



Is the more always better? A comparative study of internal and external integration practices in new product and new service development



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ABSTRACT

This study investigates the relationship between internal and external integration practices and innovation success of new products and new services. Building on the idea that key success drivers in new product and new service development may have implementing costs besides their obvious benefits, this article examines the possibility that a nonlinear relationship in the shape of an inverted U exists between innovation success and the antecedents examined in this research. The present study also addresses scholars' call for research to investigate differences in the drivers of new product and new service success. The findings suggest that differences exist in the nature of the relationship—that is, linear versus nonlinear—between cross-functional integration, customer integration, and interfirm collaboration and innovation success in a new product versus new service setting.

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1. Introduction

Practitioners and researchers consider integration practices as critical to innovation success (Hillebrand & Biemans, 2003, 2004; Johnsen, Phillips, Caldwell, & Lewis, 2006; Tassarolo, 2007). Integration practices refer to the cooperation and communication between different stakeholders in the innovation process of a new service or new product (Millson & Wilemon, 2002). Commonly, researchers distinguish between cross-functional integration as internal integration practice and customer integration as well as interfirm collaboration as external integration practices (Hillebrand & Biemans, 2003, 2004; Tassarolo, 2007).

While research provides ample evidence for the positive effects of these integration practices on innovation success (Ernst, Hoyer, & Rübsaamen, 2010), managers encounter major obstacles when implementing them in business practice (BusinessWeek, 2008). For example, customer integration may increase the risk of developing an innovation that only serves a niche market instead of addressing the entire customer base. Accordingly, the assumption of “the more, the better”—that is, a positive and linear relationship between cross-functional integration, customer integration, interfirm collaboration and innovation success—might be questioned.

Likewise, prior literature primarily focuses on integration practices in new product development (NPD), while leaving the effects in new service development (NSD) rather unexplored (Hauser, Tellis, & Griffin,

2006). This largely contrasts economic reality where service companies account for 70% of the world's advanced economies' gross domestic product (Ostrom et al., 2010) and many companies offer a portfolio of both services and products. As such, research provides only little guidance for these companies on how to implement integration practices in a new service context (Droege, Hildebrand, & Forcada, 2009).

Against this background, the purposes of this study are as follows. First, it questions the readily accepted linear nature of relationships between three integration practices—cross-functional integration, customer integration, and interfirm collaboration—and innovation success and provides evidence for nonlinear effects. Second, by deriving an integrative framework comprising new services and products, it aims at extending the ongoing debate over whether success drivers of product innovations also pertain to service innovations (Kindström, Kowalkowski, & Sandberg, 2013). Thus, it responds to calls for research on investigating differences in the drivers of innovation in these two product categories and contributes to explaining inconsistencies in results of prior research on integration practices (Droege et al., 2009; Hauser et al., 2006). Interestingly, the results show a significant increase in the explained variance of innovation success when analyzing the new product and new service samples separately instead of using a joint dataset. Furthermore, the key results of this study show substantial differences in the nature of relationship of integration practices between service and product innovations and hence, highlight the need to distinguish between these two categories. Third, by examining predictors of new service success this research strives to contribute to a better understanding of service innovations, which are “among the least studied and understood topics in the service management literature” (Menor, Tatikonda, & Sampson, 2002, p. 136; O’Cass, Song, & Yuan, 2012).

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2. Conceptual background and literature review

Integration practices provide obvious benefits for innovations such as a reduced cycle times (Bstieler & Hemmert, 2010). However, they also vary considerably in their effect sizes and even carry alternate signs with respect to innovation success (Evanschitzky, Eisend, Calantone, & Jiang, 2012; Henard & Szymanski, 2001; Montoya-Weiss & Calantone, 1994). Hence, some scholars acknowledge their negative side effects, among which are for example the monetary and non-monetary costs of solving conflicts in cross-functional teams (Cuijpers, Guenter, & Hussinger, 2011). Table 1 summarizes major benefits and costs of the three integration practices.

While the majority of prior literature focuses on the benefits of implementing integration practices in NPD and NSD, the simultaneous assessment of costs and benefits of integration practices constitutes an under-researched issue in innovation management (Cuijpers, Guenter and Hussinger, 2011). However, reviewing the theoretical and empirical arguments in favor for and against implementing integration practices as illustrated in Table 1 seems to suggest that the relationships between determinants and innovation success may be neither purely positive nor negative. Instead, this study integrates both—positive and negative—positions into one overarching conceptual framework and examines the possibility that a nonlinear relationship, and not a linear one as most previous research suggests, exists between innovation success and cross-functional integration, customer integration, and interfirm collaboration.

A nonlinear relationship originating from the prevalence of costs or benefits at some point could provide a strong explanation for inconsistencies in prior results (Cohen, Cohen, West, & Aiken, 2003). More precisely, this research supposes that weak versus strong effect sizes may arise from previous literature exclusively considering a predictor's linear relationship instead of investigating its potentially nonlinear nature. This reasoning is based on the idea that the law of diminishing returns applies to the benefits of integration practices with regard to innovation success, whereas monetary and non-monetary costs of their implementation continuously increase (Duysters & Lokshin, 2011). For example, a firm may benefit from the advantages of an increasing level of cross-functional integration until a certain inflection point, after which marginal costs of solving conflicts between functional departments are

higher than the expected benefits from this increased integration practice, implying the existence of an optimum level (Cuijpers et al., 2011; Ernst, Hoyer and Rübsaamen, 2010; Schleimer & Shulman, 2011).

Some researchers additionally argue that the inconsistent findings of antecedents to innovation success might derive from product category (i.e., product versus service) and call for the investigation of differences in the drivers of product versus service innovations (Droege et al., 2009; Hauser et al., 2006; Henard & Szymanski, 2001). An answer to the fundamental question of whether service and product innovations are similar to or distinct from each other, might allow researchers and practitioners to meaningfully leverage “the knowledge from new product development and to apply it to new service process development” (Karniouchina, Victorino, & Verma, 2006, p. 277). However, the few existing comparative studies between NPD and NSD provide several contradictory or inconsistent findings with respect to integration practices, and thus call for further research (for an overview, see: Droege et al., 2009).

The present study combines both research streams and suggests that one answer to the inconsistencies in results of prior research on integration practices could lie in differences in the nature of the relationship—linear versus nonlinear—in a service versus goods context. Hence, the extent of costs or benefits associated with an integration practice may depend on the product category that is, new service or new product. Accordingly, the central premise of the study's model refers to differences in the cost–benefit ratio when implementing the three integration practices in NSD and NPD. Extending the assumption that particularities of services such as intangibility and inseparability may provoke differences in NSD compared to NPD (Nijssen, Hillebrand, Vermeulen, & Kemp, 2006), this article argues that these distinctive differences might result in the prevalence of either benefits or costs that coincide with an integration practice.

3. Hypotheses development

3.1. Effect of cross-functional integration on innovation success

Cross-functional integration constitutes an organizational approach for collecting, sharing, and processing information among all members involved in NPD or NSD (Griffin, 1997). Mixed results exist on the

Table 1
Major benefits and costs¹ of implementing integration practices.

Integration practice	Major benefits of ...	Major costs of ...
.... cross-functional integration	<ul style="list-style-type: none"> • information exchange beyond functional boundaries • critical reassessment of each functional perspective on the NPD/NSD process • reduced cycle times and development costs • increased flexibility of the workforce • increased functional performance of innovation <i>selected references:</i> Cuijpers et al. (2011), Ernst et al. (2010), Lievens and Moenaert (2000), and Troy, Hirunyawipada, and Paswan (2008).	<ul style="list-style-type: none"> • coordination of the workflow of NPD team members • decision making between employees with different underlying goals • conflicts over resources and technical issues • budget overrun and project failure <i>selected references:</i> Cuijpers et al. (2011), Ernst et al. (2010), and Maltz and Kohli (2000).
.... customer integration	<ul style="list-style-type: none"> • provision of novel ideas • cost reductions • faster delivery of improved product quality and superior product advantage • validation of the product/service design • increased willingness-to-pay and market acceptance <i>selected references:</i> Alam (2002), Fang (2008), Kristensson, Matthing, and Johansson (2008), and Magnusson, Matthing, and Kristensson (2003).	<ul style="list-style-type: none"> • identifying and incentivizing appropriate customers • capturing and converting customers' future needs into innovations • higher coordination efforts and increased workload of NPD team members • concerns of secrecy and ownership of intellectual property • risk of serving a niche market <i>selected references:</i> Alam (2002), Chan, Yim, and Lam (2010), Ernst et al. (2010), Fang (2008).
.... interfirm collaboration	<ul style="list-style-type: none"> • provision of novel ideas • cost reductions and shared responsibilities <ul style="list-style-type: none"> • access to new knowledge, skills, and technologies • efficient resource allocation • improved cycle times <i>selected references:</i> Emden, Calantone, and Droge (2006), Knudsen (2007), Rindfleisch and Moorman (2001), and Schleimer and Shulman (2011).	<ul style="list-style-type: none"> • identifying appropriate collaborating firms • concerns of secrecy, knowledge spillover, and ownership of intellectual property • higher coordination and monitoring efforts • budget overrun and time delays • risk of opportunistic behavior by one partner <i>selected references:</i> Duysters and Lokshin (2011) Lui, Ngo, and Hon (2006), Luo, Rindfleisch, and Tse (2007) and Rindfleisch and Moorman (2003).

¹In line with Cuijpers et al. (2011, p. 565), costs are not restricted to monetary expenses but also to non-monetary expenses such as effort and time.

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