

Together we share? Competitive and collaborative supplier interests in product development

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Abstract

While supplier involvement in product development projects can contribute with valuable knowledge and expertise, such involvement also poses organizational and managerial challenges, particularly if several rival suppliers are involved. This paper explores these challenges in the wind turbine industry, based on two interrelated Danish case studies. The analysis results in three propositions regarding how supplier rivalry and technological specialization influences roles, coordination patterns and communication between actors in distributed product development projects.

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1. Introduction

The roles and positions of actors in a division of work are dynamic (Anderson et al., 1998), and strategic tensions may arise among actors with collaborative and competitive interests. But how does rivalry among suppliers affect manufacturers' management and organization of supplier involvement? In the literature on supplier involvement and collaboration in product development activities, the role of mutual interests and shared incentives for collaboration is often stressed or implied (Camarinha-Matos and Afsarmanesh, 2007). In highly dynamic and knowledge-intensive industries in particular, where product development activities are distributed because of the fragmentary stance of knowledge available and/or because the knowledge base is constantly evolving, firms have common interests, since they compete on a value-network versus value-network basis rather than on a firm-to-firm basis (Normann and Ramirez, 1993). Song and Di Benedetto (2008) introduce

the issue of supplier involvement in radical innovation, and use transaction cost theorizing to emphasize that involving suppliers from the outset through tailored production systems may provide benefits for both partners in a radical product development partnership. Whereas Song and Benedetto's analysis deals with dyadic relations, the potential rivalry in triads consisting of one manufacturer and two (or more) suppliers, and how this influences the organization and management of collaboration activities in distributed product development settings, remains unattended.

The objective of the research presented in the present paper is to understand how the competitive situation between suppliers influences the organization and management of supplier involvement in product development activities. The analysis is based on two case studies of product development activities in the Danish wind turbine industry. The paper starts with a review of the literature on management and organization of interfirm product development activities. This is followed by an overview of the role and importance of supplier involvement in product development activities in the Danish wind turbine industry. A comparative analysis of product development and management activities in competitive and collaborative-distributed product development settings, respectively

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leads to three propositions regarding how supplier rivalry and technological specialization influences roles, coordination patterns and communication between actors in distributed product development projects. Finally, implications for managers and further research are presented.

2. Distributed product development activities and supplier involvement: theoretical considerations

The importance of involving suppliers in product development activities is widely acknowledged in the literature on innovation management, and has been documented in various studies and in various industrial and country contexts (Christensen and Kristensen, 1994; Christensen et al., 2001; Roberts, 2001; Nieto and Santamaria, 2007).

The role of suppliers as contributors to innovation has been strongly emphasised in the literature on innovation systems (Lundvall, 1993). Users and producers develop a shared technical language, which enables them to bridge the gap between user contexts and technological contexts. This supports relationship building and closer interaction between suppliers and buyers (Kristensen, 1992). Past technological collaboration supports future collaborative ability among firms (Nieto and Santamaria, 2007). Furthermore, user-producer relationships may represent a cognitive division of work, which informs knowledge searches and innovativeness as each actor specializes in different aspects of knowledge development but collaborates on joining these insights in order to increase product or process performativity (Nooteboom, 2005; Katzy and Crowston, 2008). However, this line of literature mainly addresses the performance effects of collaborative innovation activities rather than the process of organizing and managing the involvement of suppliers in product development activities. Moreover, rivalling incentives are not discussed.

The literature includes a number of contributions dealing explicitly with supplier management (Croom, 2001; Holmen and Pedersen, 2003; Håkansson and Eriksson, 1993; Johnsen and Ford, 2000), which have identified a range of issues regarding supplier involvement in product development activities (Choi and Krause, 2006; Johnsen et al., 2006; Schiele, 2006; Wynstra and Pierck, 2000). Wynstra et al. (2001) present a framework of three main groups of management problems pertaining to supplier involvement. The first group are specifically related to the *motives, interests and capabilities* of the supplier. These concern both the selection and commitment of suppliers, and the development of suppliers' collaborative and technological competencies in order to bring them into strategic and operational alignment with those of the manufacturer. For instance, Katzy and Crowston (2008) discuss the development of dedicated liaison positions among suppliers collaborating in the "Virtuelle Fabrik" (virtual factory) supplier partnership.

The second group of issues concerns the manufacturer, and include *organizational problems such as organizational resistance and competence issues*. Companies differ with respect to their abilities to involve suppliers (Nieto and Santamaria, 2007). Organizational resistance to suppliers' involvement in product development activities can stem from internal R&D envy or from other departments' anxiety about becoming redundant. Competence issues concern the lack of capabilities in managing supplier relationships, i.e. including employees with technical, commercial and social skills in an organizational unit and giving this both the authority and responsibility for interacting efficiently with suppliers. In a similar vein, Croom (2001) discusses the process of realizing the strategic importance of supplier relationships for product development and of integrating such concerns in the strategic agenda-forming process of the manufacturer. According to the strategic importance of supplier involvement, manufacturers may vary their organizational setup and commitment in the involvement process. Wynstra and Pierck (2000) suggest a supplier involvement portfolio based on two fundamental dimensions guiding the extent of manufacturers' organizational and managerial commitment to the relationship in different product development contexts: One dimension concerns the degree of development responsibility of the supplier, ranging from full technical specifications to functional specifications where suppliers have the responsibility for developing a specific component. Another dimension concerns the manufacturer's strategic risk regarding the component's importance to the development (and production) of the finished product. This may be seen both in relation to output (i.e. product performance) and process (interaction with other component development tasks) issues.

These dimensions reflect both the division of work and the required management of knowledge exchange. Strategic development requires the interaction of several management functions, including production, purchasing, R&D and marketing, on both sides of the manufacturer–supplier dyad. Here, there is no clear-cut division of work, so continuous mutual adaptation is needed, suggesting frequent face-to-face meetings and the setting up of joint development teams across organizational boundaries. In critical development, a high degree of pre-specification of component requirements decreases the need both for communication and the involvement of multiple departments at both the manufacturer's and the supplier's. As regards arm's length development, the supplier has control over the development task within some pre-specified interfaces, which also limits the need for interaction and communication. Lastly, in the case of routine development, communication is more or less pre-programmed and involves suppliers' sales departments and the manufacturer's purchasing department, respectively.

The third main group of management issues concerns *the dyadic buyer–supplier relationship*, including information exchange aspects (the ability to communicate involvement

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