

Involving suppliers in product development: Insights from R&D directors and project managers

Stephan M. Wagner^{a,*}, Martin Hoegl^b

^a *Kuehne Foundation Endowed Chair of Logistics Management, WHU–Otto Beisheim School of Management, Burgplatz 2, 56179 Vallendar, Germany*

^b *Chair of Leadership and Human Resource Management, WHU–Otto Beisheim School of Management, Burgplatz 2, 56179 Vallendar, Germany*

Received 20 December 2004; received in revised form 1 September 2005; accepted 10 October 2005

Available online 11 July 2006

Abstract

While there is increasing evidence that involving suppliers in new product development (NPD) is important, and for many firms even inevitable, there is also evidence that not all such efforts are successful. Firms aiming at implementing this strategy effectively have to pay close attention to several contingency factors on the organizational level and properly manage supplier involvement on the project level. The exploratory case study research underlying this article explores key issues to be considered when involving suppliers in NPD and the counter measures they can take. Our research shows that companies differentiate between so-called “know-how” and “capacity” projects, and that they manage them differently. Furthermore, this research shows that firms outside the automotive and high-tech manufacturing industries are likely to intensify supplier involvement in the future.

© 2006 Elsevier Inc. All rights reserved.

Keywords: Product development; Supplier involvement; Relational view; Organizational level; Project level; Qualitative research

1. Introduction

In recent years, firms in many industries have increasingly extended their new product development (NPD) activities across organizational boundaries and outsourced innovation (Engar-dino & Einhorn, 2005; Quinn, 2000). For Airbus Industries, for example, there has been no alternative to integrating company resources with the resources of their major suppliers during the development of the A380 “Superjumbo”, which is due to enter service in 2006. The pressing need to achieve target performances, quality characteristics, and target prices for all systems, subsystems, and airframe items of an aircraft are major drivers for the involvement of suppliers. Significant development responsibility for the new aircraft is transferred to Easton for hydraulic systems, Honeywell for avionics, or United Technologies for auxiliary power units and air-generation systems, for example. As a result, Airbus involves the suppliers in early

stages of product development. This includes research on concepts, technologies and innovative solutions in the definition phase of systems, subsystems, and airframe items and the definition of common objectives (technical and commercial). Furthermore, early on in the product development process the suppliers are expected to accept responsibility for development, design, integration, manufacture, qualification, delivery, target performances, and quality for their particular systems, subsystems, or airframe items on the basis of frame specifications and target prices. Most importantly, early joint development in integrated teams ensures that agreed target prices, including recurring and non-recurring cost, customer induced changes, all required changes necessary for aircraft certification or weight and product support guarantees, and so forth, are achieved in the end. The other maker of big jetliners, Boeing, follows a comparable approach for the development of its 787 “Dreamliner”, which is expected to enter service in 2008. Similar and possibly even more advanced transformations in NPD have forced firms in the automotive industry towards utilization of technologies that lie outside of their firm boundaries. Automotive OEMs (Original Equipment Manufacturers) have formed partnerships with suppliers to take advantage of their technological expertise

* Corresponding author. Tel.: +49 261 6509 430; fax: +49 261 6509 439.

E-mail addresses: stephan.wagner@whu.edu (S.M. Wagner), hoegl@whu.edu (M. Hoegl).

in development, design, and manufacturing. Accordingly, these firms continue to integrate suppliers earlier in their product development projects and to a greater extent.

An analysis of the pertinent literature on supplier involvement in NPD reveals three reasons why this current study was carried out. First, and most importantly, studies show mixed results of supplier involvement in NPD. This recommends further exploration of problems firms are facing in corporate practice when involving suppliers in NPD and how they try to deal with them. Second, large high-tech manufacturing firms and firms from the automotive industry comprised the predominant empirical setting in most studies. The dominance of these firms in their supply chains, their size and channel power may not be representative. Although we recognize that learning from “best practice” may benefit firms in other industries as well as small and medium-sized enterprises (SME) and firms with a lesser channel power, conducting a study in this realm would give a more realistic picture of the problems related to supplier involvement that these firms encounter. Third, the awareness that supplier involvement needs to be managed properly on the organizational *and* the project level has only recently emerged.

The purpose of the remainder of this article is to explore and highlight key issues of supplier involvement in the customer firm’s NPD based on a variety of exploratory case studies from industries other than automotive and high-tech manufacturing. The following Section 2 provides a theoretical background of the strategy to involve suppliers in NPD. In Section 3, the method used to collect the qualitative data for this study is described. Section 4 presents the results of our analysis. Finally, the article closes with concluding comments (Section 5) for corporate practice and management research.

2. Background

As an extension of the resource-based view in strategy (Barney, 1991; Wernerfelt, 1984) and consistent with the relational view (Dyer & Singh, 1998; Johnson, 1999), supplier involvement in NPD implies the combination of the buyer’s and supplier’s R&D resources and the exploitation of joint capabilities through strategic integration of the buyer–supplier relationship. The firm’s new product related competitive position hinges on the supplier’s resources and capabilities as well as the interfirm relationship maintained. As such, to generate inter-organizational competitive advantage through supplier involvement in NPD requires the firm to build up and maintain appropriate routines and processes and to work with suppliers possessing complementary competencies in product development projects (Dyer & Singh, 1998; Johnson, 1999).

In support of this theoretical underpinning, many researchers have perceived the benefits of supplier involvement in product development to be significant (Birou & Fawcett, 1994; Clark, 1989; Dröge, Jayaram, & Vickery, 2000; O’Neal, 1993; Ragatz, Handfield, & Scannell, 1997; Wynstra, Van Weele, & Wegge-mann, 2001). It has been argued that buyers can benefit from involving suppliers early in the development process, rather than working independently when it comes to time-to-market of new products, product quality, development cost, and product

cost. Supplier involvement in NPD can also help the buying firm to gain new competencies, share risks, move faster into new markets, and conserve resources.

Other empirical studies, however, repeatedly found no positive relationships or even showed negative effects of supplier involvement on key performance outcomes. In other words, more intensive involvement of suppliers in product development resulted in increased product and development cost, worse product performance, and longer development times (Eisenhardt & Tabrizi, 1995; Von Corswant & Tunälv, 2002). For instance, Littler, Leverick, and Wilson (1998) conclude from their study of 106 companies in the UK information and communication technology sector that the collaborative development of products with suppliers may be more costly and slower (i.e., less efficient) as the supplier involvement adds significant complexity to the management of such projects. Similarly, Hartley, Zirger, and Kamath (1997) find in their study of 79 firms in the US assembly industries that the duration of the buyer–supplier relationship did not matter to time performance, that more frequent phone calls were associated with schedule slippage, and face-to-face meetings had no effect on schedule performance.

As a consequence, some authors have recently argued that it is difficult to accomplish the seemingly positive outcomes of supplier involvement in product development (Monczka, Handfield, Scannell, Ragatz, & Frayer, 2000; Primo & Amundson, 2002; Wagner, 2003; Wynstra et al., 2001). For such a supplier involvement strategy to be successful, they have hinted to the criticality of two domains: (1) contingency factors on the organizational level and (2) the management of supplier involvement on the project level.

(1) Several *contingency factors on the organizational level* of analysis have been identified as critical for the success of supplier involvement. On the technical side, the product architecture and the type of design and development interaction with suppliers must match (Boutellier & Wagner, 2003). With a modular product architecture, which implies a one-to-one mapping from functional elements to physical components and standardized interfaces between different components within a product (Ulrich, 1995), the upgrade and substitution of components can be done without difficulty. The design can easily be divided between different suppliers and between suppliers and the focal firm (Schrader & Göpfert, 1997; Von Hippel, 1990). Conversely, integral product architectures are much more complex and physical components are coupled, i.e., many functional elements are implemented by more than one physical component and several physical components implement more than one functional element (Ulrich, 1995). The change of one component requires the change of other physical components. When the development of components is divided among the focal firm and various suppliers, the innovation processes and projects must be highly intertwined (Schrader & Göpfert, 1997; Von Hippel, 1990). Therefore, several researchers have recommended that supplier involvement strategies are contingent on the architecture of the product and the design and development interfaces with suppliers, ranging from “none” and “white box” to “gray box” and “black box” supplier integration

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات