



# Task partitioning in new product development teams: A knowledge and learning perspective

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## Abstract

R&D alliances and outsourcing elements of the new product development process are now commonplace practices among many firms. However, little previous work has examined how these organizational choices influence project knowledge and learning. Based on a comparison of three new product development projects in the software industry, this paper examines how task partitioning in the project influences learning and knowledge development within the firm. The paper suggests that internal development projects encourage synthetic learning and development of architectural and tacit knowledge; in contrast, outsourcing and joint ventures encourage analytic learning and development of component and explicit knowledge. © 2005 Elsevier B.V. All rights reserved.

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## 1. Introduction

Firms are increasingly using organizational forms such as outsourcing and alliances for product development in addition to the conventional approach of developing the product entirely in-house. Some factors driving this increase that have previously been suggested include discontinuous technological change, increasing cost of R&D, globalization and lower cost of production in less-developed countries (Campione, 2003; Kakabadse and Kakabadse, 2000; Lambe and Spekman, 1997). Most research to date has focused on the economic benefits and risks of such arrangements (e.g. Williamson, 1975; Pfeffer and Salancik, 1978; Provan, 1983; Jarillo, 1988). This paper focuses on the learning implications of such arrangements.

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As Hitt et al. (2000) note, ‘in contrast, the learning and process issues related to innovation have received scant scholarly attention.’ This is surprising since learning lies at the heart of much technological innovation activities (e.g. Carayannis and Alexander, 2002; Akgün et al., 2002; Mohrman et al., 2003; Molleman and Broekhuis, 2003; Polley and van de Ven, 1996). In particular, little research has been done specifically on how the project organization facilitates or hinders different types of learning in the product development context, although a few studies suggest that there may be a link. For example, Kazanjian et al. (2000) has shown a link between project organizational structure and the technological learning and creativity that occurs within product development projects. Meanwhile Takeishi (2002) examined outsourcing in product development projects in the automobile industry in Japan and found that the type of knowledge gained by the firm (architectural versus component specific) varied according to the type of technology involved and the organizational mechanisms used to transfer knowledge. Therefore, the research question that this paper examines is ‘how does the project organization influence the learning process and the different types of knowledge that are developed?’

I begin by reviewing some of the literature on different organizational approaches to new product development and team learning. I then review different typologies of learning and knowledge and discuss why different project organizational architectures may be expected to lead to different learning and knowledge development. The following sections then outline the key findings of a study that compares the learning process and knowledge developed in three companies that adopted different organizational arrangements for new product development. I end by discussing the implications of these findings for technology management theory and practice in innovation projects.

## 2. Literature review

### 2.1. Organizing for new product development

Several different ways of organizing for acquisition and exploitation of technology are documented in the literature. For example, Granstand et al. (1992) distinguish five forms based on different types of legal contracts: internal R&D, acquisition of innovative firms, joint ventures, technology purchasing, technology scanning (legal and illegal acquisition of external knowledge without direct purchase). Monaert and Deschoolmeester (1990) list six forms of organization for R&D based on a review of existing literature: internal development, contract research, intercompany cooperation, joint venture, acquisition, purchase of technology.

Many contingency factors have been identified that may influence the choice of project organization. Task-related factors include task difficulty, interdependence and resource flows (Olson et al., 1995), activity uncertainty and complexity (Levitt et al., 1999), speed of innovation (Kessler and Chakrabarti, 1996) and time-to-market (Datar et al., 1997). Project-related factors include project management power, vision and skill (Brown and Eisenhardt, 1995). Organizational factors include the relationship of the project to the organization (Dougherty, 2001) and the core competence of the organization (Quinn and Hilmer, 1994).

Within the literature, most studies have been positioned within two main theoretical perspectives: transaction cost and resource dependence. The transaction cost perspective pioneered by Williamson (1975) focuses on the transaction costs of various organizational arrangements. According to the transaction cost perspective, the choice between performing

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