

# Managing Supplier Involvement in Product Development: Three Critical Issues

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Despite some successes in involving suppliers early and intensively in product development within the automotive and electronics industries, many companies still experience substantial difficulties in managing this involvement. This article examines three related critical issues: (a) identifying specific processes and tasks for the broader area of purchasing involvement in product development; (b) forming an organisation that supports the execution of such tasks; and (c) staffing the organisation with people that have the right skills. © 2001 Elsevier Science Ltd. All rights reserved

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## Supplier Involvement in Product Development

In many industries, manufacturing companies give suppliers increasing responsibilities with regard to the design, development and engineering of components. The overall aims are to better leverage suppliers' technological capabilities and expertise and to improve product development efficiency and effectiveness. Over the past decade or so, the interest in this so-called 'supplier involvement in product development' has increased considerably, both within the research and the practitioner community (Burt and Soukup, 1985; Kamath and Liker, 1994; Ragatz *et al.*,

1997). Studies showed, for example, that by relying more heavily on their suppliers, Japanese manufacturers were able to bring new automobiles to market at a faster pace, with more innovative features and with less effort in terms of development hours and number of engineers involved. This implies that using the extra and specialised development potential embedded in the skills, competencies and knowledge of suppliers can make product development more efficient, by decreasing input (less development costs, less design changes, less engineering hours) or — but ultimately *and* — increasing the output (a better product, a more innovative product, a faster market introduction) (Clark, 1989). Several studies have documented that the involvement of suppliers in product development is especially widespread in Japan and occurs less frequently in the United States and Europe (Dyer, 1996; Birou and Fawcett, 1994; Wasti and Liker, 1997), although the differences may be decreasing (Liker *et al.*, 1996). Despite this growing interest, supplier involvement has been around for quite some time, albeit not under the names and programs currently in use: already in 1958, for example, Toyota was using resident engineers from their suppliers in its product development process (Nishiguchi, 1994).

Interestingly, in the mid-1990s two studies in the US found evidence that supplier involvement in product development is not always beneficial. The first study found that early supplier involvement and a greater responsibility of the supplier for the development of its component do not lead to decreased costs or decreased development lead-time, nor to higher

quality of the final product (Hartley, 1994; Hartley *et al.*, 1997; McCutcheon *et al.*, 1997). The second study even demonstrated that supplier involvement results in higher product and development costs, and does not achieve better but sometimes even worse product performance and often longer development time (Birou, 1994)<sup>1</sup>. Despite some of the conclusions made by the authors of these studies, we think that the findings of these studies do not imply that supplier involvement in product development is an inappropriate strategy. The lack of positive results of supplier involvement in product development is mainly an indication that such results cannot always be (easily and quickly) achieved. There are several important problems or critical issues that need to be dealt with in managing this involvement.

This article analyses three of the most critical issues in managing supplier involvement in product development:

1. Identifying the management tasks in achieving an integrated product development and sourcing (IPDS) approach;
2. Forming an organisation for the execution of these tasks; and
3. Staffing the organisation with people that have the right skills.

In analysing these issues, the article draws on original research in a variety of industries, in trying to avoid a bias towards the well-researched automotive industry. Between 1994 and 1998, we carried out 21 case studies in two European countries (the Netherlands and Sweden) and across a number of different industries, including the telecommunication equipment sector, truck manufacturing, medical equipment sector, food packaging, plastic components production and power plant construction. The first nine case studies specifically looked at the inter-organisational relations between manufacturers and suppliers with regards to collaboration in product development. The second series of nine case studies focused more on the intra-organisational relations at manufacturers between (primarily) technical functions such as Research & Development or Engineering on the one hand, and the purchasing function on the other hand. These first two series of case studies were exploratory in nature, aimed at identifying critical issues and successful measures in managing supplier involvement in product development. Finally, a third series of three in-depth case studies that was more explanatory in nature sought to verify the insights developed earlier. This article is a synthesis of the findings from these case studies<sup>2</sup>. For a similar study, but then on the role of customers in product development, see Biemans (1990).

By way of introduction, this article first takes a brief look at the goals of supplier involvement in product development. Subsequently, it describes the main

problem areas in managing this involvement. Of these areas, we focus on the problems primarily related to the manufacturer and this leads to the identification of three critical managerial issues. At various points, our case studies provide specific illustrations of problems and solutions in managing supplier involvement.

## The Goals of Supplier Involvement

Regarding the possible benefits of supplier involvement, a distinction can be made between long-term and short-term goals. Research into the actual results of supplier involvement has, however, mainly been limited to the short-term benefits of supplier involvement. Short-term goals are related to the specific development project the supplier is involved in. Primarily, short-term goals of supplier involvement in product development can be divided into two main areas: development efficiency and effectiveness (Clark, 1989; Birou and Fawcett, 1994; Mendez and Pearson, 1994; Zirger and Hartley, 1996; Dobler and Burt, 1996; Ragatz *et al.*, 1997).

In terms of efficiency, supplier involvement can lead to the reduction of development costs and the reduction of development lead-time. This is mainly achieved by preventing, reducing or introducing design changes earlier by means of early and intensive communication with the supplier ('first time right' development). It is also realised by separating development tasks, and developing various components or modules in parallel, which helps to solve capacity bottlenecks in the manufacturer's engineering department. Finally, when for each phase in a development project, design (development or engineering) responsibility is given to the most competent company of the two — the supplier or the manufacturer — efficiency is also promoted.

In terms of effectiveness, supplier involvement may lead to the reduction of product cost and the increase of product value<sup>3</sup>. This can be achieved by mobilising and leveraging supplier expertise regarding Design for Manufacturing (DFM), the quality and reliability of component designs, alternative materials and possibilities for component standardisation (Wasti and Liker, 1997). Apart from improving (short-term) development project performance in terms of effectiveness and efficiency, manufacturers may have an interest in collaborating with suppliers in product development to achieve long-term benefits. One common long-term goal involves getting (long-term) access to the technological knowledge of suppliers (Bonaccorsi and Lipparini, 1994; Bonaccorsi, 1997). Ultimately, manufacturers may even have an interest in influencing supplier decisions with regard to the kind of technologies to invest in, in order to provide the best conditions for future technological collaboration. These kind of long-term alignment efforts are

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