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Knowledge sharing and strategic fit in integrated product development proejcts: An empirical study

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ABSTRACT

While product strategy has been approached from a variety of perspectives, the role of strategic fit as a critical linkage of knowledge sharing practices and new product development outcomes have not been adequately explored. This paper discusses how strategic fit is instrumental for cross-functional teams to integrate product development outcomes. This paper identifies critical knowledge sharing components that enhances the extent of strategic fit that in turn improves the success of product development efforts. Strategic fit or alignment requires knowledge sharing practices of the product development team. Teams with a shared knowledge base are more capable of thinking strategically, adapting their actions to their project environment and accordingly engaging in innovative problem-solving while ultimately achieving project goals of time, cost and value. This paper presents and tests a research model using a sample of 285 product development projects of firms from USA, Canada and Spain. The results suggest that strategic fit is associated with greater knowledge sharing and enhance product development outcomes in both small and large firms as well as diverse regions (i.e., USA, Canada and Spain).

1. Introduction

While product strategy has been approached from a variety of perspectives, the role of strategic fit as a critical linkage of knowledge sharing practices and new product development outcomes have been mostly in the program level but not necessarily in the project level (Zajac et al., 2000; Hughes and Morgan, 2008; Carmeli et al., 2010). Strategic fit is a critical linkage that connects the productivity of projects and its ultimate outcomes (Smith and Reece, 1999; Murray and Kotabe, 2005; Katsikeas et al., 2006). For projects that involve value creation and delivery through innovative problem solving requires knowledge sharing practices of the product development team (Fernie et al., 2003; Fedor et al., 2003. Hong et al., 2005).

The resource-based view (RBV) of the firm assumes that firms can be conceptualized as bundles of valuable, rare, inimitable and non-substitutable resources through which they achieve sustainable competitive advantages (Wernerflet, 1984; Prahalad and Hamel, 1990; Barney, 1991; Teece et al., 1997). Increasingly, RBV is extended to dynamic markets, where the utilization of knowledge resources is especially regarded as critical strategic resources of firms (Grant, 1996; Kogut and Zander, 1992; Rauniar et al., 2008a; Adenfelt, 2010). Firms with superior resources (e.g., knowledge resources and absorptive capacity) may have better chances of sustaining their competitive advantages. A few papers suggest empirical grounding particularly on the strategic process mechanisms by which knowledge resources are utilized for competitive advantages in dynamic markets (Williamson, 1999; Priem and Butler, 2001; Eisenhardt and Martin, 2000). However, it is still not so clear how firms translate their knowledge resources in the project level to design, develop and deliver products that allow their product advantages.

Key interface issues in engineering and management are to examine how organizational practices impact business performance. Thus, empirical studies have examined the relationship between: design quality and performance (Fynes and De Búrca, 2005), manufacturing strategy gap and business performance (Rho et al., 2001), manufacturing systems, strategic change and performance (Lloréns et al., 2005), innovation, quality management and performance (Sadikoglu and Zehir, 2010), product modularity and performance (Lau Antonio et al., 2007), shared knowledge and product design glitches (Rauniar et al., 2008b), lean manufacturing and business performance (Yang et al., 2011), and supply chain flexibility and firm performance (Merschmann and Thonemann, 2011).

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Strategy literature adequately discusses the role of strategic fit in organizational level (Zajac et al., 2000; Kim and Finkelstein, 2009; Yin and Zajac, 2004; Murray and Kotabe, 2005; Naesens et al., 2009). However, in what context (i.e., antecedents and drivers) and to what extent (i.e., outcome effects) strategic fit operates in project level is unclear. Nothing in the prior literature on product development focuses so carefully with a large sample study on strategic fit at the project level. No other study supports the mediating or partially mediating role of project strategic fit with such a large and multi-country sample. In view of this critical research gap, this paper explores the following specific research questions: (1) how critical is strategic fit in the integrated product development projects?; (2) what are the essential knowledge components that enhance the strategic fit which in turn improve the success of product development efforts? and (3) what are the key performance outcomes that measure the effectiveness of strategic fit? Cross-functional teams need to utilize an adequate shared knowledge base by thinking strategically, adapting their actions to their project environment and thus engaging innovative problem-solving while achieving integrative project goals in terms of time, cost and value. Thus, this study is to highlight the critical linkage and coordinating mechanism of strategic fit in the increasing knowledge intensive, innovative project management.

This paper provides a unique and rich research context. Previous research by Hong et al. (2004b) has discussed the impact of shared knowledge of customers on clarity of project goals, knowledge sharing on process performance (Hong et al., 2004a), role changes of design engineers (Hong et al., 2005) and manufacturability (Doll et al., 2010) upon product development outcomes. This paper is different from these previous papers in that: (1) we examine a comprehensive set of shared knowledge, which includes shared knowledge of customers, suppliers, competitors and internal capabilities; (2) we present a research model that explains how firms within dynamic markets utilize knowledge resources through strategic fit as an important value-creating project linkage mechanism; (3) we also explore how these knowledge capabilities, via strategic fit, impact performance outcomes of new product development (i.e., time-to-market, value-to-customers and manufacturing cost) and (4) the data base includes USA, Canada and European data ($n=285$) in contrast to all the previous papers ($n=205$) which is based on the data collected only from firms of USA/Canada (Hong et al., 2004a, 2004b; Hong et al., 2005; Doll et al., 2010).

This paper is organized as follows. The next section discusses a conceptual framework that provides a theoretical perspective of strategic fit for effective project management, particularly in the knowledge intensive innovative environment. Then, this paper presents a research model that defines the different aspects of shared knowledge components that enhance the extent of strategic fit. The value of strategic fit is articulated in the critical project outcomes in terms of customer values, time to market and cost effectiveness (i.e., create and deliver highly valued products in a short time at low costs). Research methods are described and the research results based on 285 projects from USA, Canada and Spain are presented in details. Theoretical and managerial implications of this study are discussed along with the future research issues.

2. Conceptual framework

We derive our main theoretical basis of this paper from two streams of theory sources: (1) project level view of strategic fit through the integration of project environment, project resources and project goals; and (2) the enactment process of information (i.e., knowledge, strategic fit and project performance).

2.1. Project level view of strategic fit

Complex environment requires enactment of the perceived environment through dissonance reduction, strategic profiling and assessment of alignment, which becomes the basis for project strategy (Weick, 1964; Hill and Brown, 2007; Rauniar et al., 2008b). Enacted sensemaking requires unequivocal information sharing and shared sense of legitimacy for authoritative action (Wagner and Gooding, 1997; Ericson, 2001; Weick, 2010). Product development team members discuss customer expectations, competitors' offerings, product lines, internal capabilities and suppliers capabilities. Business environment is quite complex and the nature of information is volatile, changing, uncertain and ambiguous. As cross-functional project team members engage in goal-directed behaviors (e.g., successful new product development), it is critical for them to enact the knowledge from external environment, internal context and goal articulation. Strategic fit is the alignment of the project goals (targets) with the project's competitive situation (e.g., customer expectations and competitive offerings), the project resources available (e.g., internal design and manufacturing capabilities as well as suppliers' design and manufacturing capabilities) and the firms overall business strategy.

Fig. 1 shows how strategic fit is derived through integrative processes of enactment of knowledge from project external environment, project internal resources and project team goals. In the context of cross-functional team, new product development team members need the enacted information (i.e., knowledge) about external entities (i.e., knowledge about competitors, customers and suppliers), internal resources (i.e., knowledge about internal capabilities) and product development goals in terms of time, cost and value. As shown in Fig. 1, strategic fit is the critical linkage of the above three categories of enacted knowledge.

2.2. Process view of knowledge, strategic fit and project performance

From process point of view, the enactment of information is the foundation of knowledge sharing and exploitation. Project team, as knowledge sharing communities, needs knowledge sources (e.g., competitors, suppliers, customers, internal resources and goals) (Ruuska and Vartiainen, 2005). Project team members perceive the extent of knowledge through enactment processes (i.e., cognition, categorization and goals) that overcome the derailment of projects and instead work toward project progress (Drabek, 1994; Sonuga et al., 2002; Danneels, 2003; Jones, 2005). Fig. 2 shows how this processes of information enactment result in defining strategic fit, which in turn direct the knowledge outcomes in new product development.

As enacted knowledge is shared among cross-functional team members, this shared knowledge becomes the basis for important decision making. One of the most important decisions criteria is to assess the strategic fit of a particular project, which is critical for fulfilling specific project goals. Without adequately assessing and assuring the overall compatibility and realistic possibility of a project's success, team efforts would not be effectively directed toward the project goals.

2.3. The research model

Product development routines are regarded as a dynamic capability in knowledge intensive work environment for value creation through innovative problem solving. Product development is also a strategic process in that it utilizes knowledge capabilities within firms for numerous projects on a continuous basis (Clark and Fujimoto, 1991; Brockman and Morgan, 2003; Schroeder et al., 2002). We examine the mechanisms of delivering