INFORMATION & MANAGEMENT

A taxonomy of players and activities across the ERP project life cycle

Toni M. Somers[a,*], Klara G. Nelson[b]

[a]*Department of Information Systems and Manufacturing, School of Business Administration,*
Wayne State University, 5201 Cass Avenue, Detroit, MI 48202, USA
[b]*Department of Information and Technology Management, John H. Sykes College of Business,*
The University of Tampa, 401 West Kennedy Blvd., Tampa, FL 33606-1490, USA

Abstract

An important problem in probabilistic description is to understand who are the key players, which activities associated with enterprise system implementations are important, and when their effect is most prevalent across the IT development stages. Using an information theory approach, we analyze the fit between their importance, as noted in the current literature, and the experiences reported by a cross-section of 116 organizations that completed an enterprise system implementation experience. Our results suggest that the early literature- and case-based research on enterprise systems does not take into account the importance of several key variables. These findings provide guidance to managers on how best to utilize their limited resources by employing such factors at the stage in the project's life cycle when they will have the greatest impact.
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Successful implementation of information systems continues to be a source of great managerial concern and frequent frustration [71].

1. Introduction

Enterprise resource planning (ERP) systems have been considered an important development in the corporate use of information technology in the 1990s, enhancing organizational cross-functional efficiency and effectiveness through the seamless integration of all the information flowing through a company [23]. Major business drivers behind ERP implementations are: improving productivity, providing competitive advantage, and satisfying customer demands. With ERP penetration at 67%, the ERP market is the largest segment of a company's applications budget (34%) and is expected to remain so through 2004 [80].

ERP systems are complex pieces of software. Consequently, many such implementations have been difficult, lengthy and over budget, were terminated before completion, and failed to achieve their business objectives even a year after implementation [64]. The significance and risks of ERP make it essential that organizations focus on ways to improve ERP

* Corresponding author. Tel.: +1-313-577-6116/9145;
fax: +1-313-577-4880.
E-mail address: toni_somers@wayne.edu (T.M. Somers).

implementation. Combining the factors view of implementation with a process perspective, we have examined a comprehensive framework that allows us to investigate the issues that should dominate each implementation stage. Specifically, we explored the following important questions:

- Which key players and activities are playing a pivotal role in an organization's experience with the ERP implementation?
- At which stage of the implementation process is it critical for an organization to introduce a key player or activity in order to derive major benefits?

Based on an extensive review of the practitioner and research literature we classified a number of critical success factors using the Markus and Tanis [56] framework into key players and typical activities. We also examined the importance of each player and activity using Cooper and Zmud's [21] six-stage model of IT implementation to determine when key players and activities need to be given higher priority than others. We then used an information theoretic approach to analyze the information discrepancy between the hypothesized literature-based importance of each player and activity across stages and their actual importance derived from a survey of medium to large organizations that completed their ERP implementation.

2. Theoretical background

2.1. A factors view of ERP implementations

A number of factors that affect the implementation process and the probability of conversion success have been identified in the literature [48,50,52]. The study of ERP systems and the factors that impact their success have been the subject of empirical investigation only recently. Success factors identified in the literature include support and commitment of senior management, redesign of business processes to fit the software, investment in user training, avoidance of customization, use of business analysts and consultants with both business knowledge and technology knowledge, integration of ERP systems with other business IS, and ability to build key in-house IT capabilities [31,87]. A review of the nonacademic literature suggests other important factors, such as

careful software and vendor selection, standardization, transition planning and data conversion, upfront business changes, and ongoing vendor support. In summary, our review of the academic and non-academic literature, which included descriptions and analyses of ERP implementations at 111 companies, yielded 22 players and activities that are considered critical for such implementations (see Appendix A).

2.2. A process view of ERP implementations

While a factors view identifies which issues are critical to the implementation process, a process approach, which has historically been neglected in the IS field, sees implementations as a sequence of stages and seeks to explain how outcomes develop over time [12,57]. Researchers have described ERP transition with models having three to six stages (e.g. Deloitte Consulting's [26] three-stage model, Ross and Vitale's [75] five-stage model). Rajagopal [68] frames ERP implementations in terms of the six-stage model of IT implementation consisting of initiation, adoption, adaptation, acceptance, routinization, and infusion. A strength of this model is in the last two phases, which represent post-adoption behavior.

2.3. Integrated model of the ERP implementation experience

Success factors can, of course, be temporal, i.e. their relative importance changes with the stage of the project life cycle [72]. We therefore integrate the factors approach with the six-stage IT implementation stage model and provide the more comprehensive research model of ERP implementations shown in Fig. 1 to determine the significance of players $(P_1, \ldots, P_n)$ and activities $(A_1, \ldots, A_n)$ in the implementation process for a particular period of time.

3. Key players and activities across the ERP project life cycle

3.1. Key players

3.1.1. Top management

Sustained management support, cited as the most relevant factor in implementation projects, is needed