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The effects of organization context on knowledge exploration and exploitation

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ABSTRACT

The knowledge-based view of the firm points knowledge as the main resource able of generating competitive advantage for organization. This competitive advantage is the result of the innovative process, which requires knowledge exploration and exploitation. Several studies have aimed to analyze factors that support the knowledge management (KM) process and generate taxonomies related to the practice of KM. However, there is a gap in the literature on organizational knowledge regarding the relationship of contextual factors with the knowledge exploration and exploitation process as well as with the generating of a typology that considers these two processes. To achieve this goal, this study uses a quantitative approach, based on a survey with 234 companies in the automotive industry. Our results show that the knowledge exploration and exploitation process are differently impacted by five contextual factors considered in this research - human resources management, supportive leadership, learning culture, autonomy and systems of information technology (IT). While exploration is more impacted by learning culture, autonomy and IT systems, exploitation is more associated with supportive leadership and learning culture. Considering innovation for knowledge exploration and exploitation and contextual factors, this research also identifies three clusters in the automotive industry, named innovative companies, exploitative companies and passive companies.

1. Introduction

The intensity of business competition has significantly increased and the knowledge is the main organizational resource able to generate a competitive advantage through innovation (Grant, 1996; Torugsa & O'Donohue, 2016). In this context, knowledge management (KM) has become one of the most influential models in the field of Managerial Sciences. Recent surveys show that KM influences the performance of firms as it offers an effective framework for implementing innovation strategies (Lee, To, & Ty, 2013; Lin, 2014). KM applications are not restricted to the business world. Blanco, Echaluze, and Peñalvo (2015), for example, have developed a model of ontological spirals for innovation in higher education. The authors propose that the individuals' knowledge is transferred to the universities in order to reach educational innovations.

Much of the research on KM seeks to relate the knowledge creation, storage, distribution and application to organizational performance, in terms of financial results and innovative performance (Chen, Huang, & Siao, 2010; Jones & Knoppen, 2018; Lee et al., 2013). It is noted in the literature that little attention has been given to the impact of the

contextual factors of the organization that support the firm's KM process and innovation. Some studies examine the influence of one factor in isolation in relation to KM and innovation, as occurs in Martins and Meyer (2012) and Zangiski, Lima, and Costa (2013), who focus on the relationship between human resources and KM; Corfield and Paton (2016) and Marouf (2016), who deal with the relationship between organizational culture and KM; and Gonzalez, Martins, and Toledo (2014), Chen et al. (2010) and Chen and Huang (2007), who focus on the relationship between organizational structure and KM; and also Kane and Alavi (2007) who relate Information Technology (IT) systems and KM. However, White and Cicmil (2016) warn that it is essential to treat these factors simultaneously, for analyzing a single factor in isolation can lead to erroneous conclusions.

The literature addresses the factors related to KM as “organizational contextual factors” (Gonzalez & Martins, 2014; Martins & Meyer, 2012; White & Cicmil, 2016) or “success critical factors of KM” (Gold, Malhotra, & Segars, 2001; Lee & Choi, 2003; Lin, 2014). In this study, the first terminology is used. These factors establish the organizational behavior, in what concerns values and beliefs that guide individuals, integration and forms of organization of employees into groups, level of

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training of employees, and the posture assumed by the company's management. Without the effort to develop these factors, any organizational initiatives geared towards KM ends up not creating the expected benefits (Gonzalez & Martins, 2014).

Considering that contextual factors are developed differently by organizations and that its impact the ability to knowledge exploration and exploitation, the innovative capacity will also be affected by the development of these factors (Gonzalez & Melo, 2017; Patterson & Ambrosini, 2015; Gonzalez et al., 2014; Chen et al., 2010; Torugsa et al., 2016). In this sense, the main objective of this study is to analyze how five factors of the organizational context (Human Resource Management, Supportive Leadership, Learning Culture, Autonomy and Information Technology system) are related to the processes of innovation from knowledge exploration and exploitation in automotive industry. In addition, this study presents a secondary objective, the development of a typology of companies in the automotive industry that considers the level of innovation through knowledge exploration and exploitation and also of the contextual factors of the organization.

2. Knowledge exploration and exploitation

Innovative process is crucial for companies to create strategic flexibility and maintain competitive advantage. Many studies classify innovation from the way knowledge is applied, accessed, and rescued (Gonzalez, 2017; Lee, Park, & Kang, 2018). Previous studies classify innovation as explorative or exploitative depending on the proximity to technologies, products, services and consolidated processes (Lee et al., 2018; March, 1991). Exploratory innovation is developed to search and acquire unfamiliar and novel technologies and resources and aims to generate variation. Exploratory includes things captured by terms such as search, variation, risk taking, experimentation and flexibility (March, 1991). The level of primary knowledge will restrict the acquisition of new knowledge that supports the process of innovation through exploration (Grant, 1996). Otherwise, exploitative innovation is conducted to meet the needs of customers and current markets, expanding the existing products and services, and also refining and improving the efficiency of the processes. In comparison with exploratory innovation, exploitative innovation is based on knowledge and information associated with primary knowledge and skills.

The establishment of the concept of knowledge exploration and exploitation has led to research on ambidexterity strategy, in which firms pursue both short-term survival and long-term growth by combining these two organizational learning activities (Lee et al., 2018; He & Wong, 2004). March (1991) emphasizes that the results associated with exploration are more variable and long-term, while the results relating to exploitation are more precise and short-term. In other words, companies that exploit new knowledge generate great variation in performance, while the use of exploitation leads to a more stable performance. Levinthal and March (1993) and Ganzaroli, Noni, Orsi, and Belussi (2016) argue that it is important for companies to maintain an appropriate balance between exploration and exploitation to increase competitiveness.

Exploration and exploitation require significantly different structures, processes, strategies, capacity, and culture. In general, exploration is associated with an organic structure, systems that are not rigid, improvisation, and autonomy. Exploitation, on the other hand, is associated with mechanical structures, more rigid systems, routine, control, and bureaucracy (Holmqvist, 2004).

To achieve the organizational ambidexterity firms need to balance innovation by knowledge exploration and exploitation (Hill & Birkinshaw, 2014). March (1991) consider that there is tension between exploration and exploitation. If on the one hand, adaptation to the environment can promote inertia, in addition to reduction of the company's capacity to adapt to new opportunities, on the other, trying new alternatives reduces the speed at which the existing competences are improved and refined (March, 1991).

Ganzaroli et al. (2016) and Gupta, Smith, and Shalley (2006), argue that an excessive focus on exploitation results in organizational "short-sightedness," hindering innovation and leading to a process of obsolescence. Similarly, excessive exploitation is also equally destructive, because organizations can enter into a cycle of failure – research – change – failure. The authors argue that based on the failures, polls are originated in the organizations, which support the changes that, in turn, will result in new failures, initiating a new cycle of research. These organizations suffer from never gaining the return of their acquired knowledge. Crossan and Bedrow (2003) believe that there are important implications in balancing exploitation and exploration. According to the author, the organizations that manage knowledge well are competent in developing innovative ideas, as well as in institutionalizing and redeeming individual learning.

There is a complementary effect between the two strategies: exploitation promotes static optimization, while exploration supports dynamic optimization. The success of a company when competing in stable environments involves the exploitation of the consolidated competences, while surviving in dynamic environments involves the development of new competences. Thus, the two strategies are essential to maintain a competitive edge, and their combination is implied in recent concepts that deal with the organization's dynamic capabilities (Eisenhardt & Martin, 2000).

3. Contextual factors that support KM

The knowledge-based view of the firm proposes that knowledge generation, retention, distribution and application process are the firm's core activities (Grant, 1996). This theory places knowledge to be the main strategic resource because it enables the company to create cultural, intellectual, social and economic value (Zack, McKeen, & Singh, 2009). In this context, the firm is an entity that is continuously transforming its acquired knowledge through its dynamic capabilities, in a prospect of knowledge exploration and exploitation (Kogut & Zander, 1992).

Grant (1996) recognizes two types of contributions from KM. The first refers to the recognition of two kinds of knowledge – tacit and explicit knowledge – that require different approaches for their management. While explicit knowledge is presented in codified form; tacit knowledge is manifested through abilities and skills intrinsic to people (Zack et al., 2009). The second contribution concerns the way in which the knowledge is renewed or transformed. Grant (1996) proposes that organizations can transform knowledge into a continuum between exploitation, that is, using the same primary knowledge base in order to achieve incremental improvements; and exploration, which focuses on research, discovery and experimentation in order to modify the primary knowledge acquired (March, 1991).

Two contributions enunciated by Grant propose that KM should be addressed as a social and technical phenomenon (Lin, 2007; Van Dijk, Hendriks, & Romo-Leroux, 2016). In this sense, the KM process is conditioned by organizational development. This organizational development that supports KM is associated with contextual factors and IT systems act as support mechanisms related to the processing, retention and distribution of explicit knowledge through integrative applications such as knowledge repositories (Zack et al., 2009), as well as promoting the exchange of tacit knowledge among individuals through interactive applications such as discussion forums (Park, Stylianou, Subramaniam, & Niu, 2015).

Organizational culture is a contextual factor often listed by scholars (Chen & Huang, 2007; Corfield & Paton, 2016; Gonzalez & Martins, 2014; Gonzalez & Melo, 2017; Lin, 2014; Marouf, 2016). The success of KM depends on the integration of strategy and vision with organizational culture and structure to promote the exchange of knowledge, experimentation, appropriate degree of autonomy and leadership support, and also the motivation and development of employees who retain the primary knowledge (Gold et al., 2001). Heisig (2009) identified four

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