Refining Information Systems (IS) Competencies: The role of Organizational Learning

Research-in-Progress

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Abstract

Information systems competencies (IS competencies) has been an important area of inquiry for both business managers and academicians. It is now widely believed that for achieving sustainable business advantages, a firm must be able to renew its IS competencies. Although the literature has discussed the importance of organizational learning, there is not much known how organizational learning renews IS competencies. In this preliminary research, we take a step in this direction and analyze the relationship of organizational learning on IS competencies for business advantages. We plan to collect data through a survey of IS and business managers. COMPUSTAT will be used for collecting business profitability data. Our argument is that organizational learning will positively affect the relationship between IS competencies and business advantages.

Keywords

IS competencies, organizational knowledge, business advantages

Introduction

Traditionally information systems (IS) planning was conducted on ad-hoc basis, because IS was considered as a support system performing the back-end service functions. Therefore, the main function of IS management was to choose those systems that could perform back-end functions efficiently. Since 1980s, however, IS planning started playing important role in business planning, still, however, both business planning and IS planning exercises were done in isolation. Even though business managers acknowledged the key role of IS, but they did not take notice of IS competencies. Similarly, IS management did not consider business strategy in their IS planning exercise (King, 1978).

It is only in the early-1990s, IS planning changed radically. One of the main impetuses for this change took place with a path-breaking article by Prahalad and Hamel in 1990 in the Harvard Business Review on “The Core Competence of the Corporation.” The idea of competence was not new, since its importance was already recognized in Edith Penrose's (1959) book, “The Theory of the Growth of the Firm.” As early as in 1984, the resources based view (RBV) of the firm was put forth by Wernerfelt, but the importance of competencies did not diffuse into management circle until Prahalad and Hamel's (1990) work on “core-competence.”

Since the 1990s, IS planning and business planning exercises are conducted in conjunction to each other, where IS strategy and business strategy are considered as reinforcing the business advantages. Despite understanding the importance of IS competencies in business performance, there has not been much research that has examined how a firm over time refines its IS competencies. Our paper fills this gap in the literature and examines empirically how a firm refines its IS competencies via organizational learning. Below we define the concept of IS competencies.
IS Competencies

Based on the resource based view (RBV) of the firm, we consider IS as a key resource of a firm. Even though many systems can be purchased from the marketplace, the use and customization of these systems is recognized as anchoring the IS competencies of the firm. For example, Bharadwaj (2000), and Rockart, et al. (1996) view IS infrastructure as an IS competence, because not all the firms can equally capitalize on information technology (IT) without using a flexible IS infrastructure. According to Barney (1991), firm competencies inherit following properties: they are valuable, rare, inimitable, and non-substitutable. These attributes cannot be easily imitated by competitors in short-run because capabilities are deeply rooted in the history of the firm, and some capabilities could arise just being in the right place at the right time. Based on the above categorization, we define IS competencies as those attributes of IS that cannot be easily imitated by other IS units in different firms. For example, Mata, et al. (1995) conclude that only managerial IS skills can be considered as IS competencies. Ross et al. (1996), on the other hand, state that IS infrastructure flexibility, business expertise of IS-groups (IS-business expertise), and trusting relationship between IS groups and business personnel (relationship infrastructure) constitute IS competencies. Feeny and Willcocks (1998) present even a broader set of nine attributes for IS competencies, ranging from business systems thinking, relationship building, architectural planning, to making technology work and vendor development. For this research, we measure IS competencies as put-forth by Ross et al. (1996). These constructs are: Flexible IS infrastructure, shared expertise about the potential of information technology (IT) and business strategy between IS personnel and other business units, referred here as (shared IS-business expertise), the quality of relationship between IS and other functional units, referred here as (trusting IS-business relationship). Below we briefly define these constructs:

**IS Infrastructure Flexibility**

A flexible IS infrastructure allows sharing of data and applications through communication networks. It pertains to the arrangements of hardware, software, and networks so that data and applications can be accessed and shared within and between suppliers, customers, and vendors (Broadbent, et al. 1999). A flexible IS infrastructure helps in integrating disparate and geographically distributed systems and make IS applications cost effective in their operations and supports, therefore, flexible infrastructure becomes critical source of advantages to the firm.

**Shared IS-Business Expertise**

Shared IS-Business expertise refers to extent to which IS groups possess an understanding of business objectives and strategies, and management understands the potential of IT. The mutual understanding of IT and business strategies between IS and line management is considered important for firms in creating a shared understanding of goals and long-term objectives of the business (Ross et al, 1996).

**Trusting IS-Business Relationship**

Relationship between IS groups and business groups to work together to solve organization-wide problems is considered a critical attribute of IS competencies. The relationship requires developing those systems that can meet existing and future information needs of the business. It also requires sharing risk and responsibility of IS application between IS and business unit management (Ross et al, 1996). Because only business units are in a position to dictate their IS resource requirements, it becomes essential that IS and line management work closely to share IS responsibilities and roles (Rockart, et al. 1996).
Theoretical Model

Below we explain how IS competencies can be refined by organizational learning. Then we set a series of hypotheses.

Refining IS Competencies through Organizational Learning

Competencies are considered as the source of competitive advantages, which suggests that competencies are not static; they need to be refined for creating and sustaining business advantages. Teece et al. (1997) state that key role of management lies in integrating and reconfiguring competencies to match the requirements of a changing environment. Therefore, it becomes important to refine IS competencies to meet changing environments of the business. One of the ways in which a firm can refine its competencies is by learning. The importance of organizational learning was noted in the seminal article of Argyris and Schon (1978). Second, Senge’s (1990) book on “The Fifth Discipline” emphasizes the importance of open innovation strategy making organizational learning a subject of system dynamics. Open innovation strategy does not only provide company personnel to connect with outside groups through different systems but also provides guidelines about refining the capabilities of its communication and information technologies. There are some other concepts—collaboration, changes in IS management, and R&D investment—that can be used for refining IS Competencies (Teece, et al. 1997), but for the current research, we limit our scope to organizational learning only. Below we define the relationship between IS Competencies and Organizational Learning (see Pérez-López and Alegre, 2012).

Flexible IS infrastructure and organizational learning

A flexible IS infrastructure, according to Bharadwaj (2000), is an integrated shared system that is built piece by piece over time. That means, as a firm learns to work with a system and gradually becomes proficient in using the system, it continually works to add other pieces in the infrastructure that can set it apart from other firms. Therefore, we hypothesize:

H1: Organizational learning will have positive relationship with IS infrastructure flexibility.

IS-Business expertise and organizational learning

The shared knowledge that IS and business personnel require to plan business and IS strategy does not occur automatically. Neither does it result from college education, nor can it be acquired from imitation. It is rather a continued practice of learning by both IS and line management and understanding each other’s perspectives. Thus we hypothesize:

H2: Organizational learning will have positive relationship with IS-Business expertise.

IS-Business relationship and organizational learning

Developing and maintaining relationship between IS groups and business personnel require continued interactions. Coordinating projects in the context of organization requires that IS and business personnel continually redefine and to readjust to the need of each other. As each new project requires learning and understanding the needs of management and providing appropriate solutions, trusting relationships between IS and business personnel become critical to fully understand management information needs. Thus, we hypothesize:

H3: Organizational learning will have positive relationship with IS-business relationship,
Methodology and Analysis

In this paper, we plan to collect data from an online survey and Compustat database. The survey will be targeted to IS managers, working in Fortune 1000 companies. IS Competencies have been extensively used in IS literature and several well defined scale are available for measuring flexible IS infrastructure, shared IS-Business expertise, and trusting IS-Business relationships. For measuring IS competencies, we use reference paper of Bhatt and Grover (2005). For measuring Learning, we take items from Sinkula et al. (1997). Control variables, such as the size, age, and industry type will be measured from Compustat. Data will be analyzed through hierarchical regression analysis in understanding the relationship of organizational learning on IS competencies.

Expected Results and Conclusions

Despite the importance of IS Competencies in business advantages, management still does not know the importance of refining IS competencies. Organizational learning has been always important, but its relevance for IS competencies has not been empirically tested. By using an empirical study to examine the relationship between IS competencies and organizational learning, we make an important contribution to the literature.

REFERENCES

