

# TOWARDS A FRAMEWORK OF ERP IMPLEMENTATION OUTCOMES

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## ABSTRACT

Enterprise Resource Planning (ERP) systems are becoming an essential component of organizational strategy for companies striving to integrate and extend their enterprises. ERP systems that are properly implemented and supported enhance organizational competitiveness through the integration of modular business applications. This study explores the factors contributing to the success / failure of ERP projects and frames a conceptual framework of ERP implementation outcomes. The framework is based on the analysis of ERP case studies and two ERP implementation projects at Trojan Battery Company (TBC). The practical significance of the proposed framework is in helping IT specialists and their business clients devise tactics for successful ERP implementation. Future research is needed to test the framework and evaluate the interdependence of the success factors for ERP implementations.

## BACKGROUND

Enterprise Resource Planning (ERP) systems are commercially available software packages that enable the integration of transactions-oriented data and business processes throughout an organization (Par and Shanks, 2000). The integrated modular applications of ERP systems may include Material Planning System (MPS), Material Requirement Planning (MRP), Financial Reporting Planning (FRP), Supply Chain Management (SCM), Customer Relationship Management (CRM), and a host of other modules. The ERP implementation process is comprised of seven inter-depending phases, including setting the context for the project, business process redesign, analysis of requirements, system selection and contract negotiation, implementation planning, system implementation and post implementation review (Ball, 2001). The motivation to implement an ERP system can be assessed using McFarlan's strategic grid in which factory, strategic, support, and turnaround strategies are plotted against IT impact on core operations and IT impact on core strategy. In spite of the many benefits of implementing the software that integrates and extends the enterprise, more than 50% of all ERP implementations end in failure (Robbins-Gioia, 2002). The purpose of this study is to develop a framework of ERP implementation outcomes based on the analysis of case studies for successful/failed ERP projects.

## ANALYSIS

A successful ERP implementation project begins with a well thought out implementation process, from setting the context for the project through vision and commitment to post implementation review and planning. The analysis of ERP case studies and two ERP projects at Trojan Battery Company, revealed five success and six failure factors for ERP implementation projects. In the case of TBC, a manufacturer of deep cycle batteries, the first of the two ERP projects caused a virtual blackout of all operations, leading to extended product shipping delays and loss of several major customers. On the other hand, the second implementation was considered a success because the project's stated goals were met. The analysis of the TBC's ERP implementation experience and five other ERP case studies revealed five

factors contributing to successful ERP implementations and six factors contributing to failures. Tables 1 and 2 summarize these factors. The five ERP implementation cases analyzed in this study were as follows: Edgetech Inc. (Nelson, 2000); Nestle USA (Worthen, 2002); Great Atlantic & Pacific Team Company (Patton, 2001); Cisco (Applegate et al., 2003); Harley-Davidson (Applegate et al., 2003); FoxMeyer (Scott, 2004).

**Table 1: Factors contributing to successful ERP implementation outcomes**

<b>Factor</b>	<b>Description</b>
<i>Top management assumes project ownership</i>	Top management has two key responsibilities during the ERP implementation process: (1) provide leadership; and (2) provide the necessary resources.
<i>Strong and multi-talented project management</i>	The ERP implementation project manager must lead the project team with clear and concise communication of the goals and objectives and provide the team with the proper processes so that appropriate timings, resources and tasks are executed in their proper sequences to produce outcomes that match the goals and objectives of the project.
<i>Active risk management and tight project controls on schedule and scope</i>	The ERP implementation process is very costly and involves every aspect of the company. Therefore, it is prudent for a company to have an active risk management program. Furthermore, a formal reporting process should be established and adhered to by top management and the project team. This process should be conducted frequently to allow time for corrections to keep the project on scope, on budget and on time.
<i>Capable and committed project team members</i>	To keep the ERP implementation on schedule and within budget capable project team members are a must. The project manager needs to negotiate with top management to ensure that the brightest, most capable resources are allocated to the ERP implementation team.
<i>Good external consultants</i>	Finding a good external consultant/supplier can be a long, arduous process; however, this process should never be cut short.

**Table 2: Factors contributing to failed ERP implementation outcomes**

<b>Factor</b>	<b>Description</b>
<i>Weak Project Risk Assessment Processes</i>	The greatest deficiency that occurs during ERP implementations is the failure to assess and mitigate project risks.
<i>No Executive Sponsor</i>	Nothing can cause an ERP implementation to fail more quickly than having a weak liaison between top management and the implementation team.
<i>No Buy-in</i>	An ERP implementation is a corporate project, not an IT project. Each functional group must be not only involved in the ERP implementation process, but also must have a say in the process design.
<i>No Full-time Project Manager</i>	Due to the complex nature of an ERP implementation, at least one full-time project manager should be allocated to the project. A failure to have this full-time project manager can lead to delays and project overruns.
<i>Lack of Training</i>	Companies often overlook the importance of training the people who actually use the system.

## DISCUSSION

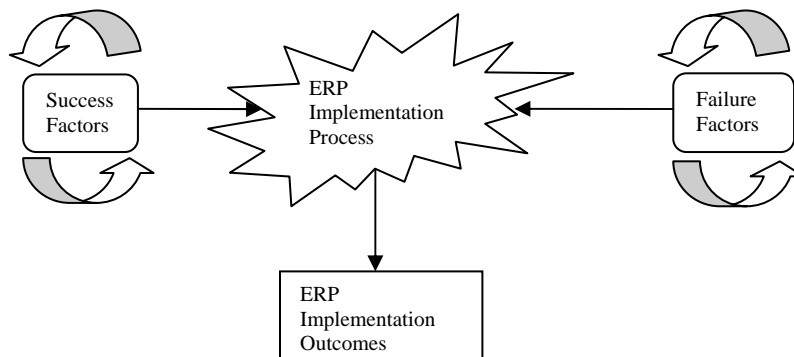
It might seem that all of the factors for a successful or non-successful ERP implementation discussed in the previous section are independent factors that should not affect each other. However, as the case studies demonstrated, these factors are quite interdependent. It is the corporate culture within the company that intertwines these factors together. In essence, as one of these success factors begins to fail during the ERP implementation process, it affects other critical factors, causing a snowball effect to the point where the company may have little chance of a successful ERP implementation.

Figure 1 presents a framework of ERP implementation outcomes derived from the analysis of case studies and two ERP projects at TBC. The factors for a successful or non-successful ERP implementation discussed in this study are not independent factors because an organization is a living entity with a set culture that is derived from being in business over an extended period of time. The culture binds these factors together making them interdependent, especially due to the very intrusive nature of an ERP implementation. A major flaw within any of the five factors for a successful ERP implementation can result in a snowball effect that can quickly lead an organization down the path to a failed ERP implementation.

However, a company can recover from a downward spiraling ERP implementation by reversing enough of the negative success factors, such as top management did in the case of Trojan Battery Company. While this approach can be very difficult, it is obviously advisable to start the ERP implementation process by having a solid foundation of success factors in place.

The effort to avoid an ERP implementation failure should begin with the realization that without the proper executive support, strong project management team, active risk management, tight project control, capable/committed project team, and good external consultants any attempt at an ERP implementation is likely to fail. The executive team and the ERP implementation team must work in concert with each other and actively assess the state of the ERP implementation at regular intervals.

**Figure 1: Framework of ERP Implementation Outcomes**



## SUMMARY AND CONCLUSION

An ERP system can produce many benefits to an organization; however, because ERP implementations involve every aspect of the organization, they need to be approached judiciously to avoid costly and crippling implementation failures.

A successful ERP implementation begins with a solid foundation of the success factors as discussed in the study. It is important for this foundation to exist before a company decides to implement an ERP system because these success factors are interdependent. Any one negative success factor can result in a snowball effect that can cripple the chances for a successful ERP implementation. If a company does experience this snowball effect, reversing enough of the negative success factors will put the company back on the path to a successful ERP implementation.

Trojan Battery Company was rewarded tremendously after its second, successful implementation of the ERP system. The average lead-time of an order to shipment is now only ten business days, compared to an average of four weeks, before the ERP implementation. The ERP system created the necessary infrastructure for a make-to-order environment. Within a year-and-a-half after its second ERP implementation, Trojan Battery Co. reduced its raw material carrying cost from \$8 million to \$4 million. Furthermore, customers not only receive their product on time, currently at 96%, but product accuracy has never been better in the almost 80-year history of the company.

As the IT specialists and their business clients embark upon the ERP implementation efforts, they should have a good understanding of the factors that can either positively or negatively impact the implementation outcomes of their project. The practical significance of this study is in making the success / failure factors for the ERP projects explicit and exploring the inter-related nature of these factors. The next step in the inquiry of the factors that facilitate or inhibit successful ERP implementation projects is to test the proposed framework and further evaluate the interdependence of these factors. Furthermore, more research is needed to delineate the specific factors that impact *each phase* of the ERP implementation process.

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