

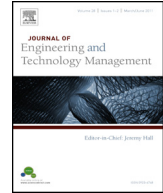


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# Influence of contingent factors on the perceived level of supplier integration: A contingency perspective



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### ABSTRACT

Research on the impact of supplier integration on new product development has yet to be empirically verified. This study aims to explore what contingent factors influence supplier integration and how such integration affects new product performance using a contingency approach. The study uses structural equation modeling to analyze data from 251 manufacturers. We found that product newness, environmental uncertainty, and internal coordination affect supplier integration, which in turn improves new product performance. The results not only confirm the contingent factors and influence of supplier contribution on new product development but also provide new insights for future research.

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## Introduction

As the benefits of internal integration become more widely acknowledged, recent literature suggests that a firm will perform well if it can integrate external suppliers in order to optimize the total performance of all partners in the supply chain (JPIM special issues, 2003; Dyer, 2000; Brown and Eisenhardt, 1995). Supplier integration is useful as it provides access to external resources for product development (Verona, 1999). Many companies have taken advantage of supplier integration to improve product performance, access the technological knowledge of the supplier, and improve

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internal capabilities (Ellis et al., 2012; Johnson and Filippini, 2013; Zhao et al., 2013; Handfield and Lawson, 2007; Dyer, 2000; Ragatz et al., 1997).

However, prior empirical studies show that the impact of supplier integration on product performance is still inconclusive (Koufteros et al., 2012; Song et al., 2011; Parker et al., 2008; Koufteros et al., 2007; Ragatz et al., 2002; Hartley et al., 1997) with inconsistent results exhibiting variations in magnitude, statistical significance, and direction of the relationships studied (Gerwin and Barrowman, 2002). Koufteros et al. (2012) noted that “The small number of studies on integration and the conflicting findings indicate that the verdict is still out as to whether integration improves performance” (p. 95). Some researchers have argued that supplier integration leads to lower development costs, fewer engineering changes, higher quality with fewer defects, shorter time to market, highly standardized components, and detailed process data (Monczka et al., 2000; Bonaccorsi and Lipparini, 1994). Others have found that integrating suppliers in product development increases product development time (Perols et al., 2013; Filippini et al., 2004; Zirger and Hartley, 1994) and development costs because of greater co-ordination requirements (Ittner and Larcker, 1997). To improve product innovation, supplier integration efforts may be redirected to supplier selection based on NPD capability (Koufteros et al., 2012). This may reflect the difficulties of implementing supplier integration as a part of high quality product development activities (Lockstrom et al., 2011). An alternative view is that supplier integration results from different contextual conditions the companies face. Understanding the contextual factors of a contingency approach is thus suggested in examining the impact of supplier integration on product development (Mahapatra et al., 2012; Parker et al., 2008; Echtelt et al., 2007). For such supplier integration to be successful, organizations have to identify contingent factors in product development (Xu et al., 2012; Wagner and Hoegl, 2006; Chen, 2005; Gomes et al., 2003; Souder et al., 1998; Emmanuelides, 1993). This study supports the view that supplier integration improves new product performance but only when the contingent factors meet the appropriate conditions.

The present study contributes to existing knowledge in two ways. First, informed by structural contingency theory, this study explores the effect of four important contingent factors on supplier integration and new product performance in an empirical study in Hong Kong, China. The study is thus a response to the literature on the reexamination of generalized beliefs about supplier integration in product innovation (Koufteros et al., 2007, 2012; Song and Benedetto, 2008; Koufteros et al., 2007; Primo and Amundson, 2002). The study not only provides empirical evidence useful in re-examining the impact of supplier integration in product development in a Chinese context (Lockstrom et al., 2011) but also explores the contingent factors that may influence supplier integration.

Second, this study extends prior studies of the contingent roles of product modularity, product newness, internal coordination, and environmental uncertainty on the relationship between supplier integration and new product performance. These factors have been studied in prior studies separately but have rarely been examined simultaneously (Cabigiosu et al., 2013; Parente et al., 2011; Hauser et al., 2006; Droge et al., 2004; Song and Parry, 1999). Cabigiosu et al. (2013) argue that there is no conclusive evidence about the role of modularity in supplier integration in product co-development projects. Some factors, such as product modularity and newness, have inconsistent findings in the literature (Lau et al., 2011). The study is thus a response to the literature on identification of the contextual factors that facilitate supplier integration in new product development (Parker et al., 2008; Petersen et al., 2005). This study extends prior studies examining the direct and indirect effects of these contingent variables on supplier integration.

The following sections will discuss the theoretical development of the hypothesized research model, followed by statistical analysis and discussion of the results. The implications and the limitations of the study will be discussed in the conclusion.

## **Theoretical development**

### *Contingency theory*

Contingency theory suggests that no theory or method can be applied in all instances. In other words, there is no one best way to design, lead, or manage an organization because much in business

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