

CRITICAL REVIEW OF STRATEGIES FOR REDUCING ERP FAILURE IN SMALL AND MEDIUM ENTERPRISES

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Abstract

Enterprise Resource Planning (ERP) systems have become crucial for enhancing business processes and driving digital transformation, especially in Small and Medium-Sized Enterprises (SMEs). While larger enterprises have traditionally led ERP adoption, SMEs are increasingly adopting these systems as costs decrease and technology matures. However, ERP adoption in SMEs comes with unique challenges, including limited financial resources, insufficient IT expertise, and resistance to organizational change. This article reviews the key failure drivers in ERP adoption for SMEs, focusing on the digital transformation process encompassing technology, processes, and organizational adoption. The article also discusses strategies for mitigating these challenges, emphasizing the role of organizational commitment, training, and alignment of business processes with ERP systems. By addressing these factors, SMEs can enhance their chances of successful ERP implementation, leading to improved efficiency and competitiveness.

Keywords: Enterprise Resource Planning (ERP), Small and Medium-sized Enterprises (SMEs), ERP Adoption, ERP Implementation, ERP Success Factors, ERP Failure Factors

Introduction

Enterprise Resource Planning (ERP) has become a vital platform for companies looking to enhance their competitive business processes. Historically, the use of ERP systems was largely confined to large organizations due to the complexity of their operations (Setiawan et al., 2024). The high costs associated with ERP implementation and the challenges in meeting management expectations have been major obstacles for Small and Medium-sized Enterprises (SMEs) in adopting these systems (P. D. Deshmukh et al., 2015; Dixit & Prakash, 2011; Khadrouf et al., 2020; Rupčić, 2021). Small and Medium-Sized Enterprises (SMEs) are typically defined as businesses with fewer than 250 employees and either annual revenues below €50 million or total assets below €43 million (European Commission, 2003). These enterprises play a crucial role in driving economic growth, providing employment, and fostering innovation. However, over the past decade, the adoption of ERP systems in SMEs has become more prevalent, driven by the maturity of the technology and the reduction in costs. This shift is evident from the growing number of ERP vendors focusing on SMEs and the fact that major ERP providers, like SAP and Microsoft, have been actively expanding their services to cater to the SME sector (Ali & Cullinane, 2014). This trend has been further reflected in the continuous growth of the ERP market within SMEs. The increased adoption can be attributed to the realization by SMEs of the benefits of integrating all business processes into a single system, leading to greater efficiency. For instance, leading organizations have fully integrated their manufacturing processes into their supply chains, and much of the interaction between customers and suppliers is now conducted electronically (Poba-Nzaou et al., 2008). According to Davenport, ERP systems are intended to address the fragmentation of information within large organizations by integrating all the data circulating throughout the company. Integrated systems like ERP function much like the nervous system of an organization, where data acts as the nervous impulses. If these impulses are flawed, the responses from different functional areas will be incorrect (Mamoghli & Cassivi, 2019). SMEs are becoming more aware of this and have

come to realize that integrated systems can convert vast amounts of data into precise, real-time information. This allows them to make informed decisions that support the achievement of their business objectives. This article reviews the adoption of Enterprise Resource Planning (ERP) systems in Small and Medium-Sized Enterprises (SMEs), focusing on the critical failure factors and offering actionable insights to prevent common pitfalls. While the previous article focused on the benefits of ERP systems in SMEs, this article addresses ERP failure prevention, providing strategies to mitigate the challenges and risks associated with ERP adoption. By understanding the common failure factors and addressing them proactively, SMEs can successfully navigate their ERP journey. The key findings include the importance of organizational readiness, proper training, and the alignment of ERP systems with business processes. Key failure drivers such as inadequate planning, lack of top management support, and insufficient change management are identified, along with early warning signs like user resistance and misalignment with business goals. To mitigate these risks, SMEs should prioritize executive commitment, invest in comprehensive training, and adopt a phased implementation approach. A prevention blueprint based on the DRM Success Framework is also proposed to guide ERP adoption and improve system longevity.

1.1 Role of SMEs

SMEs play a crucial role in the economies of countries worldwide, making significant contributions to both national economies and employment. SMEs hold considerable strategic importance. Their contributions include boosting the manufacturing sector and significantly impacting the country's GDP. SMEs also play a key role in promoting exports and improving the balance of payment accounts (Basu et al., 2012). Unlike large-scale organizations, which may contribute to income and wealth inequalities, SMEs promote a more equitable distribution of wealth and income. Additionally, small sectors create opportunities for a greater number of entrepreneurs. SMEs can also help free up scarce capital for more productive use. The level of risk in SMEs is generally lower, and they tend to employ a larger workforce (Sadat Safavi et al., 2013). SMEs can be categorized into two types. The first category includes traditional cottage industries, such as coir production, handicrafts, and village industries, which are typically unorganized and found in semi-urban and rural areas (Chatti et al., 2021; Grandhi & Chugh, 2012; Mirbagheri & Khajavi, 2013; Setiawan et al., 2024). These industries often operate without power-driven equipment, require minimal investment and technology, and play a significant role in providing employment, often on a part-time basis, to large portions of the population (Alaskari et al., 2021; Federici, 2009; Kiarie & Wanyama, 2017; Setiawan et al., 2024). These SMEs often produce essential products for mass consumption, some of which can even be exported. The second category comprises modern SMEs, which tend to be larger in both workforce and investment, with specific contributions to the economy (A. A. Deshmukh & Kumar, 2016).

1.2 Factors Contributing to ERP Success and Failure in SMEs

Enterprise Resource Planning (ERP) implementation in small and medium-sized enterprises (SMEs) continues to present both opportunities and challenges. Contemporary research indicates that success or failure hinges on a combination of organizational, technical, and human factors that shape implementation outcomes (Malik & Khan, 2021). Critical Success Factors (CSFs) commonly identified in the literature include strategic leadership commitment, business process alignment, and effective training. Senior management support has been

consistently found to be one of the most influential determinants of success, as it facilitates resource allocation, drives organizational buy-in, and reinforces project prioritization throughout the ERP lifecycle (Estébanez, 2021; Gessa et al., 2023; Kiran & Reddy, 2019; Setiawan et al., 2024; Upadhyay et al., 2011). Similarly, aligning the ERP system with the SME's business goals and processes often through thorough business process reengineering helps ensure that the technology supports operational needs rather than disrupting them. Comprehensive training and change management empower end users and reduce resistance, which is especially crucial given SMEs' typically limited IT expertise and smaller implementation teams. System compatibility with organizational needs (especially in cloud-ERP contexts) and robust data quality management are also significant drivers of successful adoption and performance post-implementation (Patalas-Maliszewska, 2012).

Conversely, failure factors outlined in recent systematic reviews emphasize the detrimental impact of inadequate planning and organizational readiness. Lack of top management support is frequently cited as the top cause of ERP failure; when leadership engagement is low, projects often suffer from insufficient budgeting, unrealistic timelines, and weak governance. Other prominent failure factors include inadequate education and training, misalignment between ERP capabilities and business strategies, insufficient project management capabilities, and low user willingness to adopt the system. Key failure drivers in ERP adoption include inadequate planning, insufficient top management support, and poor communication during implementation. Early warning signs of ERP failure include misalignment with business goals, lack of user engagement, and poor data quality management. These factors can compound throughout the project, leading to cost overruns, schedule delays, and ultimately poor system utilization (Handayani et al., 2013). ERP adoption is a critical part of the digital transformation process in SMEs. However, ERP failure is often framed as a failure of digital transformation spanning technology, processes, and adoption rather than merely a software issue. To mitigate ERP failure risks, SMEs should invest in training, ensure alignment with business processes, and engage top management early in the process.

1.3 SME-Specific Challenges in ERP Adoption

Small and medium-sized enterprises (SMEs) face a distinct set of challenges when adopting Enterprise Resource Planning (ERP) systems, which differ significantly from those encountered in large organizations (Olson & Staley, 2012). While ERP systems promise enhanced integration, process automation, and data visibility, the adoption process in SMEs is often constrained by resource limitations, technological readiness, and organizational dynamics. A primary challenge for SMEs is financial and resource constraints. ERP systems require substantial investment not only in software licensing but also in hardware, consulting, training, and ongoing support (Venkatraman & Fahd, 2016). Unlike large firms, SMEs typically operate with limited budgets and smaller IT departments, making it difficult to allocate adequate resources for a complex ERP rollout. Research highlights that lack of adequate funding and infrastructure remains a major barrier to successful ERP adoption in smaller firms. Closely tied to financial constraints is the lack of IT expertise. SMEs often do not have in-house technical staff with sufficient ERP knowledge to manage and customize systems. This gap frequently leads to reliance on external consultants, increasing costs and exposing firms to risks if the expertise is not aligned with organizational needs. Limited IT competency also hampers effective data

migration and system configuration, critical components of any ERP project (Supramaniam et al., 2014).

Another significant challenge is organizational change resistance. ERP adoption usually necessitates changes in workflows, job roles, and internal processes. Employees and managers in SMEs may resist such changes due to fear of complexity, disruption of routines, or perceived threats to job security (Loh & Koh*, 2004). Without robust change management and effective communication strategies, resistance can slow adoption and reduce user acceptance. Customization and system fit also present obstacles. Many ERP solutions are designed with larger enterprises in mind. SMEs may find that preconfigured modules do not align well with their specific business needs, yet extensive customization can be cost prohibitive and technically challenging (Ahmad & Cuenca, 2013). Balancing standard system capabilities with required custom features remains a recurrent issue documented in ERP adoption research. Moreover, post-implementation issues, including user training and system support, are disproportionately taxing for SMEs. Insufficient post-go-live support can result in configuration errors, workaround practices, and diminished return on investment (Chatzoglou et al., 2016). Case studies show that SMEs sometimes experience performance dips long after implementation due to inadequate ongoing training and troubleshooting capacity. Finally, the cloud ERP adoption landscape, while offering affordability and scalability, introduces its own set of barriers such as data security concerns, internet dependency, and integration complexity with legacy systems. This suggests that newer ERP delivery models, although promising, still require careful contextual adaptation for SMEs (Doom et al., 2010).

Review of the Literature

Kamakura et al. (2012) explored SMEs in the context of internationalization, highlighting the importance of adopting technologies to enable global operations and quicker expansion into new markets. They emphasized that technology adoption presents significant opportunities for businesses to operate at an international level. Innovation plays a crucial role in the growth of SMEs. However, they identified several barriers to innovation, including limited public support, tax burdens, regulatory challenges, access to financing, and unfair competition. Additionally, studies on open innovation in SMEs and large enterprises revealed valuable insights, with innovation being closely linked to market orientation and entrepreneurial mindset in SMEs.

According to Shiau et al., 2009 The Micro & Small Enterprises (MSEs) sector remains a dynamic and essential part of the Indian economy. This sector has consistently outpaced other industrial sectors in terms of growth. Small enterprises in India manufacture over 6,500 products, ranging from traditional to advanced high-tech items. Following agriculture, the MSE sector is the largest contributor to self-employment and job creation in the country. The potential for further expansion and growth within the MSE sector is substantial, with its employment opportunities being unparalleled by any other sector in the economy.

ERP implementation requires a strong commitment from the organization, along with an effective change management program, particularly in environments with a culturally diverse workforce. When an organization is committed to the process, it positively influences the implementation, facilitating the effective management of both structural and cultural changes at the organizational and workforce levels. Research highlights that failure cases often involve budget overruns, with management opting to cut costs related to future training. Therefore, it is crucial to involve end-users early in the planning, design, and implementation phases of the ERP

system to ensure a smooth transition. Implementing strong change management procedures is essential for the success of ERP implementation and overcoming these challenges (Snider et al., 2009).

Leadership from top management is a critical factor for the success of ERP implementation projects. Senior management plays a key role in ensuring resource allocation and prioritization of the ERP implementation project, addressing issues proactively and making necessary decisions to ensure the project stays on track. Without the support of top management, ERP projects may face significant challenges in terms of resources, commitment, and guidance. By providing strong leadership and direction, senior management helps mitigate risks and increases the likelihood of successful ERP adoption. This underscores the importance of top management involvement, as their foresight and proactive actions are pivotal to the successful deployment and optimization of ERP systems (Aisyah, 2011; Christofi et al., 2013; Kale et al., 2010; Setiawan et al., 2024; Wu et al., 2006; Xia et al., 2009)

Business Process Re-engineering (BPR) is crucial for aligning organizational processes with ERP software, which is often equipped with many modules designed to adhere to industry best practices. To maximize the potential of ERP systems, organizations should strive to minimize customization, as large-scale customizations can hinder the efficiency and flexibility of the system. ERP systems are designed to enhance standardization, and over-customization can limit their effectiveness. To ensure successful ERP implementation, organizations should establish quantifiable goals and use benchmarking practices to guide the process. Additionally, project management must focus on identifying milestones and critical paths for success, while ensuring active and continuous monitoring throughout the implementation phase (Haddara & Zach, 2011, 2012; Johansson & Sudzina, 2008; Setiawan et al., 2024)

Effective communication is vital throughout the ERP implementation process. Stakeholders must be kept informed of progress, and clear timelines and implementation strategies should be established from the outset. The decision to centralize or decentralize ERP implementation can have significant implications on cost and overall project management. As ERP systems often involve unforeseen costs, it is important that the budget remains flexible and is free from assumptions or speculations. Furthermore, selecting the right ERP package is a crucial decision. The chosen system must align with the organization's processes and strategic goals. Additionally, selecting and maintaining a strong relationship with external consultants is key to the success of the implementation. These consultants bring valuable expertise and facilitate Knowledge Transfer (KT) to the organization, enhancing the likelihood of success. Studies highlight that successful ERP implementation requires careful planning, training, and active management support throughout the process (Abbas et al., 2013; Setiawan et al., 2024; Zach & Olsen, 2011; Zaiad & Mohamed, 2020).

Methodology

This study presents a comprehensive literature review of ERP adoption in Small and Medium-Sized Enterprises (SMEs). A total of 92 articles published between 2010 and 2025 were reviewed, including 60 journal articles and 32 conference proceedings. These articles were sourced from various outlets, with journals contributing the largest share of publications, followed by conference proceedings. The review highlights the growing research interest in ERP systems in SMEs, with a peak in publications around 2018, followed by a slight decline in 2019. In terms of research methods, case studies and surveys were the most widely used

methodologies across the reviewed literature, while other methods appeared less frequently. These findings reflect the increasing prominence of ERP research within the SME sector.

To complement this literature review, the study also incorporates a structured, six-phase ERP implementation methodology, developed based on extensive international ERP project experience. This methodology, refined over many years, is now tailored to meet the specific needs of SMEs and comprises six phases: Launch, Design, Realization, Pre-Deployment, Deployment, and Closure. It emphasizes the importance of aligning ERP systems with business processes, ensuring executive support, and providing comprehensive training to mitigate common ERP failure drivers, such as financial constraints, limited IT expertise, and resistance to change.

The ERP implementation framework offers a proven roadmap to guide SMEs through the complexities of ERP adoption, providing practical guidance on responsibilities, risk management, and progress tracking. By blending theoretical insights from the literature review with the framework's real-world application, this study aims to provide SMEs with actionable strategies for successful ERP adoption and long-term system optimization.

The methodology section uses both secondary data from academic research and practical insights from the ERP implementation framework to deliver a holistic view of ERP implementation. The framework is instrumental in addressing failure drivers identified in the literature, such as inadequate planning, misalignment with business strategies, and insufficient top management support. It also incorporates risk mitigation strategies, ensuring that SMEs are well-prepared for successful ERP rollouts, leading to measurable improvements in efficiency, cost savings, and long-term sustainability.

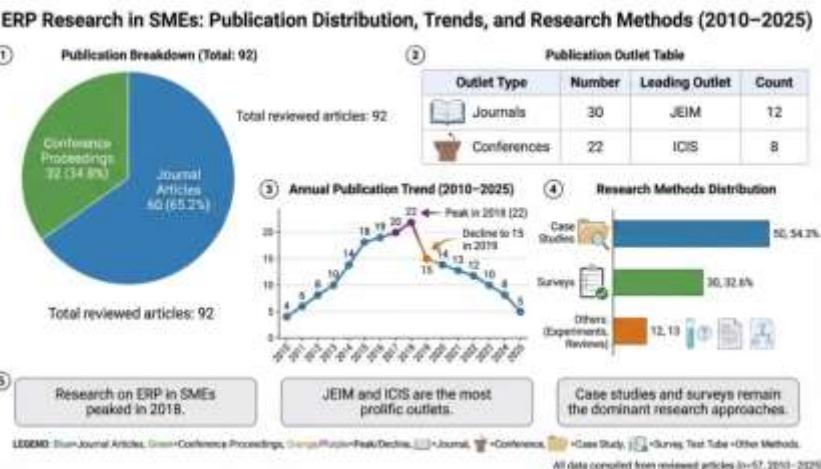


Figure 1: ERP Research in SMEs: Publication Distribution, Trends, and Research Methods (2010–2025)

5. Results and Future Research Avenues

The ERP implementation framework has demonstrated significant results for small and medium-sized enterprises (SMEs) across various regions. By focusing on key elements such as executive commitment, training, and process alignment, the framework has led to substantial improvements in operational efficiency, cost reductions, and job creation for SMEs. SMEs utilizing this framework have reported substantial savings, with some organizations realizing

notable cost reductions. Additionally, the framework has facilitated operational efficiency improvements ranging from 25% to 40%.

In addition to cost savings, each ERP project based on the framework has contributed to job creation. On average, direct and indirect jobs have been created per implementation, contributing to local economic growth. To date, a large number of professionals have been trained in ERP systems, with the training program improving system usage by approximately 30%. The Internal Rate of Return (IRR) for companies adopting the framework has been notably high, with a projected net profit per SME.

The framework also provides significant value beyond operational efficiency, impacting growth, compliance, and market expansion. Case studies demonstrate the importance of key success factors in ERP adoption. Executive support is crucial for ensuring adequate resource allocation and project prioritization. The framework emphasizes the need for tailored training and effective change management programs, which reduce user resistance and ensure smooth system adoption. Furthermore, aligning ERP systems with existing business processes is essential to prevent disruptions and ensure that the technology supports the SME's operational needs.

The research indicates several key failure drivers in ERP adoption, including inadequate planning, lack of top management support, and misalignment with business goals. Early warning signs such as user resistance, poor data management, and insufficient communication during implementation are frequently observed in ERP failures. To mitigate these risks, SMEs should focus on executive commitment, invest in comprehensive training, and ensure that ERP systems are aligned with the business's specific processes from the beginning. The framework provides a structured approach to these areas, helping organizations navigate the challenges of ERP adoption effectively.

Future Research and Gaps:

The review of the existing literature highlights several key gaps in ERP research, particularly regarding the later phases of the ERP life-cycle. Although the first four phases Adoption, Acquisition, Implementation, and Use have been well-documented, there is limited research on the Evolution and Retirement phases of ERP systems. As SMEs adopt ERP systems to improve their operations, these systems will eventually need to evolve or be replaced. However, the motivations and strategies behind upgrading or retiring ERP systems remain underexplored. Further studies are also needed to examine the impact of government policies on ERP adoption and how Software as a Service (SaaS) technologies are transforming ERP acquisition and implementation.

There is a significant need for cross-national studies to compare ERP adoption across different regions and industries, particularly in regions where ERP adoption is still in its early stages. Additionally, research should explore the differences between small, medium, and large SMEs, as the ERP adoption processes may vary significantly depending on the size of the enterprise. Service-oriented SMEs also remain underrepresented in the literature, with most studies focusing on manufacturing SMEs. Extending the research to include other sectors will provide valuable insights into how ERP adoption differs across industries with different business models. Finally, there is a growing need to consider the perspectives of various stakeholders in the ERP process, including suppliers, consultants, and employees. These perspectives will enrich

the understanding of ERP implementation success and failure, and exploring ERP failure cases can provide valuable lessons that improve future projects.

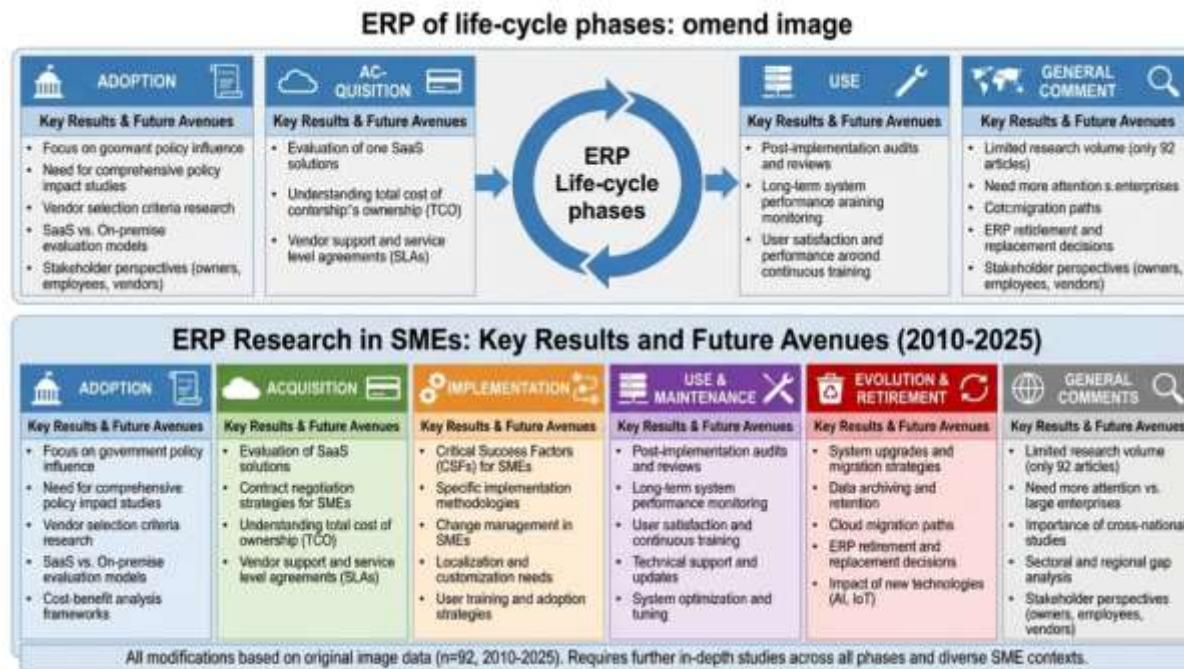


Figure 3: ERP Life-cycle Phases and Key Results (2010–2025)

Conclusion

This study offers a comprehensive review of ERP adoption in Small and Medium-Sized Enterprises (SMEs), highlighting both the challenges and key success factors that influence successful implementation. As ERP systems continue to play a significant role in driving digital transformation, SMEs are increasingly adopting these systems despite facing obstacles like financial limitations, lack of IT expertise, and resistance to organizational change. The review identifies that inadequate planning, lack of top management support, poor communication, and misalignment with business processes are the most common drivers of ERP failure. To mitigate these risks, SMEs must prioritize executive commitment, invest in comprehensive training, and ensure that ERP systems are aligned with their business objectives from the outset. Additionally, the DRM Success Framework can serve as a useful blueprint for ERP adoption, helping SMEs manage risk factors throughout the ERP lifecycle. Future research should focus on exploring the evolution and retirement phases of ERP systems, the influence of government policies, and conducting cross-national studies to address gaps in the existing literature. By focusing on these areas, SMEs can enhance their chances of successful ERP implementation, improving efficiency and gaining a competitive advantage in the market.

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