

# Assessing Critical Success Factors of ERP Implementation

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## INTRODUCTION

An enterprise resource planning (ERP) system is an integrated set of programs that provides support for core organizational activities. ERP is a software infrastructure embedded with “best practices,” or best ways to do business based on common business practices or academic theory. The aim is to improve the cooperation and interaction between all the organizations’ departments, such as the products planning, manufacturing, purchasing, marketing and customer service department. ERP systems is a fine expression of the inseparability of IT and business. As an enabling key technology as well as an effective managerial tool, ERP systems allow companies to integrate at all levels and utilize important ERP systems applications, such as supply-chain management, financials and accounting applications, human resource management and customer relationship management (Boubekri, 2001). ERP systems hold the promise of improving processes and decreasing costs. Furthermore, two important new frontiers for ERP systems are electronic business (e-business) and supply-chain management (Wang and Nah, 2001). The systems can connect with suppliers, distributors, and customers, facilitating the flow, the product and information.

ERP systems implementation is costly and complex. In many cases, an ERP system is the largest single investment in any corporate-wide project. The software is expensive, and the consulting costs even more. Meta Group found that the average ERP systems implementation takes 23 months with total owners’ cost of \$12 million (Stewart, 2000). The ERP systems implementation is the process where business process and ERP system match each other. Usually the firm has to change the business process per ERP systems. Sometimes most positions have to be redesigned according to the ERP systems. Thus the difficulties and high failure rate in implementing ERP systems have been widely cited in the literature (Davenport, 1998; Kim, Lee, & Gosain, 2005). The failure percentage of ERP systems was determined by one study as ranging from 40 to 60% and from another study as between 60 and 90% (Langernwalter, 2000; Ptak and Schragenheim, 2000; Yingjie, 2005).

Although the failure rates of these ERP implementations have been highly publicized, this has not distracted companies from investing large sums of money on ERP systems (Somers & Nelson, 2004). ERP systems provide companies with the

means of integrating their business functions into a unified and integrated business process. As companies implement more enterprise based systems throughout their organizations, the need for integration of these systems becomes even more paramount. Expanding from the functional areas of accounting, human resources, and shop floor control to an enterprise-wide system has become a format for producing full organization integration.

Over the past few years, limited research has been conducted about ERP implementation issues: mainly case studies in individual organizations have been reported. That is a motivation toward conducting empirical studies to explore critical factors that affect ERP systems implementation.

This study presents the results of an empirical study that surveyed managers from seven corporations, who were identified as having a key role in ERP systems implementation, in order to assess empirically which CSFs are critical in leading a successful implementation of ERP systems. A factor analysis solution was used to derive factors affecting successful ERP implementation. These factors are: ERP implementation management, users aptitudes and communication and technical knowledge. The study reveals that about 81.5% of the variances in ERP systems implementation were explained by the critical factors identified in the study.

The remainder of this article is organized in four sections. First ERP-related literature is reviewed. The next section introduces the research methodology, followed by the presentation of the results. The paper ends with the conclusions and implications for future research and practice.

## BACKGROUND

Implementing an ERP system is not an easy task (Tsai et al., 2005). It can cause dramatic changes that need to be carefully administered if the potential advantages of an ERP systems solution (Al-Mudimigh, Zairi, & Al-Mashari, 2001) are to be gained. In some well-documented cases, spectacular results have been achieved (Johnston, 2002). There is on the other hand a relatively high failure rate: it was reported that three-quarters of ERP systems projects were judged to be unsuccessful by the ERP systems implementing firms (Kyung & Young, 2002). What is more, failures are much less extensively documented. As a result, pitfalls to be avoided tend to be less well known.

## Assessing Critical Success Factors of ERP Implementation

A recent summary of ERP systems literature states that research of critical success factors (CSFs) in ERP systems implementation is rare and fragmented (Nah, Lau, & Kuang, 2001). Identifying CSFs relevant to local companies is one way to increase the chances of a successful local implementation (Sum, Ang & Yeo, 1997). The idea of identifying CSFs as a basis for determining the information needs of managers was popularized by Rockart (1979). CSFs are those factors that are critical to the success of any organization, in the sense that, if objectives associated with the factors are not achieved, the organization will fail—perhaps catastrophically (Rockart, 1979). In the context of ERP systems project implementation, CSFs represent the essential ingredients without which a project stands little chance of success. (Colmenares, 2005)

A literature review was conducted to understand the CSFs in successful ERP implementations. So we find that in a study on ERP implementation in China, the authors posit strong considerations for national cultural issues, since critical success factors may vary significantly, depending on the country in which an implementation is carried out (Shanks & Parr, 2000). ERP implementations have also been investigated through case studies with varying degrees to describe critical success factors. These include the impact of

ERP on job characteristics (Perez & Rojas, 1999), strategic options open to firms beyond the implementation of common business systems (Upton & McAfree, 1997), means to avoid ERP project failures (Scott, 1999), issues of business alignment (Smethurst & Kawalek, 1999; Volkoff, 1999) business process reengineering (BPR) ( Slooten & Yap, 2000), and change management (Klaus, Rosemann, & Gable, 2000). Others studies have assessed the ambiguous role of large systems as both catalysts and inhibitors to change (Pawlowski & Boudreau, 1999) analyze the special challenges of ERP implementations outside the business world (Sieber & Nah, 1999), and describe global supply chain (Chatfield & Andersen, 1998 ). Implementing ERP with or without BPR has been surveyed and analyzed (Bernroider & Koch, 1999). Theoretical considerations have focused on global business processes (Basu & Palvia, 1999) and IT architecture options (Chan, 1999), as well as on enhancement of process engineering and development methodologies (Sato, 2000).

The critical challenge in ERP implementation has been to first identify the gaps between the ERP generic functionality and the specific organizational requirements (Soh, Kien, & Tay-Yap, 2000). Too often, ERP adopting companies fail to understand the business requirements which the ERP systems are expected to solve. The congruence between

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Table 1. Critical success factors for ERP implementation

Top management support
User training
Use of consultants
User participation
Vendor package selection
Use of steering committee
Discipline and standardization
Minimal customization
Use of vendor's development tools
Best people full time
Technical and business knowledge
Implementation approach
Clear goals, focus and scope
Business process reengineering
Project management
Effective communications
Presence of a champion
Interdepartmental cooperation and communication
Management of expectations
Vendor/customer partnership

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