



Effect of ERP Implementation on Organizational Performance: Manager's Dilemma

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Abstract. Enterprise Resource Planning (ERP) improves commercial activity control and provides a competitive advantage when combined with existing benefits. However, end-users oppose ERP implementation because it disrupts the status quo. In addition, ensuring that all operational units use the same ERP system is not an easy task. Therefore, a lack of adaptability is the cause of ERP failure. This study used a qualitative case study approach to analyze an event and understood the ERP system and natural phenomena. The data was collected using a semi-structured interview. The researcher reached data saturation at the 15th respondent's feedback. Documentary data were examined for patterns and themes prior to triangulation. The result of this study shows that end-user support is critical to a system's daily operation and implementation, especially when it is new. Only a system that has been effectively designed, delivered, and trained may be used by end users. Implementing ERP enhances an organization's capacity and performance. Post-implementation evaluation is needed to determine the organization's potential and the system's value. Except for financial performance, the organization's overall performance has improved across all Balance Score Card (BSC) perspectives of internal processes, customers, learning, and growth. Adopting new technologies is expected to enhance the organization's overall efficiency. Each identified thematic area affects an organization's ability to use its ERP system effectively and efficiently to achieve previously identified benefits. In addition, the study found that STP organizations focus on the benefits of implementing ERP rather than the associated costs. Finally, organizations can better plan for the future benefits of replacing or updating ERP systems.

Keywords: Behaviour of the end-user; Enterprise performance; ERP system; Post-ERP implementation; STP organization

1. Introduction

Enterprise Resource Planning (ERP) systems represent the most significant development in the application of information technology. However, risks associated with implementing an ERP system include the challenge of learning new systems and the need for enterprise-specific procurement plans. However, by implementing project management, limiting the project's scope, and avoiding extensive system customization, this risk can be reduced.

Companies frequently run into operational issues after making a sizable ERP investment (Ismail & Harun, 2021). The Malaysian Science and Technology Park (STP) is also experiencing similar challenges. In addition, end-users frequently object to ERP

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implementation because it has resulted in unavoidable workplace changes (Liere-Netheler et al., 2017). Based on previous research, the failure of ERP implementation may be attributed to the inability of employees to communicate effectively and meet changing standards (Bento et al., 2019). In addition, employees' attitudes towards ERP implementation may negatively impact productivity and client satisfaction. Additionally, if a company spends too much to implement an ERP, it may also damage the reputation of the ERP system.

Notwithstanding the benefits and challenges of the ERP system, the STP for this study had decided to proceed with implementing the ERP as part of its digital transformation initiative. The STP chose ERP because of its non-financial and financial benefits. After implementation, the STP did not evaluate the ERP systems to see if their potential had been fully realized. As a result, preliminary interviews indicated that STP end-users have mixed feelings toward adopting the ERP. Thus, this ERP study aims to determine how ERP has benefited the STP organization.

The most challenging phase of an ERP system is system implementation. ERP/SAP implementation uses the SAP Accelerated SAP (ASAP) methodology (Mueller et al., 2019). The ASAP methodology is an effective SAP project management tool for planning, managing, and implementing SAP (Supriyono & Sutiah, 2020). However, the current ASAP methodology lacks an evaluation element to assess the ERP post-implementation benefits. After years of ERP implementation, a post-implementation evaluation is recommended to determine if benefits were realized. Following ERP implementation, a new framework for ASAP will be created by adding evaluation components. Therefore, this study aims to provide managers with the knowledge necessary for a successful ERP implementation.

1.1. Implementation Challenges

ERP systems have the potential to help businesses improve their operations and develop a competitive edge (Alomari et al., 2018). It is because the ERP system integrates best practices, management capabilities, real-time reporting, and data analysis to increase value creation and efficiency within the organization. Furthermore, in today's business environment, an ERP system enables the organization to manage all aspects of its operations comprehensively (Ullah et al., 2018). As a result, ERP systems improve process efficiency, streamlined inventory, supply chain communication, and customer experience (Govindaraju et al., 2018). Furthermore, an ERP system can reduce costs and increase investment return, improving consumer decision-making (Seyal & Rahman, 2017). Additionally, the ERP reduces turnaround times, order cycles, and inventory levels (AboAbdo et al., 2019).

Notwithstanding the above, the organization often faces business issues after significant investment in an ERP system, which receives no return (Abd-Elmonem et al., 2017). This study was done on STP ERP systems because they face similar implementation challenges. The fact that no system performance evaluation had been carried out despite years of ERP implementation also motivated this study. Therefore, the study findings will assist future ERP system implementations by understanding key issues and potential solutions. Furthermore, IT managers and managers must be able to quantify the system's benefits to justify ERP maintenance costs (Berić et al., 2018). When an ERP system is fully implemented, only then its benefits become apparent.

1.2. Research Gaps

- Gap 1: The research gap on ERP post-implementation within STP focuses on end-user resistance to change to a new system.
- Gap 2: There is a research gap in the success of ERP implementation in STP, which focuses on organizational performance using a balanced scorecard.
- Gap 3: The ASAP methodology has a research gap in the post-ERP implementation component. i.e., ERP success requires post-implementation evaluation.

2. Relevant Theories and Models to the Implementation of ERP System

STS, UTAUT, and BSC are among the theories/model that may explain the challenges, as shown in Table 1 below. This section provides an overview of relevant theories and approaches to the study.

Table 1 Relevant Theories/Models

Theories /Model	Description	Why the Theory / Model is appropriate for this study?
Social Technical System (STS) Theory	The STS emphasizes person-process interactions in achieving organizational goals. (Thomassen et al., 2017)	This STS theory suggests that combining ERP with social and technological factors can improve outcomes. According to the STS theory, ERP performance improves when it meets business and social needs. User participation improves system acceptance and reduces resistance. (Demyanova et al., 2018)
Unified Theory of Acceptance and Use of Technology (UTAUT)	Evaluating user acceptance of technology (Chakraborty, 2018) determines the likelihood of a successful ERP implementation.	The UTAUT theory can help a company identify acceptance factors. Hence, this allows for the design and implementation of marketing and training aimed at those less likely to adopt and use ERP systems (Asvial et al., 2021). In addition, UTAUT will be used to collect data to help identify ERP effectiveness and ROI in this study.
Balanced Scorecard (BSC)	The Balanced Scorecard (BSC), created by Kaplan and Norton (1992), helps businesses manage performance and align strategy and vision (Gozali et al., 2020)	According to research, balanced Scorecards are effective ERP project evaluation tools (Parto, 2017). According to other studies, BSC has two ERP management responsibilities (Sislian & Jaegler, 2020). First, help a company turn its vision into strategies. Second, the system must be constantly monitored and controlled.

The following are the objectives of this paper:

- a) To review post-implementation research gaps in the Malaysia STP organization,
- b) To propose an STP conceptual framework based on research results.

2.1. Conceptualisation

Figure 1 shows a conceptual framework for post-implementation studies emphasizing the evaluation stage. The two predominant theories and the BSC method for comprehending these three distinct facets:

- a) Sociotechnical system (STS) theory: End user behavior
- b) A unified theory of technology acceptance and use technology (UTAUT) for ERP implementation
- c) A Balanced Scorecard (BSC) approach to measuring organizational performance

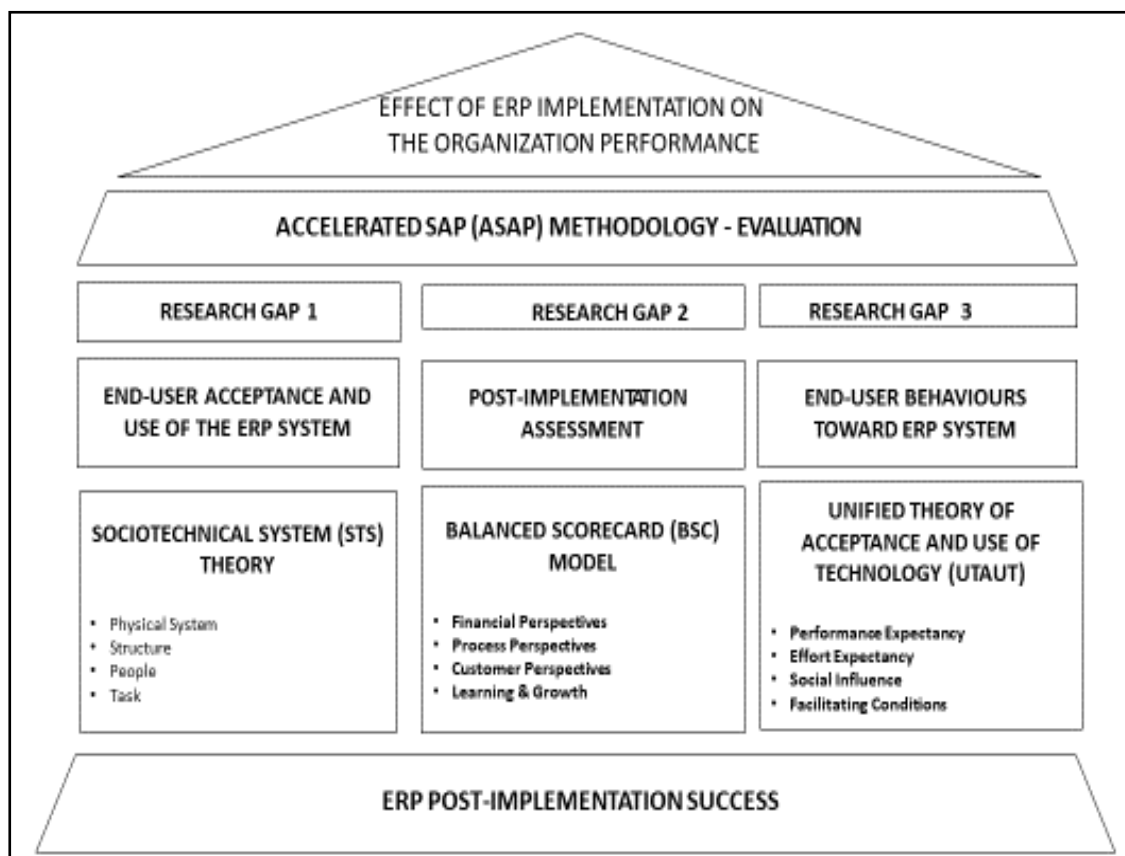


Figure 1 Conceptual Framework

3. Methods

This study is based on an interpretive paradigm appropriate for investigating natural phenomena using the qualitative research method (Thelwall & Nevill, 2021). As a result, this study employs a case study methodology (Vega, 2018). Interviews were collected using semi-structured questions (Boulos et al., 2022). Triangulation was used to check the accuracy of the interview data (Goodman-Scott, 2022). The study's case organization is a Malaysian STP. Therefore, the sample for this study was chosen using purposive sampling (Doan, 2018). Purposive sampling is a non-random sampling design in which respondents were selected based on their similarity to the phenomenon under study (Agapiou, 2022).

This sample included fifteen (15) respondents who were interviewed from four different employee groups at the Malaysian STP organization. End users of ERP systems and those working on ERP implementation projects in Malaysia STP are eligible for participation because they meet the criteria of the sample. At the fifteenth (15) participant, data saturation was achieved. Data saturation aims to determine when to end data collection (Lassig, 2022). In addition, according to Yin (1994), a diverse group of respondents gives more useful answers (Ye, 2022).

In this study, a qualitative data analysis methodology was employed. The qualitative data revealed recurring patterns in underlying themes or beliefs (Darko, 2022). Furthermore, themes and patterns from the qualitative data analysis were extracted, and the results were triangulated with data from the supporting documentation. Therefore, this study used respondents' semi-structured interview data and other relevant documents related to the implementation of the ERP. Thematic analysis was used to analyze the study interview data. Analysis of interview data revealed the shape and meaning of substances (Maming, 2022). The use of thematic analysis has made it possible to identify common

analysis, external factors like the economic slowdown, for example, cannot be considered (Kliestik et al., 2020).

4.5. Organisation Performance Assessment using a Balanced Scorecard Model (BSC)

In the case organization or a selected STP organization, three years after implementing ERP, overall organizational performance based on the Balanced Scorecard assessment had improved from internal processes, customers, and learning and growth, except for financial performance, which had decreased. The organization's financial performance is impacted by several factors, such as the ERP implementation and external factors beyond its control. External factors such as the slowdown in the economy, shifts in government policy, and the inability to secure contracts have contributed to the organization's poor financial performance.

4.6. Triangulation

Using a technique known as "triangulation" in qualitative research can help improve the validity of the results (Bryman, 2004). The researcher collects data that converge from various methods or data sources. For example, this section will discuss Research Question 2 (RQ2) findings. The current study used triangulation to ensure the highest data quality by examining participant perceptions using semi-structured interviews, financial data analysis, and the organization's Balanced Scorecard output on Research Question 2 (RQ2).

The fifteen (15) semi-structured interviewees' responses support the second Research Question (RQ2). Participants agreed that the ERP implementation improved the non-financial performance of this organization, except for financial performance. This response is consistent with this organization's financial ratio analysis before and after ERP implementation. This analysis revealed that the organization's financial performance had deteriorated due to the ERP system's implementation. On the other hand, implementing ERP has increased performance across all three (3) Balanced Scorecard dimensions, namely internal processes, customer service, and learning and growth.

5. Discussion

This study looks at how interactions among people, processes, and technology can improve the implementation and use of ERP. As no previous research has examined the STP organization's ERP challenges, this study focuses on the STP organization. The conceptual framework for this study originates from the STS, UTAUT, and Balanced Scorecard (BSC). Accordingly, STS, UTAUT, and BSC were used to examine whether implementing an ERP benefited STP organizations. The qualitative case study also explored end-user ERP adoption and post-implementation evaluation to determine if STP fully leveraged the system's benefits. Furthermore, this study can help organizations implement strategies and processes and realign management support to increase ERP acceptance and end-user use.

This study led to the identification of three major themes. Each thematic area influences an organization's performance and end-users ability to use the ERP effectively to achieve their objectives. The study results indicate that ERP systems have enhanced organizational performance, except for financial performance, which has declined. In order to promote the adoption of the ERP, this should be followed by ongoing end-user training. In addition, it is essential to make regular use of the system and to provide the necessary resources to increase operational success and achieve the expected benefits. As a result, end-users will be more likely to embrace change if they have adequate resources, continuous learning, and a user-friendly system. Thus, the ERP project will be able to achieve its objectives, and the STP organization will reap all the benefits. Furthermore, this

study may influence STP's future decision to invest in an ERP system, enabling the company to maximize benefits.

6. Conclusions

This study aims to inform the ERP Knowledge Community about research gaps in ERP implementation and organizational performance. Adopting new technologies is expected to improve the organization's overall effectiveness. After ERP was implemented in this STP organization, its relationship to organizational performance was analyzed. These thematic areas influence an organization's ability to utilize its ERP system effectively. For example, organizations with knowledge-based employees may ignore the full impact of missing or incomplete attributes and inadequate training if they are not carefully monitored. The study found that STP organizations prioritize the benefits of implementing an ERP system over the costs. In addition, as the organization replaces or upgrades the system, it will have a better return on investment plan.

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