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Competitive intelligence and absorptive capacity for enhancing innovation performance of SMEs

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ABSTRACT In dynamic and complex environments, it can be difficult for small and medium-sized enterprises (SMEs) to achieve business performance, innovate and survive, even though these actions are crucial for economic growth and competitiveness. Competitive intelligence (CI) appears as a strategic practice to help them. Although there are many theoretical studies that propose the relationship between CI and innovation, few studies have conducted empirical studies in the context of SMEs. The objective of this paper is to investigate how competitive intelligence enhances innovation performance in the context of a SME. Based on a literature review and empirical data from several interviews with managers of one SME, our findings allowed us to propose a framework showing the contribution of CI to innovation performance relying on absorptive capacity. Our findings also highlight that a prospector owner-manager can improve the results of CI in the SME and contribute to better innovation performance.

KEYWORDS Absorptive capacity, competitive intelligence, innovation performance, prospector owner-manager, SME

1. INTRODUCTION

Small and medium-sized enterprises (SMEs) are considered the primary source in creating jobs and economic wealth (Julien 1995; Olawale and Garwe 2010), employing more than 95% of the world's working population (Pellissier and Nenzhelele 2013). In Canada, SMEs account for 99.7% of total firms in terms of working population and contribute about 54% of Canada's GDP (Statistics Canada, 2016).

Despite the importance of SMEs in economic growth, significant obstacles impede their sustainability, leading in most cases to failure. To overcome challenges and survive, SMEs need to improve their innovation performance (Rujirawanich et al., 2011). Innovation requires research and development (R&D) (Baldwin and Hanel, 2003), which is a determinant of innovation (Raymond and St-Pierre, 2007). However, most SMEs do not

have sufficient resources to invest in R&D (Moilanen et al., 2014). Moreover, they are not qualified to benefit from government assistance programs for R&D (Institut de la Statistique Quebec, 2002). They are, more than ever, compelled to exploit external information (Amara and Landry, 2005; Davila et al., 2009) by adopting environmental analysis activities such as competitive intelligence (CI) (Guimaraes et al., 2016).

CI allows companies to gather information from customers, suppliers, competitors and technologies and thus build a strong foundation for the innovation process (Pacitto and Tordjman 1999; Tidd, et al., 2005). However, the literature shows that the effectiveness of CI in the context of SMEs depends on the company's owner-manager profiles and the absorptive capacity of the company. Indeed, the SME prospector owner-manager seems to contribute to more effective CI in acquiring and interpreting external

information (Baldwin and Gellatly, 2003). In addition, absorptive capacity allows the company to transform external information (Cohen and Levinthal, 1990) into knowledge, which in turn contributes to innovation performance (Bayarçelik et al., 2014). Although CI is useful for businesses, few studies have been devoted to SMEs (Priporas, 2019; Talaoui and Rabetino, 2017). More specifically, there are few empirical studies that have treated the relationship between CI and innovation (Calof and Sewdass, 2020; Hassani, 2020). However, to our knowledge, there is no framework that explains the role of CI in the innovation performance of SMEs in practice. This paper addresses this gap and proposes a framework for a better understanding on how CI contributes to innovation performance relying on absorptive capacity for better results. The proposed framework is based on empirical data and the published literature.

The first section presents a literature review on innovation performance and CI, as the concepts supporting this study. The following sections present methodology and results. In discussing the implications of the proposed framework, the paper proposes several propositions predicting the positive impact of CI and absorptive capacity on innovation performance.

2. LITERATURE REVIEW

2.1 Innovation

Innovation can be classified into four types: product innovation, process innovation, organizational innovation, and marketing innovation (OECD, 2008). Innovation is considered to be the engine of growth and development for SMEs (Raymond and St-Pierre, 2007). Empirical studies have shown that the most successful innovative SMEs in Canada, the United States and Europe generate strong growth (Baldwin, 1994) and are able to survive for long periods (Baldwin and Gellatly, 2003). Innovation performance is a critical requirement for business competitiveness (Baldwin and Gellatly, 2003; Song et al., 2015). It can be defined as a concept with two dimensions such as efficiency and effectiveness (Alegre et al., 2006). According to those authors, efficiency refers to the degree of effectiveness of innovation, and effectiveness refers to the use of resources in terms of the time and cost required to complete the innovation project. Similarly, Guimaraes et al.

(2016) emphasize that innovation performance represents the degree of effectiveness of the firm in implementing innovation, which in turn has a significant impact on the organization's performance.

To stimulate innovation, companies invest more and more in R&D. Large companies can cover the costs associated with R&D activities and spread the risks associated with innovation across their entire project portfolio (St-Pierre and Mathieu, 2003). They have access to resources to invest in equipment, marketing and technical work, which can lead to major innovations (Laforet, 2008). However, most SMEs do not have sufficient resources to invest in R&D (Moilanen et al., 2014). Therefore, to promote and conduct innovation better, organizations need to be proactive in identifying and exploiting opportunities. To do this, these organizations, and in particular SMEs, should have anticipatory approaches such as CI (Calof and Sewdass, 2020; Guimaraes et al., 2016). In addition, absorptive capacity is also pointed out as being crucial to convert the information collected into knowledge useful for the innovation process (Andreeva and Kianto, 2011, Cohen and Levinthal, 1990).

2.2 Competitive Intelligence

CI is an evolving concept (Brody, 2008). Its definition presents a challenge for both academics and practitioners writing in French (Jakobiak, 2006; Larivet, 2001) or in English (Brody, 2008; Smith et al., 2010). CI is an amalgam of disciplines covering economics, marketing, military theory, information science, and strategic management (Pellissier and Nenzhelele, 2013). In addition, CI is different from industrial espionage, which is both an illegal and unethical activity (Crane, 2005). CI is both a process and a product (Vedder et al., 1999). The Society of Competitive Intelligence Professionals (SCIP) defined CI as the systematic and ethical collection, analysis and management of external information that can affect the company's planning, decision-making and business operations. CI can also be defined as a product, which refers to intelligence information about competitors' activities from public and private sources, and its scope is the present and future behavior of competitors, suppliers, customers, technologies, acquisitions, markets, products and services, and the general business environment (Vedder et al., 1999). CI has been considered to be the

fourth factor for the survival of enterprises after capital, technology and talent (Bao, 2020). The main objective of CI is to provide an alert system for external turbulent events that may have an impact on the company's strategy and performance (Ngamkroekjoti and Speece, 2008). The three main sources of such environmental turbulence are: market, technologies and competitors' intensity (Jaworski and Kohli 1993; Ngamkroekjoti and Speece 2008). Many studies have highlighted that SMEs prefer to monitor sources in their immediate environment (Johnson and Kuehn, 1987; Ramangalahy, 2001). This environment consists of customers, competitors, and suppliers (Smith et al., 2010), and technologies (Bao, 2020; Calof and Sewdass, 2020; Jaworski et al., 1995). CI is essential for business because it not only provides a solid foundation for the innovation process (Pacitto and Tordjman, 1999; Tidd et al., 2005), but because its absence can also be considered a barrier (St-Pierre and Trépanier, 2013) or even a factor in the failure of innovation (Wycoff, 2003; Baldwin et al., 2000).

2.2.1 Customers' intelligence information and innovation performance

Customer engagement enables enterprises to effectively enhance the success rate of radical innovation and incremental innovation (Wang and Xu, 2018). To innovate, enterprises must identify potential customer needs, and collect and analyze their demands, which can help generate new ideas for products and services (Bao, 2020). According to Bao (2020) and Kohli and Jaworski (1990), intelligence information from customers is essential for companies. Indeed, intelligence information increases the level of innovation performance (Bayarçelik et al., 2014) and helps the development activity of new products (Bayarçelik et al., 2014; Voss, 2012). More specifically, customers' intelligence information improves both radical innovation performance (Nguyen et al., 2015; Frambach et al., 2016) and incremental innovation (Laforet, 2008; Nguyen et al., 2015) in particular, in the early stages of the innovation life cycle (Laforet, 2008). A study by Tanev and Bailetti (2008) found a positive correlation between customer intelligence information and innovation in SMEs.

2.2.2 Competitor intelligence information and innovation performance

Competitor analysis is the soul of CI (Bao, Xie, Li, 2003). CI helps enterprises analyze competitor strengths and weaknesses, predict their strategies, and evaluate their new products, especially their prices, costs, profits and development (Bao, 2020). Prior research advises companies to monitor competitors in order to develop a greater ability to accelerate product innovation activities (Lee and Wong, 2012; Laforet, 2008) and innovate in those areas where competitors are weak (Story et al., 2015). CI on competitors has an impact on different types of innovation in companies. It contributes to radical service innovation (Cheng and Krumwiede, 2012). In the same vein, Frambach et al. (2016) noted that intelligence information from competitors stimulates the exploitation of skills and leads to the development of radical innovation.

2.2.3 Suppliers' intelligence information and innovation performance

Suppliers are a very important information source for helping firms' innovation performance (Dahlander and Gann, 2010). The participation of suppliers in the innovation process contributes to a potential source of sustainable competitive advantage (Bao, 2020). Suppliers often establish strategic partnerships with customers and competitors to implement technologies, processes or new products. To gather information from suppliers, the company can therefore conduct primary research (Slater et al., 2012). According to Carbonell and Rodríguez Escudero (2010), intelligence information from suppliers allows the product development team to understand the market dynamism and act faster, which can contribute to new-product performance. Zhang and Chen (2014) argue that intelligence information from suppliers helps companies to improve innovation performance. Nassimbeni and Battain (2003) highlight the fact that suppliers contribute to innovation in different forms, such as the provision of new product / process technologies, or the development of joint projects. Supplier intelligence information is also one source of innovation and has a positive effect on innovation performance (Bao, 2020).

2.2.4 Technologies intelligence information and innovation performance

Several research results highlight the importance of technologies as a rich information source, which contributes to the emergence of innovative ideas. Information from technologies allows organizations to be more competitive (Duncan 1972; Souitaris 2001; Vedder et al., 1999).

The literature highlights multiple tools and technology platforms that can help companies gather information about their external environment. The internet, especially social media, are the sources of information most often mentioned in the literature (Roch & Mosconi, 2016). Teo and Chow (2001) argue that the internet helps companies gather quality market information and make more informed decisions. In the same vein, Afuah (2003) emphasizes that the internet improves the integration of innovation activities through the exchange of ideas with external actors, especially with customers. Social media, on the other hand, is at the same time a kind of source and a tool for gathering information about competitors' offers and customers' needs (Itani et al., 2017). Laforet (2008) notes that the companies, especially SMEs, that are more interested in technologies can achieve a high degree of novelty in their products, which helps innovation performance.

2.3 SME owner-manager and competitive intelligence

Ramangalahy et al. (1997) found that, among several organizational factors, strategy is the factor that best explains CI. In the context of SMEs, the strategy is intimately linked to the profile of its owner-manager (Geraudel, 2008). In fact, the owner-manager has a relevant impact on the strategy and behavior of their company over time (Serrano-Bedia et al., 2016).

The literature has pointed out that the SME's owner-manager is concerned with the collection, analysis and dissemination of information (Ramangalahy, 2001). To perform in innovation, the owner-manager, among other responsibilities, develops new technologies and implements new processes, especially those that allow for the generation of new knowledge on the market (Baldwin and Gellatly, 2003). These processes may include, for example, how companies coordinate and disseminate information flows from their customers, competitors and suppliers to their

research and development teams and production units (Baldwin and Gellatly, 2003).

According to the strategy typology of Miles and Snow (1978), the prospector owner-manager, characterized by innovation, proactivity and risk-taking, significantly improves CI (Chandler and Jansen, 1992). Thomas et al. (1993) argue that proactive managers who analyze the external environment can detect disturbances and react before the emergence of threats. Similarly, the prospector owner-manager analyzes the external environment, selects promising opportunities and formulates strategies (Chandler and Jansen, 1992). Belley and Ramangalahy (1994) note that the prospector owner-manager contributes greatly to developing new activities (innovation) and to anticipating new needs and market demands (strategic planning). In addition, the effectiveness of CI is related to the prospector owner-manager in acquiring and interpreting external information, especially in SMEs (Baldwin and Gellatly, 2003).

2.4 Absorption capacity, competitive intelligence and innovation performance

Cohen and Levinthal (1989, 1990) define absorptive capacity as a firm's ability "to recognize the value of new, external knowledge, assimilate it, and apply it for commercial ends." The literature shows that there is a link between absorptive capacity and innovation. Indeed, absorptive capacity contributes to improving innovative capacity (Cohen and Levinthal, 1990) and innovation performance within the firm (Andreeva and Kianto, 2011; Bayarçelik et al. 2014; Lichtenthaler, 2016).

Previous studies have highlighted that absorptive capacity has been viewed as a possible moderator of various determinants of innovation performance (Moilanen et al., 2014). Absorptive capacity helps managers understand the effect of CI on the organization performance (Najafi-Tavani et al., 2016). Bellamy et al. (2014) report that firms' absorptive capacity positively moderates the relationship between CI and its innovation performance. Wang et al. (2010) argue that to exploit the benefits of information gathered from suppliers, the ability to assimilate and transform this information is required. In the same vein, the results of the study by Guimaraes et al. (2016), which was conducted on 1000 companies representing a variety of

sizes and business sectors, shows that organizational absorptive capacity is positively related to CI practices and innovation performance. In the context of SMEs, Zobel (2017) points out that a high assimilation capacity allows a good understanding and dissemination of information coming from customers, competitors, suppliers and technologies. According to Pacitto and Tordjman (1999), it is useless to have a variety of information sources without being able to exploit emerging information.

3. METHODOLOGY

The purpose of this exploratory study is to investigate the contribution of absorptive capacity and CI to innovation performance. A qualitative research approach is appropriate for an exploratory study. A case study was conducted which involved close observation of the phenomenon of interest in a real-life context (Eisenhardt, 1989; Yin, 2017). In addition, a case study approach is recommended for investigating the topic of the contribution of CI to the innovation performance of SMEs, since it has been relatively unexplored. The case study and data collection were conducted within an SME located in Canada, referred to here as "Company A".

3.1 Data Collection

Multiple data-collection methods, including semi-directed interviews, document analysis and non-participant observation, were used for triangulation (Miles and Huberman, 2005; Yin, 2017). Semi-structured interviews were conducted with a sample of seven members of Company A, including the Chief Executive Officer, and six managers and middle-managers representing management,

marketing departments, the development of new services, and systems engineering. The managers were selected using the non-probabilistic method of convenience.

Data was collected between November 2016 and March 2017. Before each interview, a list of topics was sent to the interviewees. Nine interviews in total, including three interviews with the Chief Executive Officer (CEO), were conducted in the field. The interviews were audio-recorded, with the authorization of the interviewee, and were transcribed verbatim. These interviews lasted between 60 and 90 minutes. In addition, we were non-participating free observers in Company A. Data was collected by note-taking in several activities, which mainly involved weekly meetings and strategic-planning workshops. Secondary data was collected from official documents and Company A's website.

For data analysis, we used a thematic analysis to refine the grouping of themes and thematic categories and subcategories (Saldaña, 2013). Table 1 describes the characteristics of the firm studied and the interviewees. Concerning the sampling unit, a medium-sized company was taken into consideration. This company offers professional, scientific and technical services, and develops design services for companies operating in the manufacturing sector.

4. RESULTS

4.1 Innovation in Company A

Company A has an innovation process called "development offering". This process aims to develop new technological solutions, new approaches and working methods to create added-value for customers. To generate new ideas, the CEO reported:

Table 1 Characteristics of the company sample and interviewees. ^aAccording to North American Industry Classification System (SCIAN), (Canada, 2017). ^bAccording to Industry Canada (2019), a micro-company has less than 5 employees; a small company - between 6-99 employees; a medium company - 100-499 employees; and a large company - over 500 employees.

Company	Code	Sub-Sector ^a	Company Size ^b	Interviewee Positions	Code	Number of Interviewees
Company A	SCIAN 5414	Specialized design services	Medium	Owner-Manager	CEO	3
				Manager	1	1
				Manager	2	1
				Manager	3	1
				Manager	4	1
				Manager	5	1
				Manager	6	1

“Ideas are generated through different techniques. These techniques can be creative workshops that are organized around a service development project or specific meetings to discuss the emergence of a new technology or a work approach. The creativity workshops within Company A have led to several innovative projects. For example, operations support projects, cost reduction applications, and other projects associated with operational excellence and industrialization activities.”

4.2 Competitive intelligence in Company A

CI activity has been identified in Company A as "strategic monitoring". CI allows the company to develop a new vision, strategies and new projects. As Manager 1 explains:

“We have already done strategic monitoring; we reviewed the market trends before doing our strategic planning.”

The most prominent CI activity in Company A occurred when the concept of Industry 4.0 emerged. In this context, the CEO of the company mentioned:

“In doing the strategic monitoring, Industry 4.0 emerged. We retrieved this information to clarify our position in the market and develop a new project.”

In the same vein, Manager 2 reported that:

“Industry 4.0 is the result of reflection, monitoring, and especially customer needs analysis.”

The CEO plays an important role in the business of CI within Company A. Indeed, his presence at conferences, fairs and exhibitions, and local and international shows allows him to collect information on market dynamics and trends through exchanges with experts and CEOs of other companies. Manager 2 and Manager 4 emphasized:

“Our CEO often generates quality information and creative ideas.” (Manager 2)

“Our CEO is a visionary person, using his great ability to analyze the market, he manages to unlock crisis situations.” (Manager 4)

The primary data in our case-study shows that Company A uses CI to collect information

from multiple external sources. Manager 1 claimed:

“The activities organized by various professional and socio-economic associations allow the leaders of Company A to interact with the presidents, directors and managers of other organizations including competitors. These events promote the exchange and collection of strategic information.”

According to all managers interviewed, the most important source of useful information is the customers. Manager 2 pointed out:

“Some members of Company A are directly connected to their customers' factories, which allows them to collect information about the needs of these customers. In addition, Company A directors organize regular meetings with clients to evaluate projects and therefore to have feedback on their product and service development work.”

Collaboration with external partners, especially with suppliers, plays an important role in acquiring information. Manager 1 and the CEO mentioned:

“Our company has established partnerships with suppliers, which led to the deployment of a new technological solution.” (Manager 1)

“We are in constant contact with some suppliers to develop products and meet the needs of customers.” (CEO)

For monitoring the external environment's dynamics, Company A uses many technologies and platforms. Several managers talked about the importance of technology platforms in CI's business. For example, Manager 3 and Manager 5 argued:

“For gathering new information, our employees use the internet, especially digital media.” (Manager 3)

“In order to gather information, Company A uses the Internet, in particular professional networks, social media, blogs, forums and Google Alerts.” (Manager 5)

4.3 Absorption capacity within Company A

The CEO of Company A understands absorptive capacity as:

“Our ability to organize the work, to be able to deploy and execute the actions we must do to achieve our goal. It's the organizational capacity to execute the blueprint.”

Specifically, in the context of Industry 4.0, Manager 1 noted:

“Industry 4.0 is a novelty for our company. At first, the absorptive capacity is the capacity to self-learn, to define what this element is. Also, to conceptualize and define the situation. In a second step, formalize it and transfer it.”

An organization's absorptive capacity is based on its ability to gather, transform and exploit external knowledge. In Company A, the CEO pointed out:

“A good understanding of the market needs for innovation and our ability to assess the effect of technology solutions for customers and help our teams better identify, value and then gain external knowledge.”

For other managers, the valuation of external knowledge depends on its impact on the strategy and its effects on the company's outcome, whether related to an opportunity, a threat or new technology.

Regarding the transformation and exploitation of external knowledge, Company A relies on the varied skills of its employees. Indeed, most employees are highly qualified (about 90% of employees have engineering, Master's degrees or PhD training) combining knowledge and experience in several fields. Their skills allow for the transforming and exploiting of external knowledge in the form of concrete and competitive projects. Manager 2 emphasized:

“Experienced employees have been instrumental in using their previous knowledge, turning it into new knowledge, and then creating new and innovative projects.”

However, Company A has to improve their absorptive capacity through taking up some challenges. Indeed, most of the employees have technical skills but they miss management skills. The CEO, and Managing Director said:

“They want to develop more professional and technical experience but not in management.”

This challenge is more important in multidisciplinary activities. In fact, as Manager 1 pointed out:

“Most projects are multidisciplinary and informal, presenting a management challenge for the firm.”

This challenge is both intra-departmental and interdepartmental, which requires managers with technical and managerial skills.

5. DISCUSSION & IMPLICATION: PROPOSITIONS

The objective of this paper is to investigate how competitive intelligence can enhance innovation performance relying on absorptive capacity to reinforce the potential results in a SME context. This section presents a set of propositions and discusses some implications from these findings. These propositions are based on analyzed empirical data and the theoretical literature. To present our main findings and data results in Company A, we adopted a narrative perspective (Seixas et al., 2021). This allows us to discuss the implications of our results for CI and absorptive capacity in regard to its contribution to the innovation performance of Company A.

First, our findings suggest that despite a lack of resources, SMEs can practice CI, at least partially (Fleisher and Blenkhorn, 2001). However, this activity can remain incomplete, unsystematic and informal, which makes it inefficient (Bergeron 2000; Dishman and Calof, 2008) if the SMEs have no absorptive capacity or engagement by top management. At Company A, the CEO conducts brainstorming, imagination and ideation exercises with several top- and middle-managers to bring out innovative ideas.

According to McAdam and McClelland (2002), the expertise and imagination of CEOs are components of creative problem-solving. The strategic planning activities, held periodically by the CEO, aim to anticipate changes in Company A's external environment. In this sense, the literature reveals that a CEO with a proactive personality is able to understand market trends and therefore anticipate planned changes (Becherer and Maurer, 1999). Based on this understanding, the prospector-CEO enhancing CI activities in SMEs were observed and lead us to proposition 1 (P1).

P1: The prospector owner-manager seems to contribute to CI.

According to several managers in Company A, employees are directly connected to customers, allowing them to understand the needs and preferences of these customers (Kohli and Jaworski, 1990). Customer needs and preferences are the main ingredients for new ideas, products and services (Narver et al., 2004). The transformation and exploitation of customer insights into innovation rely heavily on the skills of the individuals at Company A. Coordination and communication with customers contributes to creating new knowledge and to increasing absorptive capacity, which in turn leads to innovation (Gatignon and Xuereb, 1997). In Company A, intelligence information, which means data and information gathered from customers analyzed in context by managers, contributes to innovation performance. The contextual knowledge and experience are related to absorptive capacity. These observations are related to the two following propositions:

P2: Intelligence information from customers enhances the innovation performance of SMEs.

P1b: Absorptive capacity enables improving information from customers and contributes to the innovation performance of SMEs.

Our findings revealed that Company A is more oriented towards improving their understanding of customer needs and preferences than to conducting competitor-monitoring. This orientation is in line with Groom and David (2001) who stated, "Small organizations with high revenues are more satisfied with current intelligence than small organizations with low revenues". However, literature suggests that excessive customer orientation can hamper the monitoring of changes in the external environment (Koberg et al., 1996), as was the case of Company A during a period before a CI strategy was implemented.

Company A would have taken full advantage of its innovation activities if its employees were collecting strategic information about competitors. Our findings show that a low intensity of information from competitors created a barrier for innovation and growth of the company. In addition, Company A identified several lost opportunities of innovation after implementing CI practices. According to Theodosiou et al. (2012), information from competitors is

relevant to help identify their objectives, strategies, activities, offers, resources, capabilities and competitive advantage. However, managers at Company A mentioned difficulties in collecting strategic information about their competitors. Based on our findings, information from competitors can enhance innovation performance, especially if supported by information analyses and absorptive capacity. This understanding translates to the following propositions:

P3: Intelligence information from competitors enhances the innovation performance of SMEs.

P2b: Absorptive capacity improves the use of competitor information and contributes to the innovation performance of SMEs.

As the OECD report (2008) points out, companies in most countries prefer to collaborate with customers and suppliers rather than with competitors and private R&D centres to protect their development model. Indeed, the study's results show that managers at Company A are more open to collaborate with suppliers, which allows them to collect information on customers and competitors. Collaboration with suppliers allows these managers to identify opportunities for developing new Industry 4.0 technological solutions and become a leader in this domain. Song and Thieme (2009) report that the participation of suppliers in CI activities has an impact on innovation performance. In addition, frequent exchanges between employees of Company A and their external environment including vendors strengthen their absorptive capacity, which in turn facilitates the transformation of information. Their relationships with suppliers serve to stimulate the exploitation of individual absorptive capacity, and thus enhance organizational absorptive capacity, which contributes to the success of innovation (Cohen and Levinthal, 1990). Our findings showed that Company A analyzes the information or the intelligence information from suppliers to help to improve innovation performance, and the contribution of the manager's absorption capacity was useful. These findings lead us to the following propositions:

P4: Intelligence information from suppliers enhances the innovation performance of SMEs.

P3b: Absorptive capacity improves the use of suppliers' information and contributes to the innovation performance of SMEs.

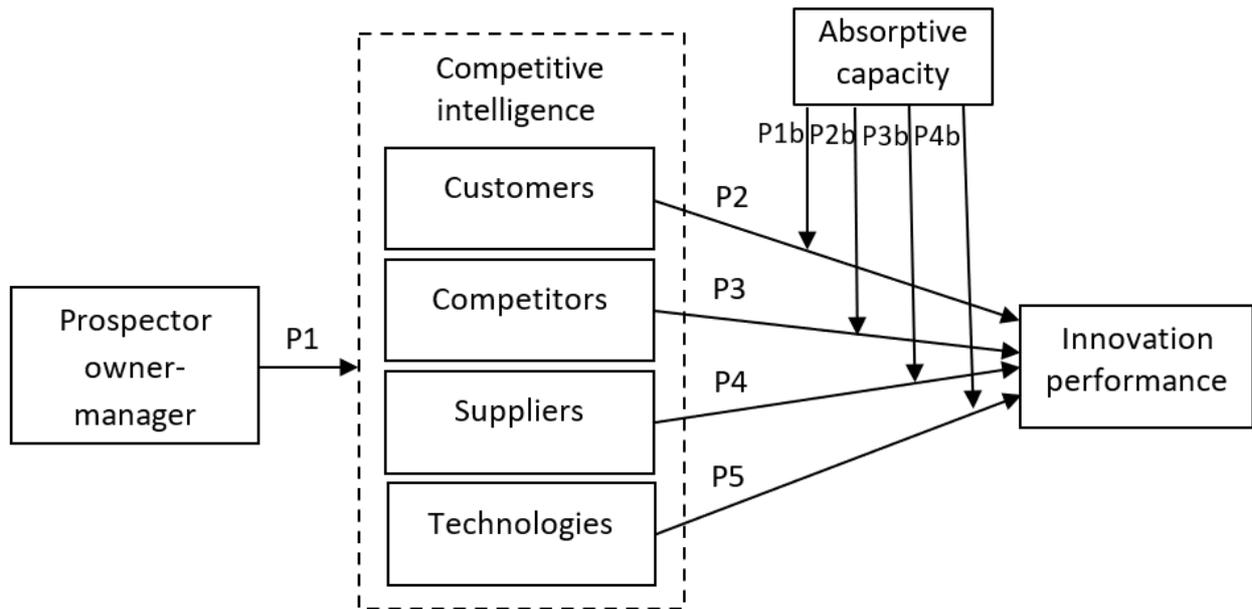


Figure 1 Framework showing the flow from competitive intelligence to innovation performance.

Our results suggest that Company A has focused on information technologies to identify future needs, which culminated in innovative projects and innovation performance. Findings reveal that these projects contributed to an increase of 15% in business revenues. This practice is in line with the literature that suggests that data and information from technologies allows firms to create new technical solutions and develop new products (Gatignon and Xuereb, 1997). Varied information technologies, including social media, blogs and forums, and Google Alerts, allowed the managers of Company A to monitor changes related to new technological trends. CI including information from technologies helped Company A make the shift to Industry 4.0 and become a leader in their region. Many studies have pointed out that technologies are considered an information source, which contributes to business competitiveness (Souitaris, 2001; Vedder et al., 1999). To better use these information sources, firms need individuals with prior knowledge in the field to take advantage by means of absorptive capacity (Cohen and Levinthal, 1990). Our findings show that Company A had some 100 engineers with technical training and experience in technological fields. These skills were crucial to transform technological information into innovative projects. These results are related to the following propositions:

P5: Intelligence information from technologies enhances the innovation performance of SMEs.

P4b: Absorptive capacity improves the use of technology information and contributes to the innovation performance of SMEs.

These propositions emerged from the data analysis and allowed us to propose a conceptual framework to illustrate how CI contributes to innovation performance (Figure 1). This theoretical framework is based on the understanding that CI comprises information collected from customers, competitors, suppliers and technologies. The capacity to analyze and integrate this information is represented by absorptive capacity that reinforces the potential of the innovation performance. Moreover, CI also benefits from the important contributions of the prospector owner-manager in the context of an SME.

6. CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

This paper presents an exploratory case study that allowed a framework proposition showing how CI contributes to innovation performance and why absorptive capacity is important for better results. This framework fills a theoretical gap and is supported by empirical data collected during the case study. Our findings suggest three main contributions. First, CI requires a prospector owner-manager characterized by a profile of innovation, proactivity and risk-taking. This type of owner-manager analyzes the external environment and detects disturbances, which contributes to better results from the CI (North and Varvakis, 2016). Second, the findings have highlighted that the contribution of CI to the innovation

performance of SMEs is mainly based on the collection, analyzing and exploitation of information from customers, competitors, suppliers and technologies. More specifically, our case study shows that understanding customer needs and preferences allows companies to create innovative ideas, as proposed by Narver et al. (2004). However, we also understood that focusing more on clients without considering competitors strategies, activities, and objectives (Theodosiou et al., 2012) can lead to the loss of growth opportunities, and to the failure of the SMEs. Our findings also allowed us to understand that collaboration with suppliers is seen as an opportunity to gather information from customers, competitors, and the market as well as to develop new creative ideas, which aligns with previous studies (see Song and Thieme, 2009). The SME studied has invested and given particular importance to technologies, both as tools and information sources. These decisions seem to be relevant to enable them to be able to monitor the dynamic business environment, which allowed them to capture opportunities and develop new products. This same aspect was also pointed out by Gatignon and Xuereb (1997): even though the business environment has changed since this time, technologies have been constantly evolving and disrupting established practices in business. At this point, to face technological challenges and continue to innovate in SMEs, it is important in future research to investigate the ambidextrous organizational-learning habits to mitigate a lack of resources. Third, the findings show that the firm's absorptive capacity is essential to understanding the contribution of CI to innovation activities, as proposed by Najafi-Tavani, Sharifi and Najafi-Tavani (2016). In addition, Božič and Dimovski (2019) argue that absorptive capacity is essential for CI because it plays an important role in transforming data into rich information and knowledge. Although this is only an exploratory study, our findings can guide managers to make the best choices for CI practices, to develop competitive advantage and be more agile than their competitors are. SME CEOs and managers need to consider their managers' profiles, as well as their involvement in operations, for innovation performance within the firm.

This study proposes a framework, certain limitations, and several propositions that should be investigated in future research. As a limitation, the observation approach, whether systematic or electronic, may have an intrusion

effect of the observer (Beaugrand, 1988). Second, the results obtained are not generalizable because of the chosen research approach, as well as due to the variability existing between SMEs (Julien, 2005; Tidd et al., 2005). Third, given that there is no single way to innovate (Tidd et al., 2005), and that CI practices are heterogeneous, future research can test our propositions using a larger sample and survey in order to gain quantitative evidence regarding our conclusions. This will improve the understanding related to innovation performance in SMEs, as they are an important component of the economy of all countries.

Additionally, in current contexts of digital transformation, and Industry 4.0 where CI is needed (Ottonicar et al. 2018) including the assimilation capability (Hassani and Mosconi, 2018), it would be relevant that future research could investigate the role of analytics capability on innovation performance. In link with the own-manager, future research can also study the managers' ambidexterity, which it is important for intelligence-based activities (Bordeleau et al., 2020).

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