mahmood, Khan and Bokhari, 2019; Menon *et al.*, 2019). Finally, the calculated Cronbach's alpha of 0.560 reflects a modest internal consistency. This baseline is psychometrically expected because the research instrument intentionally evaluates highly diverse, multidimensional operational hurdles rather than a singular, unidimensional latent construct. Accordingly, interpreting the dataset at the discrete item level preserves the distinct analytical validity of each independent challenge vector.

6 CONCLUSION

This study examined the operational and behavioral hurdles governing ERP implementation effectiveness in Bangladeshi organizations through the lens of an integrated TAM-CSF framework. Empirical findings derived from a valid sample size ($N=30$) demonstrate that all seven hypothesized challenges significantly penalize implementation outcomes. The most substantial practical effect sizes were concentrated around insufficient budget allocation, inadequate user training and support, a shortage of skilled personnel, and ongoing maintenance expenditures. Additionally, a lack of top management support, data migration and system integration difficulties, and employee resistance to change achieved statistical significance and demonstrated high practical relevance. Collectively, these insights advance the ERP literature by establishing that implementation barriers in emerging economies operate as interconnected socio-technical phenomena. While the TAM dimension clarifies how user-level training, skill readiness, and resistance influence eventual system adoption, the CSF dimension addresses the macro-level organizational readiness factors such as leadership commitment, capital availability, data migration, and long-term maintenance infrastructure essential for project survival. Pragmatically, the results indicate that Bangladeshi enterprises must move away from a purely technical, software-centric view of ERP deployment, treating it instead as an intensive organizational transformation. Practitioners can mitigate systemic risks and unlock the full strategic value of their ERP systems by implementing targeted administrative interventions: establishing conservative budget boundaries, maintaining visible executive sponsorship, designing multi-tiered training frameworks, and instituting strict data-cleansing and preventative maintenance workflows. Ultimately, the boundaries of this research suggest fruitful avenues for future inquiry. The current study is limited by its small sample size, cross-sectional design, and reliance on subjective, perceptual metrics. Moreover, the scale's internal consistency coefficient ($\alpha=0.56$) reflects the highly heterogeneous nature of the operational challenge metrics evaluated. To build upon these findings, future research should develop expanded, multi-item metrics for each distinct challenge dimension to test across larger, sector-specific sample pools. Additionally, employing longitudinal designs and advanced multivariate statistical methods would provide a more granular, time-series understanding of how these distinct challenges interact to shape user acceptance, deployment success, and ultimate firm performance.

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