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Knowledge integration and innovation: Securing new product advantage in high technology industry

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Abstract

This paper examines the impact of two processes of knowledge management, knowledge integration and innovation, on new product performance in Chinese high technology industry. The results show that knowledge integration and innovation exert significant positive effects on new product performance. The knowledge integration–performance connection is contingent on marketing and manufacturing competences and another two knowledge management processes: knowledge acquisition and dissemination. This paper concludes with a discussion of the implications and limitations of the research.

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Keywords: Knowledge integration; Knowledge innovation; Knowledge management; New product performance

1. Introduction

Knowledge management is a growing field of interest in business today. It has become the basic framework of a successful business (Davenport & Grover, 2001) and a critical source of competitive advantage (Dutta, 1997). Knowledge management impacts firm performance through its efficiency in developing the intellectual assets that are a source of competitive advantage (Ndlela & du Toit, 2001). In the knowledge management process, knowledge integration and innovation have been the central part in

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developing new products (Lee & Yang, 2000). Knowledge integration is a fundamental process by which firms gain the benefits of knowledge and create competitive advantage. Effects of simple structures on the micro-level interactions among individuals can result in a changed knowledge integration process and improved knowledge integration. In enhancing new product performance, knowledge integration depends on how members integrate their individually held knowledge. Formal interventions that focus on the improvement of the group process are a potential way to achieve superior knowledge integration (Eisenhardt & Okhuysen, 2002). Useful knowledge has become more widespread and ideas should be used with enthusiasm, thus innovators of such ideas must be able to integrate them. Firms that can harness outside ideas to advance their own businesses while leveraging their internal ideas outside their current operations will likely thrive in this new era of open innovation (Chesbrough, 2003). Knowledge innovation is described by Patterson (1998) as the engine that drives revenue growth. Innovation is also the base for organizational survival (Hurley & Hult, 1998). According to Nonaka and Takeuchi (1995), an organization cannot create knowledge without individuals. The organization supports creative individuals or provides contexts for them to create knowledge. Therefore, organizational knowledge innovation should be understood as a process of knowledge being created by individuals and amplified as a part of the knowledge network of the organization. In particular, knowledge integration and innovation play a crucial role in developing a new product in high technology industry. On the other hand, the firm's marketing and manufacturing competences and knowledge acquisition and dissemination facilitate knowledge innovation and integration during new product development. For new product development, the most important factors of the firm itself should be marketing and manufacturing competences of the firm since the competences give rise to competitive advantage in firms through effective knowledge integration and innovation (Pisano & Wheelwright, 1995). As the two endpoints of the knowledge management process, knowledge acquisition and dissemination have been regarded as the outlets of knowledge which are essential for knowledge innovation and integration (Yang, Yu, & Lee, 2002). This study intends to explore the manner of knowledge management on new product performance. It aims to address the research questions: "Do knowledge integration and innovation positively relate to new product performance?" and "Are the relationships between knowledge integration and innovation and new product performance contingent on marketing and manufacturing competences and knowledge acquisition and dissemination?"

2. Literature review

Eder (1997) suggested that knowledge in new product development is primarily tacit, such as knowledge about the strategic design approach, and knowledge about tactics and methods for designing. Several scholars describe new product development as a knowledge-intensive activity (Davenport and Prusak, 1993; Iansiti & MacCormack, 1997; Nonaka and Takeuchi, 1995; Song & Montoya-Weiss, 1998). New product development involves cross-departmental functioning, that is, employees from different units form a team with different viewpoints. In a study by Court (1997), three categories of knowledge were identified that are used in the process of new product development: general, domain specific, and procedural. General knowledge is that which people gain through everyday experiences and apply without regard to any specific domain that they might be working in. Domain specific knowledge is that which is gained through study and experience within a specific domain. This is generally improved as the person(s) involved in projects gains more experience. Finally, there is procedural

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