Expert Systems with Applications 38 (2011) 6170–6178

Contents lists available at ScienceDirect

Expert Systems with Applications

journal homepage: www.elsevier.com/locate/eswa

Performance implications of knowledge management processes: Examining the roles of infrastructure capability and business strategy

Tin-Chang Chang, Shu-Hui Chuang *

Department of Business Administration, Asia University, 500, Liufeng Rd., Wufeng, Taichung, Taiwan

ARTICLE INFO

Keywords:
Knowledge management
Infrastructure capability
Business strategy

ABSTRACT

Knowledge management (KM) has attracted significant attention from researchers and practitioners as a facilitator of firm performance. Even though companies have implemented KM, they offers inconsistent support that KM enhances firm performance. Thus, we examine that KM process is a critical variable through which infrastructure capability and business strategy effect firm performance. Data from 135 firms provide empirical support for this issue. We found the roles of infrastructure capability and business strategy have a positive association with the KM process. We confirmed the relationship between KM and firm performance.

1. Introduction

Knowledge is recognized as an important weapon for sustaining competitive advantage and improving performance. The twenty first century is the era of knowledge economy, in which most firms possess knowledge that enables them to improve firm performance. How does the firm enhance organizational capabilities to boost internal performance and external competitiveness through the creation of effective knowledge management is a critical task.

Recent research interest in the information systems (IS) literature indicates that infrastructure capability (e.g., structure, culture, etc.) can enhance the knowledge management processes (Gold, Malhotra, & Segars, 2001; Lee & Choi, 2003). For example, Some enterprises emphasize organizational culture to build supportive knowledge sharing (Grant, 1996a, 1996b). Other firms improve the knowledge access to make the collect, storage, and exchange knowledge more accessible (Lee & Choi, 2003) and to integrate fragmented flows of knowledge (Gold et al., 2001). Infrastructure capability operates as a two-edged sword. Because organizational culture with traditional thinking tends to value existing relationship with firms or contact point persons as a standard of selecting products in comparison to knowledge-based culture with knowledge thinking focusing on attributes of products, knowledge management processes in knowledge-based culture can be more effective to improve firm performance. Considering the possibility of more powerful influence of knowledge management processes on firm performance in knowledge-based culture, IS research in knowledge-based culture is expected to show the process by which infrastructure capability translates into organization's outcomes more definitely and to generalize successful knowledge management processes.

The research of enterprise internal knowledge management also focuses on the connection of knowledge management and organization performance or the introduction through the effectiveness of knowledge management organization innovation (Andrew, Arvind, & Albert, 2001). Before, less attention is paid to the companies' implementation of the strategy of knowledge management within the company and the influence of its related activities. On the other hand, the importance and the value of business strategy are highly valued. In contrast less study focuses on knowledge management process. Thus this research hopes, through the exploration of the infrastructure capability and business strategy to understand more deeply these two roles influencing on performance. Thus, the objectives of this paper are to suggest an integrative framework describing how infrastructure capability use translates into firm performance and to make a generalization of the mechanisms involved in the successful knowledge management processes. Specifically, we discussed some antecedents and outcomes of knowledge management processes. In our proposed model, we suggest that business strategy operates as an independent variable. Moreover, this study summarize model from the result of this in-depth case study, and to understand that the next step is to combine the infrastructure capability and business strategy in order to offer many industries to utilize knowledge management process to increase their competitiveness.

2. Theoretical background and conceptual model

Researchers have studied knowledge management processes using a variety of infrastructure capability. However, more recent

* Corresponding author. Tel.: +886 4 2332 3456; fax: +886 4 2332 1176.
E-mail address: joyce@asia.edu.tw (S.-H. Chuang).

0957-4174/$ - see front matter
doi:10.1016/j.eswa.2010.11.053

treatments have depicted the capability as more expansive and traditional approach, while infrastructure capability of this study, one of major components of knowledge-based, has been defined as the knowledge resource that is deployed for the specific purpose of managing knowledge. Fig. 1 presents the research model. Infrastructure capabilities, such as knowledge-based culture, structure, technology, and human resource, are proposed to have an impact on the knowledge management processes. The processes would then influence the firm performance. The rationale for these factors and the relationship among them is described in the following sections.

2.1. Knowledge management process

The knowledge management processes is defined as the degree to which the firm creates, shares, and utilizes knowledge resources across functional boundaries. Spek and Spijkervet (1997) consider that the major knowledge management lays in the flow of the organization including the development of innovative knowledge, the distribution of knowledge when needed, the storage of knowledge for the future and the field of application and the integration of the knowledge within the entire organization. Beckman (1997) considers that there are eight steps within the knowledge management processes including the definition, the access to knowledge, the selection of knowledge, the storage of knowledge, the sharing of knowledge, the application of knowledge, the creation of knowledge and the selling of knowledge. This study is based on Beckman's (1997) research to define knowledge management processes: knowledge choice, access, storage, and sharing. First, knowledge choice: based on the value to carry out an appropriate access to knowledge and to filter out knowledge based on the value. Second, knowledge access can be defined through internal working experience in the firm, external information such as market, technology, and product. Third, knowledge storage can be extracted into different categories with proper methods. Four, knowledge sharing can be understood through internal organization users and it should be able to exchange information in a regular place with contexts not only limited internal corporate best practice, also with the suppliers', the employees' and customers' interactions.

2.2. Infrastructure capability

2.2.1. Knowledge-based culture

Knowledge-based culture describes the degree to which organization culture provides support for viewing knowledge as valuable assets and resources. The culture is the most important factor for successful KM. For example, Dialogue between individuals or groups are often the basis for the creation of new ideas and can therefore be viewed as having the potential for creating knowledge.

An appropriate culture within a firm can encourage people to create and share knowledge (Holsapple & Joshi, 2001; Leonard-Barton, 1995). A knowledge-based culture fosters this knowledge dissemination so that employees understand the value and significance of knowledge (Leonard-Barton, 1995). Therefore, we expect that knowledge-based culture should have a positive impact on KM processes.

H1a: Knowledge-based culture has a significant positive influence on KM processes.

2.2.2. Knowledge-based structure

Knowledge-based structure refers to the extent of an organization's structural disposition toward encouraging knowledge-related activities. The structures must be possible to encourage these vital interactions, as well as to give the firm the ability to adapt to an ever-changing environment (Sanchez & Mahoney, 1996).

The structure within a firm may encourage or inhibit knowledge creation, sharing, and application (Nonaka & Takeuchi, 1995). Our study examines the knowledge-based structure within a firm that may encourage knowledge, a practice seen as vital in the effective management of knowledge. The structure must be appropriate to the firm in order to adapt to an ever-changing environment. Therefore, we expect that knowledge-based structure should have a positive impact on KM processes.

H1b: Knowledge-based structure has a significant positive influence on KM processes.

2.2.3. Knowledge-based technology

Knowledge-based technology is defined as the technical systems within a firm, which determine how knowledge travels throughout the enterprise and how knowledge is accessed. It includes information technology (IT) and its capabilities (Scott, 1998). IT contributes to knowledge management effectively (Sher & Lee, 2004). For example, business intelligence technologies enable a firm to generate knowledge regarding its competition and the broader economic environment. Knowledge application technologies enable a firm to use its existing knowledge.

With the improvement of science and technology, the techniques of information system become more and more important in recent years. Information system can be used to support and promote knowledge management processes. Knowledge-based technology is essentially an organizational capability for effective KM. Organizations should establish an appropriate IT that encour-

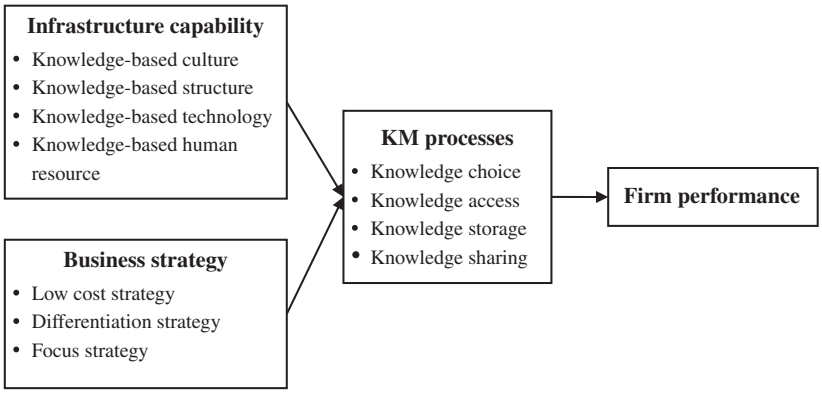

Fig. 1. Research model.