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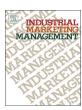
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A dynamic capabilities-based framework of organizational sensemaking through combinative capabilities towards exploratory and exploitative product innovation in turbulent environments

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ABSTRACT

This study develops a dynamic capabilities-based framework of organizational sensemaking through combinative capabilities towards exploratory and exploitative product innovation. Organizational sensemaking helps organizations develop cognitive maps of turbulent environments through its construction of shared interpretations of environmental changes. We argue, however, that successful exploratory and exploitative product innovation are not guaranteed by organizational sensemaking alone, but instead depend on how firms' capabilities synergistically combine and transform knowledge resources. Organizational sensemaking and combinative capabilities are together positioned as important dynamic capabilities. The dynamic capabilities-based framework is applied to explain why and how organizational sensemaking determining superior exploratory and exploitative product innovation in turbulent environments is realized by combinative capabilities. Furthermore, the paper examines the differential effects of combinative capabilities on the firm's exploratory versus exploitative product innovation. Firms can better understand how to leverage different type of combinative capabilities for optimal outcomes.

"Combinatorial play seems to be the essential feature in productive thought."

Einstein (1879-1955)

1. Introduction

The business-to-business marketing environment is increasingly turbulent due to complex techno-socio-economic movements such as increasing technological sophistication, globalization, reoccurring economic crises, and complicated forms of relationships and networks (Ford & Mouzas, 2010; Gebauer, 2011; Mattsson, Corsaro, & Ramos, 2015; Möller, 2010). Although turbulent environments are common for industrial markets, firms struggle to thrive and maintain sustainable competitive advantages in these uncertain environments (Varadarajan, 2015). A prevalent marketing reaction to turbulent markets has been to refine current products or to develop new products to reduce the effects of turbulence and increase performance (Cronin, Smith, Gleim, Ramirez, & Martinez, 2011; Hakonsson et al., 2016). Therefore, not only do turbulent markets require firms to better rationalize the external environment, but also internal processes so that firms can refine current products or develop the new products needed to increase performance. Scholars have become motivated to investigate why and how

firms contribute to such product innovation processes (Katsikeas, Leonidou, & Zeriti, 2016). One rationale is the dynamic capability argument, which proposes that sustainable competitive advantage is ascribed to those firms able to respond promptly to changing environments through product innovation, achieved by capably using their resources (Teece, Pisano, & Shuen, 1997). This is to say, unless organizations possess product innovation capabilities to manage resources, their new product outcomes will be undermined and as a result, they will face an unavoidable demise (Menguc, Auh, & Yannopoulos, 2014).

Firms encountering a turbulent environment may better respond to changing market demands by rationalizing internal processes. With the constant need to change, adapt, innovate, or reinvent in a dynamic environment, organizational sensemaking seems to be a valuable approach to understanding management in complex networks (Cederlund, 2015; Green & Cluley, 2014; Perks & Roberts, 2013). If organizations make sense of turbulent environments, they may see their positions in the business environment better and therefore strengthen critical processes to prepare alternatives for turbulences. Henneberg, Naudé, and Mouzas (2010) have found that organizational sensemaking enhances firms' ability to visualize the evolution of new business ideas before a competitor does. Klein, Wiggins, and Dominguez (2010) have also indicated that failures have largely been associated with a classification in

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organizational sensemaking where crucial cues were overlooked and organizations neglected to analyze and use existing information in their internal processes.

Organizational sensemaking focuses on external environments and is thought of as a strategic resource. Nevertheless, a firm must possess proper internal processes to capitalize on organizational sensemaking to reap a competitive advantage. Scholars who adopt the resourcebased theory (RBT) declare that a company's capabilities are a function of its interactions with the market, the opportunities available to it, and the weaknesses of its existing capabilities (Schroeder, Bates, & Junttila, 2002). For this reason, Cockburn, Henderson, and Stern (2000) observe that firms are sensitive to environmental cues and that an organization's competitive advantage is rooted in its capability to build the appropriate internal processes to address such cues. Extending from RBT (e.g., Ketchen, Hult, & Slater, 2007; Vorhies, Morgan, & Autry, 2009), dynamic capabilities theory (DCT) involves a company's ability to reconfigure resources to adjust to environmental changes (Helfat et al., 2007). Dynamic capabilities (Teece, 2007) expand on two major concerns. One is the organization's ability to renew competencies to adjust to changes in turbulent environments. The other is the ability of strategic management to utilize these competencies to meet the requirements of the business circumstances. Therefore, organizational sensemaking is positioned as a dynamic capability that emphasizes the internal processes of renewal competencies to respond to the changing environment.

Schumpeter (1934) suggests that "carrying out new combinations" of resources is a vital source of innovation. Innovation success depends on how a firm's combinative capabilities buffer and shape new external knowledge resources that enter the organization. Combinative capabilities are described as a company's internal capability to make appropriate use of its resources by bringing together internal and external resources to form new resource combinations (Koruna, 2004). O'Cass, Heirati, and Ngo (2014) find the role of combinative capabilities in creating value in the form of organizational ambidexterity, to balance exploitation and exploration for the purpose of innovation. Transforming external knowledge resources to product innovation fundamentally relies on the combinative capabilities within the firm. Our focus on combinative capabilities is based on the dynamic capabilities framework. Teece (2007) argues that strategy and outcome must be grounded in capabilities that respond environmental turbulences. Day (1994) contends that in a turbulent environment, organizations require capabilities that hold an "inside-out" and a matching "outside-in" view to respond to external opportunities. Combinative capabilities thus enable organizations to reach a solid market position and greater performance results. This type of combinative capability helps the firm to convert input resources into output results. As a result, we regard combinative capabilities as transformational capabilities (Lado, Boyd, & Wright, 1992) that suggest changes and decisions in converting knowledge resources into the development and shape of products towards exploratory or exploitative innovation.

Resource-based theory (RBT) indicates that a firm cannot exploit its capabilities without resources. Studies indicate that market knowledge resources are critical in developing organization capabilities for innovation (Atuahene-Gima, 2005; Sorescu, Chandy, & Prabhu, 2003). Organizational sensemaking is the internal process in building external resources/assets. Extending from RBT, dynamic capabilities theory (Teece, 2014, p. 26) claims "asset augmentation comes from learning processes. Ongoing engagement can be seen as leading to the migration of the locus of value creation." External knowledge resources can, when done well, augment the firm's internal capabilities (Capron & Mitchell, 2009). On the other hand, a capability aims to enhance the productivity of the resource possessed by the firm (Makadok, 2001). On this basis, we position combinative capabilities as an organizationally embedded capability that improves the productivity of organizational sensemaking in influencing exploratory and exploitative product innovation, and we identify organizational sensemaking as a resource core to an organization's product innovation. A firm employs combinative capabilities to obtain, integrate, reconfigure, and use its knowledge resources. We argue that combinative capabilities serve as an internal capability that orchestrates knowledge resource built on organizational sensemaking to exploratory and exploitative product innovation. Therefore, our study presents organizational sensemaking as internal processes to react to environmental turbulence, and further explores how organizational sensemaking through exercising combinative capabilities can help with the combinative integration and renovation of a firm's knowledge resources, which in turn positively affects product innovation.

The first contribution of this study is that it extends the argument why organizational sensemaking leads to innovation by contending that internal combinative capabilities explain how organizational sensemaking affects exploratory and exploitative product innovation. Through exercising combinative capabilities, organizational sensemaking can be augmented and thus markets and innovations can be created (Eisenhardt & Martin, 2000; Teece, 2014). Our study identifies organizational sensemaking and combinative capabilities through which organizations develop dynamic capabilities to influence exploratory and exploitative innovation. We can thus construct a dynamic capabilities-based framework adapted to a turbulent environment in which organizational sensemaking and combinative capabilities lie on the path towards exploratory and exploitative product innovation. The dynamic capabilities-based framework developed in our study generates impact beyond the knowledge and technological essentials underscored in resource-based theory to more explicitly including capabilities as determinants of competitive advantage. Our rationale for the argument is consistent with that of Day and Wensley (1988), Lisboa, Skarmeas, and Lages (2011), and Menguc and Auh (2010) who suggest that capabilities are a source of superior business performance. Our dynamic capabilities-based framework is higher-order, difficult-to-duplicate capabilities and based on organizational sensemaking and combinative capabilities that intelligently orchestrates resources to influence exploratory and exploitative product innovation.

Second, researchers have investigated the role of sensemaking capabilities in product innovation (e.g., Akgün, Lynn, & Yılmaz, 2006; Akgün, Keskin, Lynn, & Dogan, 2012), interfirm outcomes (Johnson, Sohi, & Grewal, 2004), and antecedents and consequences of sensemaking capabilities (Neill, McKee, & Rose, 2007). Beyond these, earlier studies have argued for sensemaking's existence within organizations (Anand & Peterson, 2000; Bogner & Barr, 2000), despite limited empirical evidence (Thomas, Clark, & Gioia, 1993). Organizational sensemaking has tended to focus on external environment and is promising in explaining outcomes. However, such research does not explain how firms perform organizational sensemaking with regard to internal processes, the very things responsible for their ability to respond to the changing environment. Our study provides empirical evidences and frames organizational sensemaking as dynamic capabilities that focus on internal processes a firm employ to respond to turbulent environments towards exploratory and exploitative product innovation. The process to manage external knowledge resources for internal uses is crucially important. Day (2011) also emphasizes that firms should build adaptive marketing capabilities internally that acknowledge the anticipation of trends and fast amendment to environmental shifts. Organizational sensemaking is valuable adaptive marketing capabilities to firms, as such internal processes can assist firms to achieve a strong market position and outcome. In this way, organizational sensemaking empowers employees to better comprehend environmental turbulence and frame them for the future. Organizational sensemaking helps firms foresee market demand and changes for innovative products and prepare the firm with the fundamental processes to respond effectively.

Third, prior studies in combinative capabilities focus on product innovation in general (e.g., Kogut & Zander, 1992; van den Bosch, Volberda, & de Boer, 1999). However, the complexity of combinative capabilities (i.e., system, socialization, and coordination capabilities)

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