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Exploratory and exploitative innovation: To what extent do the dimensions of individual level absorptive capacity contribute?

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ABSTRACT

Individuals are considered the frontline that allows firms to learn from external sources. However, a firm can only benefit from individual efforts if it understands to what extent the dimensions of individual-level absorptive capacity are related to its innovation strategy. A firm's innovation strategy is characterized by the notions of exploration and exploitation, which result in either radical or incremental innovation. This study examines the driving factors of individual-level absorptive capacity regarding a firm's exploration versus exploitation strategy. Using quantitative data from 104 individuals, partial least squares structural equation modeling (PLS-SEM) analysis was conducted, verifying individuals' competencies in identifying external knowledge as a trigger for both exploratory and exploitative innovation. Consequently, these specific abilities also contribute to organizational ambidexterity. Furthermore, the results show the dichotomous contribution of individual competencies in assimilating external knowledge. While exploratory innovation thrives with individual assimilation efforts, realization of exploitative innovation is not significantly related to these efforts. Ultimately, individuals' competencies in utilizing external knowledge are significantly related to neither exploratory nor exploitative innovation. Moreover, this study provides means for managers to systematically position individuals in the external search process.

1. Introduction

Individuals are seen as the frontline that allows a firm to learn from external sources and thus contribute to a firm's innovation strategy. By tapping into external sources, individuals widen a firm's existing knowledge base. In doing so, a firm can continuously explore and exploit new knowledge, which allows the combination and recombination of knowledge in a Schumpeterian manner (e.g., Barirani et al., 2015). The notions of exploration and exploitation (March, 1991) underlie a firm's innovation strategy (e.g., Enkel and Heil, 2014). Furthermore, various studies have argued that organizations should become ambidextrous by simultaneously developing exploratory and exploitative innovation (e.g., Chen and Kannan-Narasimhan, 2015; Gibson and Birkinshaw, 2004; He and Wong, 2004; Raisch et al., 2009; Wei et al., 2014).

Although there is evidence that individuals play a key role in open innovation (Salter, et al., 2014a, 2014b), most of the literature has focused on the organizational (e.g., Ferreras-Méndez et al., 2016; Heil and Enkel, 2015; Ritala and Hurmelinna-Laukkanen, 2013) rather than the individual level (Salter et al., 2014a). Little attention has been paid to the behaviors of individuals involved in the successful absorption of external knowledge and the extent to which these individual actions shape connections of this knowledge with a firm's innovation strategy. As a result, there is relatively little knowledge about both the ways that individuals effectively contribute to exploratory and exploitative innovation or the practices that organizations introduce to increase strategic alignment.

In line with Cohen and Levinthal's (1990) definition of absorptive capacity, individual-level absorptive capacity comprises three dimensions: individuals' ability to identify valuable knowledge external to the existing firm environment, individuals' ability to assimilate the external knowledge to existing organizational identity, and individuals' ability to advocate for the utilization of the external knowledge within an organization. Allen (1977) laid the foundation for the role of individuals in learning from external sources. Some individuals inside an organization, so-called technological gatekeepers, act as carriers of information from external to internal sources. However, in practice, individual R & D managers are challenged to act not only as technological gatekeepers but also as messengers for external ideas within and across a firm (Aalbers and Dolfsma, 2015; Colombo et al., 2011; Ebers

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and Maurer, 2014). Hence, the gatekeeper concept does not offer a continuous description of how individuals master external knowledge for innovation. The process of assimilation and utilization of externally sourced knowledge has not been explored concretely (e.g., Tortoriello, 2015). However, recent studies have elaborated on this to understand the mechanisms that enable individuals to systematically learn from external sources when they follow the open innovation paradigm (e.g., Criscuolo et al., 2013; da Mota Pedrosa et al., 2013; Hafkesbrink and Schroll, 2014; Salter et al., 2014a, 2014b; ter Wal et al., 2011; Tortoriello, 2015).

Furthermore, prior literature has elaborated on exploration and exploitation (e.g., Hernández-Espallardo, Sánchez-Pérez, and Segovia-López, 2011; Jansen et al., 2006). Since exploration and exploitation pursue different objectives, the role of absorptive capacity in exploration is understood to be different compared to its role in exploitation (Nooteboom et al., 2007). Ultimately, several studies have emphasized that individuals are important sources of organizational ambidexterity (Mom et al., 2007; Smith and Tushman, 2005). These studies agree that ambidexterity (Duncan, 1976; Tushman and O'Reilly, 1996) is rooted in individuals' ability to explore and exploit (Raisch et al., 2009). However, it is challenging for an individual to excel at both exploration and exploitation (Gupta et al., 2006). In this context, Hafkesbrink and Schroll (2014) theoretically revealed specific individual competencies for exploration, exploitation, and ambidexterity.

Motivated by a lack of focus in the academic literature on the link between individual-level absorptive capacity and firms' internal innovation strategy (Nooteboom et al., 2007), the aim of this study is to develop an understanding of which dimensions of individual-level absorptive capacity foster which innovation strategy. Hence, this study examines the following research question: To what extent are the dimensions of individual-level absorptive capacity related to exploratory and exploitative innovation?

This study makes five major contributions to the literature on individual-level absorptive capacity and its relationship to innovation strategy. First, the empirical results demonstrate that individuals' efforts to identify external knowledge are related to both exploratory and exploitative innovation. Second, by showing that knowledge identification from external sources is a critical factor in facilitating individual contributions to innovation strategy for both exploration and exploitation, this study demonstrates that the abilities underlying the identification process contribute to the concept of organizational ambidexterity. Third, the results illustrate the dichotomous contribution of individual efforts to the assimilation of external knowledge. While exploratory innovation thrives with individual assimilation efforts, exploitative innovation is not significantly related to these efforts. Accordingly, this work creates momentum for the benefit of individual external knowledge assimilation to exploratory innovation. Fourth, the empirical results show that individuals' efforts to utilize external knowledge are not significantly related to exploratory or exploitative innovation. By intensively assimilating external ideas, the dominance of the Not-Invented-Here (NIH) (Katz and Allen, 1982) syndrome can be effectively reduced. Thus, this study also contributes to knowledge about the sequential organizational learning process in absorbing external knowledge (e.g., Lane et al., 2006). Finally, the study addresses the lack of quantitative research on individual-level absorptive capacity.

2. Theoretical framework

2.1. Exploratory and exploitative innovation

Innovation is classified along two domains: technological novelty and market novelty (Abernathy and Clark, 1985; Jansen et al., 2006). In the technological domain, exploratory (radical) innovations fundamentally change the technological trajectory while exploitative (incremental) innovations result in small changes in a firm's current technological capabilities (Benner and Tushman, 2003; Dosi, 1982; Green et al., 1995). Likewise, in the market domain, exploratory innovations are designed for emerging customers or markets while exploitative innovations address existing customer or market needs (Benner and Tushman, 2003; Danneels, 2002; Jansen et al., 2009).

Exploration and exploitation are viewed as distinct innovation strategies (Enkel and Heil, 2014; March, 1991). Exploration entails breaking with an existing dominant search logic (Enkel and Gassmann, 2010). Firms following an exploratory innovation strategy move beyond domestic search to overcome the limitations of internal search (Fleming, 2001; Rosenkopf and Almeida, 2003; Rosenkopf and Nerkar, 2001). In particular, exploration includes elements that can be captured by terms such as search, variation, risk taking, experimentation, play, flexibility, and discovery (March, 1991). Exploration requires new knowledge or departure from existing knowledge to allow novel Schumpeterian combinations (Barirani et al., 2015; Datta and Jessup, 2013; McGrath, 2001; Schumpeter, 1939). Hence, exploratory innovations are new technologies, products, or services that can potentially make existing ones obsolete or non-competitive (Bierly et al., 2009; Hernández-Espallardo et al., 2011).

In contrast, exploitation is characterized as routinized learning (Nooteboom et al., 2007). Firms pursuing an exploitative innovation strategy search for opportunities primarily in their surrounding landscape and retain their basic search activities (Barirani et al., 2015; Hagedoorn and Duysters, 2002). Specifically, exploitation includes elements such as refinement, choice, production, efficiency, selection, implementation, and execution (March, 1991). Exploitation is based on existing knowledge and reinforces existing skills, processes, and structures (Jansen et al., 2006; Levinthal and March, 1993). Thus, exploitative innovations are improvements of existing products and services or efficiency enhancements of existing distribution channels (Abernathy and Clark, 1985; Jansen et al., 2006).

Many studies have emphasized the need for organizations to develop ambidexterity (e.g., Chen and Kannan-Narasimhan, 2015; Enkel and Heil, 2014; Raisch et al., 2009; Wei et al., 2014). Ambidextrous organizations have the ability to synchronize exploration and exploitation and thus simultaneously pursue exploratory and exploitative innovation (Jansen et al., 2008; Li, 2013). Organizational ambidexterity not only supports firms in overcoming structural inertia resulting from a focus on exploitation but also prevents them from fostering exploration without gaining benefits from it (Jansen et al., 2008; Levinthal and March, 1993).

2.2. Individual-level absorptive capacity

Enriching a firm's knowledge base through external knowledge sources can increase its innovativeness (e.g., Cohen and Caner, 2016; Gassmann, 2006; Laursen and Salter, 2006; Leiponen and Helfat, 2010; West and Bogers, 2014). To take advantage of external knowledge, successful exploration and exploitation require high levels of absorptive capacity, which is found in individual cognition, motivation, action, and interaction (Volberda et al., 2010). Individual-level absorptive capacity is defined as an individual's ability to identify, assimilate, and utilize new external knowledge (Cohen and Levinthal, 1990; Lewin et al., 2011; Todorova and Durisin, 2007).

Identification of external knowledge is basically a search process by which individuals monitor the technological and market environments to recognize valuable opportunities for the focal firm (da Mota Pedrosa et al., 2013). It is understood that the identification process requires organizational resources and that firms need to actively encourage employees to identify external knowledge (Foss et al., 2013). This is crucial since most individuals are unseasoned in identifying this type of knowledge (Salter et al., 2014b). Indeed, in the past, R & D professionals were typically rewarded for discovering new products rather than successful external engagement (Salter et al., 2014a). Moreover, organizations should allow individuals substantial autonomy (Amabile,