Innovation Managed and IT Infrastructure Capability

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ABSTRACT

Appropriate information technology (IT) infrastructure capability is critically needed for organizations when seeking effective adaptation to a dynamic market. This adaptation can be treated as a type of management of innovation in terms of Miles and Snow’s typology. Although many studies have explored IT infrastructure capability, it is still unclear how that capability can be diverse among innovation types managed. We use Miles and Snow typology as a surrogate to measure various innovation types and examine how IT infrastructure capability can be differentiated accordingly. Our results show that not all types of IT infrastructure capability are important for facilitating innovation managed and different types of innovation managed have their own IT infrastructure capability emphasized. For example, IT personnel’s technical skills (e.g., computer or systems) are not relatively important for any certain innovation type, but business skills (e.g., performance skill, business knowledge, and organizational skill) are key differentiators. Companies may foster their required IT infrastructure capability according to innovation managed. Implications are discussed.

Keywords: Business Skills, Innovation Managed, IT Infrastructure Capability, Miles and Snow Typology, Strategic Alignment, Technical Skills

INTRODUCTION

Information technology (IT) infrastructure capability has been increasingly recognized as vital for large multibusiness companies adapting to environmental dynamics (Fink & Neumann, 2007; Weill, Broadbent, & Subramani, 2002). With appropriate IT infrastructure capability, a company can effectively adapt to market changes (Broadbent, Weill, & Neo, 1999; Chung, Rainer, & Lewis, 2003; Duncan, 1995). According to Miles and Snow (1978), this adaptation can be treated as a kind of management of innovation practices that aligns products/services (or market) domain and IT used. Under an information intensive environment, such practices are generally viewed as typical business strategy that should have appropriate IT infrastructure capability to gain competitiveness (Blumentritt & Danis, 2006; Broadbent et al., 1999; Miles & Snow, 1978; Tallon, 2003).

IT infrastructure capability can be a company resource and potential distinctive competence that is difficult to imitate, requiring complementarity and cospecialization of human and technical assets (Barney, 1991; Broadbent et al., 1999). It can be considered a strategic capability that helps companies to identify customers, offer products/services and conduct related activities effectively (Porter, 1996) and thus becomes the source of long-term

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profitability (Barney, 1991; Weill & Broadbent, 1998; Zhu, 2004). For example, as the number of existing and future IT infrastructure services increases, the business value of the infrastructures increases (Broadbent et al., 1999).

Executives are continually facing new and ever changing competitive pressures (e.g., deregulation, globalisation, ubiquitous connectivity, convergence of industries and technologies; Bhatt, 2003). To handle this, they are expected to invest in an IT infrastructure that enables the company to scan the environment agilely and provide innovative products/services at low costs (Chung et al., 2003) or business initiatives that may support new types of organizations (e.g., virtual companies; Strader, Lin, & Shaw, 1998; Lee, Eom, Kim, & Katerattanakul, 2007), facilitate electronic commerce through the development of virtual chains (Sawy, Malhotra, Gosain, & Young, 1999) and provide business connectivity and integration (Byrd & Turner, 2001). Going through dynamic changes, maintaining continuity and global competitiveness of business innovation requires a robust IT infrastructure (Broadbent & Weill, 1997; Byrd & Turner, 2001).

As such, IT infrastructure capability is a fundamental differentiator for competitive innovation that depends on how an executive adapts to the environmental changes (Duncan, 1995; McKenney, 1995; Tallon, 2003). Different managerial perceptions give rise to different types of adaptation or innovation managed (Miles & Snow, 1978). Because aligning IT to business (concern for innovation managed) is critical to the competitiveness (Hirschheim & Sabherwal, 2001), the company must be able to provide appropriate IT infrastructure for the corresponding innovation managed (Duncan, 1995; Huang, 2009).

In the literature, more extensive IT infrastructures are found in those innovative companies where products change quickly (Broadbent et al., 1999), where efforts are made to identify and leverage synergies across business functions (Maleyeff, 2006), where there is greater integration of information and IT needs as part of a strategic-planning process (Prahalad & Krishnan, 2002) and greater emphasis on monitoring the implementation of business strategy (Hedelin & Allwood, 2002), and where there is a cost efficiency of business processes (Gebauer & Schober, 2006).

These findings have implications for how companies link the strategic formulation process of innovation and IT infrastructure investment (i.e., strategic alignment [Chung et al., 2003]). While the literature recognizes the importance of IT infrastructure and its success with strategic initiatives and business processes change implementations (Broadbent et al., 1999; Chanopas, Krairit, & Khang, 2006; Chung et al., 2003; Robertson & Sribar, 2002; Schalken, Brinkkemper & Vliet, 2005), few studies have clearly identified the patterns of IT infrastructure capability within the diverse strategic contexts of innovation managed.

As noted, innovation managed can be reflected as “business strategic adaptation” of a company (Miles & Snow, 1978). Executives in companies with different strategic adaptations develop distinctive competences in their own companies to support the desired innovation managed (Huang, 2009). That is, successful innovation needs a match between the opportunities and risks inherent in the environment and the internal competencies resources and skills posses by the company (Gupta, Karimi, & Somers, 1997). A company may have distinctive competence in IT that is the degree to which IT infrastructure supports the company’s innovation. Hence, our research objective is associated with the research question “How IT infrastructure capability required can be differentiated when managing different types of innovation?”

In this paper, we develop our theoretical framework by first reviewing definitions of IT infrastructure and its components. We then define the concept of IT infrastructure capability and its relationship to innovation managed. We empirically examine how a company’s IT infrastructure capability may differ with respect to the strategic type of innovation by comparing the importance level of that capability. Lastly, we discuss the implications and conclude.
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