Chapter 13
Information Technology and Firm Innovations:
A Review and Extension Explicating the Role of Networks, Capabilities, and Commercialization of Innovation

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ABSTRACT

This paper provides a framework comprising of research agenda explicating the relations between IT Capability and Firm Innovation. Firm innovation is conceptualized as a combination of three constructs: networks, capabilities (absorptive capacity), and commercialization of innovations (CI). These three constructs have received a very lukewarm response from the IS research community. Inclusion of these three constructs, and examining how IT- capability affects the relationships between these constructs, is essential to examining the role of IT in innovation at the firm-level. Five research agendas are identified.

INTRODUCTION

In order to extract strategic value from IT firms have to apply IT capabilities to harness and exploit their *knowledge capabilities* to continually *innovate* their business products, services, and processes. The current information systems literature shows mixed results in establishing a relationship between IT investment on firm performance, which has been attributed to factors such as sample size, data sources, and industry type (Devaraj & Kohli, 2003; Kohli & Devaraj, 2003). However, we argue that central problem is that the relationship has not been conceptualized through the lens of three aspects of firm innovations: networks, knowledge capabilities and commercialization of innovations.

Although the existing IS literature that has modeled the relationship between IT capabilities and firms performance has acknowledged the role of knowledge capabilities and innovation

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(Bharadwaj, 2000; Mata et al., 1995; Ray et al., 2005; Wade & Hulland, 2004; Bhatt & Grover, 2005), its treatment for the most part is implicit and indirect. We extend existing literature by explicating the role of networks, knowledge capabilities and commercialization of innovations in evaluating the relationship between IT capability (ITC) and firm innovation. The paper does three things: (a) establish gaps in the current literature IT capabilities, firm performance and innovation (2) posit relationships among constructs of firm innovations: networks and absorptive capacity, and commercialization of Innovations, and (c) positing research agenda on the impact of IT capability on the strengths on relationships between the innovation variables.

The rest of the paper proceeds as follows. First, the research methodology for the paper is discussed. Second, we discuss the four key observations that were revealed during the literature review process. Third, we present the framework: comprising of a definition, discussions, and relationships among the constructs: networks, knowledge capabilities and commercialization of innovation and the corresponding propositions. While the relationships between constructs are proposed, we also recommend the research agenda on IT capability can be studies in light of those posited relationships. The paper concludes with a discussion, implications and future directions.

LITERATURE REVIEW

The literature review process followed three steps (1) the development of criteria for the types of studies, (2) a literature search strategy, and (3) an analysis scheme outlining the documentation and coding of various studies (Leidner & Kayworth, 2006).

1. **Criteria for the types of studies:** We searched for conceptual and/or empirical papers that looked at the impact of IT capability on firm innovation.
2. **A literature search strategy:** The EBSCOhost, ABI Informs, JStor Databases were used to search articles. We searched articles using the key word IT capability and then narrowed the search using several combinations of key phrases such as knowledge management, knowledge activities, knowledge capability, and innovation. The articles that focused on the association between IT capability, knowledge assets, and/or firm innovation were included. Our search resulted in 91 articles. We reviewed all 91 papers to examine the role of ITC on firm innovation. Our total search revealed a total of 49 relevant articles.
3. **An analysis scheme outlining the documentation and review of included various studies:** We reviewed the articles to uncover the characterization of ITC, knowledge networks, knowledge capabilities, and innovation. Each article was reviewed to determine whether or not a study explicated the role ITC in enabling organizational knowledge networks and capabilities to create firm innovation. A summary of this review is presented in Table 1 and used to make observations about the perceived gaps in IT capability literature to address the role of IT in firm innovation. Second, each study was evaluated and used as a foundation for developing the research framework posited in this study.

ITC as a Firm Resource

Employing the resource Based View (RBV) concept, the IS researchers argued that IT capability is a resource that a firm can use to create value. The review of the literature highlights and supports the argument that IT acts as an enabler of knowledge resources that can create strategic value for a firm. Such knowledge resources are IT-enabled intangibles, Human IT resources (Bharadwaj, 2000; Melville et al., 2004; Santhanam & Hartono, 2003), IS Managerial skills (Mata et al.,