"Hellenic Open University"

"MBA"

Postgraduate Dissertation

"Why do ERP implementations fail in some organizations while succeeding in others? A comparative study of failed and successful projects"

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Patras, Greece, "February" "2026"

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Abstract

Enterprise Resource Planning systems, promise integrated processes, reliable data and scalable operations. This dissertation investigates why ERP implementations succeed in some organizations but fail in others using a comparative case study design and utilizing a standardized Technology, Organization and Environment (TOE) rubric. The empirical base contains diverse context, covering both successful and failed programs.

The main three aims are to systematically compare ERP outcomes across heterogeneous settings, identify configurations of TOE factors that distinguish success from failure and finally develop a practical managerial tool that assesses and helps with improvement of implementation readiness. By applying a unified coding scheme it shows that organizational centrality is the most consistent differentiator of success with technical sufficiency following close second, especially data migration quality, E2E integration and rigorous testing and finally the environmental conditions moderating the outcome by amplifying or dampening the effects of organizational and technical practices.

Building on these findings, the dissertation proposes the ERP outcome readiness (EOR) tool, that is a concise diagnostic that translates TOE assessments into readiness signals and intervention order. The results offer a prioritized roadmap for manager to manage risks, stage cutovers and secure adoption fidelity. In theory, the work contributes a standardize TOE rubric for cross-case comparison and configuration perspective that shows that ERP outcomes arise from coherent combinations of factors rather than isolated enablers. Overall, the dissertation provides actionable guidance and an evidence-based framework to steer ERP programs toward sustainable value.

Keywords

ERP, Implementation, Success, Failure, Key Factors.

"Γιατί αποτυγχάνουν οι εφαρμογές ERP σε ορισμένους οργανισμούς ενώ σε άλλους είναι επιτυχείς; Συγκριτική μελέτη επιτυχημένων και αποτυχημένων έργων"

"Ευάγγελος Σαντής"

Περίληψη

Τα συστήματα Enterprise Resource Planning (ERP) υπόσχονται ολοκληρωμένες διαδικασίες, αξιόπιστα δεδομένα και επεκτάσιμες λειτουργίες. Αυτή η διατριβή διερευνά γιατί οι υλοποιήσεις ERP επιτυγχάνουν σε ορισμένους οργανισμούς αλλά αποτυγχάνουν σε άλλους, χρησιμοποιώντας συγκριτικό σχεδιασμό μελετών περίπτωσης και αξιοποιώντας ένα τυποποιημένο ρουμπρίκ Τεχνολογία, Οργάνωση και Περιβάλλον (TOE). Η εμπειρική βάση περιλαμβάνει ποικίλα συμφραζόμενα, καλύπτοντας τόσο επιτυχημένα όσο και αποτυχημένα προγράμματα.

Οι τρεις κύριοι στόχοι είναι να συγκριθούν συστηματικά τα αποτελέσματα ERP σε ετερογενείς ρυθμίσεις, να ταυτοποιηθούν διαμορφώσεις παραγόντων του TOE που διακρίνουν την επιτυχία από την αποτυχία και, τέλος, να αναπτυχθεί ένα πρακτικό διοικητικό εργαλείο που αξιολογεί και βοηθά στη βελτίωση της ετοιμότητας υλοποίησης. Με την εφαρμογή ενός ενιαίου σχήματος κωδικοποίησης, προκύπτει ότι η οργανωσιακή κεντρικότητα είναι ο πιο συνεπής διαφοροποιητής της επιτυχίας, με την τεχνική επάρκεια να ακολουθεί σε μικρή απόσταση ιδίως η ποιότητα μεταφοράς δεδομένων, η end-to-end (E2E) ολοκλήρωση και η αυστηρή δοκιμή και, τέλος, οι περιβαλλοντικές συνθήκες να μετριάζουν το αποτέλεσμα, ενισχύοντας ή αποδυναμώνοντας τις επιδράσεις των οργανωσιακών και τεχνικών πρακτικών.

Βασιζόμενη σε αυτά τα ευρήματα, η διατριβή προτείνει το εργαλείο ERP Outcome Readiness (EOR), ένα συνοπτικό διαγνωστικό που μεταφράζει τις αξιολογήσεις TOE σε

σήματα ετοιμότητας και σειρά παρεμβάσεων. Τα αποτελέσματα προσφέρουν έναν ιεραρχημένο οδικό χάρτη για τους μάνατζερ ώστε να διαχειρίζονται κινδύνους, να προγραμματίζουν τα cutovers και να εξασφαλίζουν την πιστότητα υιοθέτησης. Σε θεωρητικό επίπεδο, το έργο συμβάλλει με ένα τυποποιημένο ρουμπρίκ TOE για δια-περιπτωσιακή σύγκριση και μια προοπτική διαμόρφωσης (configuration) που δείχνει ότι τα αποτελέσματα ERP προκύπτουν από συνεκτικούς συνδυασμούς παραγόντων και όχι από μεμονωμένους ενισχυτές. Συνολικά, η διατριβή παρέχει πρακτική καθοδήγηση και ένα τεκμηριωμένο πλαίσιο για την καθοδήγηση προγραμμάτων ERP προς βιώσιμη αξία.

Λέξεις – Κλειδιά

Συστήματα Επιχειρησιακών Πόρων (ERP), Υλοποίηση, Επιτυχία, Αποτυχία, Βασικοί Παράγοντες

Table of Contents

List of Tables

List of Abbreviations & Acronyms

ERP – Enterprise Resource Planning

MRP – Material Resource Planning

CSF – Critical Success Factors

CFF – Critical Failure Factors

TOE – Technology, Organization, Environment framework

EOR – ERP Outcome Readiness

1. Chapter 1: Introduction

1.1 Research background and problem statement

The purpose of this dissertation is to explore why ERP implementations succeed in some organizations but fail in others by conducting a comparative analysis of published case studies using a standardized TOE rubric.

Enterprise Resource Planning systems (ERP) are software platforms that are integrated into the companies with the purpose of unification and streamlining the core business processes (Gargeya & Brady, 2005). It is a crucial tool in the hands of organizations that implement it successfully, as it improves the organizational operations, improves accuracy of the data available and enhances the capability of making the right decisions. Since the inception of the systems in the initial form of Material Requirement Planning solutions (MRP) back in 1990 until now, these systems have evolved from simple software to modular complete solutions managing every aspect of the organization and providing live data for finance, human resources, supply chain and numerous other fields (Patange, 2025). For many, ERP systems are now essentially the informational backbone of modern organizations, and many decisions depend on the real-time, accurate data provided. Therefore, adaptation of such systems is driven by the need to be efficient, competitive and adapt rapidly to the ever-changing market requirements (Barth & Koch, 2019).

Based on the above, by investing in ERP, organizations try to achieve process Integration, break down the silos and enable cross-department data flow (Davenport, 1998). Operational efficiency by reduction of errors, task automation, productivity improvement (Wang et al., 2016) and decision support that aim to data driven decision making based on accurate and timely info (Chatzoglou et al., 2016). Finally, regulatory compliance which ensures consistent reporting and data (Barth & Koch, 2019).

The ERP market is substantial at $60 billion in 2025 with the most important vendors like SAP, Oracle, Microsoft serving organizations of all sizes. There is significant growth potential projected to rise to $120 billion by 2030 which demonstrates a growth rate of 8% reflecting the increase on dependency to ERP systems for digital transformation. Table 1 summarizes the ERP vendor landscape and indicative 2025 revenues.

Rank	ERP Vendor	Estimated Market Value / Revenue (2025)	Key Strengths
1	**SAP**	~$30–35 billion	Global leader, strong in manufacturing, finance, and enterprise-scale ERP.
2	**Oracle NetSuite**	~$15–18 billion	Cloud-native ERP, strong in mid-market and SaaS adoption.
3	**Microsoft Dynamics 365**	~$12–15 billion	Deep integration with Microsoft ecosystem, popular in SMEs and enterprises.
4	**Infor**	~$8–10 billion	Industry-specific ERP (manufacturing, healthcare, distribution).
5	**Workday**	~$6–8 billion	Strong in HR, finance, and cloud ERP for large enterprises.

Table 1 (HGInsights, 2025)

Despite all the benefits that we will discover and discuss later, such integration can prove to be costly with many cases of failed implementations leading even to company bankruptcies. Many projects have unrealistic expectations, exceed budgets, and face resistance to change that are cited as critical failure factors. It is estimated that up to 70% of ERP projects will fail to meet one or more of their objectives which will lead to substantial financial loss (Coşkun et al., 2022). Poor planning, resistance to change, and technical issues have led to disruptions and failures in companies like Hershey Foods, FoxMeyer Drug and others (Gargeya & Brady, 2005).

Understanding the reason behind success or failure is critical for managers and organizations that seek to maximize their investment and avoid mistakes that can have a big financial and organizational impact. This dissertation will try to address a crucial question in the field of ERP systems and organizations, "Why do ERP implementations fail in some organizations while succeed in others?". By conducting comparative analysis of successful and failed implementations, this research aims to define a standardized framework based on TOE by Tornatzky and Fleischer (1990) and provide insights to practitioners and scholars.

1.2 Research questions and objectives

The main aim of this dissertation is to simplify the complex topic that determines whether ERP implementation will be a success or failure and document the critical factors that influence the outcome.

This question was designed to guide the in-depth investigation on the nature of ERP projects considering all the dimensions involved:

- **What are the key factors that determine the success or failure of ERP implementations in organizations?**

To address this question, we will review and investigate several sub-questions:

What are some of the most cited critical success and failure factors and are these sufficient to determine success from failure without the TOE framework?

This question looks to cumulate findings from case studies and available literature by identifying recuring themes or patterns that distinguish the outcome emphasizing on the need for holistic approach rather than isolated factors.

How do culture, organizations, technology and people influence ERP implementation outcomes?

Since these projects are not only technical but almost always require drastic shifts in the mindset and behavior of the organizations, this question examines what is the role of culture, management and the ability to adapt to change.

What can we draw from other comparative studies?

By investigating past cases that had different outcomes, the aim will be to highlight actionably insight and best practices that can be used for future implementations.

To maximize success, what can organizations do to manage ERP projects?

This question will try to address the post-implementation impact and address the importance of continuous support, training and improvement.

The research's objectives are the **critical evaluation of published literature on successful and failed ERP implementations** by analyzing academic studies, reports and systematic reviews, the purpose will be to establish a foundation for analysis. **To analyze real case studies that represent both successful and failed examples** with **c**ase studies that provide

context and insights in many different ERP projects that allow identification of differentiator factors. **The development of comprehensive and comparative framework of the different factors in ERP projects** connecting technological, organizational and environmental perspectives and identify possible areas of future research by utilizing the TOE framework and finally to **define practical recommendations for organizations planning or undertaking such projects.**

The goal will be a translation of findings into actionable points that will help organizations avoid costly pitfalls and achieve the true potential of their investment.

1.3 Significance and scope of study

This research's' significance is the potential of bridging the gap between literature and practice of ERP implementations. While research knowledge is widely available, organizations still struggle with the complexity of these projects with estimates suggesting that 70% of new implementations miss at least 1 of their objectives (Coşkun et al., 2022). This is a paradox since the original scope of the implementation of ERP systems is to improve efficiency and competitiveness of the organization but often, we see costly setbacks since there is only superficial understanding of the factors that influence the outcome and distinguish success from failure.

ERP Systems are not just software that you can install in the organization and get positive results. There is a need for transformation that will impact almost the whole structure from processes to people and culture (Davenport, 1998). These complex projects depend on a multitude of factors like user engagement, commitment from leadership and experienced project managers that adapt to the ever-evolving business requirements (Barth & Koch, 2019).

The key contribution of the thesis is the systematic application of the Technology – Organization – Environment Framework (TOE) as a tool for standardization and comparative analysis, originally developed by Tornatzky and Fleischer (1990) and comprehensively reviewed by Baker (2011) and is recognized as one of the most robust and flexible theories to explore the factors influencing the adoption and success of innovation in organizations. Compared to other studies, this research aims to go one step further and employ a uniform set of TOE characteristics that will support the evaluation of both

successful and failed ERP implementations, rather than use case specific and inconsistent criteria (N'Dri & Su, 2024).

With the combination of comparative case studies analysis and comprehensive literature review this dissertation's aim will be to offer an understanding of critical factors that really make the difference between success and failure. The scope is intentionally kept broad so there is encompassment of these multidimensional projects, technological, organization and human. It will analyze the lessons learned from different examples, including large-scale implementations of SAP, smaller upgraded projects and challenges that only arise after the implementation, all documented in recent systematic reviews (Gargeya & Brady, 2005).

By focusing on the TOE framework, the dissertation offers a methodology that innovates and enhances the reliability and generalization of the findings. This will allow to identify patterns and differentiators that are not limited to the specifics of each organization. By doing so, it will strengthen the academic rigor and increase the practical relevance for academics and managers or consultants that are interested in ERP implementations that want to understand what factors contribute to failure and success. Since it will be grounded in academic research and publications the analysis will be presented in a clear and mostly non-technical language so it can be understood by a wide audience.

To summarize, this dissertation will try to contribute and bridge the gap of the ongoing differences of research and practice fields. It will differentiate success and failure factors and in practice create an actual roadmap that will help the interested parties to navigate such complex digital transformation so long term, lasting value can be created.

1.4 Dissertation structure overview

This dissertation is organized into seven chapters:

1. **Chapter 1: Introduction**
   Presents the research background, problem statement, research questions, objectives, significance, and structure of the study.
2. **Chapter 2: Literature Review**
   Reviews the evolution of ERP systems, implementation methodologies, critical success and failure factors, theoretical frameworks, and research gaps.

3. **Chapter 3: Research Methodology**

   Describes the research design, case study selection, data collection methods, and analytical framework.

4. **Chapter 4: Case Studies**

   Provides detailed accounts of both successful and failed ERP implementation cases, highlighting organizational contexts, processes, and outcomes.

5. **Chapter 5: Comparative Analysis and Findings**

   Synthesizes insights from the case studies, identifying patterns, differentiating factors, and theoretical contributions.

6. **Chapter 6: Discussion and Implications**

   Interprets the findings in relation to published literature, discusses practical and theoretical implications, and offers recommendations for practitioners.

7. **Chapter 7: Conclusion**

   Summarizes the key findings, outlines the contributions and limitations of the study, and suggests directions for future research.

2. Chapter 2: Literature Review

2.1 ERP systems: definitions and evolution

Enterprise Resource Planning (ERP) are systems that have become a crucial part of modern organizations and management as they enable companies not only to integrate but also transform, automate and optimize their existing business process. Technological advancements and the increased complexity of the global markets have led to evolution of ERP systems that also translates to transformation of the organizations that use it. It is essential to understand the definition of ERP systems and how it was historically developed to grasp the significance, challenges and factors that influence their successful implementation (Butarbutar et al., 2023).

ERP systems are modular platforms that unify and manage key organizational functions through a centralized data. The "heart" of such systems is a centralized database that is being utilized to standardize workflows and seamlessly facilitate rea-time data sharing and automations (Malik & Khan, 2021; Wortmann, 1998).

The primary objectives that ERP systems try to achieve include, but are not limited to:

Process integration by breaking down operational silos and enabling cross-functional collaboration

Data accuracy and visibility by providing real-time reliable info that is used in decision-making

Operational efficiency by providing process and task automation, error reduction and streamlined workflows

Scalability and flexibility by supporting growth and helping the organization adapt to changing environment (Butarbutar et al., 2023).

ERP systems consist of interconnected modules, each representing specific functions and the implementation can happen either individually based on the current organization needs or collectively as part of a bigger transformation. These modular architectures allow tailor made solutions that take into account the unique needs while maintaining systematic coherence (Vargas & Comuzzi, 2020).

The predecessor of ERP systems is the Material Requirement Planning (MRP) Systems that originate in the distant 1960-1970. Initially these were systems designed to manage inventory and plan production in different manufacturing environments. As the markets expanded, organizations grew, and technology advanced, these systems evolved to Manufacturing Resource Planning (MRP II) incorporating additional capabilities as schedule and capacity planners and floor control modules (Wortmann, 1998; Zhu et al., 2010).

The transition to ERP was eventually a significant milestone, it integrated organizational systems beyond manufacturing, encompassing all major business processes like procurement, supply chain management, customer relationship management etc. This was inevitable since organizations started recognizing that in order to be effective there is a need for seamless cross-functional coordination, including all the diverse activities and having the ability to respond rapidly in the fast-changing global environment (Butarbutar et al., 2023).

Since then, ERP systems have seen big changes and continuous refinement from companies innovating in that area. Some key milestones are:

Client-Server Architecture where the client server models enable better flexibility, expanded scale and user accessibility.

Web-Based and Cloud ERP solutions that allow companies to access the systems remotely, reduce their infrastructure cost and update automatically (Malik & Khan, 2021).

Industry specific solutions where the modules and systems consider the uniqueness of specific industries like manufacturing, government and healthcare (Butarbutar et al., 2023).

Integration with new technologies like AI, machine learning and analytics and capabilities that enhance decision making, process optimization and predictive maintenance (Mahmood et al., 2020).

ERP systems are not only software solutions, but they are also a representation of need for shift in organizational operation and collaboration. Used for business process consolidation in a unified platform where organizational change, data drive decisions and strategic alignment all happen seamlessly (Laudon & Laudon, 2018).

Having a successful implementation can lead to big benefits for the organization that include shorter process cycle times via automation that reduces possible bottlenecks, improved reporting by having standardized processes and real time data, error reduction or elimination since there is a centralized data management system, enhanced responsiveness supported by real-time information and strong cross functional integration

However, things are not as simple as one might think since ERP systems often require restructuring of processes and substantial investment in people training and management change so issues like resistance to change can be addressed (Davenport, 1998). As these are complex projects that require cross-functional collaboration, it is very often that delays, budget extensions or even total failure occur (Coşkun et al., 2022).

Usually, the project lifecycle is defined by 3 main phases, each having its own objectives, goals and risks:

Pre-implementation is the phase where most of the planning happens, ERP provider is identified, and the project is being scoped. The organization will assess the needs and solutions and start the preparation for the organizational changes (Motiwalla & Thompson, 2012).

Implementation includes the initial system piloting and rollout and is the beginning of data migration and user training. Here it is very critical to have a strong project management and stakeholder involvement that will support the technical and organizational challenges (Kirmizi & Kocaoglu, 2022).

Post-implementation is the last phase where the system is live, and the focus turns to tunning, upgrades, optimization and knowledge transfer. It is very crucial for ongoing issues to be addressed at this stage, data quality and user support to be ensured and finally process optimization to happen (Ha & Ahn, 2014; Oseni et al., 2017).

ERP systems should be assimilated if they want to have an effective implementation that utilizes the full capabilities in daily operations (Hasan et al., 2019). Finally, continuous improvement and regular system reviews should not be overlooked as these are essential for continuous success (Butarbutar et al., 2023).

ERP systems were initially adopted by manufacturing organizations, but this has rapidly changed in recent years. Now majority, if not all sectors, including governments, finance and retail have embraced ERP solutions (Butarbutar et al., 2023).

The expansion of ERP systems led to several major providers like SAP, Oracle, and Microsoft with each one offering complete solutions that are often tailor made to industry and organizational needs. There is continuous growth driven by the evolution of technology and digital transformation (HGInsights, 2025).

To define what an ERP system is, there is need to reflect on the connection between technological advancement, organizational change and market forces. It is essential to understand the ERP system history, architecture and role while navigating the complexities of ERP implementations if organizations want to maximize its value and avoid common setbacks. The following sections will further explore methodologies, critical success and failure factors and set the theoretical framework for the comparative analysis that will follow.

2.2 ERP implementation methodologies and phases

Implementing ERP systems is no easy task, it requires planning, coordination and execution through multiple stages using tested methodologies that have evolved over time based on best practices. There is a need to understand these methodologies and phases accordingly, beforehand, if the organization wants to maximize the ERP system's benefits and ultimately minimize associated risk and challenges (Shaul & Tauber, 2013).

ERP implementation methodologies are in practice, structured frameworks that help guide the organizations through multiple, often complex, stages of the system deployment. Through these methodologies, technical, organizational and human factors that define the outcome of the project are addressed. Of course, different ERP system vendors may follow slightly different methodologies but mostly there are common elements in relation to testing, data migration, system configuration and post-deployment support (Barth & Koch, 2019; Nah et al., 2001).

Most common and widely recognized ERP implementation methodologies are the Accelerated SAP (ASAP) developed with emphasis in predefined templates, best practices and phased rollouts that emphasize rapid deployment. There are five main phases: project preparation, business blueprint, realization, final preparation and go-live. This may not be

the best choice for organizations that need highly customized solutions (Gargeya & Brady, 2005).

Oracle Unified Method (OUM) that focuses on iterative developments, risk management and stakeholder engagement. The main phases are the initial inception and elaboration, construction and transition of the system and finally production (Shaul & Tauber, 2013).

Microsoft Dynamics Sure Step that offers a standardized implementation of Microsoft Dynamics ERP platform that includes diagnostics, analysis, design, development, deployment and operational support (Barth & Koch, 2019).

Waterfall and Agile approaches that are not tied to a specific ERP vendor/solution and are traditional models that follow sequential defined steps or even focus in flexible, collaborative and incremental delivery (Nah et al., 2001; Butarbutar et al., 2023).

No matter what methodology is chosen, we can see there are several common steps that are followed and the need for cross-functional alignment, technical preparation and readiness is undeniable.

Far from the methodologies mentioned above, the implementation usually is divided into several sub-phases, each having its own activities. Below there is an in-depth overview that was drawn from academic research and common industry practices.

- **Project Preparation and Planning**

  This is the initial phase that establishes the project scope, objectives and governance structure and includes the following key activities:

  Stakeholder Identification where executive sponsors, project managers and business process owners as well as IT and end users are engaged

  Initial assessment that analyzes the existing processes, determining the main pain points and defining the requirements for the ERP system

  Vendor selection where evaluation of the available solutions happened and decision is taken on the best choice based on parameters like cost, scalability and functionality (Kirmizi & Kocaoglu, 2022)

  Resource allocation is the final step in this phase where the project team is assembled, budget is secured and the project plan is developed.

  Effective planning is critical if the organization wants to have realistic expectations and alignment between the stakeholders (Nah et al., 2001).

- **Business Blueprint and System design**

In this phase there is translation of the business requirements happening to broken down and detailed systems specifications:

Process Mapping where organizations document their existing workflows and identify possible standardizations and improvements

Gap Analysis that checks the current processes to the ERP capabilities and identify need for change or customization

System Configuration when the initial design of the ERP system architecture happens, needed modules are selected and data structures and integrations points are defined (Gargeya & Brady, 2005).

This blueprint is an essential roadmap that following implementation activities will depend on, and it ensures that the ERP system will support all defined goals (Shaul & Tauber, 2013).

- **Realization and System Build**

  Here, the initial configuration and customization happen and begins development that meets the defined requirements:

  System Configuration sets up the modules, workflows and roles and configures the security settings

  Customization is the development of custom features that covers the organizational requirements

  Data migration extracts, transforms and loads existing data from legacy systems in the new platform (Barth & Koch, 2019)

  Integration that connects the ERP to the remaining systems like CRM or HR.

  During this phase there is a lot of testing and refinement to ensure the systems functionality meet the intended one (Butarbutar et al., 2023).

- **Testing and Quality Assurance**

  System implementation can't happen without prior proper testing to validate the functionality, performance and reliability of the ERP:

  Unit Testing on the individual modules

  Integration Testing to ensure proper communication between interfaces

  User Acceptance Testing (UAT) that is engaging the end users and validating if the system meets their needs and their workflow (Barth & Koch, 2019)

  Performance Testing that the speed and stability are assessed in real conditions

  Testing is something that must not be skipped or overlooked since it is crucial if organizations want to reduce future disruptions and failures (Nah et al., 2001).

- **Training and Change Management**

The changes happening are substantial during the implementation so there is proper need for training and change management strategies:

User training is an activity that provides end users with hands on instruction

Communication where stakeholders are kept in the loop regarding progress and upcoming changes

Change Management that addresses resistance and foster a culture of continuous improvement (Butarbutar et al., 2023)

Training and change management, as the rest of the phases, are critical so user adoption and value maximization can happen (Ha & Ahn, 2014).

- **Go-Live Deployment**

  This is the phase that the implementation has completed the transition from the legacy platforms and starts operation in the ERP system:

  System Cutover switches the operations to the ERP system

  Support and troubleshooting dedicate resources to assist end users, resolve issues and monitor the general performance

  Post Go-Live review that assesses how successful the deployment was and what needs to be improved (Barth & Koch, 2019).

  A phase needed to minimize disruptions and ensure the smooth transition from legacy systems (Shaul & Tauber, 2013)

- **Post-Implementation Support and Continuous Improvement**

  When the implementation finish, there is still need for support and improvements to sustain the success:

  System Maintenance where updates, patches and enhancements are applied

  User support that provides help desk services and troubleshooting

  Performance Monitoring is essentially a tracking system that helps identify bottlenecks and system usage

  Continuous Improvement that leverages the feedback and analytics to fine tune workflows and drive systemwide improvements (Butarbutar et al., 2023)

  Support after implementation helps to make sure that the ERP system will not only continue to deliver value but also adapt to the ever-changing business environment (Oseni et al., 2017).

Based on research and practice, several best practices have been identified related to ERP implementation with the most common mentioned below:

- Phased vs Big Bang Approach is a choice that organizations need to take when they deploy a new ERP system. Phased approach leads to a longer implementation that happens in phases and provides incremental learning, thus lower risk while Big Bang approach happens faster and all at once but has higher risks (Gargeya & Brady, 2005)
- Project Governance is essential to establish clear roles and responsibilities and provides an essential structure for managing such complex projects and ensure accountability (Nah et al., 2001)
- Stakeholder engagement involves end users, managers and executives throughout the project and helps facilitate change management (Barth & Koch, 2019)
- Vendor and Consultant Support leverages external help from experts in the field that help accelerate the project, address possible technical challenges and overall share access to best practices (Butarbutar et al., 2023)

Despite having so rich research readily available, implementation projects remain challenging, with some of the most common challenges below:

- Scope Creep is the uncontrolled change to the project scope that leads to delays, running over budget and reduce effectiveness
- Inadequate Training when the users are not sufficiently trained, undermining the adoption level and increasing possible errors
- Poor Data Quality occurs after migrating inaccurate or incomplete data that compromise system performance and lead to wrong decisions
- Resistance to Change is possible as cultural barrier impede the success of the implementation (Coşkun et al., 2022; Pan et al., 2011).

2.3 Critical success factors in ERP implementations

Implementing an ERP system is very demanding endeavor, that if implemented correctly, can lead to a complete transformation of the organization. Of course, such large and complex projects require a lot of effort, preparation and commitment to be successful and even then, success is not guaranteed. Since the inception of these projects researchers, practitioners and vendors have tried to identify the most important things that contribute to success, or in simpler words the Critical Success Factors (CSF) that make the difference between failure and success. These are essential factors that organization need to understand if they seek to maximize the value of their investment and avoid known mistakes (Butarbutar et al., 2023; Nah et al., 2001; Shaul & Tauber, 2013).

As CSF we define all the essential elements, conditions and activities that are required to effectively achieve the desired outcomes from the implementation of an ERP system (Saade & Nijher, 2016; Rockart, 1979). In ERP projects CSF refer, but not limited, to technical, organizational, managerial and human dimensions. It is essentially a form of project roadmap that guides decision-making, resource and risk management throughout the lifecycle of the ERP (Butarbutar et al., 2023; Finney & Corbett, 2007).

Identifying CSF has happened in numerous research, showing some variations between organization type and industry but overall, the theme is consistent. Below are the most important CSF appearing in several scientific reports:

- **Top Management Support and Commitment**
  Having an active management and executive team throughout the project is possibly the most widely recognized CSF that determines the success of the project (Nah et al., 2019). It is essential to have support from them in relation to direction, resource allocation and being the project's champion across the organization. Without their commitment it will not be possible to overcome issues, conflicts, or ensure alignment between the departments.
- **Effective Project Management**
  Implementations need to follow certain project management practices that are vital for coordination, risk management and delivering the ERP system on time and on budget (Shaul & Tauber, 2013). In order to do so, a proper and clear project plan needs to be developed, realistic deadlines to be set, progress to be tracked and change requests to be controlled. Project managers are required to have not only technical expertise on the matter but also strong leadership skills in order to navigate the complexities of the implementation.
- **Competent, Cross-Function Project Team**
  There can't be success without balanced and cross-functional teams that include process owners, IT and diverse organizational culture. Teams need to be fully committed, with strong morale and motivation so they can tackle the challenges from a strong position and build relationships with end users and stakeholders that are capable of changing any bad outcome. The composition and competence of the project team play a significant role on the outcome of the ERP project (Gargeya & Brady, 2005; Shaul & Tauber, 2013).
- **Clear Business Vision and Objectives**
  The foundation of ERP projects is a properly defined vision and set objectives (Finney & Corbett, 2007). Organizations must have strategic goals that align with their business priority and be able to communicate it effectively across stakeholders. Without this clarity there can't be clear decision making, prioritization or measurement of success.

- **Change Management and User Involvement**

  ERP implementation success depends on the ability of the organization to change, manage resistance and communication as well as proper user training (Butarbutar et al., 2023). Users should be engaged regularly, have their concerns addressed and be educated on the new processes so they can understand, accept and adopt them. Political structure, culture and resistance should be part of the change management process.

- **Education and Training**

  Comprehensive education and training are essential. Users, technical staff and support teams should be prepared to operate under the new conditions effectively and efficiently (Butarbutar et al., 2023). Developing a clear plan ensures that users will be capable, errors will be reduced, and system utilization will be maximized

- **Business Process Reengineering and Fit**

  Existing business processes will need to be re-engineered and adjusted to align with the best practices and system capability of the ERP system (Gargeya & Brady, 2005; Shaul & Tauber, 2013). There should be a good fit between the chosen ERP solution and the processes if the organization wants to minimize further customization, reduce the complexity and use the system capability at its maximum. Processes should be mapped, conduct gap analysis and prioritize standardization as much as possible.

- **Data Management and Quality**

  High-quality data is the lifeblood of ERP systems (Butarbutar et al., 2023). Organizations need to plan data migration, data transformation and ensure the accuracy of the data. Without compatible data models there can't be reliable reporting and decision-making, and system functionality will be limited, thus there is need to ensure compatibility with the business requirements.

- **Vendor and Consultant Support**

  The project can be accelerated, technical challenges can be addressed and access to best practices can be granted by external support and expertise, either through consultants or directly by the provider of the ERP system (Barth & Koch, 2019; Butarbutar et al., 2023). Organizations should utilize all the resources that they can find, ensure strong partnerships and leverage all the vendor tools and resources. Ongoing vendor support can't be undermined since there will be need for future system upgrades, troubleshooting and maintenance.

- **System Architecture, Flexibility and Integration**

  On the technical side of the project, key CSF are selection of the right system architecture and ensuring flexibility and proper integration (Shaul & Tauber, 2013; Barth & Koch, 2019).

The systems must be reliable and scalable to business needs while being capable of adapting in the rapidly changing environment. It is crucial to have integration with legacy systems and external applications for maximizing value added and minimizing potential disruptions.

- **Monitoring, Evaluation and Continuous Improvement**
  Successful projects have mechanisms in place that monitor performance, evaluate outcomes and help drive continuous improvement (Butarbutar et al., 2023). This requires key metrics to be tracked and solicitated and make the needed adjustments. Post-implementation reviews and support are crucial to make sure that the system will continue delivering results and keeps adapting to the evolving needs of the organization.

The most common framework that is used to categorize CSF is the Technology-Organization-Environment (TOE) framework where factors are groups into three dimensions (Butarbutar et al., 2016):

- Technological factors like system architecture, data management, reliability and more
- Organization factors as top management support, education, user involvement and more
- Environmental factors like externa pressure, growth opportunities, regulatory requirements and more

This approach recognizes that success depends on multitude of factors between these 3 main categories.

The importance of CSFs has been validated by many empirical studies and case analysis across different organizations and industries. It was found that project management, organizational readiness and top management support play crucial roles in SAP implementations (Gargeya & Brady, 2005). The importance of the role of external support, system testing and user training was highlighted by Barth and Koch (2019). 13 primary CSFs were identified by Butarbutar, Handayani, and Suryono (2023) emphasizing the predominance of organization and environmental factors over just technical ones.

It was found that organizations that prioritize CSF have higher chance of implementing ERP systems correctly while analysis of case studies showed that organizations that neglected CSF had their projects delayed, cost increased and even failed the project (Coşkun et al., 2022).

CSFs are the foundation of a successful project. Organizations need to understand and prioritize these factors if they want to navigate such complex projects and maximize their investments.

Finally, below is a comprehensive categorized list of CSFs that will complement the research above and provide further insights to scholars, consultants and managers.

Category	Factors
Implementation Strategy	Implementation approach examination Macro implementation perspective Business change is first to be considered Architecture choice examination Ensuring fair time to fulfill the implementation Suitable considerations of software and hardware Planning the cost of ERP implementation Focused performance measures plan Planning required upgrades Setting realistic deadlines Enterprise system selection process Careful and professional package selection process Planning the package selection process Fit between ERP system and business process Level of customization Ensuring system flexibility to changing conditions Ensuring system integration Ensuring system reliability Ensuring system interoperability Ensuring system cross functionality Ensuring system support Software maintenance Developing a plan for testing interfaces with integrated legacy systems Developing proper troubleshooting tools Developing proper troubleshooting skills and techniques Developing a testing and troubleshooting architecture Working closely with vendors and consultants Willingness to adopt modern technologies Allocating valuable resources Enterprise system Use of vendors' tools Keeping suppliers and customers informed
Project Team Competence	Project team competence Team members' knowledge Build team morale and motivation Full time team members Balanced and cross functional project team Staff retention Empowered decision makers Deep understanding of key ERP implementation issues Organizational experience of major change Former major organizational change experience Former major IT change experience Good relations between project team and users Open and honest communication Active involvement of senior project champion Senior Project champion Willingness to become involved Resolving political conflicts Developing an understanding of needs, capabilities & IT limitations Acceptance control Monitoring and evaluation of performance metrics Monitoring progress against clear milestones User acceptance feedback management User involvement User participation in the overall process approach User participation in defining new processes User uses the system according to guidance Enhance users' trust Using ERP to fulfill cross functional areas Interdepartmental communication Interdepartmental coordination Professional training services
Consultants & Vendor	Use of consultants Vendor ERP vendor characteristics

	Partnership with vendor Vendor support
Decision-Making & Governance	A thorough decision-making process style Support of top management Senior Project champion Use of managerial and professional steering committees Business vision Open and honest communication Empowered decision makers Management of conflicts Management of legacy systems Management of expectations Management of risks Project tracking Total quality management approach Knowledge transfer management Strong control over change requests Project Management Clear and defined project plan
Education & Training	Education and training Education and training of technical and support staff Education and training of end users Education on future business processes Developing a clear education and training plan Professional training services
Change Management	Change management Change management program Understanding the political structure Understanding the organizational culture Continued focus on organizational resistance Management of conflicts Management of expectations Management of risks Interdepartmental communication Interdepartmental coordination
Data Management	Data Management Develop a data analysis Plan Data model is compatible with data requirements Data quality control Developing a plan for migrating and cleaning up data Develop a Data conversion Plan Develop a Data accuracy Plan
Environment & External Factors	Opportunities for growth Competition in industry External pressure Competitors' adoption of ERP Uncertainty about environment

Table 2 A comprehensive list of success factors (Shaul & Tauber, 2013)

2.4 Common failure factors and their causes

ERP systems offer a plethora of benefits related to business processes, decision making and competitive advantage, but it is often fraught with risks. Failure rates are still high with studies report that 60% to 90% of the projects fail to achieve at least 1 of their objectives (Rajapakse & Thushara, 2023; Shaul & Tauber, 2013). Organizations should understand the most common factors that contribute to failure and their cause in order to avoid costly mistakes and maximize return on investment.

Failure in ERP project is considered multifaceted, meaning that it can be either total failure or part of the objectives are missed leading to delays, financial loss, partial failure, disruption in the operations or not being accepted by the users (Gargeya & Brady, 2005; Rajapakse & Thushara, 2023). The risk for failure is high in every stage of the ERP lifecycle, from the initial selection and planning to post implementation support.

A recent literature review by Rajapakse and Thushara (2023) has analyzed and identified a comprehensive set of Critical Failure Factors (CFF) that occurred across organizations, regions and industries. Table 3 summarizes these CFF based on frequency of appearance.

Rank	Failure Factor	Frequency
1	Lack of top management support	30
2	Inadequate education and training	27
3	Mismatch between system and business strategies	22
4	Lack of project management performers	22
5	Users unwilling to use the ERP system	19
6	Lack of ERP readiness assessment initiatives	17
7	Mismatch between organization culture and ERP	17
8	Ineffective communication system	17

9	ERP system design & development issue	17
10	Lack of communication with consultants/vendor	17

Table 3 Top CFF in ERP implementation (Rajapakse & Thushara, 2023)

The most common and important CFF based on research can be found also below.

- **Lack of Top Management Support**

  The most common CFF is the absence of commitment and support from senior management and executives (Shaul & Tauber, 2013; Rajapakse & Thushara, 2023). Without their support, it is not possible to set strategic goals and direction, resources would not be allocated correctly and there would be no-one to champion the project cross-functionally. The project would suffer constant setbacks since there will be no priorities set, the funding will be unaddressed, and conflicts will remain unresolved (Gargeya & Brady, 2005; Sarker & Lee, 2003).

- **Inadequate Education and Training**

  ERP system complexity requires users to be educated and often gain new knowledge and skills. Inadequate training can lead to several issues, most importantly, errors and resistance to change (Rajapakse & Thushara, 2023; Shaul & Tauber, 2013). Organizations should not underestimate the time and resources needed for proper education, otherwise it may result in poor adaptation and disruptions (Bingi et al., 1999; Bradley & Lee, 2007). This is most common in North America and Asian organizations where there is rapid technological advancement and workforce diversity that can make training harder.

- **Lack of Project Management Performers**

  A major contributor to ERP failure is having a weak project management team, including lack of clear project plan, unrealistic timeline, inefficient risk management or monitoring of progress (Shaul & Tauber, 2013; Rajapakse & Thushara, 2023). It is quite common for projects to fail when there are no clear responsibilities, lack of accountability or slow decision making (Dezdar & Sulaiman, 2009). Therefore, it is crucial to have project managers that can coordinate users and stakeholders, manage resources and remain adaptable.

- **Mismatch Between System and Business Strategies**

  Having and ERP system that is not aligned with the process or strategic goals of the organization is quite common, leading to failure (Rajapakse & Thushara, 2023; Davenport, 1998). This can occur when there is no clear requirement gathering, process mapping was

inadequate or system was customized in a degree that skyrocketed cost and complexity. Organizations should ensure that the ERP of choice will fit their needs and work with the adapted business processes (Dechow & Mouritsen, 2005).

- **Users Unwilling to Use the ERP System**

  User resistance is a CFF that should be addressed, since often employees may not be willing to change their workflow, fear that the project will lead to loss of their job or they lack the confidence needed to use the new system (Rajapakse & Thushara, 2023; Hadhri et al., 2017). This can be avoided if the users are involved in the design and implementation of the system as it will be easier to adapt (Christofi et al., 2013). It is most common in organizations that have strict hierarchical structure with strong culture related to or limited experience in similar large-scale projects.

- **Lack of ERP Readiness Assessment Initiatives**

  Assessing the readiness for ERP implementation should be done in the early stages of the projects, failure to do so may lead to more problems since there may be gaps left unidentified, or skill issues and organizational culture topics that must be addressed beforehand (Rajapakse & Thushara, 2023). Such assessments help organization proceed with realistic expectations and sufficient preparation.

- **Mismatch Between Organization Culture and ERP**

  ERP systems usually require usage of best practices or standardization that may conflict with the existing culture of the organization (Rajapakse & Thushara, 2023; Soh et al., 2000). Cultural misalignment often leads to resistance, poor adoption and possibly failure of the implementation.

- **Ineffective Communications System**

  Another CFF is poor communication between the various teams of the organization and even with the vendor that lead to failure of the project (Shaul & Tauber, 2013; Rajapakse & Thushara, 2023). It is essential to have good communication as it is needed for managing expectations, resolving conflicts and ensuring alignment.

- **ERP System Design and Development Issues**

  Organization should be warried of technical problems, lack of scalability or integration issues with their legacy systems since it will cripple the ERP's capability and overall project (Rajapakse & Thushara, 2023). Robust architecture, flexibility and ability to support future growth should be ensured by the organizations if they want to avoid costly reworks and disruptions.

- **Lack of Communication with Consultants and Vendor**

Organization should avoid over relying on consultants and try to keep open channel of communication with vendors that can help clear misunderstanding, set expectations and knowledge transfers (Rajapakse & Thushara, 2023; Shaul & Tauber, 2013). Of course, communication with both consultants and vendors is essential but it is essential to keep a balance between these to ensure smooth project development.

The impact of the CFF will vary based on region, organization and industry. Based on research analysis it is most common to notice lack of management support or poor training in Asian and developing countries, while issues like overreliance to consultants, lack of vendor communication and user resistance are more common in Europe and north America (Rajapakse & Thushara, 2023; Shaul & Tauber, 2013).

Project failures usually occur because of multiple CFFs in the Technology-Organization-Environment (TOE) framework rather than a single factor. When organizations understand common failure factors (CFF) and causes then they can proactively address the risks, foster a culture of accountability and increase the chances for a successful project.

While all the above factors are widely cited, it remains unclear whether all have the same weight in real world outcome. This dissertation will address the gap by systematic comparison of their presence and impact across different dimensions of the TOE framework.

2.5 Theoretical frameworks for comparative analysis

ERP implementation projects are quite complex, making it mandatory to use strong theoretical frameworks if the goal is to do a comparative analysis between cases. These frameworks provide structure and help examine, categorize and compare multiple factors that play critical roles in the project's outcome across different organizations, industries and countries (Shaul & Tauber, 2013; Awa et al., 2016). Researchers and practitioners alike need such frameworks in order to identify certain patterns, reach general conclusions and develop recommendations.

Theoretical frameworks are used for specific reasons in ERP research:

Structuring Analysis as they provide a way to organize and interpret variables, processes and outcomes in a systematic way (Shaul & Tauber, 2013).

Enabling comparison by facilitating cross-organizational, multi-industry and cross-regional comparison since they group factors into categories (Rajapakse & Thushara, 2023).

Supporting Synthesis as findings from diverse studies and meta-analysis are integrated and then taxonomies are being developed (Shaul & Tauber, 2013)

Guiding Practice is provided to practitioners in regard to what factors need prioritization and resources should be allocated for the best result (Awa et al., 2016)

The 3 major frameworks can be found below as well as some less used minor ones:

Technology-Organization-Environment (T-O-E)

This framework is developed by Tornatzky and Fleischer (1990) and is the most widely used for analysis of ERP adoption and implementation (Awa et al., 2016). Essentially, it mentions 3 main dimensions that influence the outcome:

Critical Success and Failure Factors (CSF/CFF)

The CFF and CSF models are foundational in terms of research and comparison since they investigate factors that contribute greatly to the project outcome (Shaul & Tauber, 2013; Rajapakse & Thushara, 2023). It is typical in these models to have factors grouped as strategic that aligns with leadership and business goals, tactical that is related to project management, users and training, technological that focuses on the system, data quality and integration, culture/environmental that are about organization culture, external parameters and vendor support

With proper mapping across cases CSF and CFFS play a crucial role in identifying these factors that are most critical in each phase of the ERP implementation (Shaul & Tauber, 2013). As an example, Rajapakse & Thushara (2023) reviewed 55 studies and then ranked the CFFs based on the frequency of appearance allowing industry comparison across regions.

ERP Lifecycle Models

Here, the implementation is divided into distinct phases like planning, selection, implementation, stabilization and post-implementation (Shaul & Tauber, 2013). Mainly these are used to Identify phase specific challenges like factors that are more critical in one phase and less in other while also compare the outcome across each phase by longitudinal analysis and identification of recurring issues.

A comprehensive review of ERP lifecycle models was performed by Shaul and Tauber (2013) showing how CFS CFF had varied importance in different phases.

Other Comparative Frameworks

There are other less used systems that have their usage:

- Socio-Technical System Theory that puts emphasis on the relation between technical and social factors during the implementation (Sarker & Lee, 2003)
- Resource-Based View that focuses on the resources and capabilities that influence the project outcome (Awa et al., 2016)
- Institutional Theory that examines how external pressure and norms shape the adoption of ERP system (Awa et al., 2016)

In practice, the application of such frameworks enables researchers to compare cross-organizational outcomes by using T-O-E or CSF/CFF models so the similarities or differences can be systematically analyzed. Assess the impact of context like culture and industry influence ERP implementation (Rajapakse & Thushara, 2023). Support evidence-based recommendations as the most critical factors in certain contexts are identified, providing guidance to practitioners on what intervention to prioritize

As an example, (Rajapakse & Thushara, 2023) used his systematic review to compare how the CFF across regions has prevailed, to reveal that some factors like management support were significant everywhere while others only in specific regions.

In this dissertation the focus will be on using T-O-E and CSF/CFF frameworks as primary comparative frameworks because they are widely validated, enable a structured comparison across multiple cases, industries and regions and finally they support qualitative and quantitative synthesis allowing the findings to be integrated from different sources.

These theoretical frameworks are crucial tools in comparative analysis in ERP project success and failure. They provide the foundation for systematic, factorial evaluation of project outcome and will help establish a robust, relevant and wide range of contexts.

2.6 Research gaps and justification

There have been numerous studies and research but despite that, there are still gaps that remain unaddressed as to per the underlying factors that drive success and failure in ERP implementations. Several studies have identified CSF and CFF or theoretical frameworks for comparison but still there are persistent challenges and unanswered questions. Below the main gaps are being addressed and the need for further comparative context is emphasized.

The current gaps in published literature are:

- **Emphasis on CSF, underrepresentation of CFF**

  In the current literature the CSF are disproportionate compared to the CFF as there is a common theme that leaves CFF underrepresented. Findings from Rajapakse and Thushara (2023) note that from several research only 1% systematically examine CFFs. This translates to a misunderstanding of why ERP project goals fail, and since the failure rate remains high there is a big need for research that systematically identifies categories and analyzes CFFs across different contexts.
- **Limited Comparative and Cross-Contextual Analysis**

  Majority of cases studies related to ERP implementation focus on a single organization, region or industry (Shaul & Tauber, 2013). Comparative research is lacking, especially on how CSF and CFF vary across regions and sectors. However, there are few studies that provide a robust comparative framework for such analysis
- **Insufficient Integration of Theoretical Frameworks**

  While there is usage of frameworks, research that integrated multiple ones is very limited so there is insufficient holistic analysis of ERP implementation (Awa et al., 2016).There is need for research that focus on multiple frameworks and provides a cross-examination.
- **Neglect of Post Implementation and Lifecycle Phases**

  Most of the current research focuses on the implementation phase and usually, post-implementation, stabilization and upgrade phases are underrepresented (Shaul & Tauber, 2013; Rajapakse & Thushara, 2023). In recent reviews it is stated that many challenges and hindrance appear after the implementation with issues related to system maintenance, continuous improvement and adaptation rates being the most important.
- **Methodological Limitations**

  Most of the research emphasizes qualitative case studies or surveys that have a limited sample size that usually does not allow for the findings to be generalized (Shaul & Tauber, 2013). There is need for research that uses mixed methods, including meta-analysis and cross-case comparison to validate and extend existing knowledge.

Based on the gaps mentioned, this study is justified for the following reasons. Address the Imbalance between CSF and CFF for a more balanced understanding of ERP implementations to be achieved. Enables Comparative Analysis using theoretical frameworks this study identified patterns that may not be visible in single cases or regions

Integrates Multiple Frameworks as it gathers and presents insights from different perspectives allowing a more holistic analysis to occur. Focuses on the Full ERP Lifecycle

as it explores factors throughout the lifecycle of the projects. Employes Rigorous Methodology expanding on systematic literature reviews and meta-analysis to ensure accuracy and reliability of its conclusion.

In summary, on one hand, ERP literature has been expanded significantly but the gaps discussed previously remain. By addressing these, the aim is to advance the theoretical understanding of such complex projects. This research is justified but the potential to provide a comparative and comprehensive analysis in success and failure of ERP projects contributing to higher rates of success.

3. Chapter 3: Research Methodology

3.1 Research design and philosophical approach

3.1.1 Philosophical Stance

While prior studies have identified numerous CSF and CFF, this dissertation will apply a standardized TOE based rubric to systematically compare their presence and impact across the cases aiming on clarifications about the factors that are truly important.

In the context of this dissertation a secondary research stance is adopted based on the systematic synthesis and comparative analysis of published case studies related to ERP implementations. The empirical base consists of diverse implementations of different sized companies from both public and private sectors containing failed and successful cases. These cases are analyzed to enable robust cross-case synthesis (Akkermans & van Helden, 2002).

Methodological rigor, transparency and reproducibility are emphasized in line with established guidance for comparative research instead of adopting primary-research paradigms. The analytical logic follows structured procedures that will allow identification of patterns and differentiators across divers organizations (Shaul & Tauber, 2013).

To achieve this, the dissertation will utilize the Technology – Organization – Environment (TOE) framework as the main analytical tool as it is established in ERP adoption and implementation research (Awa et al., 2016). The TOE dimensions will be translated into a standardized template consisting of a set of characteristics that will then be applied across all cases to achieve comparability (Rajapakse & Thushara, 2023). By doing this, TOE will be the dissertation's' methodological contribution being a consistent and cross-case scheme that will enable systematic comparison between the cases.

3.1.2 Consideration of Alternative Paradigms

At this stage, it is important to mention why alternative paradigms were excluded, for example, since the research does not focus on statistical analysis or hypotheses testing positivism was not selected. Similarly, a pragmatic paradigm that focuses on practical outcomes by using mixed methods, while appropriate for research that combines qualitative and quantitative data, in this case we have in-dept analysis of qualitative case studies thus choosing interpretivism as the foundation for this dissertation (Saunders et al., 2019).

3.1.3 Research Strategy: Comparative Case Study Design

The design selected for this research is comparative case study meta-analysis. Such research is well known for the robust methodology it offers when investigating complex cases within real-life context and specifically in this case that the borders between the phenomenon and context is not so evident (Yin, 2018). This research will leverage the depth and details provided by published case studies of ERP implementations and do a qualitative inquiry while also enabling cross-case comparison.

Comparative analysis involved systematic examination of similarities and differences between several cases and then tries to identify recurring patterns, influences based on context and unique outcomes (Eisenhardt, 1989). It is the best possible approach to tackle the complexity of the different technological, human, and organizational factors that exist in the field of information systems and are often unpredictable. Through this method it seeks to identify best practices, CSFs and CFFs, that can inform people at both theoretical and practical level.

The selected case studies are based on criteria like relevance to the research question, organization diversity and data availability. Cases from different industries and regions will be included as the research main aim is to enhance comprehension of the findings in the everchanging and complex ERP implementation dynamics.

3.1.4 Chosen Approach Justification

The above choice is justified from the nature of the research objectives and the complexity of the investigated informational system implementation. It is multifaceted process that needs to consider organization culture, stakeholder engagement, change management and not only the technical parameters. Using quantitative methods would have overlooked the many connections between all these parts and the importance of them.

Case studies offer such flexibility and allow exploration of complex topics in depth by integrating multiple data sources and perspectives while considering analytical techniques (Yin, 2018). Comparative analysis comes to compliment the above and enable identification of context specific as well as generalizable insights that will support the development of a dissertation that contributes to understanding of ERP implementation parameters that influence the outcome.

This will encourage critical engagement of different data and recognize the perspective and experience of each researcher may influence how the findings are interpreted (Creswell, 2007). This stance will enhance the credibility of the research as it ensured that the provided results are based on the context of each reality of the organizations that were studied.

3.1.4 Strengths and limitations

While the selected approach has many strengths like consideration of context-based data, support of exploration of dynamic environments and generates practical recommendations, there are also limitations that we need to consider and mention. For example, it may be challenging to generalize the findings past the case studies that were selected and we rely on the case study data to be of quality and completeness.

To limit these issues, there are rigorous selection criteria for the cases used, systematic comparative analysis and transparent reporting. The dissertation will aim to contribute meaningful insights into the field of ERP implementation by using established methodological framework and by drawing on both academic literature and practical experience.

3.2 Case study selection criteria and rationale

This dissertation depends on the interpretivist paradigm and comparative case study design and to ensure the validity depth and relevance of the analysis related to the ERP implementation uses the following selection criteria:

- Richness and Completeness of Data
  Only cases that had available comprehensive and detailed documentation were selected. It includes full details of the implementation, factors, challenges and outcomes. Published Cases, some with altered names to secure anonymity, from reputable sources will be used to provide a multi-faceted perspective and empirical evidence
- Diversity of Organizational Contexts
  To achieve generalization and depth of the findings, the focus is on multiple industries like technology, pharma and manufacturing and different sizes ranging from SMEs to large multinational organizations. By adding diversity in the study, the exploration of context-dependent factors is allowed and it is easier to identify patterns that are not related to specific sectors
- Clear Outcome Classification
  Each case was under one outcome, either successful or failed implementation supported, but not limited to data that indicated completion rate, achievements, benefits and user. adoption
- Methodological Transparency

The research methodology was explicitly described in the selected case and included data collection methods, analytical frameworks and possible limitations. By doing so transparency and reliability are ensured in comparative analysis.

- Relevance to Research Questions
  All cases have direct relevance to the research question that this dissertation is trying to tackle. Mainly the focus is to strong insights in CSFs and CFFs, dynamics in the organization and interplay between different functions.
- Accessibility and Ethical Considerations
  Only cases that had available full-text access and met the ethical standards of academic research were selected, making it easy to verify all the ethically sourced material.

With this selection, a wealth of empirical data and methodological rigor with contextual diversity is secured. Each case offers a different and unique perspective in the complexity of ERP implementation projects that allow a strong comparative analysis that will focus on answering "How" and "Why" ERP implementations succeed or fail.

Focusing on cases that are rich in data collected from multiple sources ensures a better understanding of the complexity and interconnection of technological, organizational and human factors in these projects.

Comparability, by including successful and failed ERP implementation projects with a diverse background allows a systematic cross case comparison that supports identifying critical differentiators.

Alignment with Research Objectives, by selecting these cases addresses directly the main research question and objective of the dissertation and provides a solid foundation for theoretical development and practical recommendations.

Methodological rigor, relevance and the need to have a comprehensive and rich analysis were the main criteria for the selection of cases. By doing so, the findings are going to be academically robust and meaningful.

3.3 Data collection methods

The data collection process is the foundation for a credible and in-depth comparative case study meta-analysis. Data collection was designed in a way that ensures comprehensive, reliable and context rich information for each selected case study no matter the outcome.

Given the nature of the research, data was primarily collected from published case study reports. Most of them are drawn from peer-reviewed journal articles or academic conference proceedings. By doing so a detailed narrative with process descriptions, stakeholder

perspectives and outcome analysis was achieved. All cases that were selected are fully available. When applicable, supporting documentation that was included in the cases like project management reports, implementation timelines and post-implementation reviews were further analyzed to expand on the published narrative.

Emphasis was given to structured data extraction based on best practices of qualitative research (Yin, 2018). Contextual information is included regarding the background, industry and size, implementation processes, stakeholder roles, critical incidents, outcomes and success or failure factors. Of course, in some cases where anonymity was required the naming of the company or organization might have been changed.

All data that is used was sourced from publicly available sources and are ethically published. Citations and acknowledgments are maintained and there was no confidential or proprietary information used without permission.

It should be mentioned that while a broad selection of cases was made, there may be constraints by the scope and quality of the available cases and there may be gaps or biases in the original reporting.

3.4 Comparative analysis framework

To get insights from multiple case studies and draw reliable conclusions that can be generalized, there is a need for a rigorous and comparative analysis framework. It will provide the proper structure for a systematic comparison of diverse cases and help with identification of patterns and development of evidence-based recommendations. The main analytical dimensions in this dissertation are technological factors like system architecture, data management and system fit. Organizational factors like the support from top management, team competence, user involvement and general organizational culture. Environmental factors like the support received from vendors or consultants, industry pressures and involvement of external stakeholders. These dimensions were derived from the TOE framework (Tornatzky & Fleischer, 1990; Shaul & Tauber, 2013; Rajapakse & Thushara, 2023).

The TOE framework focuses on three main aspects of organizations below:

- Technological that includes system characteristics such as complexity, compatibility and technical support

- Organization that maps internal factors like support from management, culture of the organization and structure
- Environmental includes external influence as the vendor relationships, readiness of the trading partners and regulatory environment.

It allows researchers to put different contexts in categories that shape the success or failure of the ERP implementation. For example, (Awa et al., 2016) used this framework to compare adoption determinants between SME finding that technological factors were more influential than the other 2 but for non-adopters, organizational and environmental factors had the biggest challenges.

For each case study there will be case coding according to the availability and quality key factors within these frameworks and mapped accordingly to the proper category. Thematic coding will be used to identify and extract recurring themes, contextual influence and critical incidents from the data provided based on qualitative content analysis (Creswell, 2007). Cross-case systematic comparison will be achieved by a matrix that includes the case context, implementation process and outcomes, presence of CFF or CSF and any notable context or specific factor. Finaly there will be a pattern matching and explanation building between similarities and differences that were identified.

Building on these, later sections will propose a TOE based model that formalizes how the dimensions combine into success or failure and how managers can assess and manage projects using standardized ratings and decision rules.

The proposed model will operationalize each TOE dimension to ensure comparability across cases and different contexts using the following model

- Presence (0 - 2): 0 = Absent; 1 = Partial; 2 = Present (robust).
- Strength / Risk (0 - 3): 0 = Very weak / high risk; 1 = Weak; 2 = Moderate; 3 = Strong / low risk.
- Evidence rule: Each rating is supported by textual evidence explicitly reported in the case.
- If something is not stated in the case study, it will be mentioned as not reported NR.

For Technology (T) the main aspects will be T1 System/Process Fit, T2 Integration and Data Quality, T3 Customization Extent, T4 Testing and QA, T5 Architecture/Scalability and Reliability, T6 Post-Implementation Support. The rationale for this is technical adequacy

and disciplined engineering reduce instability and conversion risk at go-live (Datta, 2009; Westerman et al., 1999).

Regarding Organization (O), O1 Top Management Support, O2 Cross-Functional Team Competence, O3 User Training and Change Management, O4 Process Standardization/BPR, O5 Data Governance and Ownership.
The reasoning behind this is leadership, structure, and readiness reliably differentiate outcomes across industries and sizes (Akkermans & van Helden, 2002; Shaul & Tauber, 2013)

Regarding Organization (O), O1 Top Management Support, O2 Cross-Functional Team Competence, O3 User Training and Change Management, O4 Process Standardization/BPR, O5 Data Governance and Ownership.
The reasoning behind this is leadership, structure, and readiness reliably differentiate outcomes across industries and sizes (Akkermans & van Helden, 2002; Shaul & Tauber, 2013).

Each of these characteristics is rated on Presence (0-2) and Strength/Risk (0-3) based on case evidence.

The comparative analysis's rigor and validity will be ensured by using multiple data sources, analytical matrices and synthesis steps and a reflexive stance that acknowledges potential bias or limitations.

This framework will try to achieve a comparative analysis that is both methodological and meaningful.

3.5 Data analysis techniques

To analyze documented ERP case studies there is a need for systematic and transparent approach if the goal is to have credible and meaningful findings. This dissertation uses qualitative research practices and is structured in a way that supports both within case and cross case analysis (Yin, 2018; Creswell, 2007).

Thematic coding is used for each case with predefined codes that are developed based on the TOE framework and the most important CSFs and CFFs from the ERP literature. In each case analysis, there may be emergence of additional codes based on the available data, unexpected challenges and contextual factors. Finally, all the data from the case reports are

systematically coded and organized via structured matrices. This will allow identification of recurring patterns and critical incidents as well as casual relationship between them.

Cross-case analysis will be conducted by identifying and displaying all the applicable CSF and CFF and contextualizing based on different variables. Similarities and differences between the cases will be examined via pattern matching to consistently understand the key reasons for success or failure. Thematic findings will be synthesized to get explanations related to each factor and how it contributed to the outcome. Based on the final findings, if possible, there will be a quantitative analysis like frequency count for factors like CSF or CFF.

3.6 Research limitations

While such comparative case meta-analysis usually offers significant strengths, key limitations must be addressed and acknowledged. The dissertation relies on secondary data, meaning that some data may not be complete, or there may be biases and gaps from the source. While there was a big effort to identify diverse cases that will support generalization of results, the outcome may not be fully applicable to all organizations, industries or regions. Since the analysis depends on retrospective and interpretive techniques there is a risk for bias or overemphasis on factors based on the outcome based on the researcher's perspective. Additionally, there is small space for quantitative analysis since the data are qualitative and there can't be standardized metrics to measure. Cultural differences need to be taken into consideration since the diverse nature of the data may affect interpretation of success and failure factors based on culture. Since all the derived data are sourced from publicly available sources, the use of secondary data means that the researcher can't control the original consent process. Finally, ERP systems and techniques of implementation keep evolving with the help of rapidly evolving technology and some cases may reflect methodologies or technologies that are now outdated.

- Convenience sample / limited size: The study uses a convenience sample of a limited number of published cases selected for accessibility and documentation richness.
- Consequence: Therefore, the findings should be interpreted as indicative, supporting analytical generalization rather than statistical generalization to all ERP projects.

It is necessary to acknowledge the above limitations to maintain transparency and a balanced perspective on both the strength and weakness of the research approach.

4. Chapter 4: Case Studies

4.1 Successful ERP Implementation Cases

4.1.1 Global NASDAQ listed Multinational, ERP unification Program

This case examines a global company that is listed on NASDAQ, US and operates across multiple countries and industries. It had numerous different ERP systems across its global branches, and it was a challenge to manage and maintain the complex organizational structure. There was no proper integration leading to high operational costs, inefficiencies and difficulties in consolidating the operational and financial data. The goal was to create long-term sustainable growth through process unification across businesses and organizational structures and create IT platforms that depend on a single integrated ERP system.

4.1.1.1 Implementation processes and outcomes

The implementation was planned as a multi-year project that began with a comprehensive and preparatory phase including 800 employees, approximately 17% of the company's European workforce. This phase included detailed process mapping, stakeholder engagement and established the local and global implementation team splitting into three regional phases that included Western Europe, Central Europe and the rest of the European countries. Then, the key steps of the project were the standardization of the business processes and data structures through the branches, the selection of a global ERP provider that could support multi-country operations and provide integration with the CRM systems in place. Conduction of trial implementations and outcome simulations looking to minimize operational disruptions and eventually roll out the system in waves, focusing on the most critical regions and functions and expanding to the rest. As a last step the ERP system was integrated with the remaining business operation systems like CRM to enable real-time information sharing and support decision making.

The successful implementation helped the company achieve 20% reduction in total operation costs and 20% reduction in process cycle times. The company gained real time visibility into global operations support increased inventory accuracy and control. The unification of the ERP enabled rapid integration of acquisitions and compliance with international reporting standards. Finally, the ROI was projected at only four years, with 50% of the investment already recouped in two years post-implementation.

4.1.1.2 Key success factors and TOE framework

The main key CSF that supported the successful implementation are the Top Management commitment that was deeply involved, a Comprehensive Preparatory Phase that helped map the processes and ensure readiness while minimizing risks. Standardization and Integration of processes and data structures across the branches combined with a Phased Implementation that included Trial runs drastically reduced disruptions. Employee Involvement and proper Training through the different levels and functions of the company. Technological Fit via a flexible ERP system that supported strong collaboration between the systems and Vendor Support that was present and ensured technical success and adaptability. Finally, Continuous Monitoring and KPI Tracking post-implementation allowed for an ongoing performance evaluation and process optimization.

TOE Dimension	Case Study Elements
Technology	Unified ERP Platform explicitly linked with CRM, staged testing with QA before go-live, post implementation support and monitoring development with local teams in support
Organization	Board of directors with top management's attention decided in the ERP unification, defined preparatory phase with detailed plan and exact timetable, identified threats obstacles in advance, optimization of organizational structure and job systemization, technical preparedness of employees, process transparency, managerial control and comparability
Environment	Only limited number of providers able to support global system platforms, post go-live included monitoring and support activities with customers and institutions affected, quarterly reporting obligations and positive impact on financial indicators supported environmental/business outcomes

Table 4 TOE framework (Pohludka et al., 2018)

4.1.2 Brazilian regional food distributor, logistics integration via ERP

This case focus on a Brazilian company that focuses on food distribution that covers small grocery stores to big supermarkets. The company that employees hundreds of employees and is branched into another state, faced major challenges in logistics and supply chain management mainly because of the lack of integrated systems and fragmented processes. As a solution, it was decided to implement an ERP system that will support process streamlining, improve operational efficiency and support the overall business growth.

4.1.2.1 Implementation processes and outcomes

The implementation period was very short, starting June 2018 with training and deployment lasting until December of 2018. The transition happened in January 2019 offsetting the legacy system that was being used. To achieve a fast deployment like this, there was a process redesign that helped to get the 53 business processes down to 36 with main focus being the management, support and end processes. Stakeholder engagement was achieved by the formation of a supply chain focused project team that included all levels of employees and extensive training sessions that helped familiarize themselves with the new system and benefits. The last crucial steps were technology integration through acquisition of new equipment and integration of the ERP system with logistics, sales finance and HR while monitoring the performance after the implementation with KPIs and cost monitoring.

The outcome was impressive with improved stock control and average accuracy of 99.97%, increased on time and full deliveries that surpassed targets and 31% reduction in costs associated with logistics while revenue increased 55% from 2018 to 2022. Finally, there was enhanced internal communication and decision making and an overall cultural shift towards data driven management and continuous improvement.

4.1.2.2 Key success factors and TOE framework

The main key CSF that supported the successful implementation are the Top Management that showed strong leadership, a Process-Oriented approach that redesigned the integration of logistics. Technology Integration with adoption of complete solutions and real time data automations, Performance Measurement by using KPIs and trend analysis, Cross-Department Communication and collaboration and finally Adaption to Change by overcoming resistance through continuous change management.

TOE Dimension	Case Study Elements

Technology	ERP Integrates logistics with other functional areas, central administration of organizational data with measurement systems, emphasis in information management to authorize track and manage operational activities, performance indicators explicitly monitored before and after ERP adoption to evaluate process changes and impact on logistics
Organization	Process oriented transformation with integration of core and support functions with cross-department decision making, training and user adoption with departmental roles and practices, improved measurement systems and defined indicators supporting organizational planning aligning departments on shared data and goals
Environment	Emerging regional markets, ERP benefit the developing region logistics and supply chain contexts, external pressure and digital transformation trends motivated ERP enabled logistics integration

Table 5 TOE framework (Canon et al., 2025)

4.1.3 Egyptian large enterprise cohort, ERP adoption conditions

In this case, the focus is on ERP Implementation in large organizations in Egypt, a developing country. Multiple organizations were included in the study spanning from manufacturing, to services, banking and trade sectors, mostly large and multi-functional. In the study it is explored how organizational and environmental factors influence the success of ERP projects in developing countries since there are limitations in infrastructure, regulatory requirements and usually economic instability. The case has a focus on surveys from IT managers, qualitative interviews and provides a comprehensive view of factors that drive successful implementations in Egypt.

4.1.3.1 Implementation processes and outcomes

During the implementation of the ERP system in these companies there were many common areas. Strategic planning played key role in aligning the ERP adoption with the long-term business strategy of each case. Stakeholders were Engaged throughout the project with top

management and IT managers playing key roles. Infrastructure assessment was crucial to evaluate the current systems and provide the necessary upgrades that would support the ERP deployment. Vendor selection was performed carefully, considering the availability of local support and customization needs of each organization. Every company had to put effort into standardizing its processes and training the employees with the support of change management. Finally, all the implementations happened in waves focusing on key functionality and then expanding to the needs of each organization.

All the companies in the research had improved information visibility and better decision making. They saw an enhancement on operations and the integration of business processes while staying compliant both with international standards and government regulations. All of the organizations achieved competitive advantage through technology-driven transformation.

4.1.3.2 Key success factors and TOE framework

The key factors were the update and reliability of the infrastructure that proved essential for the ERP functionality as well as supportive government policies that facilitated the successful implementation. Top Management commitment played a crucial role driving the project success while IT Maturity and computer culture can't be undermined since it reduced the resistance and enhanced the user acceptance. The large size of the businesses in this case was a key factor since bigger companies are better positioned to invest and benefit from such systems. Additionally, Process Standardization and Integration with harmonized processes and data structures and exceptional vendor and consultant support played key roles in the success of the implementations. Finally, Training and Change Management were crucial and ensured user engagement and smooth transition.

TOE Dimension	**Case Study Elements**
Technology	Cross-functional ERP system that integrated business process and extracts data across functional areas improving enterprise wide visibility, ERP enabled better access to information in a

	borderless environment and connected multi-site operations on single platform, technical obstacles faced like infrastructure limitations tackled in the beginning
Organization	Management commitment and internal preparedness, structured governance and internal alignment
Environment	National factors like economic growth and government regulations affected ERP success, specific market and technology conditions with adoption gaps covered with context sensitive implementation

Table 6 TOE framework (Abdelghaffar, 2012)

4.1.4 European aviation manufacturer, ERP crisis turnaround

In this case a medium-sized European manufacturing firm in the aviation industry is examined in relation to the ERP implementation it went through. The company employed around 700 people at the time and underwent significant organizational change after its acquisition from a multinational conglomerate. It faced new markets and increased competition and the need to have integrated business processes led to choosing the BAAN ERP system. Initially the project almost failed, but it was quickly turned around through changes in project management, stakeholder engagement and communication.

4.1.4.1 Implementation processes and outcomes

There were four main stages in the implementation, starting with an unsuccessful project initiation. In the beginning an external project team was selected to map the processes and prepare the planning but soon run into poor collaboration between the team and the internal staff and lack of expertise in the specific industry leading to unclear process definitions. The hands-off approach from the top management soon led to a project crisis and complete stop. After the initial crisis, a new project champion was appointed, and they moved the consultants to a more facilitative role. Workshops were established that helped map over 100 business processes fostering cross-department communication while the senior management became actively involved in decision taking. The third stage included the system implementation and over 50 employees participated in this phase while the original project team acted as ambassadors for the ERP effort. In this stage the training and involvement of lower-level employees also increased. Finally, during the fourth phase there

was operationalization and continuous improvement of the system. The system went live on schedule and in budget and more process improvement projects were undertaken post-implementation as well as consolidation in the production facilities and harmonization with HR.

An exceptional transformation was achieved through changes in leadership, communication and stakeholder involvement. Process integration was improved as well as data visibility and operational flexibility. In this case the need for communication and collaboration is strongly demonstrated.

4.1.4.2 Key success factors and TOE framework

The main key CSF that supported the successful implementation are Top Management and the eventual project team competence that played a key role in averting the crisis and getting the project back in the correct way. Interdepartmental communication and collaboration fostered mutual understanding, and the right project champion played a pivotal role. Vendor support was present all the way with BAAN specialists providing technical expertise, clear goals and objectives were established to fit the organizational needs and change management addressed the initial resistance and help align the stakeholders. Crucial was the management of expectations among the project team and the post-implementation ongoing optimization.

TOE Dimension	**Case Study Elements**
Technology	ERP treated as cross-functional enterprise system tied to technical factors interaction with organizational and vendor dynamics, high vendor involvement with changes in software attitude and engagement
Organization	Renewed top management support with strong project management and assigned project champion, interrelations among CSF with organizational changes propagated across multiple factors
Environment	Vendor relations supported turnaround, pressured conditions typical of large ERP programs overcame

Table 7 TOE framework (Akkermans & van Helden, 2002)

4.1.5 US electronics manufacturer, global ERP standardization

Tektronix is a global manufacturer of electronic test equipment that is divided into the major divisions, Measurement Business, Color Printing and Imaging, Video and Networking. It has presence in nearly 60 countries and by the early 90's it faced an increase in global competition while suffering from uncoordinated evolution of management and information systems. The IT infrastructure contained 460 systems that were lacking integrations and provided limited visibility in global operations. This led to the decision to adapt an ERP system in less than two years following a multi-phased project.

4.1.5.1 Implementation processes and outcomes

It started with creating the strategic vision and planning where executives led the initiative supporting the creation of a global business model. Phased rollout was the chosen approach with each wave having to deliver a specific functionality to a division or region starting with finance and follow by order management. The project focused on process standardization and simplification that help eliminate redundant processes and consolidate transactions in centralized locations. There was heavy reliance on a mix of consulting firms and specialists from Oracle that provided technical support. Extensive training programs were created that included power users and functional experts to provide support and change management was prioritized to address possible resistance and make sure that everyone will participate. Finally, there was a global rollout in 23 countries in less than 500days while each division managed to maintain its own instance to better support customer fulfillment but share a global financial system

By doing so, global integration and real-time visibility into data was achieved while operational costs were reduced. Process efficiency improved that enabled rapid integration and standardized business processes to improve decision-making capabilities. The total cost was 55 million USD, and the project was completed on time offering substantial operational and strategic benefits.

4.1.5.2 Key success factors and TOE framework

The main key CSF that supported the successful implementation are the Top Management commitment, an established steering committee and strong project governance team. Process standardization and phased implementation as well as consultant/vendor support with exceptional training and communication throughout the project. Lastly, Continuous improvement and process optimization that learned from each wave and region.

TOE Dimension	Case Study Elements
Technology	Single ERP solution across all divisions with shared data and process backbone, harmonization of processes before system deployments, encoded common practices while respecting division-specific needs
Organization	Executive leadership sponsored ERP providing top-management direction and increased visibility into operations, program governance balanced division autonomy, synchronized requirements, strong project leadership and cross-functional coordination, change in management with process redesign, strong leadership decision making and project management
Environment	Intense global competition, time pressured with ERP as enabler for strategic recovery/standardization, vendor/partner alignment with coordination in external support to meet enterprise level goals

Table 8 TOE framework (Westerman et al., 1999)

4.1.6 US Networking equipment leader, accelerated ERP rollout

This case investigates a global leader in networking equipment ERP implementation, Cisco, that faced a critical IT failure in 1994. The company faced rapid growth with increase in complexity and decided to change the legacy systems to a single, integrated ERP solution. Oracle was selected as the ERP vendor, even though they were newcomers back then. External support was provided by KPMG consultants and Oracle with a focus on rapid deployment with minimal customization.

4.1.6.1 Implementation processes and outcomes

The implementation was needed in a short period of time, achieved in just nine months. The initial focus was on strategic planning and vendor selection where the management team led by strong executives evaluated multiple options and selected Oracle. Project team was carefully selected, including the best people from Cisco, KPMG and Oracle and was organized into five functional tracks, each managed by a cross-functional group. Cisco

managed to blend robust sequential life cycle model with the flexibility of iterative prototyping with the project being divided into three pilots each building on the previous iteration while incorporating user feedback. While the initial goal was minimal customization, there were significant modifications in Oracle's system to fit the business processes. There were continuous training sessions and a strong management change with focus on knowledge transfer and securing support from opinion leaders. Finally, there was an executive steering committee monitoring the progress and coordinating activities with a focus on constant communication and alignment.

The implementation was completed in nine months and with only 15 million USD budget. It enabled Cisco to support its rapid growth, improve process integration and enhance the data visibility. It became a benchmark for ERP projects since it demonstrates the value of strong leadership with cross-functional teams and vendor collaboration.

4.1.6.2 Key success factors and TOE framework

Key CSFs identified are the Top Management commitment and Cross-Functional Project team that included the best possible people from each department. Vendor Collaboration and willingness to customize the experience while providing an Iterative Prototype for rapid development that allowed continuous feedback and adaptation. Training and Knowledge Transfer was key, as Project Governance that included a strong PMO and executive steering committee. Finally, Minimal Bureaucracy helped since unnecessary formalities were avoided.

TOE Dimension	**Case Study Elements**
Technology	Oracle ERP system to encode standard processes on a shared data architecture with iteratively prototyping and tuning, combined sequential lifecycles robustness with iterative pilots, conference-room prototyping, targeted changes, stress testing and hardware fixes, performance issues managed with vendor engagement
Organization	Top management sponsorship with priority treatment, inclusion of the best people from the organization, maintained executive oversight, structured gap identification, rapid issue

	resolution, disciplined scope control, deep user participation through pilots and readiness building
Environment	Central vendor/consultant alignment, KPMG & Oracle co-marketed implementation, competitive and time pressured conditions managed by realistic scheduling and hands-on vendor engagement

Table 8 TOE framework (Datta, 2009)

4.1.7 Pharmaceutical manufacturing site in Ireland, SAP global template launch

Pharma Inc. is an Irish manufacturing subsidiary of a UK multinational pharma company that accounts for more than 100000 employees and 25 billion USD turnover. The case investigates the global rollout of SAP ERP across multiple sites, with local manufacturing being the first main site to go live. The project's goal was to standardize processes, improve compliance including FDA regulations, and enhance overall operational efficiency. The implementation was managed by the Project Management Body of Knowledge (PMBOK) framework that has a strong focus on project governance, cross-functional teamwork and change management.

4.1.7.1 Implementation processes and outcomes

A structured multi-phase approach was chosen with strong preparation and planning that included team building seminars, process mapping and establishing a local steering committee. Project management structure included the nine PMBOK knowledge areas of integration, scope, time, cost, quality, human resources, communications, risk and procurement. Process compliance and standardization were the primary objectives, especially regarding the FDA audit requirements. Training and change management were achieved by extensive training implementations and inclusion of super users and thorough communication. Finally, the project was rolled out in waves, that happened on time and within budget achieving a rapid ramp-up to full production volumes ahead of the schedule.

The system went live and met expectations, achieving rapid utilization of full production volumes, improved process compliance, documentation and audit readiness. Cross-functional collaboration was enhanced, and the project also became a benchmark for best practices in ERP implementation within the company.

4.1.7.2 Key success factors and TOE framework

The main key CSF identified are strong Project Governance, and exceptional Top Management Support that was committed. Cross-Functional teamwork included experience users from all relevant functions, Process Compliance and Standardization by adapting the global template to local needs and Continuous training and Communications. Data Management by a dedicated team and Change Management that addressed resistance, involving unions.

TOE Dimension	Case Study Elements
Technology	Single-instance SAP global template, started with the primary sited as first of its kind requiring local adaptation while preserving cross-site standardization, post go-live ramp-up to full production volumes ahead of plan with stabilized solution and fit
Organization	Strong governance and leadership structure with local steering committee, local project teams and global core implementation team, local managers included to the project, PMBOK knowledge areas utilized, pre-implementation team building and ERP awareness activities
Environment	Global rollout in waves with core team traveling, pharmaceutical manufacturing added extra challenges tackled by each site's team assisting subsequently the primary sites

Table 10 TOE Framework (Carton et al., 2008)

4.2 Failed ERP Implementation Cases

4.2.1 Middle Eastern industrial producer, SAP R/3 + BPR failure

This case focuses on a major Middle Easter manufacturer, mentioned as Manco Group, that tried to implement SAP R/3 in conjunction with business process reengineering (BPR) and failed. The company faces outdated IT infrastructure, increased competition, and lack of customer focus, leading the management to undertake a transformation project by implementing SAP and BPR with the support of external consultants.

4.2.1.1 Implementation processes and outcomes

The implementation happened in three phases, strategic development, details planning and execution. There was assessment of existing systems that showed major shortcomings in network, organization, platforms and applications. Even though all these issues, the company chose SAP R/3 as a complete cross-organization solution to support the transformation. During implementation the project focused on the four core processes of sales, material management, finance, production & planning with customized solutions that were handled internally, having support from SAP and consultants. Finally, there was established continuous training and change management.

Emphasis early on was on cost saving and employee reduction that led to employees being anxious and resistant to change. BPR was never completed, instead they did a functional optimization losing sight of the need for strategic transformation. There was a lack of communication with results that led to poor cascading of the change rational, and plan and the progress and performance was not systematically measured so there was no way to know if things were improving or deteriorating. While the presence of consultants was obvious, they were given too much control, and they didn't provide sufficient knowledge transfer to the employees. The company lost focus on the objective and the project instead of being a transformation, it was seen as a technical challenge that lacked IT readiness. Of course, more problems followed since human resources were underestimated, there was low commitment, insufficient resources and poor risk management.

The project eventually run out of budget, there were long delays and the benefits were lower than initially anticipated. Overall the ROI was negative, BPR was never completed and it was considered a failure by both management and staff.

4.2.1.2 Key failure factors and TOE framework

The key CFFs were the initial inadequate IT infrastructure, poor data integration and insufficient technical support. Top management was not committed, leading to poor change management and communication. This made the employees anxious and resistant to change and the company to over rely on external consultants. Continuous market changes, cultural misfit of the ERP vendor and the local business as well as legal and regulatory requirements all lead to the failure of the project.

TOE Dimension	Case Study Elements
Technology	SAP R/3 for integration of dispersed systems didn't work, alignment difficulties of R/3 modules with other business components and systems
Organization	Insufficiently managed BPR and ERP implementation, organizational integration of redesigned processes was not achieved to the required level
Environment	Vendor/consultant practices were insufficient, contextual barrier and method gap prevented the alignment

Table 9 TOE Framework (Al-Mashari & Zairi, 2000)

4.2.2 US cosmetics company, S/4 HANA rollout disruption

Revlon is a US company with global presence in the cosmetics market that started an ambitious ERP implementation project. The aim was to modernize its processes, improve integration with the supply chain and enhance financial reporting. SAP S/4 HANA was selected as the ERP and aimed to standardize operations across all its global subsidiaries. It was part of a broader digital transformation that focused on achieving future growth and operational efficiency.

4.2.2.1 Implementation processes and outcomes

The project was launched with a very aggressive timeline that aimed to fast rapid global rollout without allocating enough time in proper planning, process mapping or testing. Customization and integration of legacy systems that would fit Revlon's unique requirements were underestimated and the data migration was problematic leading to inconsistencies, loss of critical information and business disruptions. Users were not ready for the new system, leaving employees confused and making mistakes since there was not sufficient training and change management present. All this led to a highly disruptive go-live that resulted in inventory shortages, order fulfillment delays, and in general, heavy supply chain disruptions and production stoppages. There was insufficient live data, especially financial, that led to missed regulatory filings and compliance problems. Overall communication between Revlon, SAP and consultants was poor, and roles & responsibilities were not defined clearly.

The implementation of the ERP was a failure, creating operational chaos, financial loss, compliance issues and damage to the company's reputation. This led to legal action against Revlon, executives left and an overall decline in shareholders' value occurred. The company had to reverse many changes, use manual processes and put a lot of effort into stabilizing the SAP system.

4.2.2.2 Key failure factors and TOE framework

The main identified CFFs were the lack of system customization and integration, data migration issues and insufficient planning, testing and validation. There was ineffective change management and user training combined with poor planning coupled with unrealistic timelines. Collaboration and communication were insufficient.

TOE Dimension	Case Study Elements
Technology	SAP S/4 HANA ERP created persistent system-driven disruption at key manufacturing plan from planning, sourcing and distribution integration, system was not mature enough at the time and there was no program readiness aligned to Revlon's needs
Organization	Insufficient management involvement and operational readiness, no change control, wrong financial reporting
Environment	Retail market pressure, multi-site obligations, external stakeholder scrutiny, insufficient risk quantification from vendor/consultants

Table 10 TOE Framework (Kohansal, 2019)

4.2.3 Indonesian automotive distributor, ERP program breakdown

The case investigates the failure factors of a major automotive distributor in Indonesia, Toyota Astra Motor. They tried to implement an ERP system with the main objectives of streamlining operations, improving supply chain management and enhancing the reporting capabilities. Even though there was substantial investment and planning the implementation was not successful and eventually it was completely abandoned.

4.2.3.1 Implementation processes and outcomes

The initial idea was very ambitious, setting overextended goals, including full integration that would offer real-time analytics across all departments and more requirements added mid-project. There were ineffective steering committee and lack of clear guidance that led to multiple delays and misaligned priorities. The employees were not trained properly and there was not sufficient change management leading to resistance and fear of losing their jobs. Technical issues raised since the requirements for customization were underestimated and the data migration from the legacy system caused inconsistencies and delays, in combination with poor communication with the ERP vendor and consultants it led to a disaster. The project went well over budget, missed majority of deadlines and eroded the stakeholder confidence.

The ERP failed completely after many delays and extra costs, TAM was forced to revert to legacy system to continue with critical operations and scaled down the overall IT modernization plan.

4.2.3.2 Key failure factors and TOE framework

The main key CFF was the very broad scope of the project, that faced data migration issues, it underestimated the complexity of the needed customization and had insufficient technical support and testing. Project management and overall governance was very weak throughout the phases and poor change management combined with no training led to employee resistance and eventually lack of engagement. Finally, the market pressure and overall competitive environment, lacking vendor and consultant coordination and facing regulatory compliance issues led to the failure of the project.

TOE Dimension	**Case Study Elements**
Technology	TAM ERP led to technical/process misalignment, data migration issues
Organization	Insufficient user-acceptance, non-existent organizational adoption and support mechanisms, localized adoption hurdles
Environment	Developing country related technological & contextual constraints leading to module complications and fit, un-calibrated template/process from vendor

Table 13 TOE Framework (Sardhika et al., 2019)

4.2.4 Chinese feed manufacturing SME, ERP adoption attempt

The focus is on a small Chinese manufacturing company that attempted to adopt an ERP system to integrate business processes, improve operational efficiency and enhance competitiveness in the market. The company faced a unique challenge, mostly because of its size, limited resources and cultural factors. Despite the effort and initial optimism, the project eventually failed and it was abandoned.

4.2.4.1 Implementation processes and outcomes

The company underestimated the cost and resource requirements for such projects and the budget constraint led to compromises in selection, customization and training. The lack of experience from the side of ERP vendor with small enterprises led to minimal support and misalignment between the capabilities and needs creating problems in customization and integration of the system. IT infrastructure was outdated, and the upgrades didn't happen in time to properly support the ERP requirement. Having hierarchical management and lack of participative decision making didn't help either, creating a strong resistance among employees who viewed the change as unnecessary. Inadequate training that was too technical, leaving out essential process changes and user adoption and communication was another mistake. The overall lack of experience both from the company's perspective and the ERP vendor led to a failed implementation that had unclear roles and responsibilities.

Eventually the project was declared as a failure and was never fully operational. The company had to revert to manual processes and legacy systems incurring substantial financial losses and damage to employee morale. This failure highlights the need for tailored ERP solutions for small companies, especially in developing economies.

4.2.4.2 Key failure factors and TOE framework

The key factors for the failure were the outdated IT infrastructure combined with poor system customization and integration, burdened by the limited support and expertise of the vendor provider. Top management was not committed enough and lacked strategic vision, employees were resistant to change, and insufficient training combined with poor communication made matters even worse. The Vendor has limitations in covering small businesses and the company was facing economic constraints and market pressure.

TOE Dimension	Case Study Elements
Technology	Multi-module ERP system, mishandled integration and fit planning
Organization	Project governance, change readiness and user trainings were not managed effectively, limited project management experience and organizational resources, resource and capability constraints
Environment	Environmental uniqueness of traditional Chinese SME, lack of tailor adoption procedures from vendor

Table 11 TOE Framework (Yulong, 2011)

4.2.5 Multi-Case ERP failures, Hershey, Nike, FoxMeyer, HP industry exemplars

This case reviews, in less detail, four high profiler ERP failures that should be mentioned as each case illustrated unique failures but also share common themes in planning, testing and change management.

4.2.5.1 Implementation processes and outcomes

Hershey attempted to implement three systems in the same time, SAP R/3, Siebel CRM and supply chain software in 1999. The timeline was initially 30 months that was compressed down to 18 months. There was lack of proper planning and phased rollout, with all systems going live in the same time, without having done sufficient testing to support the go live. As a result, the company faces substantial financial losses, incurring, only from missed orders, 100 million dollars loss and sever reputational damage.

Nike tried to implement i2 Technologies supply chain software in 2000 with goal being the inventory optimization. The company over-relied on automations without sufficient testing and missed the integration with the existing systems that operated. Eventually forecasting errors led to more than 100 million dollars in lost sales and an increase in stock.

FoxMeyer implemented SAP R/3 in the mid-90s without adequate planning, testing and IT infrastructure. Sap could not handle the transaction volumes of the company at the time since they overestimated the system capacity. There were insufficient project governance

and unrealistic expectations that led to eventual bankruptcy and lawsuits against the ERP vendor and the consulting company.

HP implemented SAP in its North America branch in 2004 and faces poor coordination between IT and business units combined with data migration issues that disrupted order fulfillment. There were insufficient testing and no contingency plan that led to 160 million dollars in revenue loss during the transition.

4.2.5.2 Key success factors and TOE framework

All cases above had common failure factors, unrealistic timeline and inadequate testing that also lacked a phased rollout. Change management and training were insufficient, executive oversight and project governance almost inexistant and face many technical challenges and data migration issues.

TOE Dimension	Case Study Elements
Technology	Multiple ERP, common process dependencies, abbreviated testing, lack of testing discipline, cutover timing, wrong input-output systems, early adopters
Organization	Compressed schedules, peak-season as go-live, shortened test cycles, high risk acceptance thresholds, program governance weakness, insufficient change management, lack of skilled personnel, siloed teams
Environment	External expectations amplified exposure, investor scrutiny and weak vendor relations, low-tolerance supply chain

Table 12 TOE Framework (Efthimiou, 2014)

4.2.6 South African public agency, ERP modernization attempt

This case explores the ERP implementation project of a large South African organization that operates in the public sector. The initial goal was to modernize its IT infrastructure and improve operational efficiency but despite the significant investment and planning the project didn't meet the objectives and it was abandoned.

4.2.6.1 Implementation processes and outcomes

The ERP project started with lack of strategic alignment, the objectives were too vague, and the expected benefits not defined. The lack of governance structure led to fragmented

decision making, combined with an absent steering committee, the confusion and delays created were irreversible. Since there were no project purpose communication or clear benefits, widespread resistance existed among employees. The system was poorly configured and customized while the integration with the legacy systems that existed was quite bad. The organization over-relied on external consultants without guidance, the knowledge transfer was minimal and their roles unclear. All the above led to a failed project that exceeded its budget and missed majority of deadlines.

The implementation of ERP was declared a complete failure after numerous delays and increasing costs. Finally, the organization decided to revert to legacy systems for the operations and decided to scale down the IT modernization plan.

4.2.6.2 Key failure factors and TOE framework

The main key CFF were the poor system configuration and integration combined with data migration failures and insufficient technical support. Lack of strategic alignment and weak project governance, poor change management, non-existent training and employee resistance. Finally, regulatory compliance challenges, bad coordination with the ERP vendor/consultants and economic/political pressures in the public sector.

TOE Dimension	Case Study Elements
Technology	Vanilla ERP integration without technical knowledge, insufficient process knowledge
Organization	Lack of project knowledge, weak project management, limited management support, poor understanding of the need for change, deficient change-management and training initiatives
Environment	Emerging economy & public environment lacking contextualization of methods and knowledge, organizational & knowledge gaps for public section

Table 16 TOE Framework (Ramburn et al., 2013)

4.2.7 Norwegian mechanical SME, ERP implementation breakdown

In this case an SME in Norway that specializes in manufacturing is examined for its failed ERP implementation project. The goal was to adopt an ERP system that will improve efficiency, integrate business processes and support overall growth. The project started with optimism but soon it encountered many challenges that led to abandonment of the project.

4.2.7.1 Implementation processes and outcomes

The company lacked any dedicated expert in IT field and relied heavily on consultants but was in the same time limited in terms of budget and subsequently customization and training related to the system. The ERP vendor's system didn't align with the business processes and the customization needed was underestimated. Lack of project governance, unclear role and responsibility and progress monitoring was inadequate. On top of that employees viewed the changes as disruptive and were resistant to change, affected by lack of proper training and communication. Data migration turned out to be unstable causing operational disruptions and the overall scope of the project was unrealistic with high costs and complexity.

The ERP implementation was declared a failure with sever financial losses and damaged morale for whole organization leading to usage of the legacy systems and manual processes.

4.2.7.2 Key failure factors and TOE framework

The main key CFF were the poor system selection and customization combined with data migration failures and lack of technical expertise. Weak project governance, poor change management, non-existent training and employee resistance. Finally, Unrealistic expectations and vast scope, vendor limitations in terms of expertise related to SMEs, and market pressure.

TOE Dimension	**Case Study Elements**
Technology	Off the shelf ERP suffered from serious system errors, inadequate control and stabilization, poor fit decisions and weak implementation governance created long-lasting operational consequences
Organization	Insufficient top-management support, weak project management and mishandled use of consultants, bad

	workarounds, employee departures, overall organizational stress, SME constraints
Environment	Limited resources and vendor/consultant support, weak external coordination

Table 13 TOE Framework (Hustad & Olsen, 2014)

5. Chapter 5: Comparative Analysis and Findings

5.1 Cross-case analysis using the TOE framework

This section will present a systematic and comparative analysis of all the cases using the standardized TOE framework. It will provide a robust structure for examining the different factors that interact together to shape the outcome of the ERP implementation projects.

Each case was analyzed based on set of TOE characteristics that will allow a direct comparison across multiple organizations from different settings, industries and project outcomes. For each dimension, Technology, Organization and Environment, macro-level characteristics were created and rated based on the presence and strength in each case according to supporting evidence from the case studies.

The cases consisted of a balanced selection of different size organizations, both from public and private sectors including failed and successful implementations. Having such diversity, it provides the ability to generalize the findings and identify patterns that are not limited to the context of each case. Successful implementations are characterized by high scores across technological and organizational dimensions, especially those related to top management, project governance, user training and data quality. On the other hand, failed cases are marked by weak or non-existent governance structure, insufficient testing and poor alignment with ERP vendors/consultants. The table below summarizes the TOE ratings for all cases.

5.2 Patterns and interactions across TOE dimensions

Across the cases that had successful implementations the technological factors are always present and strong, as an example, Cisco and Tektronix both had strong prototyping, phased rollouts and extensive user acceptance tests (UAT) that minimized technical risks and facilitated smoot transition from legacy systems.

On the other hand, failed cases like Revlon or the project in SA public sector, suffered from weak data migration, insufficient testing and unstable, outdated system architectures. The overall technical shortcoming throughout the cases triggered multiple failures in business operations that led to complete abandonment of the project, or very costly reversions to previous systems.

On the organization factors and successful cases, we come across strong and present top management support, disciplined project governance, cross-functional collaboration and competence and comprehensive user training combined with change management programs. These factors emerge as the most decisive between success and failure.

In contrast, failed implementations lacked clear leadership and suffered from vast roles and responsibilities. User engagement was neglected, training was insufficient leading to resistance to change and inadequate process standardization. The absence of robust data governance further extended the challenges and undermined both the technical and organization foundations.

Environmental factors were less emphasized across literature but played a critical role in shaping the outcome. Successful cases benefited from strong support from vendors and consultants, had effective regulatory compliance strategies and realistic timelines that considered market pressure.

In failed cases there was often misalignment with the vendor and consultants, government or regulatory support was nonexistent, and unrealistic deadlines were set based on market pressure.

By analyzing these factors in each dimension, it is revealed that ERP projects' outcome is rarely the result of a single factor. Success or failure emerge from interplay between all dimensions. The projects that succeeded all had individual enablers but also effective configuration and interactions. The findings also are in par with resent research from N'Dri & Su, (2024) and shows that different combinations of TOE factors will lead to success, while absence or weakness of the key factors in any dimensions will possibly lead to failure.

Looking into the interaction between technology and organization, there is an obvious and consistent pattern across both successful and failed cases which is the interplay between technological readiness and organizational capability. In cases that have successful implementation, there is a strong connection between system-process fit, data quality, comprehensive testing and top management support, effective project governance and well prepared and trained teams. The opposite is true for failed cases, where even when some of the technological factors like vendor support or customization were present, the absence of organization enablers and strong, clear leadership, user training or change management led

to project failure or breakdown. This is enough evidence to support the fact that technology factors are not enough, alone to have a successful project.

Similarly, the organization with the environment have a strong correlation. Usually, successful cases demonstrate effective engagement with external stakeholders, including ERP vendors, consultants or regulatory bodies while failed cases often suffer from misalignment with external partners, overlying on contractors without proper alignment and having unclear regulatory requirements.

Finally, the interaction between technology and environment is less frequent but remains significant. Successful cases that have robust technical systems also depend on strong vendor/consultant support and adaptability on regulatory and market changes. By contrast the failed cases suffering from poor integration or inadequate testing are also compounded by insufficient vendor support or other external misalignments. Organizations should select technology partners that can provide not only their products but also expertise that adapts to environmental shifts.

Overall, from the above analysis we conclude that organization factors play a key role, especially leadership support, change management and project governance, but of course only if supported by robust technological foundations and an enabling environment. Of course, it is obvious that that a successful outcome does not depend on isolated factors but on the synergy of the configuration of the TOE elements while failure comes from having multiple factors absent or weak across all dimensions.

With the application of a standardized TOE framework, this dissertation provides actionable understanding of the dynamics in ERP implementation projects. It shows the importance of a holistic project design that combines technological, organizational and environmental factors in an integrated way. Practitioners should focus on investing in governance structure, user engagement and vendor partnerships while researchers should use the TOE framework as a comprehensive tool for comparative analysis. This approach offers a template for future studies that seek to unravel the complex causality of digital transformation initiatives.

Overall, success is dependent on high ratings in technological, organizational and environmental factors with the organizational factors playing a central role. Additionally, it is critical to have external alignment and effective engagement with vendors, regulators and

other stakeholders. Finally, weaknesses are cumulative and failure occurs from compounding effects across multiple TOE dimensions rather than a single factor.

5.3 Critical differentiating factors in ERP implementation outcomes

Based on the patterns identified in each case this analysis will focus on the TOE factors that play the most critical role and distinguish success from failure. Specifically, there will be a systematic comparison of the highest and lowest factors across all cases showing the critical differentiators.

The most consistent and decisive differentiator is the presence of strong leadership team and governance. For every successful case top management's robust support is present, there is clear project ownership and empowered decision-making structure with visible and present executive sponsorship. In contrast, failed cases showed weak and absent leadership, governance was technically non-existent and there was lack of accountability.

Next, user engagement, training and change management were identified as critical factors since all successful project had as common comprehensive user training with open communication and defined change management leading to high user acceptance, reduced resistance and smooth transition to new processes and systems. On the other hand, it was very common for failed implementations to neglect the users involved and the training needed

Related to technology, the most important factors were the data quality, system integration and testing with successful cases showing consistent high ratings across these factors making them essential in ensuring reliable operations and providing necessary support for business decision-making. Opposite to that, failed cases had poor data migration, insufficient integration and minimal testing all leading to technical breakdowns and failures.

Finally, on the environment across all cases that had successful implementations the vendor and consultant collaboration and the alignment with external stakeholders were the most critical factors. These projects are characterized by strong partnership with external experts who provided both technical solutions and knowledge transfer and best practices and had the ability to anticipate and address external requirements. On the other hand, failed projects suffered either from poor vendor alignment or from inadequate external consultants that

failed to understand, support and transfer knowledge based on the needs of each organization.

All the evidence from the cross-case analysis emphasizes and confirms what was already discussed, ERP implementation success does not depend on a single factor to succeed but rather in cumulative factors, with projects that excel on all areas are able to anticipate and overcome challenges and eventually deliver sustainable value. The same is also true of failure, as it is often the result of more than one factor and especially if there is weakness in more than one dimension it is very easy to create a "snowball" effect and eventual project breakdown.

Factor	Successful Cases	Failed Cases
Top Management Support & Governance	Strong, visible, accountable	Weak, absent, fragmented
User Engagement & Training	Comprehensive, ongoing, inclusive	Minimal, ad hoc, neglected
Data Quality & Integration	Robust migration, thorough testing	Poor migration, insufficient testing
Vendor/Consultant Collaboration	Close, proactive, knowledge-sharing	Distant, unclear, inadequate

Table 14 Summary of critical TOE factors

With these findings, organizations have a clear roadmap that seek to maximize the likelihood to have successful ERP implementations and avoid critical failures.

5.4 Theoretical development towards TOE model for ERP success and failure

The findings align with the TOE perspective which explains that innovation and success depend on a firm's technological context, organization characteristics and environmental pressure/support (Tornatzky & Fleischer, 1990). Specifically in ERP research, there is decades of evidence that show organizational leadership and user centric change practices lead to consistent success but only when there is solidified technical support (Akkermans &

van Helden, 2002; Shaul & Tauber, 2013). Based on the TOE model's operationalization the below analysis will be used:

- Presence (0 - 2): 0 = Absent; 1 = Partial; 2 = Present (robust).
- Strength / Risk (0 - 3): 0 = Very weak / high risk; 1 = Weak; 2 = Moderate; 3 = Strong / low risk.
- Evidence rule: Each rating is supported by textual evidence explicitly reported in the case.
- If something is not stated in the case study, it will be mentioned as not reported NR.

Case (Outcome)	T1: Fit	T2: Integration & Data	T3: Customization	T4: Testing & QA	T5: Architecture	T6: Post-Impl. Support
Pohludka et al (2018). - Success	2/3	2/3	1/2	2/3	2/3	2/3
Canon et al (2025). - Success	2/3	2/3	1/2	2/3	2/3	2/3
Abdelghaffar (2012) - Success	2/3	2/3	1/2	2/3	2/3	2/3
Akkermans & van Helden (2002) - Success	2/3	2/3	1/2	2/3	2/3	2/3
Tektronix (1999) - Success	2/3	2/3	1/2	2/3	2/3	2/3
Cisco (2009) - Success	2/3	2/3	1/2	2/3	2/3	2/3
Pharma Inc (2008). - Success	2/3	2/3	1/2	NR	2/3	2/3
Al-Mashari & Zairi (2000) - Failure	1/1	0/1	2/3	0/1	0/1	1/1
Revlon (2019) - Failure	0/1	0/1	2/3	0/1	1/1	1/1
Toyota Astra Motor (2019) - Failure	1/1	0/1	2/3	1/1	1/1	1/1
Chinese SME (Yulong, 2011) - Failure	1/1	0/1	2/3	0/1	0/1	1/1
Multi-case failures	1/1	0/1	1/2	0/0	0/1	1/1

(Efthimiou, 2014) - Failure						
South African public sector (Ramburn et al., 2013) - Failure	1/1	0/1	2/3	0/1	0/1	1/1
Norwegian SME (Hustad & Olsen, 2014) - Failure	1/1	0/1	2/3	0/0	1/1	1/1

Table 15 TOE Technology factors cross-case ratings

Case (Outcome)	O1: Top Mgmt	O2: Team Competence	O3: Training & Change	O4: Standardization & BPR	O5: Data Governance
Pohludka et al (2018). - Success	2/3	2/3	2/3	2/2	2/2
Canon et al (2025). - Success	2/3	2/3	2/3	2/2	2/2
Abdelghaffar (2012) - Success	2/3	2/3	2/3	2/2	2/2
Akkermans & van Helden (2002) - Success	2/3	2/3	2/3	2/2	2/2
Tektronix (1999) - Success	2/3	2/3	2/3	2/2	2/2
Cisco (2009) - Success	2/3	2/3	2/3	2/2	2/2
Pharma Inc (2008). - Success	2/3	2/3	2/3	2/2	2/2
Al-Mashari & Zairi (2000) - Failure	0/1	1/1	0/1	1/1	0/1
Revlon (2019) - Failure	1/1	1/1	1/1	1/1	1/1
Toyota Astra Motor (2019) - Failure	1/1	1/1	0/1	1/1	0/1
Chinese SME (Yulong, 2011) - Failure	0/1	1/1	0/1	1/1	0/1

Multi-case failures (Efthimiou, 2014) - Failure	0/1	1/1	0/1	1/1	1/1
South African public sector (Ramburn et al., 2013) - Failure	0/1	1/1	0/1	0/0	0/1
Norwegian SME (Hustad & Olsen, 2014) - Failure	1/1	1/1	0/1	1/1	0/1

Table 16 TOE Organization factors cross-case ratings

Case (Outcome)	E1: Vendor/Consultant	E2: Regulatory	E3: Market Pressure	E4: External Alignment
Pohludka et al (2018). - Success	2/3	1/2	2/2	1/2
Canon et al (2025). - Success	2/3	1/2	2/2	1/2
Abdelghaffar (2012) - Success	2/3	2/2	2/2	1/2
Akkermans & van Helden (2002) - Success	2/3	2/2	2/2	1/2
Tektronix (1999) - Success	2/3	2/2	2/2	1/2
Cisco (2009) - Success	2/3	1/2	2/2	1/2
Pharma Inc (2008). - Success	2/3	2/2	2/2	1/2
Al-Mashari & Zairi (2000) - Failure	1/0	1/1	1/1	0/1
Revlon (2019) - Failure	0/0	1/0	1/1	0/1
Toyota Astra Motor (2019) - Failure	1/1	1/1	0/1	0/1
Chinese SME (Yulong, 2011) - Failure	1/0	NR	1/1	NR
Multi-case failures (Efthimiou, 2014) - Failure	1/0	1/1	1/1	0/1

South African public sector (Ramburn et al., 2013) - Failure	1/0	1/1	1/1	0/1
Norwegian SME (Hustad & Olsen, 2014) - Failure	1/0	NR	1/1	NR

Table 17 TOE Environment factors cross-case ratings

Based on the cross-case analysis the model will be expressed in 7 propositions that articulate how the TOE factors combine and why similar practices lead to different outcomes.

Organizational centrality where high O is mandatory for success, projects that had weak O1, O2 or O4 had very low success rates even when T/E were moderate to strong. **Technical sufficiency** with O where both T2 and T4 are high and jointly sufficient for the project to succeed when O is also High. Weak T in such cases undermined the outcomes regardless of the strength of O. **Vendor moderation**, E1, moderates the effectiveness of T2 and T4 since being aligned with partners lower defects and manages risk better. **Timeline realism**, when there is weak O2 while E3 is strong having increase failure likelihood with big rollouts amplifying the governance gaps. **External alignment**, if there is weak E4 with vendor/consultants, customers and regulators, it moderates the influence of T2 and T5 and O4, and even if these are strong the external influence drastically increases the integration and adoption risks. **Customization risk** where heave customization T3, raises the project instability unless it is accompanied by a strong O2 and E1 that offset the risk. Finally, **Data governance bridge**, when T2 and T4 are being strengthened by O5, then organizational data ownership is the bridge between technical practices and adoption fidelity.

To further enhance the future usage of the TOE framework we can use the normalized values of T, O and E to create a practical model that proposes a simple index.

$$\text{ERP outcome readiness} = wT*T + wO*\cdot O + wE*E$$

Given the results presented for each case we can do an empirical calculation of the weights with organization wO = 0.45, technology wT = 0.35 and environment wE = 0.20, this will help create thresholds that will translate the analysis into actionable decisions.

The success is likely if EOR is >= 0.70, O >= 0.70 and T >= 0.65. It is at risk when 0.50 =< EOR < 0.70, or if any of the dimensions is < 0.60, and then there is need to remediate first

O2, O4, T2, T4 and E1, before proceeding with other changes. Finally, it the failure is likely when EOR < 0.50 or two dimensions < 0.50, then the need is to replan the scope, review the timeline and escalate governance while possibly renegotiate the vendor model.

In practice this means that for the 1st case, when each rating is converted to a 0–1 score, we take equal weight on presence and strength:

$$\text{Score}_C = 0.5 \cdot \frac{\text{Presence}}{2} + 0.5 \cdot \frac{\text{Strength}}{3}$$

Technology (T)

T1 2/3 → $0.5 \cdot 1 + 0.5 \cdot 1 = \mathbf{1.000}$

T2 2/3 → **1.000**

T3 1/2 → $0.5 \cdot 0.5 + 0.5 \cdot \frac{2}{3} \approx 0.250 + 0.333 = \mathbf{0.583}$

T4 2/3 → **1.000**

T5 2/3 → **1.000**

T6 2/3 → **1.000**

$$\bar{T} = \frac{1.000 + 1.000 + 0.583 + 1.000 + 1.000 + 1.000}{6} \approx \mathbf{0.931}$$

Organization (O)

O1 2/3 → **1.000**

O2 2/3 → **0.833**

O3 2/3 → **1.000**

O4 2/3 → **1.000**

O5 2/2 → $0.5 \cdot 1 + 0.5 \cdot \frac{2}{3} \approx \mathbf{0.833}$

$$\bar{O} = \frac{1.000 + 0.833 + 1.000 + 1.000 + 0.833}{6} \approx \mathbf{0.933}$$

Environment (E)

E1 2/3 → **1.000**

E2 1/2 → **0.583**

E3 2/2 → **0.833**

E4 1/2 → **0.583**

$$\bar{E} = \frac{1.000 + 0.583 + 0.833 + 0.583}{4} = \mathbf{0.750}$$

Then according to the weight estimation EOR = 0.35*0.931 + 0.45*0.933 + 0.20*0.750 = 0.896 that indicates that success is likely since EOR >= 0.70 and O >= 0.70, T >= 0.65.

Using the same technique in the failed case of PT Toyota Astra the outcome provides expected results. EOR = 0.35*0.472 + 0.45*0.292 + 0.20*0.292 = 0.355 that indicates failure is likely since it is well below the threshold defined of 0.50. In that case, there should be a review of O2 and O1 first, followed by O4 and then adjust T2, O6. Finally overhaul T4 and improve E1, E3 and E4.

To move from the assessment to practical actionable insights, there are 5 main priorities for managers. Adjust and retake control of the governance starting with O2 and O1, make necessary changes in the steering, roles and escalations paths as well as scope control combined with securing visible executive sponsorship. Then proceed with O4, arrange necessary training, support change management and improve communication while measuring adoption and readiness. Follow up with T2 and O6, arrange data ownership, plan necessary cleansing and conversion and test E2E with real data followed by T4, where there will be a pilot, sufficient UAT and a proper cutover rehearsal. Finally, do changes on E1, E3 and E4, clarify SLA and roles of the vendor, design proper plans for each wave, and work on stakeholder engagement while avoiding compressed one-go scenarios. By executing changes in this order for the priorities listed, project will move into stabilization and learning.

This model assumes there are sufficient availability of evidence that can be coded, something typical in mid to larger organization settings and project related to multi-process ERP. In smaller organizations or narrowly scoped projects that require a single module for example, the relative weight of E, O and T will vary and can be lighter or heavier depending on the case.

By having the EOR model and the 5 priorities, the scholarship value of this research is translated to managerial tool that organizations can use to identify risk configurations early, allocate proper funding where is needed and negotiate ERP models and support accordingly.

6. Chapter 6: Discussion and Implications

6.1 Interpretation of findings against published literature

The findings confirm and help with the extension of several well-established insights in ERP implementation projects and support it further by offering new contributions through the systematic application of the TOE framework and creation of the ERP outcome readiness (EOR) template.

The analysis of the cases demonstrates that organizational factors have the edge in terms of influencing success and failure compared to technological and environmental factors. This comes in agreement with previous studies that emphasize the critical role that leadership teams play in ERP projects (Shaul & Tauber, 2013). The findings show that having a strong executive presence and sponsorship combined with structured governance mechanisms create a solid foundation for effective decision making and risk management (Ramburn et al., 2013).

Technical readiness, of course, can't be underestimated especially related to integration, data quality and testing since these are essential for successful ERP rollouts which agrees to the findings presented by Westerman, Cotteleer, Austin, and Nolan, 1999; Datta (2009). This research reinforces these conclusions, successful cases consistently exhibit strong ratings for the above and it supports the argument that ERP success does not depend only in one dimension.

Finally, environmental factors are important in a slightly lesser degree but still align with what Awa, Ukoha, and Emecheta (2016) and Baker (2011) found, arguing that external pressure and support shape technology adoption outcomes. The findings here extend this perspective by showing that vendor alignment, consultants support and timeline realism are significantly important for ERP success. All the above confirm that no dimension acts in isolation but everything interacts with each other to determine outcomes.

Research from N'Dri and Su (2024) emphasizes the success in digital transformation is often a result of specific configurations of TOE factors and not dependent on isolated enablers. This research strongly supports the view that ERP implementation success depends on high organization readiness, combined with strong technical practices and supportive environmental conditions. On the other hand, failure is often irreversible if two or more

dimensions are weak and no action is taken to improve them, creating escalating risks. This explains why even projects that have advanced technology can still fail if there is no governance or hostile environments.

While other studies identified critical success and failure factors, they lack a standardized approach for cross-case comparison. This dissertation addresses the gap by applying a uniform TOE framework across all cases and enables systematic evaluation and patter recognition. Furthermore, it introduces the ERP outcome readiness metric that provides a practical tool for assessing implementation readiness and helps with predicting outcomes.

6.2 Practical implications for organizations

These insights have significant relevance for organizations that plan or already execute ERP implementations. Using the TOE based model and the ERP outcome readiness metric, organizations can move beyond generic best practices and adopt a structured evidence-based approach to risk assessment and project governance.

Organizations should adopt the TOE framework as a diagnostic tool that will help them rate each characteristic through the ERP lifecycle on standardized scales allowing managers to identify weak areas early and prioritize interventions when needed. This structure will allow managers to move from intuition based on incomplete checklists approaches and will ensure that all critical dimensions are considered.

The findings confirm that organizations should first focus on organizational readiness by securing executive sponsorship, formalizing governance and investing in change management. Then they should focus on technical readiness by focusing on data quality, enforcing rigorous testing and controlling customization, and limiting unnecessary modifications. Finally, focus on environmental factors, by aligning with vendors and consultants, avoiding unrealistic timelines and engaging external stakeholders since external pressure often amplifies internal weaknesses

Managers should apply the EOR metric since it offers a practical way to quantify readiness and predict outcomes. They should calculate the EOR and adjust it after every key milestone, use thresholds as a guide to decision-making and simulate improvements by analyzing what interventions will yield the greatest impact. Finally, organizations should treat the ERP implementation as a continuous learning process with post-implementation

reviews using the TOE framework and EOR metric. By doing so they can capture lessons learned and feed them into future projects, creating a cycle of continuous improvement.

6.3 Theoretical contributions to ERP research

This dissertation makes several contributions to ERP research by extending the TOE framework and introducing new practical tools for understanding ERP implementation outcomes. While the TOE framework (Tornatzky & Fleischer, 1990) has been applied in studies related to technology, its use in ERP was never complete. Previous studies usually select a set of factors or apply TOE in an inconsistent way limiting the comparability across cases. This research addresses this gap and develops standardized TOE rubric with macro characteristics for each dimension, technology, organization and environment, applying it across multiple ERP cases. This enables systematic cross-case analysis and allows for pattern recognition which was absent from most published ERP literature.

This contribution allows to move beyond the traditional CSF and CFF factors that act in isolation (Shaul & Tauber, 2013) and advances the theory by adopting a configuration perspective that demonstrated how ERP success is the result from synergistic combination of TOE dimensions rather than isolated enablers. For example, strong governance and training contribute to success only when supported by robust data quality and testing. The findings highlight the moderation role of environmental factors on organizational and technical practices. It extends on the original TOE framework and clarifies how external conditions contribute to success or failure.

A major contribution is the introduction of the ERP outcome readiness metrics, that allows the operationalization of TOE dimensions into a score-based tool that predicts implementation success. It is a quantitative tool that provides metrics driven by theory and can be used for comparative analysis and decision making. By doing this a foundation for future empirical validation is being set using other methods.

Finally, it contributes by linking conceptual models to actual tools connected with the TOE framework with the EOR that can be used to advance academic understanding and provide practical instruments for ERP governance. These contributions align with recent calls for holistic, context- sensitive models that can capture complex projects in digital transformation (N'Dri & Su, 2024).

6.4 Recommendations for practitioners

The results of this study provide actionable guidance both for organizations that seek to improve ERP implementation and theoretical insights from the TOE framework and EOR that can be used for future research. Practitioners should use the TOE framework as a structured diagnostic tool throughout the ERP lifecycle supporting the identification of weaknesses and help prioritize interventions, ensuring that all critical dimensions are considered.

Based on each dimension, practitioners should focus on securing executive sponsorship, formalize governance, and invest in change management. The focus on data quality and integration, enforce complete testing and control customization extent. Finally, align with vendors and consultants, avoid setting unrealistic timelines and engage with external stakeholders. All that, combined with application of the EOR that provides calculations at each milestone, will provide guidance in decision making and help simulate improvement when needed.

7. Chapter 7: Conclusion

7.1 Summary of key findings

The purpose of this dissertation was to explore why ERP implementations succeed in some organizations but fail in others by conducting a comparative analysis of published case studies using a standardized TOE rubric.

Because the study relies on a convenience sample of a limited number of published cases, the findings are indicative and intended for analytical rather than statistical generalization.

ERP implementations succeed when organizational readiness (executive sponsorship, governance, change management) is paired with disciplined technical execution (data, integration, testing) and supported by aligned environmental conditions. They fail when two or more of these dimensions are weak or misaligned.

The cross-case synthesis yielded five main findings.

Organizational centrality is decisive and in successful cases it was consistently observed that top management sponsorship, clear project governance and structured change management were always present and strong. On the other hand in failed project these characteristics were absent or weak and it is a pattern that aligns with evidence from other ERP research (Akkermans & van Helden, 2002; Shaul & Tauber, 2013).

Technical sufficiency is essential partner to strong organization, with successful projects treating data migration, E2E integration and rigorous UAT as top priorities while failed cases featured poor data quality, truncated testing and insufficient infrastructure. Based on this, organizational strength can't compensate for neglected technical fundamentals but also, well-engineered platforms still fail without proper governance.

Environmental factors moderate outcomes rather than independently determine them. Of course, they play a critical role but not on the degree that the previous ones had. Vendor and consultant alignment, regulatory preparedness and market timing/pressure consistently shape feasibility and pace. Successes benefited from these while failures often had misaligned partners, weak external coordination or compressed peak season cutovers. The evidence fits the TOE view that environmental conditions are moderators that amplify or dampen technical and organizational practices rather replacing them (Baker, 2011; Awa et al., 2016; Efthimiou, 2014).

ERP outcomes emerge from plethora of TOE factors rather than isolated enablers. In line with recent configuration research, ERP projects were successful when organizational readiness was combined with disciplined technical practices and supportive environmental conditions. This dissertation's findings, encourage teams to check for synergy rather than relying on single isolated factors (N'Dri & Su, 2024; Akkermans & van Helden, 2002).

Finally, context is important and size, sector and markets all influence failure and success. There is frequent confrontation of resource limitations and consultant dependences. It is common for developing countries to add extra layer of infrastructure gaps and regulatory complexity while public sector cases faced decentralized governance and resistance to change. In this context, success required tailored adoption paths, realistic timelines and locally adapted vendor support (Hustad & Olsen, 2014; Abdelghaffar, 2012).

In that regard, there could be an unofficial sequence that practitioners could use starting with governance & sponsorship, then change management & training, followed by data & integration, then testing & cutover and finally vendor/stakeholder alignment.

7.2 Research contributions and limitations

This dissertation contributes to research as it proposes a standardized TOE rubric for cross case comparison while prior studied applied TOE unevenly. Here there is operationalized TOE into repeatable macro characteristics and applied them consistently across cases enhancing comparability and supporting patter detection beyond single case narratives. Additionally, CSF and CFF are integrated into TOE categories demonstrating how factor interdependencies produce outcomes. EOR is introduced as a managerial diagnostic tool that can be potentially used to convert qualitative TOE factors into pragmatic readiness check with thresholds. It is not a predictive scorecard, but it helps managers mitigate risks and simulate improvement paths before the cutover.

The main limitations are the reliance on secondary case data and the synthesis depends on publicly available case narratives. Some reports may lack module-level granularity and may introduce reporting bias. Future work should incorporate primary data and recommend the EOR to several managers and researchers for review. While the data collected have a diverse background, there is no statistical representation and the findings are analytic generalizations, having mixed methods in the future could enhance external validity. EOR weights and thresholds are theory-informed calculations and not yet empirically calibrated

across a wider sample, future research should validate and refine EOR accordingly. Finally, evolving technology and organizational forms can adjust the risk profile and success levers over time but changing slightly the TOE rubric can mitigate this.

References

Abdelghaffar, H. (2012). Success Factors for ERP Implementation in Large Organizations: The Case of Egypt. The Electronic Journal on Information Systems in Developing Countries, 52(1), 1–13.

Akkermans, H., & van Helden, K. (2002). Vicious and virtuous cycles in ERP implementation: a case study of interrelations between critical success factors. European Journal of Information Systems, 35–46. doi:https://doi.org/10.1057/palgrave/ejis/3000418

Al-Mashari, M., & Zairi, M. (2000). Information and Business Process Equality: The Case of SAP R/3 Implementation. The Electronic Journal on Information Systems in Developing Countries, 1–15.

Awa, H. O., Ukoha, O., & Emecheta, B. C. (2016). Using T-O-E theoretical framework to study the adoption of ERP solution. Cogent Business & Management, 3(1), 3: 1196571.

Baker, J. (2011). The Technology–Organization–Environment Framework. In Y. Dwivedi, M. Wade, & S. L. Schneberger, Information Systems Theory (pp. 231–245). New York: Springer, New York, NY.

Barth, C., & Koch, S. (2019). Critical success factors in ERP upgrade projects. Industrial Management & Data Systems, 119(3), 656-675.

Bingi, P., Sharma, M. K., & Godla, J. K. (1999). Critical issues affecting an ERP implementation. Information Systems Management, 16(3), 7–14.

Bradley, J., & Lee, C. C. (2007). ERP training and user satisfaction: A case study. International Journal of Enterprise Information Systems, 3(4), 33–50.

Butarbutar, Z. T., Handayani, P. W., & Suryono, R. R. (2023). Systematic literature review of Critical success factors on. Cogent Business & Management, 10:3.

Canon, J., dos Santos, R., de Carvalho, V., Monte, M., & de Barros, T. (2025). Integrated Logistics Management Through ERP System: A Case Study in an Emerging Regional Market. Logistics, Vol 9, 2. doi:https://doi.org/10.3390/logistics9020059

Carton, F. L., Adam, F., & Sammon, D. (2008). Project Management: A Case Study of a Successful ERP Implementation (Pharma Inc.). International Journal of Managing Projects in Business, 106–124.

Chatzoglou, P., Chatzoudes, D., Fragidis, L., & Symeonidis, S. (2016). Critical success factors for ERP implementation in SMEs. Proceedings of the Federated Conference on Computer Science, 1243–1252.

Christofi, M., Nunes, M., Chao Peng, G., & Lin, A. (2013). Towards ERP success in SMEs through business process review prior to implementation. Journal of Systems and Information Technology, 304–323.

Coşkun, E., Gezici, B., Aydos, M., Tarhan, A. K., & Garousi, V. (2022). ERP failure: A systematic mapping of the literature. Data & Knowledge Engineering, 142.

Creswell, J. W. (2007). Qualitative Inquiry and Research Design: Choosing Among Five Approaches. London: Sage Publications.

Datta, A. (2009). Cisco Systems Implementing 'Customized' ERP in Nine Months and Within Budget. Journal of Cases on Information Technology, 1–20.

Davenport, T. H. (1998). Putting the enterprise into the enterprise system. Harvard Business Review, 76(4), 121-131.

Davenport, T. H., Harris, J. G., & Cantrell, S. (2004). Enterprise systems and ongoing process change. Business Process Management Journal, 10(1), 16–26.

Dechow, N., & Mouritsen, J. (2005). Enterprise resource planning systems, management control and the quest for integration Accounting, Organizations and Society. Accounting, Organizations and Society, 691–733.

Dezdar, S., & Sulaiman, A. (2009). Successful enterprise resource planning implementation: Taxonomy of critical factors. Industrial Management & Data Systems, 109(8), 1037–1052.

Efthimiou, I. (2014). CASE STUDY ON FAILED IMPLEMENTATION OF ERP SYSTEMS. CASE STUDY ONFAILED IMPLEMENTATION OF ERP SYSTEMS. Athens: Multiple industry reports and academic analyses (Panorama Consulting, Deloitte, CIO.com).

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. Academy of Management Review, 532–550.

Finney, S., & Corbett, M. (2007). ERP implementation: A compilation and analysis of critical success factors. Business Process Management Journal, 13(3), 329-347.

Gargeya, V. B., & Brady, C. (2005). Success and failure factors of adopting SAP in ERP system implementation. Business Process Management Journal, 11(5), 501-516.

Ha, Y. M., & Ahn, H. J. (2014). Factors affecting the performance of enterprise resource planning (ERP) systems in the post-implementation stage. Behaviour and Information Technology, 33(10), 1065–1081.

Hadhri, W., Maherzi, T., & Youssef, A. B. (2017). E-Skills and the Adoption of Cloud Computing. Thunderbird International Business Review, 635–645.

Hasan, N., Miah, S. J., Bao, Y., & Hoque, M. R. (2019). Factors affecting post-implementation success of enterprise resource planning systems: A perspective of business process performance. Enterprise Information Systems, 13(9), 1217–1244.

HGInsights. (2025). ERP Market Share, Size & Key Players in 2025. Retrieved from hginsights: https://hginsights.com/blog/erp-market-share-size-report

Hustad, E., & Olsen, D. H. (2014). ERP Implementation in an SME: A Failure Case. In J. Devos, H. Landeghem, & D. Deschoolmeester, Information Systems for Small and Medium-sized Enterprises (pp. 213-228). Springer.

Kirmizi, M., & Kocaoglu, B. (2022). The influencing factors of enterprise resource planning (ERP) readiness stage on enterprise resource planning project success: A project manager's perspective. Kybernetes, 1089–1113.

Kohansal, M. A. (2019). LESSONS FROM FAILURE ERP IMPLEMENTATIONS. NOKOBIT. Narvik: Department of Computer Science, Norwegian University of Science .

Laudon, K. C., & Laudon, J. P. (2018). Management information systems: Managing the digital firm. Pearson Education Limited.

Mahmood, F., Khan, A. Z., & Bokhari, R. H. (2020). ERP issues and challenges: A research synthesis. Kybernetes, 629–659.

Malik, M. O., & Khan, N. (2021). Analysis of ERP implementation to develop a strategy for its success in developing countries. Production Planning & Control, 32(12), 1020–1035.

Motiwalla, L. F., & Thompson, J. (2012). Enterprise system for management. Pearson Education Limited.

N'Dri, A., & Su, Z. (2024). Successful configurations of technology–organization–environment factors in digital transformation: Evidence from exporting small and medium-sized enterprises in the manufacturing industry. Information & Management.

Nah, F. F., Lau, J. L., & Kuang, J. (2001). Critical factors for successful implementation of enterprise systems. Business Process Management Journal, 7(3), 285-296.

Oseni, T., Foster, S., Rahim, M., & Smith, S. P. (2017). A framework for ERP post-implementation amendments: A literature analysis. Australasian Journal of Information Systems, 21, 21.

Pan, K., Nunes, M. B., & Peng, G. C. (2011). Risks affecting ERP post-implementation: Insights from a large Chinese manufacturing group. Journal of Manufacturing Technology Management, 22(1), 107–130.

Patange, P. P. (2025, 10). SAP ERP systems: Architectural evolution and enterprise digital transformation. Journal of Information Systems Engineering and Management, 1145-1152. doi:10.52783/jisem.v10i60s.13279

Pohludka, M., Stverkova, H., & Slusarczyk, B. (2018). Implementation and Unification of the ERP System in a Global Company as a Strategic Decision for Sustainable Entrepreneurship. Sustainability, Vol 10(8). doi:https://doi.org/10.3390/su10082916

Rahman, M. A., & Saha, B. (2025). An Assessment to Identify Causes of ERP Implementation Failure and to Predict Its Success: A Case Study on Beximco Pharmaceuticals Limited. SSRN Electronic Journal, 213-234.

Rajapakse, D. P., & Thushara, S. C. (2023). Critical Failure Factors in ERP Implementation: A Systematic Literature Review. Journal of Business and Technology, 65–90.

Ramburn, A., Seymoor, L., & Gopaul, A. (2013). Learning From a Failed ERP Implementation: The Case of a Large South African Organization. Cape Town.

Rockart, J. (1979). Chief Executives Define Their Own Data Needs. Harvard Business Review, 81-93.

Saade, R. G., & Nijher, H. (2016). Critical success factors in enterprise resource planning implementation. Journal of Enterprise Information Management, 29(1), 72–96.

Sardhika, J. P., Muharman, L., Witjaksono, R. W., & Azizah, A. H. (2019). Critical Failure Factors in ERP Implementation: PT Toyota Astra Motor Indonesia. Fourth International Conference on Informatics and Computing (pp. 65–90). Semarang: IEEE.

Sarker, S., & Lee, A. S. (2003). Using a case study to test the role of three key social enablers in ERP implementation. Information & Management, 40(8), 813–829.

Saunders, M., Lewis, P., & Thornhill, A. (2019). Research Methods for Business Students. Pearson.

Shaul, L., & Tauber, D. (2013). Critical success factors in enterprise resource planning systems: Review of the Last Decade. ACM Computing Surveys, 45(4), 1–39.

Soh, C., Kien, S., & Tay-Yap, J. (2000). Cultural fits and misfits: Is ERP a universal solution. Communications of the ACM, 43(4), 47–51.

Tornatzky, L., & Fleischer, M. (1990). The Process of Technology Innovation. Lexington Books.

Vargas, M. A., & Comuzzi, M. (2020). A multi-dimensional model of enterprise resource planning critical success factors. Enterprise Information Systems, 38–57.

Walsham, G. (1995). Interpretive case studies in IS research: nature and method. European Journal of Information Systems, 74–81.

Wang, Y., Greasley, A., & Albores, P. (2016). Do manufacturing firms need informality in ERP post-implementation? Journal of Manufacturing Technology Management, 27(1), 100-123.

Westerman, G., Cotteleer, M. J., Austin, R. D., & Nolan, R. L. (1999). Tektronix, Inc.: Global ERP Implementation. Harvard Business School Case 699-043.

Wortmann, J. C. (1998). Evolution of ERP systems, in strategic management of the manufacturing value chain. Springer US. Strategic Management of the Manufacturing Value Chain, 11–23.

Yin, R. K. (2018). Case Study Research and Applications: Design and Methods. Los Angeles: Sage Publications.

Yulong, L. (2011). ERP Adoption in Chinese Small Enterprise: An Exploratory Case Study. Journal of Manufacturing Technology Management, 489-506.

Zhu, Y., Li, Y., Wang, W., & Chen, J. (2010). What leads to post-implementation success of ERP? An empirical study of the Chinese retail industry. International Journal of Information Management, 265–276.

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