



Contents lists available at ScienceDirect

## Industrial Marketing Management

journal homepage: [www.elsevier.com/locate/indmarman](http://www.elsevier.com/locate/indmarman)

Target and position article

# How collaborative innovation networks affect new product performance: Product innovation capability, process innovation capability, and absorptive capacity

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## ARTICLE INFO

## Keywords:

New product performance  
Absorptive capacity  
Collaborative innovation networks  
Innovation capability

## ABSTRACT

The current literature has investigated the direct relationship between collaborative innovation networks and new product performance, but the results are inconsistent. This research aims to explore the role of product and process innovation capabilities as two distinct mechanisms through which collaborative innovation networks improve new product performance. The study also examines the contingent effects of absorptive capacity on the relationship between collaborative innovation networks and the two innovation capability dimensions (i.e. product and process innovation). Survey data from 258 respondents from the Iranian high and medium technology manufacturing industries indicates the need for caution when developing collaborative innovation networks. We found that the effects of collaborative innovation networks on either product or process innovation capability are significant only in the presence of absorptive capacity. This finding suggests that the level of collaboration with different partners can enhance firms' innovation capabilities only if the focal firm's managers have developed the capacity to scan and acquire external knowledge. Our analyses further indicate that in the presence of absorptive capacity, only collaboration with research organizations and competitors have a positive effect on product innovation capability. In the case of process innovation capability, collaboration with research organizations and suppliers are the most important factors.

## 1. Introduction

In an increasingly global and competitive business environment, firms have recognized the necessity of investing in new product development (NPD) to survive and gain competitive advantage (Gonzalez-Zapatero, Gonzalez-Benito, & Lannelongue, 2016; Mu, Thomas, Peng, & Di Benedetto, 2017; Najafi-Tavani, Sharifi, Soleimanof, & Najmi, 2013). NPD is, however, argued to be a resource intensive and expensive process associated with high risk (Liang, Kale, & Cherian, 2014; Luzzini, Amann, Caniato, Essig, & Ronchi, 2015; Stock, 2014; Yan & Dooley, 2014). Earlier studies have identified various internal (e.g. innovation capability) and external resources and capabilities (e.g. collaboration with channel members and absorptive capacity) as drivers of NPD success (La Rocca, Moscatelli, Perna, & Snehota, 2016; Menguc & Auh, 2010; Mu et al., 2017; Tsai, 2009).

Collaboration with different external actors such as suppliers, customers, competitors, and research organizations (e.g. universities or government laboratories) improves both knowledge sharing and market knowledge acquisition by the firm, resulting in expansion of the firm's existing knowledge base, which in turn advances a firm's innovation capability (Claus & Kesting, 2017; Freel, 2003; Luzzini et al., 2015; Zhou & Li, 2012). Such collaboration has been identified in the literature as one of the most important external predictors of NPD performance (Alexiev, Volberda, & Van den Bosch, 2016; Claus & Kesting, 2017; Heirati, O'Cass, Schoefer, & Siahtiri, 2016). In this paper, the term “*collaborative innovation networks*” refers to the firm's interaction with different collaborators, namely suppliers, customers, competitors, and research organizations for the purpose of new product development. Collaborative networks may also exist for the purpose of improved distribution, broader product assortment, increased

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<https://doi.org/10.1016/j.indmarman.2018.02.009>

Received 17 May 2016; Received in revised form 14 February 2018; Accepted 15 February 2018  
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manufacturing flexibility, and compliance with regulation among others.

Enhancing firms' accessibility to complementary resources, facilitating the exchange of tacit and explicit knowledge, and reducing the risk of R&D activities by spreading the associated costs over different channel partners are amongst the main advantages of collaborative innovation networks (Faems, Van Looy, & Debackere, 2005; Yan & Dooley, 2014). In line with existing literature that defines collaborative innovation networks as the extent to which channel members participate in new product development and innovation processes (Tsai, 2009), we focus on collaborative innovation networks among both channel members (such as suppliers and customers) and non-channel members (such as competitors, universities, research organizations or government laboratories) and consider such collaboration as a feature of the innovation process (Alexiev et al., 2016; Dodgson et al., 2008; Möller & Halinen, 2017).

An extensive body of literature has investigated the impact of different types of collaborative innovation networks on new product performance (Clauss & Kesting, 2017; Faems et al., 2005; Heirati et al., 2016). However, there remain inconsistencies in the findings. For example, whereas some researchers (Luzzini, et al., 2015; Najafi-Tavani, Sharifi, Ismail, & H., 2014; Nieto & Santamaría, 2007) have shown a positive impact of collaborative innovation networks on new product performance, others have found insignificant or even negative effects (Belderbos, Carree, & Lokshin, 2004; Freel, 2003).

These inconsistencies can be explained from different perspectives. From an empirical standpoint, they can be attributed to the different settings of the research. For example, Luzzini et al. (2015) conducted their research on the path of innovation and provided support for their hypotheses across 10 different countries in Europe and North America. In contrast, Tsai (2009) failed to find support for the direct effect of collaborative networks on product innovation performance in the context of traditional Taiwanese manufacturing firms. Similarly, Freel (2003) examined the association between collaborative relationships and both product and process innovativeness in the context of "Northern British" SMEs. He found that while firms with greater spatial reach of innovation-related networks are more likely to introduce novel product or process innovations, a considerable variety of such associations exist across different sectors and innovation types.

From a theoretical perspective, these inconsistencies can be attributed to either a lack of sufficient attention being paid to contingency factors in the association between collaborative innovation networks and new product performance, and/or the mechanism of such effects not being conceptualized accurately. Examination of these mechanisms/contingency factors are crucial, since they enhance our understanding of how and under what conditions collaborative innovation networks enhance new product performance.

The main objective of this study is therefore to cast more light on the association between collaborative innovation networks and new product performance. In doing so, we introduce product and process innovation capabilities as the mechanisms through which collaborative innovation networks lead to enhancing new product performance and examine whether this association between collaborative innovation networks and product and process innovation capabilities are contingent on the level of absorptive capacity.

The theoretical grounding for our arguments is the Resource Based View (RBV) of the firm and organizational learning theory. Based on the RBV, we argue that only firms with certain internal capabilities (i.e. product innovation capability, process innovation capability, and learning capability) can achieve superior performance (Barney, 1991; Hamel & Prahalad, 1994; Mitrega, Forkmann, Zaefarian, & Henneberg, 2017). From this perspective, firms are seen as "bundles of resources and may take the strategic decision to engage in a co-operative agreement that permits them to articulate different sets of complementary resources in their pursuit of sustainable competitive advantage" (Mention, 2011, p. 45). Innovation capability (comprising product

innovation capability and process innovation capability) is recognized as one of the most important internal resources that can result in superior firm performance (Perna, Baraldi, & Waluszewski, 2015). Without such internal capabilities, a firm's knowledge acquisition through collaborative innovation networks (as a resource) has little value, particularly in terms of new product success, since it is unable to efficiently employ these resources.

However, our main argument in this study is that while expanding on collaborative innovation network is necessary, it is not a sufficient condition for enhancing innovation capability and new product development success. Instead, we theorize the need for organizational learning capability to act as a complement i.e. collaborative innovation networks improve firms' innovation capability only in the presence of organizational learning capability. Previous studies have suggested learning as an essential antecedent of firms' innovation ability (Alegre & Chiva, 2008; Amara, Landry, Becheikh, & Ouimet, 2008; Chen, Lin, & Chang, 2009). Recent theories of organizational learning have highlighted the concept of absorptive capacity (AC) to clarify the learning process in organizations (Tu, Vonderembse, Ragu-Nathan, & Sharkey, 2006; Winkelbach & Walter, 2015). However, existing literature (Wu, 2014) has so far focused on the impact of collaborative innovation networks on innovation capability without paying sufficient attention to the contingent effects of absorptive capacity of the firm.

Thus, the main contributions of this research are to first examine the role of product and process innovation capabilities as two distinct mechanisms through which collaborative innovation networks impact new product performance, and secondly, to examine whether the relationship between collaborative innovation networks and product and process innovation capabilities is contingent on the firm's level of absorptive capacity.

## 2. Theoretical background and research hypotheses

### 2.1. Collaborative innovation networks, innovation capability and new product performance

Research on network management has evolved over the last two decades. Several approaches exist for the study of business networks (for a complete review on different streams of research in the study of business networks please see Möller and Halinen (2017)). Möller and Svahn (2003) introduced the strategic net perspective, a concept that refers to firms' attempts to form strategic networks with a few focal actors in order to pursue mutual strategic goals beyond their individual resources. Ford, Gadde, Håkansson, and Snehota (2002) introduced the concept of network pictures, which represent "an organizational actor's subjectively perceived network" (Ramos, Henneberg, & Naudé, 2012, p. 952). The network picture approach has been the focus of research for the study of networks in recent years (e.g. Abrahamsen, Henneberg, Huemer, & Naudé, 2016; Ramos et al., 2012).

Innovation networks is yet another stream of research in network management studies that focuses mainly on collaboration with different actors aiming at innovation. To examine how firms' external actors (e.g. suppliers, customers, competitors, and research organizations) impact their innovation capability or new product performance, researchers focus on the role that relationships and networks play in developing innovative processes and products. According to the industrial network approach, firms are embedded in a complex web of interconnected ties through which they can access the resources that are needed for sustaining the business (or in our case, successfully developing new products). Based on this perspective, firms purposefully develop networking capabilities (Mitrega et al., 2017) (i.e. initiating, managing, and/or terminating business relationships) to guide the relational and network properties that they are embedded in to leverage their competitive advantage through achieving greater innovativeness (Freitag & Young, 2014). From this perspective, firms' accessibility to new external sources of knowledge and their innovation ability depends on their

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