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AN INVESTIGATION OF THE EFFECTS OF ERP POST-IMPLEMENTATION SUPPORT STRUCTURE ON ERP / BUSINESS UNIT FIT

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Abstract

Despite near saturation of enterprise resource planning (ERP) implementations in both the Fortune 500 and medium-to-large service and manufacturing organizations, little is known about system and organizational issues related to ERP in the phase subsequent to implementation and stabilization, hereafter referred to post-implementation. The purpose of this research is to investigate the effects of post-implementation support unit structure on post-implementation customizations to the ERP, and ultimately how these post-implementation customizations impact the degree of fit between the system and functional business units. Using the knowledge-based view of the firm as a theoretical lens, this research proposes that customizations are the result of integrating specialized knowledge held by both technical and functional subject matter experts, and that achieving fit between the ERP and the functional business units that utilize the system represents an organizational capability.

Keywords
Enterprise resource planning (ERP), knowledge-based view, post-implementation customization, ERP fit

Introduction and Statement of Problem

With the start of the 21st century, the majority of medium-to-large organizations have implemented enterprise resource planning (ERP) systems (METAGroup 2004). Given this level of saturation, the bulk of scholarly research has focused on the ERP configuration and implementation, while neglecting the post-implementation “operations” or “onward and upward” phase (Gattiker and Goodhue 2005). Recently, researchers have begun to address this paucity, observing that ERP’s true organizational benefits occur in phases subsequent to implementation (Beard and Sumner 2004; Gattiker and Goodhue 2005), and that many organizational issues with ERP result from a lack of “fit” between the system and business needs (Gattiker and Goodhue 2005; Gefen and Ragowsky 2005). Moreover, some have suggested that effectively exploiting ERP comes from aligning the system with business needs, with sustained competitive advantage achieved by creating new organizational capabilities (Beard and Sumner 2004).
Achieving capabilities to rapidly align and enhance ERP is complicated by the role that functional subject matter experts (SMEs) play in the implementation, configuration and maintenance of these systems. As these functional SMEs are often charged with configuring the system during implementation, a great deal of knowledge rests with these experts. As implementation efforts draw to a close and management considers how best to use these experts for ongoing enhancement efforts, the question of how to structure the post-implementation support unit and what role functional SMEs should play becomes salient (Worrell et al. 2006). In effect, organizations are faced with the question of how best to structure post-implementation support to integrate the functional knowledge of SMEs and the technical knowledge of IT staff to more effectively align the ERP with business needs.

Based on the scarce literature relating to post-implementation ERP and our lack of understanding how to structure the post-implementation support unit to effectively integrate functional and technical knowledge and align ERP with business needs, the following research question is posed: how does the structure of the post-implementation ERP support unit affect the degree of “fit” between the system and the supported business units?

**Background and Theoretical Framework**

The decision to either retain functional SMEs as part of the post-implementation support unit for ongoing enhancements or return them to their home units is imperative. This decision has implications for ongoing maintenance of the ERP and efforts to upgrade or extend functionality. Many times, these functional SMEs have become “power users” that act as liaisons between the post-implementation support unit and home units, and participate in post-implementation efforts on an ad hoc basis (Volkoff et al. 2004). While returning the functional SMEs to their home units and utilizing them on an as-needed basis for enhancements and upgrades may increase creativity and keep functional knowledge relevant and timely (Teigland and Wasko 2003), others have suggested that retaining functional SMEs in a centralized post-implementation support unit increases the likelihood of successful enhancements and upgrades (Beatty and Williams 2006). Ultimately, the decision boils down to one of which structure best supports knowledge integration and the creation of organizational capabilities. Therefore, I investigate this research question as a knowledge integration issue, using the knowledge-based view of the firm as a theoretical lens.

Proponents of the knowledge-based view of the firm (KBV) suggest that organizations exist to produce goods and services because they are effective at creating conditions whereby individuals can integrate specialized knowledge. An extension of the resource-based view of the firm, KBV suggests that knowledge is the most important firm resource, and that the role of the firm is to address issues such as coordination, structure, and allocation of decision rights to more effectively integrate specialized knowledge for firm benefits (Grant 1996a; Grant 1996b). There are two underlying assumptions associated with KBV: (1) knowledge creation occurs at the individual level and (2) the primary role of organizations is to support the integration of knowledge to create value (Grant 1996b). A key concept in KBV is knowledge integration which is defined as the application of specialized knowledge to achieve value. The underlying organizational concern is how best to coordinate individuals who possess specialized knowledge so as to achieve value and develop organizational capabilities (Grant 1996b).

The effectiveness of knowledge integration is dependent on common knowledge, such as common language, commonality of specialized knowledge, shared meaning, and recognition of specialized knowledge domains. Common knowledge represents a shared understanding between the various specialists that provides a framework for communication and an intersection of disparate knowledge bases. Knowing where to find specialized knowledge is also important to efficient knowledge integration. Equally important is the role of organizational structure, or the manner in which teams are organized for group decision processes. The outcome of effective knowledge integration is an organizational capability (Grant 1996a; Grant 1996b). Therefore, I base my research model on the following conceptual model:

**Research Model and Hypotheses Development**
In the current study, integrative mechanisms facilitate the integration of both technical and functional knowledge, which results in knowledge integration indicated by post-implementation customizations. The customizations create new organizational capabilities, such as alignment or “fit” between the system and the business units. Therefore, the unit of analysis in this study is the ERP system implementation. This includes the post-implementation support unit, the ERP system, and the fit between the ERP system and business unit objectives.

**Shared Domain Knowledge and Customization**

The effectiveness of knowledge integration depends on the degree and nature of common knowledge shared amongst team members (Grant 1996b). Prior research has demonstrated that functional diversity among members of internal project teams inhibited team processes due to a lack of common knowledge, resulting in reduced innovativeness and creativity (Cohen and Bailey 1997). Additionally, Reich and Benbasat (2000) noted that functional managers who possessed technical knowledge were able to bring tacit and explicit knowledge to bear on complex tasks, while technical managers who possessed functional knowledge were better able to understand the business domain, speak a common language with business users, and interact with their line manager counterparts. This shared domain knowledge will facilitate the identification and execution of post-implementation enhancements. Therefore,

\[ H_1: \text{Shared domain knowledge will be positively related to ERP post-implementation customization and enhancement.} \]

**Liaison Mechanisms and Customization**

Effective knowledge integration requires individuals who are aware of knowledge within the organization (Grant 1996b). Communication over organizational boundaries is a necessary precursor to recognizing the location of organizational knowledge (Persson 2006). Liaison mechanisms represent an integrative mechanism that increases organizational information processing and has been shown to positively influence intra-organizational knowledge transfer, even in the presence of other integrative mechanisms (Galbraith 1994; Persson 2006). Therefore,

\[ H_2: \text{Liaison mechanisms between post-implementation support unit and business units will be positively related to ERP post-implementation customization and enhancement.} \]

**Unit Structure and Customization**

The manner in which a unit is structured impacts the effectiveness of knowledge integration. Units comprised of individuals with diverse knowledge domains are best suited for unusual and complex decision tasks (Grant 1996b). Cross functional units, such as those comprised of technical and functional SMEs, have been associated with increased knowledge integration and project success (Cohen and Bailey 1997). Furthermore, temporary structures have been found to be more effective than permanent structures in terms of innovativeness, creativity and intra-organizational knowledge transfer (Ford and Randolph 1992; Teigland and Wasko 2003; Persson 2006). Therefore,

\[ H_3: \text{To the extent that the post-implementation support unit relies on ad hoc cross-functional structures, structure will be positively related to ERP post-implementation customization and enhancement.} \]

**Customization and Business Unit Fit**

Organizational capabilities are an outcome of knowledge integration (Grant 1996b). The capability I am investigating is ERP/business unit fit, defined as “architecting IT infrastructures to create resilient and reliable business platforms that enable and shape current and future product-market initiatives” (Sambamurthy and Zmud 2000). As ERP is a part of the infrastructure, effectively exploiting ERP for sustained competitive advantage comes from successful alignment with business needs (Beard and Sumner 2004). For many organizations, extending functionality beyond that delivered during implementation is viewed as necessary for achieving anticipated benefits in post-implementation (Beatty and Williams 2006). Therefore,

\[ H_4: \text{ERP post-implementation customization will be positively related to ERP/business unit fit.} \]
The research model is presented in Figure 2.

![Figure 2. Research Model](image)

**Proposed Study Design and Method**

The unit of analysis for this study is the system implementation. The population consists of organizations that have implemented PeopleSoft and have successfully transitioned to post-implementation. PeopleSoft was selected to standardize data collection and analysis. Data collection will be via web-based survey for all independent and dependent variables, with additional objective data to assess ERP post-implementation customization.

Shared domain knowledge, liaison mechanisms, unit structure, and ERP post-implementation customization will be assessed via survey based on scales validated in prior research. This portion of the survey will be completed by the post-implementation support unit manager. ERP post-implementation customization will be assessed via objective measures as well, using a PeopleSoft-specific SQR query that queries the underlying PeopleSoft tables for all objects that have been modified subsequent to stabilization by a user other than the PeopleSoft system user. Using the output of this query, we will be able to assess the degree of organizational-initiated customizations, which will provide an objective validation to the perceptual measure.

The dependent variable, ERP / Business Fit, will be assessed via survey based on scales validated in prior research. This measure will be administered to business managers responsible for functional units affected by ERP. This approach is consistent with recommendations that ERP fit be measured at the business unit, rather than organizational level (Gefen and Ragowsky 2005). Having separate survey respondents to assess the independent and dependent variables protects against issues related to mono-method bias. Data will also be collected to control for organizational size, spending, original ERP project goals, and reliance on consultants.

Structural equation modeling (SEM) will be used to analyze the data. SEM is a second generation data analysis technique that allows for the assessment of the structural model and measurement model, and is useful in exploring complex causal relationships. SEM has been chosen as a preferred method for assessing path models, which is what I propose in this research.

**References**


