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# Supplier integration—Controlling of co-development processes

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**Abstract**

Co-development processes are an instrument used in several industries to gain a competitive advantage and to reduce development costs. An overview of the literature is given with the identification of a gap in current literature: the patterns of supplier participation in new product development. The main goal of this article is to seek possible ways of controlling the supplier integration process in new product development.

Using 12 case studies of small and medium-sized suppliers of a medium-sized European enterprise doing business in the window and facades industry, the authors recognize several problems resulting from the interaction and coordination between customer and supplier in new development processes. With reference to the problem, propositions in form of possible solutions or advice are given. A typical new product development process is illustrated in the form of a blueprint description.

The results of the investigation are transferable to the new product development process of various technical products, mainly in small and medium-sized enterprises.


*Keywords:* Supplier integration; Co-development; Product development and innovation; Service blueprint

## 1. Introduction

### 1.1. Importance of product development with suppliers

For several years, suppliers, like customers, have been regarded as an important source of innovation (von Hippel, 1988). By using a supplier's additional resources, skills and capabilities, especially a supplier's greater design responsibilities, companies can develop and maintain a competitive advantage by reducing costs and cycle time and by offering more customized product characteristics or better product quality. Table 1 gives a detailed chronological review of the literature on co-development processes.

In collaborative product development, the concentration has been on integrating customer requirements into new product development from the supplier's point of view (Brockhoff, 1998; Fließ, 2001; Kirchmann, 1996a; Urban & von Hippel, 1988) with a general approach to customer integration. The area of supplier integration has not received that much attention. Therefore, many managers characterize the execution processes for integrating suppliers as a black box (Petersen, Handfield, & Ragatz, 2003, p. 285 and Petersen, Handfield, & Ragatz, 2005, p. 372).

The aim of this article is to bring light into the black box of the co-development process between customer and supplier and especially to identify problems of controlling the co-development process and to suggest means and procedures to overcome these problems.

Cooperation with suppliers may be designed in several ways. The possibilities are described in Section 1.2. The analysis itself is based on 12 case studies representing the different cooperation designs. The research methodology is explained in Section 2. Results of the case studies are presented and discussed in Section 3 using a stage differentiating approach. The section ends with a summary of the propositions. In Section 4 the results are interpreted and discussed. In Section 5 the question of whether and how the insights of the

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discussion can be transferred to different industries is discussed and proposals for further research are made.

### 1.2. Cooperation designs in new product development

There are several possible cooperation designs which can be distinguished by the type and intensity of the contractual relationship. The most important forms of cooperation are contract development, coordinated development and joint development (see Fig. 1).

*Contract development* is based on contracts with companies (suppliers and other companies) or institutions (Hauschildt, 2004, pp. 75–76; Kaltwasser, 1994, pp. 80; Werner, 1997, p. 80). The contract defines the object to be developed, the tasks to be done, the restrictions that have to be followed, the duration of work, the financial regulations and the regulations for the use of the results of development efforts (Hauschildt, 2004, p. 75; Wynstra, 1998, pp. 56–58). Based on the contract, the supplier performs the development activities separately from the customer. The customer is only involved in set coordination meetings. Therefore, the possibilities for the customer to influence the development process are reduced. Contract development is useful if there are not enough resources available within the customer organization. For contract development, it is helpful if the object of development can be clearly defined, the results of development can be clearly measured and the development activities can be separated from other projects (Gerpott, 1999, p. 252; Hauschildt, 2004, p. 76).

*Coordinated development* is based on a separation of tasks for the companies involved. That means that every company concentrates on certain tasks and components. Some tasks are performed by the customer himself, other tasks by the involved supplier(s).

Three basic forms of coordinated development can be distinguished (Gerpott, 1999, p. 247; Tani & Wangenheim, 1998, pp. 26–27):

- Asymmetrical cooperation (detailed instructions from customer to supplier);
- Black box cooperation (supplier develops a single module for the final product);
- Systems partnership (supplier is responsible for development of a complex part of final product and for integration of pre-suppliers).

The contributions of all parties involved form the final result. This format is used for complex development projects. There are often several suppliers involved. Every supplier develops a component of the final product or takes over partial tasks within the development project. This procedure leads to a paralleling of developmental activities, and as a result, the development time can often be reduced.

*Joint development* is based on a regular cooperation in teams with members of the supplier's and customer's company. That means that both partners are directly involved in the tasks of product development. The teams may be located in one place, or they may work from different locations with a high level of information exchange and regular coordination meetings. Joint development has a more intense level of cooperation in comparison to contract development or coordinated development. Joint development is used if the development object cannot be separated in different modules. Therefore, customer and supplier have to bring in their own resources into the development project (Gerpott, 1999, p. 252).

In order to identify main problems in the controlling of co-development processes, case studies representing the three main cooperation designs have been conducted.

## 2. Case study investigation

### 2.1. Methodology of case studies

According to Yin, a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 1994, p. 13). A case study is also a research strategy which seeks to understand the dynamics present within single settings (Eisenhardt, 1989). Development processes can be characterized as very heterogeneous and a great deviation between different development projects is to be expected. In addition, the status of present knowledge can be characterized as low. Therefore, case study research was regarded as an adequate method to gain basic information.

Objectives of the case study research were:

- to identify relevant problems in co-development processes;
- to propose possible solutions to the problems.

Case studies may be concentrated on a single or a small number of case studies or on several cases. Comparisons are possible if several cases are analyzed; therefore, twelve different case studies of one medium-sized enterprise (Schüco) have been investigated. Schüco International KG is a leading company in window and facades systems made of aluminum and PVC-U and in solar products in Europe. The company is located in Bielefeld, Germany, and was founded in 1951. It has a turnover of 1.3 billion and 4500 employees worldwide. Innovation is crucial for the company to develop a competitive position in its different markets. Schüco International KG takes the part of the customer in the case studies. The cases were selected from different business units (aluminum-systems, PVC-U systems, complete components of installation, solar products) in order to be able to transfer the results to other forms of business. The suppliers are all small or medium-sized enterprises (SME) within Europe. The majority of the suppliers is located in Germany. Permission was granted from Schüco to use the company's name in this paper.

The field work for the case study research was done in two basic steps (methodology was based on Eisenhardt, 1989; Miles & Huberman, 1994 and Yin, 1994):

- In each case, key personnel were asked about the activities for supplier and customer during all stages of the