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ORGANIZATIONAL KNOWLEDGE SHARING IN ERP IMPLEMENTATION: A MULTIPLE CASE STUDY ANALYSIS

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Abstract

This study examines how firms are able to effectively share knowledge across diverse functions and perspectives during enterprise resource planning (ERP) systems implementation. The primary objective of the study is to provide a theoretically grounded assessment of factors that enable firms to articulate and integrate the diversity of knowledge required for effective use of ERP. This includes factors that impact how existing knowledge is shared and how new knowledge is absorbed and transferred to become part of the firm's core knowledge competency.

Keywords: Organizational knowledge sharing, organizational culture, organizational structure, ERP.

RESEARCH OBJECTIVES AND QUESTIONS

ERP systems are implemented to allow firms to leverage common processes and integrate knowledge across functions (Boudreau and Robey 1999). However, these systems are large, complex, and not easily modifiable to fit an individual organization’s requirements. Thus, transition to an ERP framework is often a long and difficult process, and often does not facilitate the consistent, stable sharing of data across functional areas as predicted (Scheer and Habermann 2000). ERP failures can be partly explained because firms often fail to adequately address how people use and share information (Davenport 1998). For example, Hershey failed to adequately address information flow between processes and, thus, was unable to perform some of its critical processes after the ERP implementation (Stedman 1999). However, firms that have effectively addressed the information or knowledge sharing component of ERP implementation have realized greater successes with ERP (Al-Mashari and Zairi 2000; McNurlin 2001).

“Consensus is required from an entire enterprise to reengineer a core business process and take advantage of (ERP) software,” (Holland and Light 1999, pg. 31). Thus, organizational members must collaborate and share their knowledge as a team to successfully bring about the changes in the business required to realize long-term ERP benefits. If the right people are not involved in the ERP transition, then a critical piece of knowledge is missing when it comes time to roll out the system (Al-Mashari and Zairi 2000). Knowledge sharing is often ignored by firms until it is too late because people do not easily share what they know (Brown and Vessey 1999). Thus, it is critical for firms to focus on integrating new knowledge into existing knowledge competencies to enhance ERP success (Andreu and Ciborra 1996; Kogut and Zander 1992).

The research question underlying this study is how knowledge sharing impacts how well a firm is able to integrate its processes and move autonomous, separately functioning areas out of silo behavior and begin to take advantage of the opportunity to leverage common processes and integrate knowledge. The objectives of this study are twofold. One objective is to provide a theoretically grounded assessment of factors that enable firms to articulate and integrate the diversity of knowledge required to make the organization-wide transition to ERP. This includes factors that impact both how existing knowledge is shared and how new knowledge is absorbed and transferred to become part of the firm's core knowledge competency.

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knowledge is absorbed and transferred to become part of the firm’s core knowledge competency. Another objective is to examine the extent to which firms attempt to change their core knowledge competencies after ERP implementation. Due to the long-term nature of the impact ERP systems have on organizations, it seeks to provide guidance that other firms may find useful in implementing their own ERP systems in the short run, and managing these systems for the long term.

THEORETICAL FOUNDATION

Theory indicates that there are several contextual factors that may impact knowledge sharing such as organizational culture and structure. “Culture and behavior are the key drivers and inhibitors of internal (knowledge) sharing” (O’Dell and Grayson 1998, pg. 166). A culture that values personal expertise and knowledge creation over knowledge sharing inhibits experiential learning outside members’ own groups (Leonard and Sensiper 1998; O’Dell and Grayson 1998). A culture that rewards expertise, but does not reward assisting others in developing expertise, creates an environment where people are reluctant to share what they know (Leonard and Sensiper 1998).

However, ERP requires organizational members to “come to grips with the fact that they’re not working in silos anymore....No matter what you do now, it impacts somebody else” (Stedman 1998, pg. 2). Entire departments must be retrained, jobs redefined, and procedures redesigned with this in mind (Bingi, et al. 1999). Thus, a culture that fosters and rewards communication and interaction is more likely to be conducive to successful ERP implementation (Brown and Vessey 1999; McNurlin 2001).

“Incentives, power, and motivational systems are ultimately responsible for differences in the quality of the (organizational learning) process from one organization to another” (Andreu and Ciborra 1996, pg. 116). A culture that encourages and rewards experimentation and thinking about whether things are being done the best way, rather than focusing attention largely on meeting deadlines (favors process over product) is deemed to be the most conducive to knowledge sharing (Stein and Vandenbosch 1996). In an environment where product is favored over process, and deadlines drive the implementation, adaptation may occur, but the development of a core knowledge competency to support ERP in the long run may be inhibited (Ross 1998; Stein and Vandenbosch 1996). Therefore, we expect the way a firm explores opportunities provided by ERP and the processes they use to incorporate ERP into the organization are affected by its corporate culture.

Proposition 1a: Firms in which organizational culture rewards cross-functional or group achievements will pursue ERP implementation that is process and outcome driven to a greater extent than firms in which culture does not.

Proposition 1b: Firms in which organizational culture rewards individual over group achievements will pursue ERP implementation that is driven by meeting deadlines and that may ignore process and outcomes.

Proposition 2a: Firms in which organizational culture rewards cross-functional or group achievements will seek to exploit existing knowledge competencies during ERP implementation to a greater extent than firms in which organizational culture does not.

Proposition 2b: Firms in which organizational culture rewards cross-functional or group achievements will seek to exploit and incorporate new opportunities provided by ERP into core knowledge competencies to a greater extent than firms in which organizational culture does not.

Proposition 3: In firms in which organizational culture rewards individual over group achievements there will be changes in the knowledge of individuals or groups because of ERP, but these will not be incorporated into the organization’s core knowledge competencies (i.e., individuals will engage in silo behavior).

Organizational structure is another factor that influences the flow of knowledge in an organization and the rate of learning to which an organization is exposed (Stein 1992). Some firms fail to realize ERP potential because they do not consider their organizational structure when they choose an ERP software package (Brown and Vessey 1999; Welti 1999). Organizational structures with "fluid job descriptions, loose organizational charts, high communication and few rules" are more conducive to innovation because they promote flexibility and the exchange of knowledge and ideas (Brown and Eisenhardt 1997, pg. 7). Firms that have been the most successful in implementing innovative technology have a structure in place that defines priorities that allow organizational members to focus on critical issues, facilitates extensive communication across units to allow members to share knowledge, and allows enough flexibility in the design process itself so that members can freely exchange ideas, and
implement changes where appropriate as the process proceeds (Brown and Eisenhardt 1997). Although deadlines are important, they must be realistic enough to accommodate changes, and to thereby facilitate the free exchange of ideas and knowledge as the ERP implementation process evolves (Brown and Eisenhardt 1997; Welti 1999). Organizational members need to be able to “create and catalog the corporate memory of an organization’s expertise and abilities so others can build networks and new solutions together” (O’Dell and Grayson 1998, pg. 157). Highly centralized, hierarchical structures tend to inhibit the type of knowledge sharing required for organizational learning during periods of extensive change, whereas more decentralized structures facilitate such learning (Barley 1990; Leonard and Sensiper 1998; Pelled 1996). Structures that combine clear responsibilities and priorities with extensive communication seem to be the most successful in promoting the exchange of innovative ideas (Wilcocks and Smith 1995). Therefore, we expect firms with highly centralized structures to exhibit less knowledge sharing than those with more decentralized structures.

**Proposition 4a:** Firms with highly decentralized structures will be more likely to fundamentally change their core knowledge competencies to take advantage of opportunities provided by ERP than those with more highly centralized structures.

**Proposition 4b:** Firms with highly centralized structures will be more likely to exhibit changes in behavior (adaptation) that are not accompanied by changes in how they interpret their environment (learning) than firms with highly decentralized structures.

**METHODOLOGY**

Semi-structured interviews were conducted with six firms in the petroleum industry. Because some ERP systems are more suited to some industries than others, firms from the same industry were chosen. In addition, to minimize any bias due to type of ERP used, only firms using the same ERP were chosen. SAP was chosen because it is the most widely used in this industry. Other criteria for choice of firm include firm size and primary business. The sample includes large, medium, and small organizations and a variety of primary business focuses.

Because of the large number of people on an SAP team (ranging from 150 to 700), we selected a sample of key people that provided representative perspectives on the project team. These included IS and business staff, original members of the team and members who came on to the team later, people who are now working to make the process changes SAP affords, as well as people who were pleased with SAP and those who were not. In addition some were managers and some were not, some were working as support staff for SAP operations, and some had gone back to their functional jobs after implementation.

A series of in-person and telephone interviews with 54 people were conducted that lasted between one and two hours each over a period of eight months. E-mail and telephone calls were also used to get information not covered in the interviews and to clarify points or fill in missing data during interview transcription. Tapes and interview notes were transcribed by a third party, and reviewed by the primary researcher as well as another third party for accuracy. To enhance internal reliability, pattern matching techniques that consist of within and cross-case analysis of data were used for data analysis. Because of the number of cases examined, both theoretical and literal replications are possible so that firms that are similar on the constructs of interest can be compared, and firms that are dissimilar on those constructs can be compared.

These constructs are organizational culture and structure, organizational knowledge sharing, and the extent to which new knowledge was being incorporated into core knowledge competencies. Specific aspects of culture examined were the degree of team collaboration and the focus on deadlines and getting the job done versus focusing on how the job was being done. The specific aspect of structure was degree of decentralization. Knowledge sharing was assessed in terms of how it was facilitated on the SAP team, how conflicts were resolved, change management (including training), how team members were transitioned on and off the team, and the knowledge transfer from integration partners to the organization when they left. Change in core knowledge is assessed as the extent to which processes either have changed or are being changed as a result of SAP.

**References**
