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An investigation of critical management issues in ERP implementation: emperical evidence from Canadian organizations

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Abstract

The study investigates critical management issues in Enterprise Resource Planning (ERP) implementation projects such as selection of ERP vendor, project manager, and implementation partners; constitution of project team; project planning, training, infrastructure development, on-going project management; quality assurance and stabilization of ERP. The innovation process study approach is taken and data is collected from 20 organizations using a questionnaire and structured interviews. Although each adopting organization has a distinct set of objectives for its systems project, we found many similarities in motivations, concerns, and strategies across organizations. This study identifies many critical concerns in ERP project management.

Keywords: ERP implementation; Process theory approach; Technology innovation

1. Introduction

Enterprise resource planning (ERP) systems are reshaping business structures because they promise to solve the challenges posed by portfolios of supposedly disconnected and uncoordinated business applications (Davenport, 1998). Also referred to as enterprise-wide systems or enterprise systems due to their enterprise-wide scope, these integrated enterprise-computing systems provide seamless integration of all the information flowing through an organization (Davenport, 1998; Markus and Tanis, 2000). A large and rapidly expanding marketplace[1] that has developed for ERP systems signifies adoption of ERP by a substantial number of organizations while near term success and long-term survival of such systems is difficult to predict. Organizations that have successfully adopted ERP systems view them as one of the most important innovations that have lead to the realization of substantial tangible and intangible improvements in a variety of areas (Davenport, 1998, 2000; Markus and Tanis, 2000). However, there are a number of examples where organizations were not successful in reaping the potential benefits that motivated them to make large investments in ERP implementations (Davenport, 1998, 2000; Markus and Tanis, 2000).

In the near-term perspective, managers find ERP implementation projects the most difficult systems development projects (Wilder and Davis, 1998). ERP projects are set apart by their complexity, enterprise-wide scope and challenges posed by accompanying large-scale organizational changes in transition to new systems and business processes. In the long-term, the impact on the organization's IT support and maintenance and organizational performance of ERP projects is still unknown (Glass, 1998). Despite the wide spread popularity of ERP, not all organizations are aggressively adopting ERP systems. Some have adopted certain stand alone or partially integrated functional modules, while some organizations have even discontinued implementing or using ERP systems after adoption[2] (Davenport, 1998; Bingi et al., 1999). The lack of empirically supported research on critical ERP project management issues has motivated us to study the ERP

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[1] $16.6 billion in revenues in 1998 and projected revenues of $66.6 billion by 2003 (AMR Research (1999).

[2] Sobeys, the second largest retail chain in Canada, recently decided to abandon the ERP systems initiative and take a resulting $49.9 million charge in the current quarter (Financial Post, Jan 25, 2001)

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implementation projects by surveying the organizations which have adopted ERP systems.

ERP systems are packaged software applications originally targeted at manufacturing companies. Several studies to date have focused on adoption of packaged software applications and advanced manufacturing technologies (Dean Jr., 1986; Noori (1992); Kumar et al. (1996); Siegel et al. (1997); Lassila and Brancheau (1999). However, associated organizational and process re-engineering in ERP projects, the enterprise-wide implications, high resource commitment, high potential business benefits and risks associated with ERP systems make their implementation a much more complex exercise in innovation and change management than any other software package or advance manufacturing technology. Radding (1999) argues that when an organization puts millions of dollars into a core business application and re-engineers its business processes around it, the exercise is destined to become much more than an systems development project.

ERP applications lock the operating principles and processes of the organization into software systems. If organizations fail to reconcile the technological imperatives of the enterprise systems with the business needs, the logic of the system may conflict with the logic of business systems (Davenport, 1998). The cost, complexity, investment of time and staff, and implications of modifications, however, make a rollback very difficult. One extreme example of not getting strategic ERP implementation choices right is FoxMeyer Drugs, where the bankruptcy trustees are suing its systems' vendor and consultant company, blaming the ERP system for its business failure (Davenport, 1998).

This research explores the key considerations and successful strategies in an ERP implementation projects such as selection of project manager, ERP vendor and implementation partners; constitution of project team, challenges in training, and upgrading the infrastructure, ongoing project management, quality assurance and stabilization of ERP. The theoretical foundation is based upon the innovation process theory approach wherein we adopt the "enterprise systems experience cycle" framework of Markus and Tanis (2000) to delineate the innovation process. The next section provides a literature review of ERP and the organizational innovation process of ERP implementation. Section 3 describes the methodology used in collecting data and analysis. Section 4 presents findings and managerial implications and Section 5 presents our conclusions and recommendations for further research.

2. Enterprise resource planning systems: a literature review

The literature reviewed for the study can be classified into two main areas: one related to ERP and the other related to the organizational innovation process of ERP implementation. ERP, being a relatively new concept, made a review of the literature on ERP systems important, while the literature review on the adoption process within organizations was undertaken to develop the theoretical background and rationale for the study.

2.1. Enterprise resource planning systems (ERP)

The ERP applications we see today can be traced back to and have evolved from Materials Requirement Planning (MRP) and Manufacturing Resource Planning (MRPII) systems. The Gartner Group is credited for coining the term "Enterprise Resource Planning", for a concept they developed in the 1990s for the next generation Manufacturing Resource Planning (MRPII) systems (Dahlen and Elfsson, 1999; Keller, 1999). The concept posited to integrate software applications of manufacturing beyond MRPII to other functions such as finance and human resources. Russell and Taylor (1995) define ERP as an updated MRPII with relational database management, graphical user interface and client-server architecture. The initial definition of ERP was targeted at manufacturing companies. But being a framework of integrated application suites that unites major business processes, the use of the term ERP has expanded. Today, ERP encompasses all integrated information systems that can be used across any organization (Koch et al., 1999).

Watson and Schneider (1999) describe Enterprise Resource Planning (ERP) as a generic term for an integrated enterprise computing system. They define it as an integrated, customized, packaged software-based system that handles the majority of an enterprise's system requirements in all functional areas such as finance, human resources, manufacturing, sales and marketing. It has a software architecture that facilitates the flow of information among all functions within an enterprise. It sits on a common database and is supported by a single development environment. Various other descriptions have been provided in the literature but for the purpose of our research we adhere to the description of ERP provided above by Watson and Schneider (1999).

The key underlying idea of ERP is using information technology to achieve a capability to plan and integrate enterprise-wide resources, i.e. by integrating the applications and processes of the various functions such as design, production, purchasing, marketing, and finance. Enterprise wide integration goes beyond physical computer integration (i.e. using computer communication networks and protocols) and system integration (i.e. building integrated systems based on shared data and exchange formats, and common architecture). A salient feature of enterprise integration is business integration, i.e. understanding the way business processes and enterprise policies are structured. How they relate to one