

From dynamic capabilities to ERP enabled business improvements: The mediating effect of the implementation project



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Abstract

This study explores whether an Enterprise Resource Planning (ERP) implementation project mediates the relationship between dynamic pre-adoption capabilities and ERP-enabled business improvements. The results from our field survey of large ERP adopters in Austria suggest that the effects of the two out of three selected dynamic capabilities are dependent on the properties of the underlying organizational transformation project. While external information acquisition and IT governance capabilities are fully mediated by the performance of the ERP implementation project, decision making only directly impacts business capabilities. These results further our understanding about the role of the implementation project for ERP value creation and the different natures of capability relationships. We call for more research on co-presence conditions related to dynamic capabilities and IT transformation project performance.

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1. Introduction

Delivering improved IT enabled business capabilities through IT projects, such as Enterprise Resource Planning (ERP) adoptions, remains difficult and often unsuccessful. Many organizations seem to be unprepared to successfully plan and implement their IS/IT investment strategies, which usually have far-reaching consequences for how the entity is structured and conducts its business functions (Chen, 2001). Many ERP adoptions lead to partial successes or even abandonments prior to completion (Barker and Frolick, 2003; Dawson and Owens, 2008). Only 13% of firms characterized their ERP adoption as meeting their expectations in improving business processes or

delivering the expected business value, with more than 50% of firms rating their ERP adoption as unsatisfactory (Panorama Consulting Group, 2009). In view of such high failure rate, both researchers and managers continue to seek evidence on the organizational characteristics that can foster success of ERP adoption.

Many prior studies have focused on the implementation project capabilities to improve how ERP is adopted in organizations. Specific IT project related criteria such as poor schedules, weak project management, and insufficient user involvement have been highlighted as critical failure factors in ERP implementations (Wong et al., 2005). Project management practices such as resource allocation, scope and risk management, and stakeholder involvement contribute to the success or failure of ERP adoptions (Chen et al., 2009). A less developed stream of research has highlighted the important role of organizational pre-adoption characteristics such as the planning capabilities including evaluation, decision making, budgeting, and strategy justification (Chen, 2001). These capacities are needed to recognize the value of new

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external information, to assimilate and apply it to generate business value (Cohen and Levinthal, 1990). However, it is still unclear how these and other pre-adoption capabilities directly and indirectly relate with improved IT enabled business capabilities.

Against this backdrop, we seek to gain a better understanding of how IT enabled business capabilities are influenced by selected ERP pre-adoption capabilities. Our research model includes the implementation project as a mediator by which the pre-adoption capabilities affect business value development. We therefore link IS/IT benefit development with the business transformation inherent in ERP project and explore the project's mediating role as the central mechanism. By doing so, we directly address the concern that a direct-effect model exploring capabilities–performance hypothesis is overly simple and neglect the important transformation characteristics internal to the organization (Garrido-Moreno and Padilla-Meléndez, 2011).

Theoretically, the management and IS literature provide a rich set of dynamic capabilities conceptions that enable organizations to improve business resources. Among these frameworks, our literature review offers a three-tier classification of “inside-out”, “outside-in”, and “spanning” capabilities (Wade and Hulland, 2004). For the fieldwork, we considered one capability from each of these domains by investigating the effects of external information acquisition as “outside-in” capability, decision making methods as “inside-out” capability, and IT governance as “spanning” capability. A quantitative empirical survey of 57 large Austrian ERP adopters serves as the primary data source.

This study offers three key contributions to the ERP adoption literature.

- 1 The paper introduces three distinct dynamic pre-adoption capabilities (external information acquisition, IT decision making, IT governance) needed for ERP implementation and relates these with contemporary taxonomies of dynamic capabilities.
- 2 The paper suggests project management as a missing link in the sense of a dynamic transformation capability to fully exploit the dynamic pre-adoption capabilities. It thereby offers a better understanding of relationships between dynamic capabilities, which are often missing in prior research.
- 3 It highlights the positive effects of each considered dynamic capabilities on ERP enabled business capabilities based on primary survey data. Moreover, we show that the positive effects of external information acquisition and IT governance depend on the implementation project as a mediator in the sense of a generative mechanism.

2. Literature review

This section very briefly summarizes previous research about the nature and scope of dynamic capabilities in the context of IT management. Specifically, we seek to relate to large scale IS/IT investments, in particular to ERP, and emphasize the importance of organizational project management capabilities. We recognize three concepts of dynamic capabilities from the ongoing debate on capability typologies: the original idea of dynamic capabilities

(Teece et al., 1997), absorptive capacity (Cohen and Levinthal, 1990), and a recent framework of eight IS resources (Wade and Hulland, 2004) structured into three domains (Day, 1994).

2.1. Dynamic capability theories

The concept of dynamic capabilities refers to the capacities of an organization to renew or update itself to achieve new forms of competitive advantage (Teece et al., 1997). Dynamic capabilities by definition involve adaptation and change, as they re-design and change other resources and capabilities (Helfat and Peteraf, 2003). According to Teece et al. (1997), organizational processes have three roles, namely coordination/integration, learning, and reconfiguration. Coordination/integration is a managerial responsibility, which includes information acquisition and decision making. Reconfiguration is concerned with the internal and external transformation that is required to adopt a new technology, system or method of doing business.

Absorptive capacity was defined to be a firm's ability to recognize the value of new information, assimilate it, and apply it to commercial ends (Cohen and Levinthal, 1990). Zahra and George (2002) suggested that there are two types of absorptive capacity, namely potential and realized absorptive capacity. While potential absorptive capacity is referred to as the organizational ability to identify and acquire external information, and to analyze and interpret these information to support decision making, realized absorptive capacity is concerned with the ability in applying the acquired information in business processes to achieve business performance. Prior studies were confined to examine the realized absorptive capacity that is associated with the performance outcomes of ERP implementation (Srivardhana and Pawlowski, 2007; Zahra and George, 2002). A significant influence of organizational absorptive capacity on IT infrastructure projects relating to data warehouse adoption was found in another study (Ramamurthy et al., 2008). Other contributions looked at the individual user as unit of analysis and considered the ability of an organizational member to value, assimilate, and apply new ERP related knowledge (Park et al., 2007). Relatively limited research attention was dedicated to examining the potential absorptive capacity of firms that provides the degree of freedom and ability for firms to acquire information and exploit their knowledge on ERP adoption for business benefits and firm performance. This omission in the literature is undesirable as there is little understanding on the value of potential absorptive capacity of firms to collect and deploy new information to advance their business processes.

Another recently established framework consists of eight distinct dynamic IS capabilities, which were divided into three broad classes: inside-out, outside-in, and spanning (Day, 1994; Wade and Hulland, 2004). Inside-out capabilities tend to be internally focused in response to market developments through actions such as effective IS and infrastructure development. Outside-in capabilities are outside oriented and may, for example, relate to managing external relationships. Spanning capabilities may involve both and are needed to integrate capabilities and cross boundaries such as strategic IS planning. While contributions of

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