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Exploring Information Capability and its Role in Innovation

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Papel en la innovación de la gestión y uso eficiente de la información
Análise exploratória da capacidade de informação e do seu papel na inovação

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This study focuses on how innovation capability can be developed within a company and how information capability is integrated into the innovation process. Innovation, helped by elements that generate and share knowledge, is generated through different practices. Thus, the present study develops an analysis of the role of information capability in innovation through the assessment of the direct experiences of managers from innovative companies located in Spain through grounded theory methodology. Our findings suggest that strategy promotes the appropriate culture and values that are aligned with innovation in the company. Strategy also establishes and acquires the resources, both internal and external, that an organization needs in order to achieve competiveness through innovation. Moreover, the organizational culture and resources support the information capability, and this information capability in turn supports the knowledge management which supports and develops innovation. The contribution of this research is the proposal of a framework that explains the elements that underlie innovation management in companies. The paper contributes to a deeper understanding of how to use information capability and knowledge management as potential sources of innovation.

Este estudio se centra en analizar cómo puede lograrse la gestión y uso eficiente de la información en la empresa y cómo esto se integra en el proceso de innovación. En particular, el presente estudio analiza el papel que desempeña la gestión y uso eficiente de la información en la innovación a partir de experiencias de directivos de empresas españolas reconocidas como innovadoras aplicando la teoría fundamentada (grounded theory). Los resultados obtenidos sugieren que la estrategia de la empresa promueve los valores y la cultura organizacional alineados con la innovación. Así mismo, la estrategia también establece y proporciona los recursos, tanto internos como externos, que una organización necesita para ser competitiva apoyándose en la innovación. Es más, la cultura organizacional y los recursos sirven de apoyo para la gestión y el uso eficiente de la información que a su vez contribuye a la gestión del conocimiento necesaria para la innovación. Este estudio presenta un marco de referencia que explica los elementos que soportan la gestión de la innovación en las organizaciones; de esta forma contribuye a entender en qué medida la gestión y el uso eficiente de la información y la gestión del conocimiento son fuentes potenciales de innovación.

O presente estudo foca-se na forma através da qual a capacidade de inovação pode ser desenvolvida no interior da organização, assim como na forma através da qual a capacidade de informação se integra no processo de inovação. A inovação, potenciada pelos elementos que geram e fomentam o conhecimento, é criada a partir de diferentes práticas. Desta forma, utilizando uma metodologia de base teórica, o presente estudo desenvolve e analisa o papel da capacidade de informação na inovação, através da avaliação de diferentes experiências de gestores de companhias inovadoras localizadas em Espanha. Os nossos resultados sugerem que a estratégia promove os valores e cultura apropriados, no sentido do seu alinhamento com a inovação no seio da organização. A estratégia também estabelece e assegura os recursos, quer internos quer externos, que uma organização necessita para atingir a competitividade através da inovação. Adicionalmente, os recursos e a cultura organizacional apoiam a capacidade de informação, a qual, por sua vez, apoia a gestão do conhecimento, que patrocina e desenvolve a inovação. O contributo desta investigação é a proposta de um enquadramento que explica os elementos subjacentes à gestão da inovação nas organizações. O artigo contribui para uma compreensão mais profunda da forma através da qual se pode utilizar a capacidade de informação e a gestão do conhecimento como potenciais fontes de inovação.

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1. Introduction

Innovation is determining the way business is being conducted overall the world, indeed it has become an entrepreneurial imperative for the 21st century (Kuratko, Covin, & Hornsby, 2014). Companies that operate on a global scale are continuously competing and adapting to their customers' new needs and requirements in order to survive. Moreover, their competitiveness cannot only rely on productivity and cost improvements. In this context, innovation has been a key source of competitive advantage. In the case of more mature and established markets, competitive sales growth comes not simply from being able to offer low prices but also from a variety of non-price factors, such as design and customization, as part of product innovation (Prajogo & Ahmed, 2006). Companies need to be able to develop new products and different ways to satisfy their costumers' demands. As a consequence, organizations should not only be focused on product innovation but also on how to provide those products and how to adapt their organization's capabilities in order to satisfy demand.

Some authors have defined business innovation as the generation, acceptance, and implementation of new ideas, processes, products or services (Tarafdar & Gordon, 2007; Thompson, 1965). Other authors define it as the creation of substantial new value for customers and the firm by changing one or more dimensions of the business system (Cui, Shong-Lee, & Hertz, 2009; Sawhney, Wolcott, & Arroniz, 2011). In this paper we focus on innovation capability, defined as an organizational capability that refers to a firm's ability to develop new products and/or markets through aligning a strategic innovative orientation with innovative behaviours and processes (Wang & Ahmed, 2004). Innovation capability is also defined as the successful implementation of creative ideas within an organization (Hurley & Hult, 1998), the acquisition of new skills and new ways of managing and organizing the company (Robey and Sales, 1986; Tarafdar and Gordon, 2007). Innovation involves both technical innovations, which are related to new technologies, products and services, and administrative innovations, which involve processes and organizational forms (Davenport, 1992; Kimberly & Evanisko, 1981).

The question is not about the relevance and necessity of being innovative but rather how innovation capability can be developed within a company and how information capability and knowledge management are integrated into the innovation process (McEvily & Chakravarthy, 2002; Prajogo & Ahmed, 2006). In fact, the use and efficient management of information, can become a critical success factor that enables organisations to improve their results, and consequently may be a source of competitive advantage (Zárraga-Rodríguez & Alvarez, 2013).

Innovation, aided by elements that generate and share knowledge, is generated through different practices. Interestingly, there is little research on how organizational capabilities for innovation are developed in practice (Börjesson & Elmquist, 2011), and there is also scant research on how information capability is developed in organizations from the perspective of managers. Thus, the present study analyses innovation capability and information orientation through the assessment of the direct experiences of managers from innovative companies, grounded in the data (Glaser & Strauss, 1967; Glaser, 2002). Hence, the present paper aims to answer two specific research questions:

Q1: What are the strategic drivers for innovation?
Q2: What is the relationship between information capability and innovation?

Key words
Innovation, information capability, knowledge management, organizational culture

Palabras clave
Innovación, capacidad de información, gestión del conocimiento, cultura organizacional

Palavras-chave
Inovação, capacidade de informação, gestão do conhecimento, cultura organizacional

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The findings suggest that a company's business strategy promotes and develops the appropriate culture and values that are oriented to innovation. Such a business strategy also establishes and acquires the resources, both internal and external, that an organization needs in order to become competitive through innovation. Moreover, organizational culture and resources support and develop information capability, and through the information capability it acquires the knowledge management which guides and supports innovation.

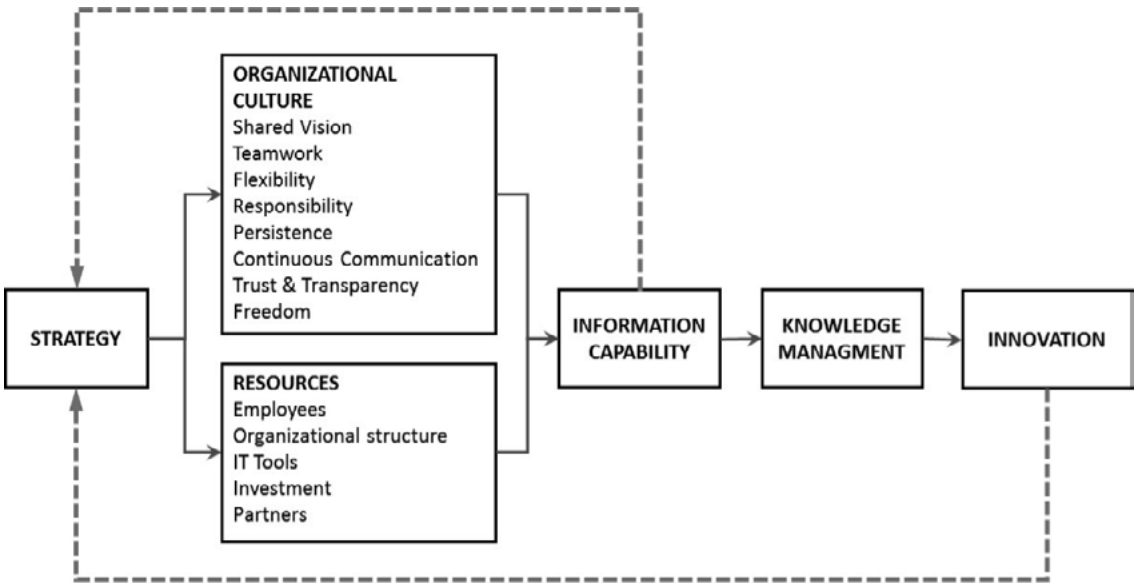
The next section explores the concept of innovation in relation to information capability, knowledge management, organizational culture and resources, as they are concepts that have been proposed as the basis for innovation processes. This is followed by an explanation of the methodology and the results of the study. Finally, the paper ends with conclusions and future research.

2. Conceptual framework

Despite the many problems that come with managing innovation, innovation has nonetheless become indispensable for many companies in sustaining long-term competitiveness. Therefore, our interest is in determining how information capability allows or develops innovation capability. Based on the research conducted, Figure 1 illustrates the framework developed from the study's research questions.

Information capability related practices promote and facilitate innovation within companies, providing the necessary flow of information for the generation of ideas that can be transformed into knowledge. Finally, feedback loops represent the fact that strategy is supported by both information capability and innovation. Information is necessary to share and develop the strategy within the organization, so strategy should be known, assumed and accepted among employees. The following sub sections introduce the concepts related to innovation according to the presented framework.

Figure 1. Conceptual framework of the relationship between Strategy, Information Capability and Innovation



2.1 Information capability

An organisational capability refers to the strategic application of competences and to the generation of value and differentiation by the combined use of a series of competencies (Peppard & Ward, 2004; Zárraga-Rodríguez & Alvarez, 2013). Information capability might influence firm performance (Cotteleer & Bendoly, 2006; Mithas, Ramasubbu, & Sambamurthy, 2011) and attaining competence and synergy on information capability use are preconditions to a company achieving superior business performance (Marchand, Kettinger, & Rollins, 2000).

Information capability is defined as the ability to provide data and information to users with the appropriate levels of accuracy, timeliness, reliability, security, and confidentiality; provide universal connectivity and access with adequate reach and range; and tailor the infrastructure to emerging business needs and directions (Marchand et al., 2000). This ability to provide accurate, timely, and reliable data and information to relevant entities and stakeholders can make it possible for firms to configure and tailor other organizational capabilities that might influence their performance (Mithas et al., 2011).

2.2 Knowledge management

The link between knowledge management and information is interpretation: an organization receives data and information from its environment and through interpretation the data and information become knowledge (Smith et al., 2006). Knowledge is more complex than information management; information results from organizing data into meaningful forms. Knowledge is the result of interpreting information based on personal understanding and it is influenced by the personality of its holder since knowledge is based on judgment and intuition; knowledge incorporates beliefs, attitude and behaviour (Chyi Lee and Yang, 2000). Several authors have studied the relationship between knowledge sharing and innovation, and they have found that knowledge-sharing processes are related to a firm's innovation capability (Calantone, Cavusgil, & Zhao, 2002; Garcias, Dalmasso & Sardas, 2015; Lin, 2007). Knowledge management provides management with a framework as they attempt to develop and enhance their organizational capability to innovate (Cohen & Levinthal, 1990). Those authors define this capability as the ability of an organization to recognize the value of new external information and knowledge, assimilate it and apply it, and this ability is critical in determining innovative output.

2.3 Organizational culture

Authors who have studied innovation emphasize the importance of culture as a major determinant in innovation performance, in different cases and contexts (Brannen, 1991; Deshpandé, Farley, & Webster Jr, 1993; Prajogo & McDermott, 2011).

Organizational culture is defined as the deeply seated (often subconscious) values and beliefs shared by personnel in an organization, expressed as a set of basic assumptions that worked so well in the past that they are accepted as valid assumptions within the organization. These assumptions are maintained in the on-going process of human interaction that is manifested in attitudes and behaviour. The components of routine behaviour, norms, values, philosophy, rules of the game and feelings all form part of organizational culture (Hellriegel & Slocum, 2005; Martins & Terblanche, 2003). Organizational

culture offers a shared system of meanings, which forms the basis of communication and mutual understanding, creating a supportive organizational environment for innovation. This environment is often built through several practices relating to managing people and information.

2.4 Resources

An organisation's capability to innovate is closely tied to its resources and its ability to utilise these resources. In this respect, there is a need for a better understanding of how resources create a competitive advantage and how these resources are utilised to achieve that advantage (Sanchez-Famoso, Maseda, & Iturralde, 2014; Sirmon & Hitt, 2003). Those resources include both internal resources, such as social capital, employees or technical resources, and external resources, such as alliances with partners or technological acquisitions. Some researchers have noticed that SMEs use external resources to shorten innovation time, reduce risk and cost and increase the flexibility of their operation (Hagedoorn, 1993), but cooperation must be carefully considered in strategic terms to ensure it is inscribed in a shared innovation strategy focused on creating value over time (Iturrioz, Aragón, & Narvaiza, 2015). For innovations to succeed in an organization, they require the commitment of key and strategic resources that are controlled by organizations' top managers (Oke, Munshi, & Walumbwa, 2009).

3. Methodology

This study analyses experiences from different companies considered to be innovative, to identify good practices and elements, and to synthesize a model of innovation in companies. We use a qualitative methodology called grounded theory, originally developed by Glaser and Strauss (1967). Grounded theory is widely known in social research (Allan, 2003; Charmaz, 2006; Strauss & Corbin, 1990), although little research related to management has applied it. However, there are some interesting studies in this field based on grounded theory, such as the analysis of ERP implementation success (Zhang, Lee, Huang, Zhang, & Huang, 2005), the sustainable global value chain (Cruz & Boehe, 2008), the delivery value of ICT tools (Grise & Zuniga Huertas, 2013) or the coping strategies of business leaders during an economic downtown (Van Zyl & Du Plessis, 2012), among others.

The study started with an open sample, which consisted of innovative companies operating in Spain. The target innovative companies were selected based on the researchers' knowledge of the population, its characteristics and the purpose of the study (Babbie, 2007). Companies were selected based on the following criteria: a) they have received recognition for their innovative products, processes or organizational innovations, and b) they operate in different activity sectors.

The main body of the information was obtained through interactive interviews, which were complemented with some reports provided by companies and in some cases we had press releases; all these sources of data allowed us to conduct an in-depth exploration of the topic of innovation. Interviews were conducted with the innovation managers and/or CEOs of eight innovative companies from different sectors to provide a global view, which is very convenient since this is an exploratory study (Bierly & Daly, 2007). The aim of this type of interview is to obtain 'rich data' or 'thick descriptions' which are

focused and detailed, fully revealing participants' views, feelings, intentions and actions, as well as the context and structures of their lives (Charmaz, 2006). Table 1 shows the main characteristics of the selected companies, whose names have been changed to A, B, C, D, E, F, G and H.

Table 1. Description of companies' activity and characteristics

Company	*Activity*	*Employees (Revenue $M)*	*Revenue ($M)*	*Innovation Type*
A	Machinery manufacturing	105	33,500	Product Organizational
B	Metal fittings	230	5,300	Product Organizational
C	Food processing	280	9,200	Product Process
D	Electronic components	40	20,000	Product Process Organizational
E	Vehicle manufacturing	200	95,000	Product Process
F	IT consulting	30	2,000	Product Organizational
G	Appliances	502	11,800	Product Organizational
H	Automotive	2,606	557,230	Product Organizational

A structured guide was used during the interviews. The standardized approach helps to attain internal validity by ensuring that responses are comparably measured across multiple informants and firms (Creswell & Miller, 2000). Validity was also achieved through a test of the survey instrument, performed through previous pilot tests with several managers, in a previous study conducted in a different region. In addition, site visits were made to all firms in the study to better assess organizational culture and innovation type adopted.

To ensure the reliability of the information in the study, several points were established: first, interviews were conducted by two researchers in each company, and in all cases they were audio recorded and later transcribed; second, the interview transcripts were reviewed;; third, text was independently coded by two researchers and then the codes were agreed upon and the final framework was established. In reviewing interviewees' responses, new dimensions were found and added to the framework. After the coding process, we arrived at the preliminary tables on elements of innovation in the companies studied. Data collection was carried out during the months of December 2013 to June 2014.

Data analysis in this study was performed using a grounded procedure, developing codes that represent the data. Data from the interviews was transcribed and the data were analysed using the software ATLAS/ti. Codification permitted us to identify a list of core categories related to innovation and the

links among them, as presented in the conceptual framework in Figure 1. The next section discusses the results of this analysis and presents the findings in the form of propositions that are grounded in the data.

4. Findings

4.1. Drivers for innovation

Companies identify innovation as part of the company strategy, caused by the need to adapt their products and services to market changes and to meet customer requirements. In other words, companies innovate because they are motivated by aspects related to their strategy. A business strategy can be described as a company's behaviour in the market, including policies, plans and procedures (Porter, 1996). During the interviews, leaders pointed out different reasons for addressing innovation: the need for growth, survival in the market, aspiration to be the market leader. Their strategy is developed through innovation, fostered by several actions: product diversification, differentiation in added value for customer, reduced costs, brand internationalization, technological development, etc... From its business strategy a company decides which resources are going to be necessary, but also what kind of structure is needed to meet its objectives. Moreover, from the strategy leaders should develop a shared vision for aligning the entire organization with its objectives. This is formulated by company H, as the necessity of investing time in formulating and explaining the strategy, so employees have a shared vision of it:

> *"People share a sense of innovation, and then, when everyone is aligned with the strategy, it is very easy to pull them forward. Therefore, a long time is required until the strategy is understood, shared and accepted and thus everyone is oriented and pulled toward that objective"*

As other authors have stated, communication channels and personal relationships among the members of the organization might facilitate strategic processes on a collective level, and so managers engage in communication and interaction processes related to their organizational strategies (de Salas & Huxley, 2014; Wrona, Ladwig, & O'Regan, 2015). The companies analysed explain and share their strategy in different ways, but most importantly, they ensure that their strategy is embraced by their people. Therefore, the following proposition is introduced:

> *P1:* A good flow of information about strategy and objectives enables employees to have a shared vision and this in turn facilitates innovation.

Moreover, in terms of organizational innovation, companies identify it as an important part of the strategy to gain a competitive advantage and to also achieve product and/or process innovation. For example, when important customers ask them to reduce prices, the company has to improve the way it is organized.

> *"Some customers are large retailers that guarantee us a constant order flow. These customers require us to innovate organizationally because we have to achieve lower costs. So, we must change our organizational structure to be able to work with these kinds of companies. Others customers are large industrial customers, which forces us to innovate in product." (Company B)*

As this company also reports, organizational innovation is perceived as an important part of the organizational culture. By developing an organizational culture with an innovative and entrepreneurial orientation, a higher level of innovation would result (Claver, Llopis, Garcia, & Molina, 1998; Lau & Ngo, 2004). Nevertheless, as noted, business strategy is not directly related to innovation success. Strategy supports the development of important competencies, which then enable a company to achieve innovation success (Ritter & Gemünden, 2004). Based on the analysis, the following proposition is introduced:

P2: To perform competitively, strategy guides resources and organization towards innovation.

Strategy leads to innovation as a result of achieving a competitive advantage or added value for the customer. This means that the objective is not to become innovative, but rather innovation comes as a result of doing things differently or making different things to satisfy customers and increase market share. Companies address innovation from their strategy; innovation itself is not a strategy, but rather innovation as tool to help companies achieve their strategic objectives.

4.2 Organizational culture and information capability

In organizations, culture emerges from shared values that are part of the culture of the company. Organizational culture influences and supports creativity and innovation, through values like flexibility, freedom and cooperative teamwork (Martins & Terblanche, 2003). It has been argued that culture influences creativity and innovation in two ways: (1) through socialisation processes in organisations, individuals learn and accept behaviours and norms, and make assumptions about whether creative and innovative behaviour forms part of the way in which the organisation operates, (2) the basic values, assumptions and beliefs become enacted in established forms of behaviours and activity and are reflected as structures, policy, practices, management practices and procedures (Tesluk, Farr, & Klein, 1997).
According to our study, the organizations analysed develop innovation capability through their employees, through different values and attitudes in their work and daily routines. Those companies pointed out that values such as teamwork, a critical spirit, flexibility, responsibility and persistence are part of their organizational culture and identity. They assume that those values enable and improve the information capability of the firm, as they facilitate sharing and exploiting information, both internally (within the company) and externally (between the company and its environment).

Respondents also indicated that continuous communication, a climate of trust and transparency and freedom are values that companies promote to facilitate a good flow of information, which, when it is well managed, generates knowledge and thus might generate innovation. Marchand et al. (2000), Choo et al. (2006) and Hwang (2011) point out very similar values as those that form a company's capability to instil and promote behaviours and values in its people for effective use of information. A manager from Company B linked innovation to information and trust:

> *"Managers and designers must listen to people and be receptive in order to facilitate innovation. Many times, when they are developing products, or developing processes, they talk to the people who are making similar products to try to understand how they do it, so they can design in more efficient way. The only way to innovate is to listen and get a climate of trust."*

The Innovation manager of company E stated a similar concept:

> *"We think that innovation is something that should be promoted at all levels and in the whole company. Innovation is more a matter of attitude and how to give value to that attitude. For us it is more important to promote ideas that arise spontaneously than to have an organized system for innovation. Here people feel free to ask and propose ideas."*

Moreover, respondents related information capability to the formulation and deployment of business strategy, since having well managed information improves internal communication, problem solving, employee motivation and teamwork.

These findings lead to the following propositions:

> ***P3:*** The organizational values of innovative companies facilitate their information capability, and thus can improve their knowledge management and innovation.

> ***P4:*** Companies that foster continuous communication, a climate of trust and transparency and freedom improve information capability and thus, innovation.

4.3 Resources and information capability

Respondents specified several resources, both internal and external, which their organizations identified as sources for processes and practices for innovation. The internal resources identified mainly refer to people (the human capital of the organization), especially sales staff and those who capture information from customers and the market. Moreover, professionals with exceptional skills and qualities are valued by those companies, regardless of their function or job area. All the firms claim to have good professionals when they explain how they get innovative results:

> *"In our R&D department there is personnel with exceptional personal qualities, people who are amazing; little formal training but what they do is awesome." (Company D)*

> *"We are very demanding about sensory quality (....) This starch (food component) is from a new provider that claims that it is identical to the previous one, the data sheet indicates it's the same as the previous one, but I do not like this aroma, so, we have to look for other one elsewhere, but we do not like this. There are so many things that affect product formulation and sensory quality that it is very complicated to control it." (Company C)*

For this reason the companies believe that they have to invest in their employees and their development, in order to achieve a competitive advantage. One of the best ways of developing an open innovative culture is to respect and invest in people, hiring the best quality researchers, experts and inventors, and then empowering them (Brooks & Muyia Nafukho, 2006; Lawson & Samson, 2001). This principle is described by managers:

> *"From our vision, we know that this (our survival) will not depend so much on investing in ovens, or manufacturing technology, or this stuff. We know that investment must be made in people." (Company E)*

> *"When we detect an idea that we think that deserves to be developed, the best suitable person to develop it is contacted from within or even outside the organization." (Company G)*

Besides having good professionals, managers advocate for the need to have an organizational structure that enables their good professionals to work efficiently. The type of structure adopted varies in each company: some establish a common R&D department, others adopt decentralized services, or share people and resources between multiple departments. But part of their ability to innovate is through dedicating specific organizational resources to innovation. Organizational structure can be defined as the way in which the set of relationships (jobs, tasks, authority and decision flows) are ordered in a company by taking into account an appropriate level of communication and coordination among people (Canós-Darós et al., 2013). Organizational structure supports the development of innovation management processes, particularly in companies where these processes form part of their strategy. The success of an organization does not depend on the mere existence of a structure, but the adjustment between the structure and business strategy (Oke et al., 2009).

R&D units and economic investment are key resources for companies so they are able to launch innovation in their business. Often the concepts of R&D, investment and innovation are mixed up. One of the respondents has clearly defined this relationship:

> *"If R&D is turning money into knowledge, and knowledge is needed, innovation is turning knowledge into money. That is, innovation makes money come back to the company." (Company E)*

Investment in IT tools and information projects is a way to manage and capture organizational knowledge; common examples are when a company used the intranet to share information among its employees or even when it develops management systems to capitalize on knowledge. A manager of one of the companies explained by way of example:

> *"One of our strategic projects, launched in 2009, is called "Knowledge Extraction", which is still running. We even hired a technological company to help us do interviews with our expert employees so their knowledge could be captured and transferred to documents…with the aim of somehow democratizing it."*

Furthermore, the external resources that companies need for innovation are based on their relationships with their partners (customers, suppliers, external agents) and on external sources of information that allow them to know what's happening in the market and what technologies can be incorporated into their products and processes. The interviews detected that external information management is a key to innovation, as all the interviewees have agreed on this point. To enhance innovation and value creation, firms must create feedback systems that allow them to both receive and provide such feedback, thereby enabling them to create an instant connection between the firm and their customers' needs (Johannessen & Olsen, 2010). Both internal R&D and external knowledge acquisition are complementary resources for innovation development (Cassiman & Veugelers, 2006). Basic R&D from universities and research centres is an information source for the innovation process, as well as collaboration with other technological partners, supplier and costumers.

> *"… and the best ones are generally outside the organization. Then, a network of contacts with universities, technology centres, with other companies, freelance (those that work on innovation) should be built." (Company G)*

All the interviewees linked knowledge management and information capability as the aspect that enables the capture and management of information. Respondents consider knowledge management to be the result of information capability, and both are considered as a key aspect of innovation processes. The information for innovation and the development of products is captured by their commercial agents from their clients, and new trends are detected from external sources such as journals, professional

forums and trade fairs. All this information from outside sources is managed by information systems, as well as the internal information that flows through structured and non-structured systems. Companies give great importance to both systems. As Castells advocates, the current technological revolution is characterized by the application of knowledge and information to knowledge generation and information processing/communication devices, in a cumulative feedback loop between innovation and the uses of innovation (Castells, 1996) (p. 32).

Based on these findings, the following propositions are introduced:

P5: In innovative companies, good professionals are key resources for capturing and transforming information into knowledge with the support of the appropriate organizational structure and IT tools.

P6: Companies need external resources based on their relationship with their partners, which allows them to get the necessary information to develop knowledge and innovation.

5. Discussion and conclusions

The main objective of this study was to explore how information capability influences innovation capability and thus enhances innovation in a company. After an inductive and systematic study of eight innovative companies, a framework that explains the relationship between strategy and innovation through information capability emerged. Innovation is determined by the companies' strategic objectives, as a way of achieving those objectives. In addition to that, innovation is obtained by a continuous process of understanding customers' needs, questioning previous solutions and exchanging information and knowledge throughout the organization as a whole. That is, information is of paramount importance for innovation processes, according to this study.

An important factor for the success of these processes is organizational culture. As it has been reported consistently throughout the study, some values are determinant of an innovative organization. Teamwork, a critical spirit, flexibility, responsibility and persistence are claimed to be essential values for facilitating information management and knowledge sharing and thus, innovation. People participating in the study recognized that innovation is closely influenced by organizational values, which, according to their strategy, generate different actions and routines that promote innovation for their products, processes or organizational structures. This fits with previous studies by Salaman and Storey (2009) and Iturrioz and others (2015) about how core values influence innovation policies in different companies. The study suggests that those values are connected to information capability: when the interviewees describe how organizational values affect innovation, they use examples and situations associated with socialization processes, such as teamwork and meetings, a shared vision regarding communication, flexibility in adapting to customers' requirements, continuous communication, and confidence to participate in decision meetings, for example.

Besides being affected by those values, as a part of organizational culture, innovation is influenced by company resources, which include employees, structure, IT tools, and other hard elements. The interview managers claim that the development of strategy requires resources, and they specifically indicated that the following are essential: qualified employees and an organizational structure, which

develop innovation in process and products; relationships with strategic partners, including clients and suppliers, to get good information about innovation opportunities and development; and IT tools and investment to support the information and knowledge management to innovate. When innovation has taken place, information should be transformed into knowledge (Hana, 2013). Moreover, organizational culture and resources guide and affect information capability and through it, knowledge management, which supports and develops innovation. Companies detect customers' needs, market opportunities and technical development using their information processes, and this information influences their strategy and objectives. Moreover, the use and efficient management of such information might become a critical success factor for a company's innovation.

In addition to those previous findings, the study make a contribution at a practical level, providing leaders and organizations with a better understanding of how information capability can influence knowledge acquisition, sharing and exploiting. Knowledge cannot be obtained simply by investing in information technology; while technology can provide access to knowledge, access is not equivalent to using or applying knowledge (Lin, Li & Kiang, 2009). As some authors argue, a positive knowledge sharing culture helps firms to improve their innovation capability (Jantunen, 2005; Lin, Li & Kiang, 2009). Specifically, from the study some information capability practices have been revealed to be agents for innovation.

Finally, the innovative companies studied here present different types of organizational structure, values, and information systems, each one fitted to their characteristics, culture and strategies. Therefore, organizations should choose the most appropriate way to manage knowledge flow and organization given their strategy (Gloet & Terziovski, 2004).

6. Future research

Some of the conclusions derived from this study support previous findings, especially those that are related to knowledge management and innovation, which was reported in section 4. More interesting are the proposals related to organizational culture, resources and information capability. This research has identified some elements that should improve information capability in the company and thus, knowledge and innovation. A deeper analysis of these elements and their interrelations could be performed in a broader group of innovative companies, to explore the relationships and degree of importance between organizational values and information capability, as well as identified resources and information capability.

Finally, no other studies were identified that examined information capability practices related to innovation. In this sense, the proposed classification and application of information practices should be studied in greater depth in order to confirm their adoption by innovative companies.

Another contribution of this study is the application of a qualitative methodology for building a theory of the relationship between information capability and innovation, through grounded data. This type of theory is based on the study of a certain number cases and thus it runs the risk of not being generalizable to the entire population (Eisenhardt, 1989). Moreover, results from this study should be regarded as exploratory. Future research should empirically test the theoretical propositions presented in this paper, using complementary research methods, in order to determine the generalizability of the findings.

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