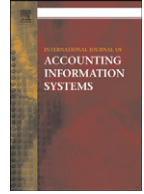Contents lists available at ScienceDirect

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Management based critical success factors in the implementation of Enterprise Resource Planning systems

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ABSTRACT

This study examines critical success factors for implementing Enterprise Resource Planning systems using the framework of classical management theory. The study is motivated by conflicting results in earlier studies examining critical success factors in Enterprise Resource Planning implementation, many of which are anecdotal in nature. Ten critical success factors in ERP systems implementation proposed in past literature are selected. The relationship between each of these factors and project success is examined. Project success is defined as organizational impact and on time and on/under budget project completion. Eight implementation projects were qualitatively analyzed using the case study method to examine the proposed relationships. The findings suggest that choosing the right full time project manager, training of personnel, and the presence of a champion relate to project success. The use of consultants, the role of management in reducing user resistance and the use of a steering committee to control the project do not appear to differentiate successful and unsuccessful projects. Integration of ERP planning with business planning, reporting level of the project manager, and active participation of the CEO beyond project approvals, resource allocation and occasional project review, are not found to be critical factors of success. Considering the financial cost and risk associated with these projects, a better understanding of critical success factors will enable practitioners and academics to improve the chance of success in the implementation projects. All organizations implementing ERP, especially small and mid-sized enterprises with limited resources, will benefit from this knowledge.

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1. Introduction

This paper examines critical success factors (CSFs) in Enterprise Resource Planning (ERP) systems implementation. Much of the prior work on CSFs relies upon surveys of project managers, IT executives or consultants giving prescriptive recommendation without systematically examining whether the practices were actually used in projects or if those projects were successful. This paper contributes to the growing literature on critical success factors in ERP implementations by determining whether the practices recommended in the literature are actually used in ERP implementation projects and whether these practices are related to project success. Ten critical success factors suggested in the IT and ERP literature were selected and tested using eight case study companies to determine: (1) whether the practices recommended in the literature were followed in their implementation projects; and (2) whether the projects were successful in terms of organizational impact and were completed on time and on budget.

ERP systems promise to provide an integrated, packaged software solution to the information needs of organizations for replacement of legacy information systems. These legacy systems are usually aging piecemeal solutions created by IS departments or older off-the-shelf packages that have become difficult to maintain and no longer meet the business needs of the organization. Despite the promise of ERP systems, these software solutions have proven "expensive and difficult to implement, often imposing their own logic on a company's strategy and exiting culture" (Pozzebon, 2000, p. 1015). Numerous examples of failed and abandoned implementation projects are cited in past literature, such as Fox–Meyer Drug, Mobile Europe, Dell and Applied Materials (Davenport, 1998). Wah (2000) cites failures at Whirlpool, Hershey, Waste Management, Inc. and W.L. Gore & Associates. Further, the University of Massachusetts-Amherst (Bray, 2004) and Indiana University (Songini, 2004), have also experienced lost revenue, wasted time, cost over-runs and delays in ERP implementation projects. The Chaos Chronicles indicate that only 34% of IT projects undertaken by Fortune 500 companies are successfully completed (Nelson, 2005). ERP is no exception. Muscatello and Parente (2006) cite ERP failure rates to be as high as 50%. Although these findings differ in percentage, the message is clear that IT projects, including ERP, are very risky. Brown and Vessey (2003) observe, "Although failures to deliver projects on time and within budgets were an old IT story, enterprise systems held even higher risks — they could be a 'bet-our-company' type of failure" (p. 65). Nike's ERP implementation is included in a listing of "infamous failures in IT project management" because of a major inventory problem which resulted in a profit drop of $100 million in the 3rd quarter of 2000 (Nelson, 2007).

Although many large organizations have completed their initial ERP implementations, demand for enterprise systems from small and mid-sized organizations is increasing (Gable and Stewart, 1999). With limited resources, experience and staffing skills (Nelson, 2007), these organizations may face problems implementing ERP. As ERP vendors add functionality to their software, large organizations that did not participate in the first wave of implementations are now purchasing the systems.

Global businesses seek to improve or maintain their competitiveness in the increasingly challenging global market place. Information systems are often used as a tool to improve customer service, shorten cycle times and reduce cost. Hitt et al. (2002) demonstrate that firms which invest in ERP show "higher performance across a wide variety of financial metrics." Wagner and Newell (2006) describe ERP as providing a powerful business system infrastructure for organizations providing "a depth of information by function and also a breadth of information horizontally across the value chain" (p. 42).

The challenges of completing successful ERP implementations have not deterred business spending. ERP spending grew from $20 billion annually in the late 1990s (Davenport, 1998) to $47 billion in 2001 (Cotteleer, 2002). Large sums continue to be spent on ERP implementation projects. Hunter and Lippert (2007) forecast the ERP market to reach $US 1 trillion by 2010. A Forrester survey found that ERP and enterprise applications remained "the top IT spending priority for 2005" (Hamerman and Wang, 2006). A summer 2005 survey of members of the Society for Information Management showed that ERP is among the top application and technology developments of its members (Luftman et al., 2006). By industry, ERP ranked second in manufacturing and education. The importance of ERP systems to an organization's competitiveness and the magnitude of ERP expenditures in relation to firm resources imply that executives who implement these systems and academics studying ERP need to know which factors are likely to improve the chances of successful implementation. This study seeks to examine those critical factors leading to ERP success.

A measure of success of IS projects that has been widely used is the Information Systems Success (ISS) theory. This theory is based on a six dimensional model consisting of systems quality and information