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Organizational applications of IT innovation and firm's competitive performance: A resource-based view and the innovation diffusion approach

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ABSTRACT

The resource-based view (RBV) argues for IT innovation capabilities as being valuable resources for competitive performance. It is characterized by three types for its applications, IT unit, intra-organization, and inter-organization. The three types are an evolutionary concept across time. Innovation diffusion theory (IDT) is an approach to explain a diffusion structure and its drivers. Grounding on these theories, this study proposes a model for the links between the drivers, diffusion process, and IT-enabled performance. Previous studies have lacked a consideration to the concept of dynamic diffusion. The empirical findings indicate the importance of a diffusion structure in realizing competitive performance.

Introduction

Information technology (IT) has been widely applied to support important business functions both internally and externally, such as customer relationships and the supply chain. The concept of innovative use of IT or IT innovation capabilities has been well considered as a source of a firm's competitive performance in terms of its potential strategic impact in an industry-wide scope, in

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particular, e-business as the next core competence (Tanriverdi et al., 2010; Ashurst et al., 2012; Hertwig, 2012; Zhu et al., 2012). This concept was originally defined from the resource-based view (RBV) of the firm. A firm's resources can be tangible or intangible assets that an organization owns or controls for use in performing a coordinated set of business tasks (Helfat and Peteraf, 2003). The RBV argues that a firm can obtain sustained competitive performance from its controllable resources while they are valuable, rare, inimitable, and non-substitutable (Barney, 1991). Competencies are further developed when such resources are combined to create specific organizational capabilities (Tarafdar and Gordon, 2007; Teece, 2007).

Many researchers argue that IT innovation capabilities are a critical determinant leading to a firm's competitive performance since they can be used to leverage structural resource differences among competitive firms, including differences in vertical and horizontal integration, diversification, flexibility, and quality (Santhanam and Hartono, 2003; Benitez-Amado and Walczuch, 2012). Thus, IT innovation capabilities intend to develop the particular competencies of a firm among competitive firms with the four attributes mentioned above. Accordingly, the RBV provides an overarching theoretical basis to define our research purpose, which is the relationship between IT innovation capabilities and competitive performance.

Innovation is a subject which has been widely studied by social and organizational scientists (Rogers, 2003). Recently, the extension to IT innovation has been extensively considered in the literature (Doherty and Terry, 2009; Wang and Ahmed, 2009; Hameed et al., 2012). IT innovation capabilities may be broadly defined as innovations in the organizational applications of IT. Accordingly, three basic types of IT innovation, Type I, II, and III are posited for different application domains in organizational settings (Swanson, 1994, 2010). Type I innovation focuses on adopting IT products and services to supporting the administrative task of IT functions. Type II innovation applies IT products and services to support the administrative core of the host organization. Type III innovation integrates IT products and services with the core business competencies, and this innovation may well be strategic, in terms of offering competitive advantage to those who are among the early adopters. Significantly, IT innovations of all three types are likely to evolve across their organizational settings over time as they are successively adopted (Xu et al., 2005). This gives rise to a major concern in terms of IT innovation diffusion. How do IT innovations of different types originate and diffuse in organizations?

This may be understood in terms of innovation diffusion theory (IDT) (Rogers, 2003). The IDT is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2003, P5). More specifically, it discusses both a set of antecedents and a multi-stage diffusion structure for the process (Rogers, 2003; Tsai and Hung, 2014). The antecedents to influence the diffusion process are, for example, innovation, individual, and organization (Chan et al., 2012). Thus, the IDT would provide insight for understanding the diffusion process across various types of IT innovations. According to the IDT, two major issues arise for IT innovation capabilities, contextual drivers of the diffusion process and a multi-stage diffusion structure (Rogers, 2003; Chan et al., 2012). This study will address both the concerns for IT innovation capabilities on the basis of the theoretical arguments of the IDT.

Grounding on the RBV as an overarching theoretical basis and the IDT as a specific theoretical foundation, this study proposes a research model for defining the relationship between IT innovation capabilities and competitive performance. Specifically, IT innovation capabilities further indicate two key concerns: the contextual drivers of the diffusion process and a multi-stage diffusion structure. Accordingly, this study proposes five antecedents: technology, task, user, organization, and environment; and three types of IT innovations: IT unit, intra-organization, and inter-organization. We discuss this in detail below. Previous studies have discussed IT innovation capabilities as only a general concept without further elaboration, and its link to competitive performance (Ross et al., 1996; Doherty and Terry, 2009; Grover et al., 2009). Further, the focus of these studies is relatively superficial and static, in view of the dynamic concept of IT innovation diffusion.

In addition, many studies on IT-enabled performance issues have reported that some organizational characteristics, such as industry type and firm size, indicate highly differentiated effects of IT investment on the realized organizational performance (Rai et al., 2006; Wu and Chuang, 2010; Saunila and Ukko, 2014). For instance, high-tech industries may be more likely to recognize the