



Supplier involvement in product development in the electronics industry: A case study

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Abstract

The movement of activities earlier in the product development process requires a re-examination of the total supply network. The objective of this paper is to determine the degree of early supplier involvement (ESI) that exists between a multinational electronics company and its key suppliers, in terms of depth of integration, information exchange and buyer–supplier relationships. The paper provides insights into the strategic factors that affect the dynamics of the ESI process. The research indicates that there are considerable impediments for those participants responsible for establishing and managing the implementation of ESI. A number of strategic insights are identified that explain the existence of the impediments to the ESI process. Finally, based upon the findings a number of lessons are highlighted for organisations considering the adoption of the ESI process.

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1. Introduction

During the past 15 years there has been a significant trend for firms and public organisations to externalise a wide range of functions that formerly might have been carried out in-house. Increasingly, business organisations are concentrating on core activities and outsourcing other functions to external suppliers (McIvor et al., 1997). This ranges from major manufacturers increasing the proportion of components and sub-assemblies designed by suppliers to the contracting out of functions such as computer services, R&D and accountancy. There are a number of reasons for this trend, including rising global competition, more rapid technical

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change and the need for the faster development of products with higher quality and reliability. It is virtually impossible for any one firm to possess all the technical expertise needed to develop a complex product. This means that organisations have to focus on their core competencies and for other activities to draw on the best expertise available world-wide. Thus, the traditional pattern of the large, vertically integrated business, is being replaced by one consisting of complex networks of collaborating organisations, and chains of buyers and suppliers (Roy and Potter, 1996).

In this new industrial structure, the design and development of complex products is one of the activities that is being devolved back along the supply chain. The extent to which this occurs varies, with some manufacturers devolving most engineering design and development work to external suppliers. In other cases, there is often a mixed situation, in which the design of sub-assemblies and components are devolved to suppliers, or where in-house designers work closely with their suppliers to ensure that components of the required performance and quality are developed. It is therefore apparent that in this new structure, design and development not only has to be managed within one large organisation, but it also involves managing relationships between many companies in an extensive chain of buyers and suppliers (McIvor et al., 2000).

The movement of activities earlier in the product development process requires a re-examination of the total supply network. Supply chain literature has traditionally examined procurement and value-adding activities, without explicitly defining product development as part of these. The literature on early supplier involvement in the design process typically focuses on the outputs (Kamath and Liker, 1994; Brown and Eisenhardt, 1995). However, such research tends to exclude the actual dynamics and factors influencing the process of supplier integration, such as, the timing of supplier involvement, supplier design responsibility and buyer/supplier communication (Hartley et al., 1997a). This paper seeks to provide a better understanding of early supplier involvement (ESI) by analysing these influencing factors in the context of an original equipment manufacturer (OEM) and its key suppliers, using case study data collection. Findings from the literature regarding the impact of supplier integration in new product development are mixed. In order to employ this strategy and justify the considerable effort and costs required, the strategic factors affecting the dynamics of the ESI process and the potential impediments to its implementation must be better understood.

2. Early supplier involvement

Firms in many industries are facing increased global competition and are operating in markets that demand more frequent innovation and higher quality. These firms are looking for ways to decrease product development times and, at the same time, improve quality and reduce product cost. A large body of literature now exists which has identified new product development as a core process that has a major role to play in achieving success in the global economy (Fiol, 1996). A number of studies have identified a wide range of variables critical to successful product development. Brown and Eisenhardt (1995) provide a summary of the key variables from the literature, which include:

- Team composition, team organisation of work and group processes (Katz and Allen, 1985; Clark and Fujimoto, 1991);
- Project leadership and senior management support (Dougherty, 1990);
- Product concept effectiveness (Handfield, 1994);
- Marketing issues (Rothwell et al., 1974);
- Supplier and customer integration (Clark and Fujimoto, 1991).

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