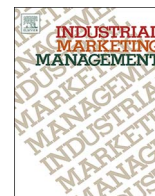




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Target and position article

## How do network resources affect firms' network-oriented dynamic capabilities?

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## ABSTRACT

While the extant literature investigating the dynamic capabilities that cross the boundaries of firms (i.e., network-oriented dynamic capabilities) has predominantly focused on the identification of their underlying routines or their impact on the firms' performance, the determinants of these routines have largely remained unexplored. Our study seeks to address this issue by investigating how the attributes of network resources (i.e., assets that belong to or are deployed by actors with whom a firm is connected through direct or indirect relationships) influence firms' network-oriented dynamic capabilities. A multiple-case study including 50 network resource sets embedded in 10 business units of five multinational firms spanning pharmaceutical, aircraft power system, and consumer goods' industries is conducted. The findings reveal the effects of eight network resource attributes on the three clusters of network-oriented dynamic capabilities (i.e., sensing, seizing and transforming) as follows: rarity affects the effectiveness of sensing, complementarity affects the effectiveness of seizing, accessibility and usability affect the efficiency of seizing, scalability and appropriability affect the effectiveness of transforming, and finally utility and versatility affect the efficiency of transforming.

## 1. Introduction

In rapidly changing environments, dynamic capabilities — “the organizational and strategic routines by which firms achieve new resource configurations” (Eisenhardt & Martin, 2000, p. 1107) — serve to provide sustainable competitive advantages (Easterby-Smith, Lyles, & Peteraf, 2009; Sirmon, Hitt, & Ireland, 2007). While initially focused on the internal boundaries of firms, dynamic capability routines have increasingly crossed the firms' boundaries to benefit from the network of external firms with whom different types of relationships have been formed (Blyler & Coff, 2003; Kale & Singh, 2007; Möller & Svahn, 2006). Specifically, dynamic capabilities may revolve around the initiation, development or termination of these relationships (Allred, Fawcett, Wallin, & Magnan, 2011; Capaldo, 2007; Forkmann, Henneberg, Naudé, & Mitrega, 2016). Dynamic capability routines may also be externally oriented to utilize the resources that are available via these interfirm relationships in responding to environmental changes (Heger & Boman, 2015; Huikkola, Ylimäki, & Kohtamäki, 2013; Kale & Singh, 2007). We refer to these dynamic capability routines that transcend a single firm's boundaries as *network-oriented dynamic capabilities*.

While network-oriented dynamic capability studies have largely focused on how firms orchestrate their internal efforts to obtain value from their interfirm networks, the ultimate outcome of dynamic capabilities is not merely attributed to these network-oriented routines. For instance, although a firm may have strong collaboration capabilities to establish common goals with its suppliers toward innovation (Allred et al., 2011), it will not achieve successful technological innovation if the suppliers do not possess the technological or managerial resources required for the adoption of the innovation. Similarly, while a firm may have strong networking capabilities to interact with its business partners (Mitrega, Forkmann, Ramos, & Henneberg, 2012), the frequency and quality of interactions are also influenced by the geographical proximity of the partner and the compatibility of their systems. In fact, the resources that belong to or are deployed by actors with whom a firm is connected through different relationships (i.e., network resources, Gulati, 1999; Lavie, 2006) possess attributes that are crucial in shaping the firm's performance (Gulati, Lavie, & Madhavan, 2011). Therefore, solely relying on firms' capabilities and behavior toward the network and overlooking network resource attributes such as their utility, accessibility or complementarity, may result in an incomplete understanding of the mechanisms that underlie the outcome of network-

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oriented dynamic capabilities.

Our study thus aims to investigate how the attributes of network resources influence firms' network-oriented dynamic capabilities. In particular, we extend and refine the existing conceptualizations of network resource attributes by systematically and empirically articulating their multiple dimensions. We further examine the effects of these dimensions on the multiple clusters of firms' network-oriented dynamic capability routines (i.e., sensing, seizing and transforming, Teece, 2007).

Our work contributes to the network-oriented dynamic capability and network resources literature. First, our research expands the understanding of network-oriented dynamic capabilities' determinants by investigating the attributes of network resources; while the extant literature has predominantly focused on the identification of network-oriented dynamic capability routines or their impact on a firm's performance (e.g., Huikkola et al., 2013; Kale & Singh, 2007; Mitrega & Pfajfar, 2015), the antecedents of these routines have remained unexplored. Second, our study extends the literature on network resources by systematically exploring different constituent dimensions of network resource attributes. The existing network resource studies examining the effects of network resources on the performance of firms (e.g., Casanueva, Gallego, & Sancho, 2013; Lavie, 2007) are inadequate in terms of the extent to which they fully explain, or capture, the multiple dimensions of network resource attributes that affect the outcome of network-oriented dynamic capabilities.

The paper proceeds as follows. First, we establish the theoretical background of our study based on the literature on network-oriented dynamic capabilities and network resources. Next, our empirical setting and case study methodology is introduced and the data collection and analysis approaches and procedures are discussed. Following the analysis, we present a set of propositions that associate the attributes of network resources with the firm's network-oriented dynamic capabilities. Our findings are then discussed in relation to the relevant literature and the original contributions to theory are elaborated. Finally, we conclude the paper with a summary of the main findings, managerial implications, limitations and directions for future research.

## 2. Literature review

### 2.1. Network-oriented dynamic capabilities

Although dynamic capabilities were initially characterized as a set of organizational routines that exist within a firm's boundaries (e.g., product development, Eisenhardt & Martin, 2000; learning, Zollo & Winter, 2002; strategic decision-making, Aragon-Correa & Sharma, 2003), these routines have been extended beyond the single firm to capture the advantages available within interfirm networks (Blyler & Coff, 2003; Kale & Singh, 2007; Möller & Svahn, 2006). We label these routines as network-oriented dynamic capabilities and explain them based on the units of analysis (firm vs. dyadic interfirm relationships) adopted in two categories (see Fig. 1).

The first category revolves around the firm's dynamic capability

routines that are extended beyond its boundaries (Fig. 1 a). This strand of work has investigated routines that enable the firm to identify, mobilize and influence network actors (Möller & Svahn, 2003). For instance, organizational routines that initiate, develop and terminate relationships with network actors (Forkmann et al., 2016; Mitrega & Pfajfar, 2015; Vesalainen & Hakala, 2014), shape a heterogeneous portfolio of weak and strong ties with them (Capaldo, 2007) or learn from these actors through articulation, codification and sharing of knowledge (Kale & Singh, 2007) have been investigated as network-oriented dynamic capabilities.

The second group considers the dyadic relationship as the unit of analysis and highlights the dynamic capability routines that are jointly employed by the firm and the network actors (Fig. 1 b). Specifically, previous studies have identified joint learning, joint sense making and knowledge integration as dynamic capability routines that are jointly used and developed (e.g., through relational investments) by the firm and network actors (Huikkola et al., 2013). These routines develop shared goals, resources, risks and rewards (Allred et al., 2011), foster an understanding of the current resources possessed by each party, and indeed facilitate the joint development of new capabilities between firms (Defee & Fugate, 2010).

Although studies from both categories have reported the positive effects of network-oriented dynamic capabilities on firms' performance (e.g., Defee & Fugate, 2010; Forkmann et al., 2016; Mitrega & Pfajfar, 2015), the determinants of these routines have been considered to a lesser extent. In particular, the literature lacks an understanding of which factors outside a firm's boundaries (e.g., the characteristics or behaviors of network actors) may drive network-oriented dynamic capabilities. Thus, our study seeks to address this gap by investigating the attributes of network resources that shape network-oriented dynamic capabilities. In our investigation, consistent with the first category, network-oriented dynamic capabilities are characterized as a set of routines that have external orientation. This allows the examination of the independent effects of network resource attributes on network-oriented dynamic capabilities from the perspective of a firm (rather than the perspective of a dyadic relationship).

### 2.2. Network resources

Firms employ network-oriented routines to realize the potential benefits of network resources (Wassmer & Dussauge, 2011), which are predominantly defined as *assets* that exist in the network of interfirm relationships in which a firm is embedded (Gulati, 1999; Lavie, 2006). These include tangible and intangible assets such as technology, marketing, finance (Lavie, 2007), knowledge (Spithoven & Teirlinck, 2015), people (Wei, Chiang, & Wu, 2012), and reputation (Musiolik, Markard, & Hekkert, 2012). The importance of network resources in shaping firms' operational and strategic performance has been empirically demonstrated (e.g., Casanueva et al., 2013; Lavie, 2007; Srivastava, Gnyawali, & Hatfield, 2015). For instance, Lavie (2007) asserted that network resources, including the level of investment in technology and marketing among partners as well as their available financial resources are positively associated with the firm's market share growth. This is consistent with Casanueva et al. (2013), who revealed that network resources such as reputation and marketing, physical, technological, financial and human resources are positively related to an airline firm's operational performance in terms of income, passenger volume and transportation indicators. Further, focusing on the strategic performance of firms, Srivastava et al. (2015) identified that more extensive technological network resources increase a firm's innovation performance (i.e., the number of patents).

While network resources have been identified as an important determinant of firms' performance, the investigation of *how* network resources influence firms' performance has been largely overlooked. Specifically, the empirical studies examining network resources have largely operationalized network resources as a one-dimensional

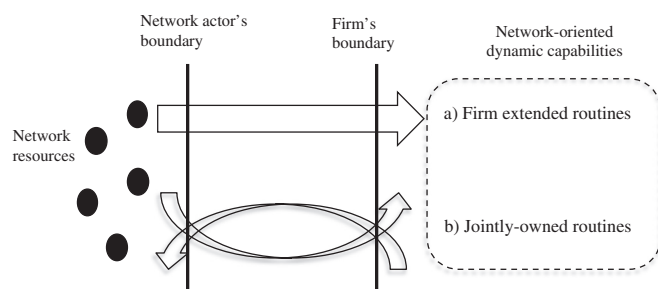


Fig. 1. Network-oriented dynamic capabilities.

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