



Information technology resource, knowledge management capability, and competitive advantage: The moderating role of resource commitment



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ABSTRACT

The role of information technology (IT) in knowledge management has always been a debatable topic in literature and practice. Despite existing documentation regarding the relationship between IT resource and knowledge management, limited information is available on the different types of IT resources describing this relationship. We integrate two research streams emerging in knowledge management and extend the literature on IT–knowledge management linkage by investigating the moderating role of resource commitment to invoke a contingent resource perspective. Data from 168 organizations in China provide empirical evidence that three types of IT resources (i.e., IT infrastructure, IT human, and IT relationship) positively affect knowledge management capability (KMC), which is positively related to competitive advantage. Furthermore, this study identifies two positive quasi-moderating effects of resource commitment on the IT resource–KMC relationship. Specifically, resource commitment directly and positively enhances KMC, and strengthens the effects of IT human and IT relationship resources on KMC. We discuss the theoretical and practical implications of the results.

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1. Introduction

For decades, the development of information technology (IT) and knowledge management in creating competitive advantage has been one of the leading concerns of managers and scholars. Today's increasingly changing environment makes the emergence of IT-enabled knowledge management capability (KMC) as a core competency for organizations to enhance individual performance, innovation, organizational capabilities, and competitive advantage (Gold, Malhotra, & Segars, 2001; Joshi, Chi, Datta, & Han, 2010; Ko & Dennis, 2011; Tseng, 2014). KMC can be defined as the process-based ability of the organization to mobilize and deploy knowledge-based resources to gain competitive advantage. For example, the German electronics and engineering company Siemens has significantly invested in its ShareNet knowledge

management system to improve business operations and create customer value, thereby evolving into a knowledge-based organization (Nielsen & Ciabuschi, 2003). The advent and in-depth use of IT, particularly communication networks and the Internet, have brought a fast, safe, and convenient method of obtaining, sharing, and storing knowledge by increasing collaborations and reducing costs (Mohamed, Stankosky, & Murray, 2006). IT may enable knowledge management to gain competitive advantage. According to the 2015 Knowledge Management Priorities Report, 93% of organizations have specific funds allocated to knowledge management, and 61% positively respond to the future of knowledge management programs (APQC, 2015). Meanwhile, the report also mentions that processes by which technology investment drives knowledge management are less obvious, consequently requiring further examination regarding the linkage between IT and knowledge management. However, Three research gaps can be identified based on previous studies.

First, the relationships between different types of IT resources and KMC remain unclear in previous research and require further investigation. The resource-based view (RBV) regards IT as a

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rare, valuable, and appropriable organizational resource, enabling a wide breadth and depth of knowledge flows for high KMC (Alavi & Leidner, 2001; Bharadwaj, 2000; Wade & Hulland, 2004). However, contradictory findings on the relationship between IT and knowledge management exist. Several researchers argue that the KMC of organizations can benefit from IT applications (Joshi et al., 2010; Tanriverdi, 2005), particularly a knowledge management system (Alavi & Leidner, 2001). As IT becomes more powerful, many organizations invest more on the technical aspect to manage knowledge and related processes (Iyengar, Sweeney, & Montealegre, 2015). Nevertheless, other researchers contend that the use of IT is not associated with the success of knowledge management initiatives (Mcdermott, 1999; Mohamed et al., 2006), and IT should be used only when necessary. Moreover, whether different types of IT resources enhance KMC is unknown. IT is commonly treated as a second-order variable (Pérez-López & Alegre, 2012; Tanriverdi, 2005) or a specific dimension, such as the use of IT (Choi, Lee, & Yoo, 2010; Iyengar et al., 2015). However, various types of IT resources have different attributes, which can result in different outcomes and effectiveness (Wade & Hulland, 2004). For example, the appropriability and imitability levels of an information system (IS) infrastructure are both high, whereas the levels of those attributes in the IS–business partnership are low–medium and low (Wade & Hulland, 2004). Thus, different levels of KMC may be generated by IS infrastructure and IS–business partnership. Accordingly, this study attempts to bridge this gap by exploring how different types of IT resources influence KMC.

Second, previous studies fail to examine the condition under which the effects of IT resources on KMC are altered and to provide an integrated analysis of the effects of the technical and social–managerial factors on knowledge management. Two research streams have been presented in previous literature regarding the effects of IT resources. One research stream comes from the technical perspective, and states that knowledge management processes are supported by infrastructure, techniques, and systems (Gold et al., 2001; Tanriverdi, 2005). Technical systems within an organization determine how knowledge is acquired, shared, and stored (Gold et al., 2001). The other stream comes from the social–managerial perspective. In this perspective, knowledge management is affected by organizational culture, climate, management support, trust, and commitment (Alavi, Kayworth, & Leidner, 2005; Bock, Zmud, Kim, & Lee, 2005; Lee & Choi, 2003), considering that knowledge is bound to humans. However, few studies have integrated these two research streams. This research void was also highlighted by Tanriverdi (2005), who suggested that a comprehensively technical and social–managerial view should be provided to enhance knowledge management. Researchers of traditional RBV argue that the required resources are insufficient for knowledge management (Chen et al., 2014). A contingent resource perspective can extend the theory through an integrated analysis of the effects of environmental factors, business strategies, and other industry-level and firm-level variables (Aragon-Correa & Sharma, 2003; Cui & Lui, 2005). Therefore, this study adopts the contingent resource perspective to address the importance of the factors in two separate streams of research, which have emerged to improve knowledge management.

This study focuses on one significant social–managerial factor (i.e., resource commitment) because of its critical role in leveraging IT resources to ensure the success of knowledge management (Li & Kozhikode, 2008; Tseng, 2008). As a type of commitment from organizations (Dong, 2001), resource commitment refers to the effort committed by an organization toward business strategies and is frequently treated as a key element of the planning process for strategy (e.g., knowledge strategy) success (Cui & Lui, 2005; Lai, Li, Wang, & Zhao, 2008; Menon, Bharadwaj, Adidam, & Edison, 1999; Wagner & Buko, 2005). Thus, resource commitment could be a

direct enabler of KMC. Meanwhile, advocates of contingency theory argue that organizations with superior performance benefit from establishing a fit between IT resources and organizational context variables (e.g., resource commitment) (Aragon-Correa & Sharma, 2003; Cui & Lui, 2005; Wade & Hulland, 2004). This situation implies that resource commitment can also serve as a potential moderator of the effectiveness of IT resource. Indeed, significant relationships between IT resources and KMC are unobserved in several studies (Mohamed et al., 2006). Furthermore, several researchers argue that organizations should effectively bundle and allocate IT resources to enhance KMC (Richey, Musgrove, Gillison, & Gabler, 2014). As a social–managerial factor of an organization, resource commitment may act as a moderator in knowledge management enhancement (Amayah, 2013; Chen & Chang, 2012; Rusly, Sun, & Corner, 2014; Wade & Hulland, 2004). A high level of commitment to IT resources reflects the belief that IT will make a valuable contribution to organizations (Newman & Sabherwal, 1996). High resource commitment can promote the effective allocation of IT resources to the enhancement of KMC. However, previous research has failed to provide empirical evidence on how the effect of IT resource on KMC is contingent on resource commitment. Therefore, this study attempts to bridge this gap by exploring whether high levels of resource commitment change the relationship between IT resources and KMC.

Third, although researchers have argued that knowledge management can mediate the correlation of IT with firm performance (Tanriverdi, 2005), whether the effects of different types of IT resources and organizational competitive advantage are mediated by KMC remains unexplored. In the relationships among IT, knowledge management, and competitive advantage, IT is frequently treated as one unified system, which causes it to become homogeneous and ubiquitous, consequently losing its way to knowledge management and competitive advantage (Bhatt & Grover, 2005; Chae, Koh, & Prybutok, 2014). However, RBV suggests that the different resource types could primarily lead to a significant difference in performance (Christmann, 2000). Thus, the process by which an organization leverages different types of IT resources for knowledge management and competitive advantage is critical. The present study attempts to extend prior research on IT–knowledge management–competitive advantage linkage by empirically examining the effects of different types of IT resources. By considering the effects of KMC on the long causal linkage of IT with organizational performance, this study intends to fill this gap by examining whether KMC mediates the effects of the three types of IT resources (i.e., IT infrastructure [ITI], IT human [ITH], and IT relationship [ITR]) on competitive advantage.

In summary, this study intends to investigate the contingency of IT-enabled KMC by answering the following research questions:

- 1) How do different types of IT resources affect KMC?
- 2) Does resource commitment enhance KMC and strengthen the effects of IT resources on KMC?
- 3) Does KMC play a mediating role in the relationship between different types of IT resources and competitive advantage?

The remaining sections of this research are organized as follows: relevant literature is presented in Section 2 and research model and hypotheses are developed in Section 3. Then, a survey instrument to test the hypotheses with 168 organizations in China is developed in Section 4. Section 5 discusses the results of data analysis. Finally, research implications of this study are discussed in Section 6.

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