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Conhecimento

**Export Performance: Organizational Learning,
Knowledge Management and Ambidexterity
relevance for IT firms in Brazil**

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Export Performance: Organizational Learning, Knowledge Management and Ambidexterity relevance for IT firms in Brazil

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DEDICATION

I thank God for all the blessings poured out in my life and for the myriad of opportunities bestowed upon me.

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RESUMO

O presente estudo teve como objetivo analisar o aprendizado organizacional e a gestão do conhecimento e sua relação com a ambidestria como antecedentes do desempenho de exportação de empresas de Tecnologia da Informação na região metropolitana de Belo Horizonte. Para um melhor alinhamento dos construtos, eles foram divididos em cinco grupos: Aprendizagem Organizacional, Gestão do Conhecimento, Exploração, Exploração e Desempenho de exportação. A partir desta divisão, as relações foram feitas com o desempenho de exportação, que é a variável dependente do modelo proposto. Com base na amostra de 109 profissionais na área de tecnologia, foi realizado um estudo descritivo e quantitativo. A coleta de dados foi feita através de um questionário respondido pelos gerentes e profissionais de TI das empresas. Para análise de dados, as estatísticas descritivas e a técnica de modelagem de equações estruturais foram aplicadas. Os resultados mostraram que a aprendizagem organizacional tem uma correlação positiva com a gestão do conhecimento nas empresas, de acordo com a percepção dos gerentes e profissionais da área, confirmando uma das hipóteses de pesquisa. A pesquisa também mostrou que a aprendizagem organizacional tem uma influência positiva sobre a capacidade de exploração e exploração nas empresas. Adicionalmente, mediadas pela capacidade de exploração, a Aprendizagem Organizacional e a Gestão do Conhecimento não apresentaram tendência significativa e positiva no desempenho das exportações, embora gerentes e profissionais da área reconheçam sua importância. Sendo assim, supõe-se que a maioria dos gerentes e profissionais de alguma forma usam esses construtos, mas da forma que entendem, talvez porque tenham pouca compreensão e clareza de como esses processos existem. Assim, os processos que levam ao desempenho de exportação não são conhecidos de forma clara, o que pode afetar o gerenciamento dessas empresas.

Palavras-chave: Aprendizagem Organizacional; Exploração; Exploração; Gestão do Conhecimento e Desempenho de Exportação.

ABSTRACT

This study aimed to analyze organizational learning and knowledge management and its relationship with ambidexterity as antecedents from export performance of Information Technology companies in the metropolitan area of Belo Horizonte. For a better alignment from constructs, they were divided into five groups: Organizational Learning, Knowledge Management, Exploration, Exploitation and Export Performance. From this division, the relations were made with export performance, which is the dependent variable of the proposed model. Based on the sample of 109 professionals in technology area, a descriptive and quantitative study was carried out. The data collection was done through a questionnaire answered by the managers and IT professionals from the companies. For data analysis, the descriptive statistics and the modeling technique of structural equations were applied. The results showed that the organizational learning has a positive correlation with the knowledge management in the companies, according to the perception of the managers and professionals of the area, confirming one of the hypothesis of research. The research also showed that organizational learning has a positive influence on the exploitation and exploitation capacity in companies. Additionally, mediated by exploitation capacity, Organizational Learning and Knowledge Management did not show a significant and positive trend in export performance, although managers and professionals in the area recognized their importance. Thus, it is assumed that most managers and professionals somehow use these constructs, but in the way they understand, perhaps because they have little understanding and clarity of how these processes exist. Thus, processes that lead to export performance are not clearly known, which can affect the management of these companies.

Keywords: Organizational Learning; Exploration; Exploitation; Knowledge Management and Export Performance;

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LIST OF ABBREVIATIONS

A.C.	<i>Cronbach's alpha</i>
C.C	<i>Compound Reliability</i>
AVE	<i>Average Extracted Variance</i>
BG	<i>Born Global</i>
BRICS	<i>(Brazil, Russia, India, China and South Africa)</i>
DOKB	<i>Distributed Organizational Knowledge Base</i>
EKI	<i>External Knowledge Integration</i>
FDIs	<i>Foreign Direct Investments</i>
IE	<i>International Entrepreneurship</i>
i.e	<i>Id est</i>
IKD	<i>Internal Knowledge Development</i>
INV	<i>International New Ventures</i>
IT	<i>Information Technology</i>
KDP	<i>Knowledge Dissemination Practices</i>
KLC	<i>Knowledge Life Cycle</i>
KM	<i>Knowledge Management</i>
KMDC	<i>Knowledge Management Dynamic Capabilities</i>
KMP	<i>Knowledge Management Practices</i>
KSP	<i>Knowledge Storage Practices</i>
OA	<i>Organizational Ambidexterity</i>
OL	<i>Organizational Learning</i>
PLS	<i>Partial Least Square</i>
R&D	<i>Research and Development</i>

SEM *Structural Equations Modeling*

SDOs *Software Development Organizations*

SLR *Systematic Literature Review*

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1 INTRODUCTION

Knowledge management in information technology (IT) services has become increasingly important in the face of the challenges of an increasingly globalized market. It is changing many business policies, it is the lever on which it is based, to lead the organization to a sustainable and balanced development. In order to have knowledge, it is necessary to use procedures that provide this change through organizational learning. Organizational learning can be understood as the process internalization of the new organizational competences generated by the knowledge management. Their relationship with knowledge management also lies in the fact that organizational learning requires that companies have the ability to manage information through information processing, storage and retrieval methods. In this context, exportation process is directly associated with knowledge management and organizational learning outcomes.

Lu (2006) investigated the impact of internationalization on a firm's growth and financial performance and pointed out that the learning-from-exporting effect is a factor that facilitates building the strong capabilities that enable the implementation of comprehensive strategies (thereby contributing to an accelerated growth). Lages, Lages, and Lages (2006) stated that the learning process accelerates with the number and diversity of foreign markets served, particularly when previous experiences in some of the export markets have been positive. An additional advantage occurs because a broadly diversified market scope stabilizes a company's earnings due to uncorrelated economic cycles in the different countries to which they export.

Early internationalizing firms do not possess established operating routines geared toward domestic markets and are quicker to absorb knowledge about dealing in foreign markets and subsequently change their processes to accommodate the needs of these markets more efficiently (Autio E and JG, 2000). This, in turn, facilitates a rapid expansion of international activities. As a result, early internationalization (precocity), combined with the rapidity of the internationalization process (Zucchella, Palamara, and Denicolai, 2007), has a positive impact on the level of geographic diversification (McNaughton, 2003).

Researchers have either implicitly or explicitly noted that exploitation and exploration entail contradictory knowledge processes (Floyd & Lane, 2000).

On one hand, exploitation involves the use of explicit knowledge bases, such that by internalizing and combining them, incremental refinements to existing technological or marketing trajectories can be made (Nonaka, 1994). In effect, the intent of exploitation is to respond to current environmental conditions by adapting existing technologies and further meeting the needs of existing customers (Harry & Schroeder, 2000). In contrast, exploration involves the use of tacit knowledge bases, such that by externalizing and combining them, new technological or marketing trajectories are developed (Nonaka, 1994). Essentially, exploration is intended to respond to, as well as drive, latent environmental trends by creating innovative technologies and new markets.

None research has applied an ambidexterity perspective to a firm's technology sourcing strategy to date. As firm competition has growth over the last few decades (Thomas, 1996) and a firm's technology sourcing strategy has become increasingly critical to its performance (Hill and Rothaermel 2003, Nicholls-Nixon 1995, Rothaermel 2001), this gap of research points to a significant gap in the burgeoning ambidexterity literature.

Furthermore applying the ambidexterity hypothesis to technology sourcing also implies that extreme positions along the internal-external technology sourcing continuum may not be tenable: a firm that sources all of its technology internally is unlikely to enhance its performance because of increased risks, including obsolescence (Eisenhardt and Martin 2000, Powell et al. 1996, Teece et al. 1997); in contrast, relying exclusively on external technology sourcing can result in a competitive disadvantage, because a competence loss leads to an inability to capture the returns to innovation (Teece, 1986).

As described and shown by Gedajlovic, Cao, and Zhang (2012) (Figure 1), some firms have a predominant exploratory focus (Quadrant III) and actively seek radical change and opportunities in new technologies, products, or markets. Exploration oriented firms actively collect new knowledge and expand aggressively through product development strategies. Other firms have a predominant exploitative orientation (Quadrant II). These firms possess highly refined routines that leverage clearly identified core strengths and focus on efficiency driven rents. A third strategic orientation utilized by some firms is a dual one emphasizing both exploration and exploitation type opportunities (Quadrant I). Some firms, however, never develop a clear strategic orientation with respect to either exploration or exploitation type opportunities (Quadrant IV).

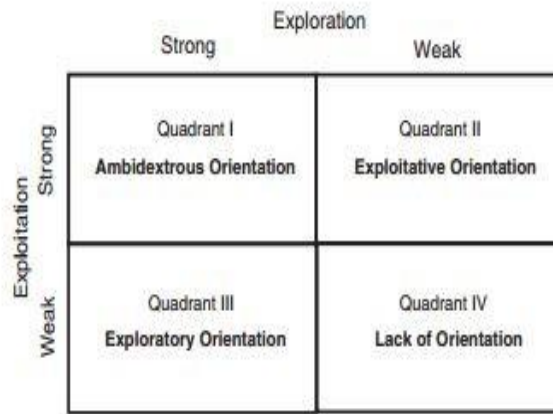


Figure 1 – Firm’s strategic orientation
Source: Gedajlovic et al. (2012)

As a concept, ambidexterity refers to an organization’s ability to carry out its core functions while at the same time build capacity to carry out tasks outside its core capabilities in order to enhance performance, and has been widely applied in the organizational literature (Raisch, 2009; Benner and Tushman, 2015). In general, ambidexterity in an innovative organization refers to its ability to develop structures and processes, which allows them to carry out both “exploitation” and “exploration” activities sequentially or simultaneously – either at an individual or at an organizational level (Raisch, 2009). In the context of a university, ambidexterity refers to its ability to carry out parallel activities outside its traditional one centred around research and education, typically those lying in the realm of commerce and engagement with practitioners (Ambos, 2008).

By processing external and internal data, decision making cycles are applied on the individual and interpersonal levels. The systems of differentiation and innovation are addressed by knowledge management (KM) and life cycles models, including Firestone and McElroy’s knowledge life cycle (KLC), as they concern processes unique for an organization, thus creating competitive advantage (through effectiveness and efficiency) and processes transforming business putting forward new ideas, and thus being of strategic relevance.

In accordance with Bose (2004), the 21st century is characterized by the growing importance of knowledge in organizations and their impact on all aspects within it. This growth is directly related to the great evolution of computers, mainly the internet and on the systems of storage and search of intelligent data, besides the great event of social networks.

Knowledge management includes the creation, valuation, mapping and indexing, transport, storage, distribution and sharing of knowledge (Coleman, 1999). Among these knowledge management processes, knowledge transfer is especially crucial in the context of globalization and global work assignments and is the focus of this study.

It can be said that in an efficient search for KM, the search for methods and measures options is crucial. These choices require a well defined taxonomy with clear concepts and timelines. The content and meaning should be clear and there should be no ambiguity about the goal when the fundamental concepts are used. Although it is a goal to be achieved, it is hardly the current state of ideas about terminology commonly used in KM. In many cases, the authors use central terms without making a distinction between them and sometimes without sufficient explanation of which perspective the terms are used.

According to Turban (2007), knowledge management is "a process that helps organizations to manipulate important knowledge that is part of the organization's memory". The author also mentions that for success in the organization, it is necessary that the knowledge is registered in some format so that it can be exchanged between people. Still according to Turban (2007) knowledge is "contextual, relevant and actionable information", in other words, one can interpret this statement as being the source of professional or social contribution among people. KM involves individuals and groups both within and between firms managing tacit and explicit knowledge to make better decisions, take actions and deliver results to support the underlying business strategy (Howrwitch and Armacost, 2002).

According to Gentile (2011), software and services sector had a growth of almost 24% in 2010, as compared to the worldwide rate of a mere 0.5%. Therefore, Brazil is demonstrating exceptional growth and its 19 billion dollars software sector had risen to 11th in the worldwide rankings at that time. Innovation facilitates the acquisition of knowledge that leads to capabilities that drive international performance. The early internationalizing company possesses a deeper capacity for innovation (Cavusgil, 2015). Companies can leverage their innovations by securing business opportunities in those markets and thus increase their innovative capabilities (Knight and Cavusgil, 2004)).

On the one hand, most studies explain firm internationalization by maximizing innovation (Knight and Cavusgil, 2005). On the other hand, scarce studies propose that firms should sustain limited levels of innovation to manage the trade-offs of higher internationalization (Fernhaber and McDougall Covin, 2014). Indeed, innovation is crucial both to the markets become more globally integrated and as new forms of competition and technology rise. Managers must continuously adapt to, and exploit, changes in their business environment, while seeking opportunities to create change through strategic innovation (Martina, Javalgib, and Cavusgil, 2017). International markets are turbulent and diverse with respect to customer needs, cultures, and competitiveness; therefore, innovation assumes a primary role. (Kleinschmidt, De Brentani, and Salomo, 2007).

Recent research has emphasized the rise of new firms from emerging markets that are challenging the complexity of internationalization. Therefore, the IE (International Entrepreneurship) literature look for more early company internationalization research from emerging markets (Cavusgil, 2015).

Researchers generally agree that seeking an ambidextrous orientation, that is, the ability to attend both exploration and exploitation type opportunities is highly desirable as it helps the dynamic balance the short and long term needs of the company. At the same time, such an “ambidextrous” orientation is also difficult to achieve because exploratory and exploitative opportunities often compete for the same scarce resources and place somewhat conflicting demands on organizational processes (Gedajlovic et al., 2012).

From the perspective of organizational learning, exploitation captures activities such as efficiency, production, selection, and execution (March, 1991). Firms innovate by engaging in two forms of learning: exploitative (refinement of existing knowledge) and exploratory (development of new knowledge) (March, 1991). The ambidexterity literature argues that firms need to exploit simultaneously existing skills in order to gain efficiency but also provide new-to-the-world products to withstand competitors’ imitation and achieve sustainable advantages (Lisboa, Skarmeas, and Lages, 2011).

An oriented technology firm is committed to research and development (R&D) and is proactive in acquiring and integrating new and sophisticated technologies in the new product development process (Zhou, Yim, and Tse, 2005 ; S. Slater, Hult, and Olson, 2007).

Organizations that pursue exploitative activities refine their capabilities, apply current knowledge, and focus on current activities in existing domains (Holmqvist, 2003). Hence, exploitative innovations build on existing knowledge and reinforce existing skills, processes, and structures (Holmqvist, 2004). In the end, exploitative activities create reliability in experience through refinement and routinizing of knowledge. Interpreted in a broader, management-oriented way, exploitation refers to incremental innovations of existing products and operations (or more generally, competencies) to meet the needs of existing customers (Benner and Tushman, 2003). This implies the use and the expansion of existing knowledge and skills and finally leads to improved established designs, the expansion of existing products and services, or the increased efficiency of existing distribution channels (Abernathy and Clark, 1985).

March (1991) divided all organizational activities into explorative and exploitative categories. Due to their different nature, companies found hard to practise both simultaneously, i.e. ambidexterity issue (Gupta, Smith, and Shalley, 2006).

R&D and export are both exploration activities, but the question remains, whether the ambidexterity is inter (between exploration and exploitation) and/or intracategorization issue (e.g. within exploration) (March, 1991)? Especially since intra ambidexterity seems to follow the same tendencies for solutions as inter ambidexterity (Gibson and Birkinshaw, 2004). R&D and export are interconnected by providing input and feedback to each other, and may suffer the same way ambidexterity issues (Rungi and Ida, 2015).

The global reach of young, global startups and other competitors are pressuring BG firms to achieve superior performance outcomes, often at a faster rate. The rapid pace of change in many industries increases the premiums achievable from active participation in a global economy. Perhaps the most important requirement to survive and prosper is further emphasis on innovation. Firms will need to become more innovative along their value chains, in terms of both identifying and exploiting opportunities. Managers will need to refine their capabilities to anticipate more effectively and control continuous change (Cavusgil, 2015).

According to Ahimbisibwe, Nkundabanyanga, Nkurunziza, and Nyamuyonjo (2016), given the impulsiveness of international business environment, knowledge is an important capability required by firms for competition in export markets requiring internationalizing firms to recognize the value of external knowledge, and also generate and apply it to commercial ends. Firms recognizing the importance of external knowledge perform better in exporting; manifest in their likelihood to devise and adapt their products, services and processes that continue to meet the needs of the evolving market. The lack of knowledge has been cited as one of the possible factors explaining the marginal performance of exporting firms in emerging economies.

Organizational capabilities that significantly contribute to enhance companies export performance in developed countries are likely to be unique and specific for companies in developing countries to achieve export success. Even though, Dai and yu (2013) indicate that there is a positive and significant relationship between skills related to identifying and using export market knowledge and export performance. When companies develop a strategy, they typically analyze environmental and industrial conditions, assess internal strengths and weaknesses and define a strategic position based on competitive advantage (Kim and Mauborgne, 2009).

This process follows an alignment of the value chain according to the selected business model and setting of financial targets as well as budget allocations. For example, if an organization aims to become a dominant player in the mass market, it needs to focus on efficiency (exploitation) and cost reduction based on centralized decision making. If a firm instead aims to excel by constantly harvesting new opportunities and expanding its existing markets, it needs to focus on flexibility (exploration) and product innovation, which require decentralized decision (Doty and Glick (1994)).

According to Bhatt, Gupta, and Kitchens (2004), the key goal of KM is to achieve a balance between knowledge exploitation and knowledge exploration. Exploitation of existing knowledge is useful given a stable environment. Due to environmental changes, the adequacy of the firm's knowledge base can be reduced and, therefore, the ability to use knowledge effectively becomes essential for companies. In such conditions, firms require the ability to create new knowledge to effectively sustain their competitive advantage (i.e.knowledge exploration). The KM process should contain both the knowledge exploitation and knowledge exploration to create sources of sustainable growth and to pursue KM best.

While the conceptual distinction between exploration and exploitation and their implications for strategy have been studied separately, there has been surprisingly little empirical investigation of the association effect between the two (SIMSEK, 2009). This is not withstanding the popular ambidexterity premise suggested by O'Reilly and Tushman (2004), that firms need to achieve a 'balance' between the two to achieve superior performance. Ambidextrous firms are capable of exploiting existing skills as well as exploring new opportunities with equal dexterity (Gibson and Birkinshaw, 2004).

Exploration and exploitation are fundamentally different logic that create tension. They compete for firms' scarce assets, resulting in the requirement for firms to manage the trade-offs between the two. However, recent literature suggests synergistic effects between the two, and hence there is a need for firms to manage the balance between each (Raisch and Birkinshaw, 2008).

The software industry plays a considerable and increasing role in the world economy. In the so called BRICS countries (Brazil, Russia, India, China and South Africa), software production exhibits the highest growth rates in the world, indicating the growing role of technological development in these emerging economies.

In essence, it is an industry strongly influenced by knowledge and innovation; where learning and the capability to develop new solutions are, see as important factors in firm survival and growth. Knowledge retention and use is defined as the capacity of firms to create new knowledge (exploration based activities) or to replicate existing knowledge (exploitation based activities), being essential to innovation development processes. Organizations with this ability have been called ambidextrous (Bermejo, Tonelli, and R.D. Galliers, 2016).

Knowledge management and learning processes have become a major factor for making long-term competitive advantage and for international success. In the export market literature, market knowledge management is considered to facilitate the achievement of higher performance and efficient responses to customers' needs and requirements (Cadogan and Siguaw, 2002).

To meet the complex challenges presented by globalization and technological change, managers must adopt an entrepreneurial mindset and emphasize both exploration and exploitation type-opportunities. Of these, exploration-type opportunities involve pursuing business opportunities that are radically new to the firm, whereas exploitation-type opportunities involve the pursuit of opportunities to refine and sustain competitive advantages in areas in which the firm currently operates (Gedajlovic et al., 2012).

An important implication is that managers should foster organizational learning and create a structure to support these configurations (Hsu and Chen, 2013). Hence, knowledge management practices are confined to managers' attitude to foster learning and improvement within the firm. This is a particularly relevant issue for companies, where decisions on international strategy usually are due on a person or a reduced management team (Fernandez and Nieto, 2005). Thus, application of current knowledge improves and exploits existing products and services, for example, to generate profits in the short run (March, 1991).

As described by Mishra and Bhaskar (2011), today's organizations in their effort to adapt to changes and to increase their agility deal with large amounts of information. By processing external and internal data, decision-making cycles are applied on the individual and interpersonal levels (Firestone and McElroy, 2004). In case of mismatches on the operational level, problem detection and formulation induces knowledge processing through problem and knowledge claim formulation (codified beliefs, guiding principles and metacognitive elements), shown on Figure 2.

Repositories, such as the distributed organizational knowledge base (DOKB in Figure1), play a crucial role once knowledge processing is coupled with business processing. As integrative living design memory, they allow reconfiguring previously produced knowledge claims and tie them to running codification schemes and business processes. The latter represent organizations from an operational perspective (Stary, 2014).

The systems of differentiation and innovation are addressed by knowledge management (KM) and life cycles models, including Firestone and McElroy's (2003, 2004) knowledge life cycle (KLC), as they concern processes unique for an organization, thus creating competitive advantage (through effectiveness and efficiency) and processes transforming business putting forward new ideas, and thus being of strategic relevance.

Both developments not only require a single learning loop for operative change, but rather a double learning loop stepping beyond operation into a knowledge processing environment, as shown in Figure 2. The KLC can be considered exemplary for knowledge life cycle models due to bridging the gap between single and double-loop learning, and thus knowledge and business processing: knowledge processing in terms of knowledge production, evaluation and integration interfaces business process management and engineering. The latter is referred to in the model as single-loop learning loop to reduce operational performance gaps. Hereby, cyclical processes send achievements and feedbacks to the organization knowledge main point (Stary, 2014).

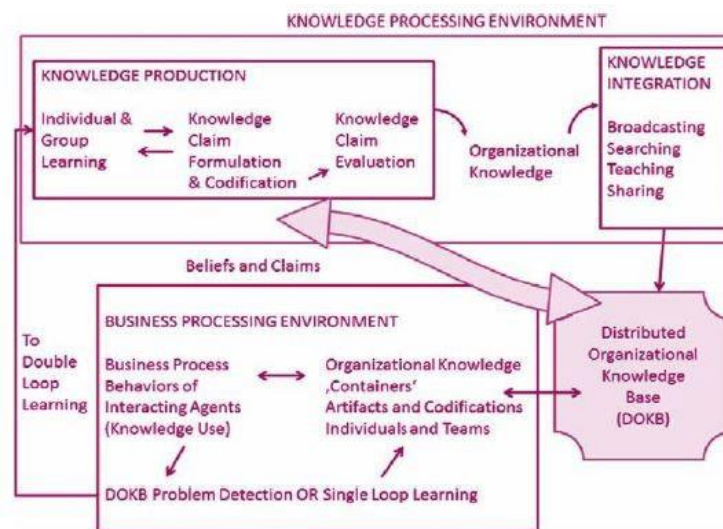


Figure 2 – Scheme of Firestone and McElroy's knowledge life cycle
Source: Firestone and McElroy (2004)

A technology oriented firm is particularly open to state of the art technologies (Gatignon and Xuereb, 1997) favoring experimentation beyond the current technological boundaries by quickly identifying new technological trends and emerging designs (March, 1991). As the accumulation of technical knowledge takes place, the firm increases the ability to evaluate new technologies' trajectories and capturing more opportunities as a result. Exploration is strongly associated with technology exporters (Hortinha, Lages, and Lages, 2011) since these firms are used to combine different technologies in hyper competitive markets having short life cycles and rapid technological changes (Nidumolu, Prahalad, and Rangaswami, 2009).

From exploratory perspective of company, both capabilities have explorative tendencies, interdependent to each other and fighting for the same resources – can they successfully coexist?

Data from the world top 2000 companies – including Shell, Samsung and Johnson & Johnson – provide evidence for successful ambidexterity of capabilities. As an interesting outcome, both capabilities independently have own balance for successful operation. Findings indicate that top companies' equilibrium point for export intensity is around 61% and for R&D intensity around 30% (Rungi and Ida, 2015).

According to T. R. Nonaka I. and Hirata (2008), knowledge is “not a self-contained substance waiting to be discovered and collected. Knowledge is created by people in their interactions with each other and the environment”. Hence, a company requires a “process in which a firm creates its future by changing itself and its environment through knowledge creation”, as addressed through the double loop.

On this scenario, the following question arises "What is the relation between knowledge management and organizational learning on Exploration and Exploitation, and how they influence on IT exportation performance?".

1.1 General Goals

The general goal on this study is to analyze the relation from organizational learning and knowledge management related as ambidexterity context on export performance in the IT companies from metropolitan region of Belo Horizonte.

1.2 Specific Goals

- To analyze how the exploration and exploitation process are most addressed on export IT companies.
- To analyze what is the influence of KM and OL on Export Performance.
- Identify the relation between KM and OL.

1.3 Motivation

Because technology refers to the “practical application of knowledge” to “achieve a commercial or industrial objective,” a natural first limitation a firm faces is the knowledge boundary. In this sense, the technological boundary denotes whether a firm sources a technology that builds on knowledge that is known or new to it (Gaynor, 1996).

Although a known technology builds upon the existing knowledge base held by the firm, the methods or materials used to achieve the firm's objectives can nonetheless steadily improve over time. Intel's continuous incremental innovations in microprocessors within the existing semiconductor architecture illustrate this well (Chesbrough, 2003). In contrast, a new technology involves knowledge that is, by definition, novel to the firm, which must be derived from either an entirely new knowledge base or from a novel recombination of parts of the firm's established knowledge base with a new knowledge stream (Kogut and Zander, 1992).

Analyzed from the point of view of a competence, ambidexterity can be understood as the ability of the individuals of an organization to simultaneously demonstrate two behaviors that are apparently incompatible and even antagonistic, but which are not mutually exclusive per use and, when they coexist, decisive for the success of the organization.

In the last five years, academic production on the subject has accelerated enormously across the globe. A bibliometric study carried out at the SCOPUS database, in the first week of June 2014, with the broad term "organizational ambidexterity", returned 195 articles, of which 77% were published as of 2010 worldwide in the field of Social Science (Bastiani and Gutierrez, 2016). The chart (Figure 3) details the growing interest in the topic.

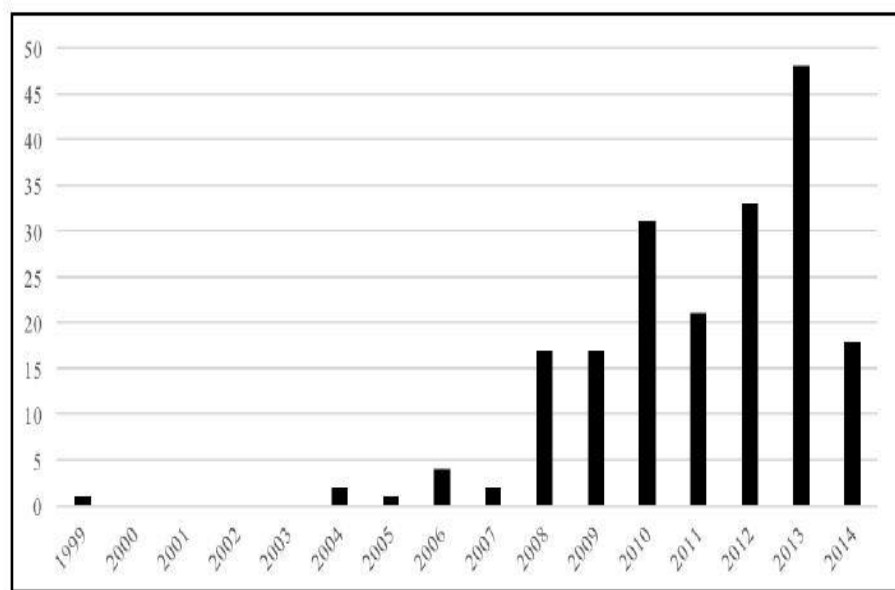


Figure 3 – Chart showing the growing interest in the topic OA, 1999 -2014

Source: Bastiani and Gutierrez (2016)

One of the factors that probably contributed to this significant increase in production on the theme is the fact that the organizational ambidexterity is related to the most varied fields of management. An analysis of the keywords in these articles related to 20 areas of the organizational management study that were analyzed in the light of the ambidexterity construct. Except for the key words that referred to the ambidexterity itself, methodologies, Theoretical models, countries, regions or categories of industries, 482 Keywords that were grouped into themes according to the following chart, as Table 1.

Topic	Quantity	%
Innovation	78	16%
Strategy and Performance	57	12%
Human Resources	40	8%
Structure and organizational management	39	8%
Management systems	31	6%
Knowledge management and network	30	6%
Organizational performance and leadership	29	6%
Process management	26	5%
Organizational learning	25	5%
Business Process	24	5%
Behavior	21	5%
Dinamic Capabilities	17	4%
Fusions, achievements and aliances	15	4%
Change management	12	3%
Complexity	10	2%
Organizational evolution	8	2%
Project Management	8	2%
Public policies	5	1%
Organizational culture	4	1%
Sustaintability	3	1%
Keywords	482	100%

Table 1 – Related topics of organizational management studies in literature

Source: Bastiani and Gutierrez (2016)

Exporters faces the challenge of allocating their limited resources between their possible strategic orientations. However, international marketing research has paid little attention to understanding the relative roles of customer and technology orientations on innovation and performance. In this study, we used organizational learning literature to support our hypothesis with a model in which we used innovation (exploratory and exploitative) as a mediator variable between strategic orientations (customer and technology) and export perceived performance.

Our findings support the view that customer and technology orientations have a key role in ensuring that investments in both exploratory and exploitative innovation capabilities achieve optimal performance (Blarr, 2012).

The concept of ambidexterity that originated in the literature on learning recently gained popularity in various research fields including technology, innovation management or organization design. While most empirical studies confirm a positive effect of a high level of ambidexterity in various areas, only few have so far looked at ambidexterity from a strategic viewpoint. And those that do, have hardly linked ambidexterity to existing theories in strategic management (Blarr, 2012).

This option seems important since firms may risk obsolescence of knowledge when relying only on internally generated knowledge (Eisenhardt, 2000). Especially, for exploration the external acquisition of knowledge has a greater impact than its counterpart (Rosenkopf and Nerkar, 2001) and therefore may contribute significantly to the renewal of existing knowledge bases. An externalization of knowledge might be easier to achieve than internalization of knowledge because it bypasses potential problems associated with the trade-off between exploration and exploitation (Gupta et al., 2006). However, externalization might not be an easy task due to the difficulty of integrating knowledge across firms (Benner and Tushman, 2003).

1.4 Documentary Organization

The study is structured in five chapters. Chapter 1 is the document introduction. The Chapter 2 is presented as a Literature Review on Ambidexterity forms on IT companies around the world. Chapter 3 describes the methodological procedures that were taken for this experiment. The chapter 4 will show the discussion and analysis result and the last chapter (5) will conclude the study.

2 BACKGROUND CONCEPTS

The debate on legal mechanisms for ensuring intellectual property product software has been gaining increasing importance in forums countries. The computer program, which today interacts with the most varied equipment and systems used by society, constitutes an abstract and the way of securing property is a reason for complex controversy between different institutions and economic agents (Paulo Bastos Tigre and Lourença F. Silva and Denise Freitas Silva and Joaquim Adérito Correia de Moura and Rosângela Veridiano de Oliveira and Arlan Souza, 2009).

Still according to and Paulo Bastos Tigre and Lourença F. Silva and Denise Freitas Silva and Joaquim Adérito Correia de Moura and Rosângela Veridiano de Oliveira and Arlan Souza (2009), the regime of protection of intellectual property has important implications for the process of innovation and diffusion of new technologies, constituting an interdisciplinary theme of a technical, legal and most important for technological development. Exist a trade-off between stimulating innovation, by protecting property and the encouragement of dissemination through greater freedom of movement of technologies. On the one hand, ensuring a return on investment in software development is important to stimulate technological innovation. The value of a technology depends on the appropriateness, that is, the possibility of maintaining monopoly control technology over a period of time. Such control is usually exercised through intellectual property over intangible assets, mainly through patents or copyrights. A technology unprotected and easily imitated model takes the monopoly yields of an innovation to near zero.

On the other hand, exclusive and prolonged innovations can restrict the diffusion of knowledge. This occurs not only because they imply higher costs for users, but technical transparency offered. Proprietary software is a black box whose source code is not open to third parties. As a result, there is little exchange of knowledge and insufficient incentives for the learning and improvement by users.

Proprietary technologies, when successful, constitute a natural monopoly progressively reinforced by the network savings they generate for their users (Paulo Bastos Tigre and Lourença F. Silva and Denise Freitas Silva and Joaquim Adérito Correia de Moura and Rosângela Veridiano de Oliveira and Arlan Souza, 2009).

From the point of view of intellectual property, a problem has been established as to the form of protection to be given to the software product. The hardware has always been an object that could be protected by patents. The software, however, was eventually framed as copyright, although there are claims by producers to include it as a invention or to define a new *suis generis* form of protection (Paulo Bastos Tigre e Lourença F. Silva e Denise Freitas Silva e Joaquim Adérito Correia de Moura e Rosangela Veridiano de Oliveira e Arlan Souza, 2009).

Duncan (1976) suggested that to accommodate the conflicting alignments required for innovation and efficiency firms needed to shift their structures over time to align the structure with the firm's strategy; that is, in his view, organizations achieved ambidexterity in a sequential fashion by shifting structures over time. Innovation has become widely recognized as a key to competitive success (Francis and Bessant, 2005). Firms with a technological and R&D based advantage can expand into overseas markets at little or no marginal cost of developing these advantages at home (Hortinha et al., 2011). Garvin (1993) defined a learning organization as "an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights".

Both exploration and exploitation are essential for organizations, but they compete for scarce resources. As a result, organizations make implicit and explicit choice between the two. Explicit choices are found in calculated decisions about alternative investments and competitive strategies. Understanding the choices and improving the balance between exploration and exploitation are complicated by the fact that returns from the two options vary not only with respect to their expected values, but also with respect to their variability, their timing, and their distribution within and beyond the organization (March, 1991).

2.1 Research Strategy

Seeking to search and find important and consistent relationships between exploration and exploitation studies in the literature, the search were done in five electronic databases - Science Direct, IEEE Xplorer, Wiley,ACM and Emerald - with papers published until 2016. The search terms definition was made following the below steps:

1. Define the major terms from research questions.
2. Identify similar forms and spellings to the identified terms.
3. Check on relevant papers already known for search terms related to.
4. Use the Boolean AND to link major terms.

The following search applied for each database, making sure to adapt for each library rules: ("Ambidexterity") AND ("Ambidexterity Software") AND ("Exportation"). The filter returned 813 papers, splitted as shown in Figure 4. The search string tries to filter papers that applies Ambidexterity forms.

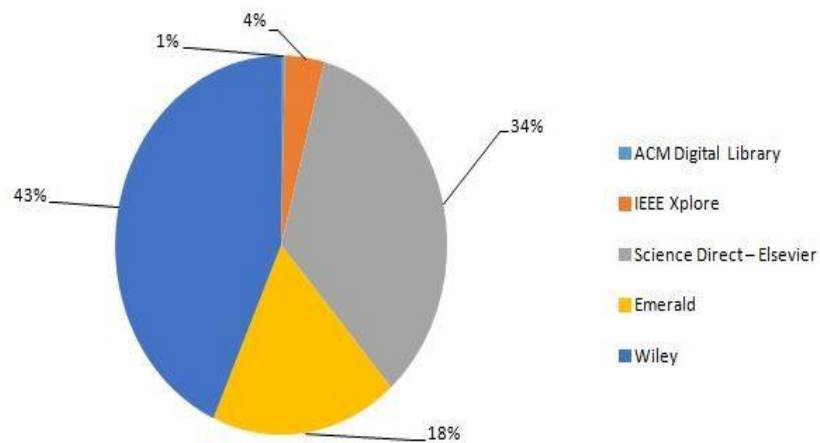


Figure 4 – Papers by electronic database

Source: Made by Author

After to apply the filter, 6 duplicated results were removed, having as results 807 articles remaining. The papers were filtered by the publication title, abstract and article type, removing any study which was not related to the Ambidexterity classification, leaving 76 results. The latest filtering was manually applied removing articles that contend was not according to our search criteria, having as final result 60 papers. The steps were summarized in Figure 5. Each step was peer reviewed by two graduated students, the results were compared and discussed to reach a consensus.

The inclusion and exclusion criteria for those filters were defined as follows.

* Inclusion criteria

- Articles those contemplate ambidexterity forms
- Articles those contemplate IT / IS / High Tech organizations / software

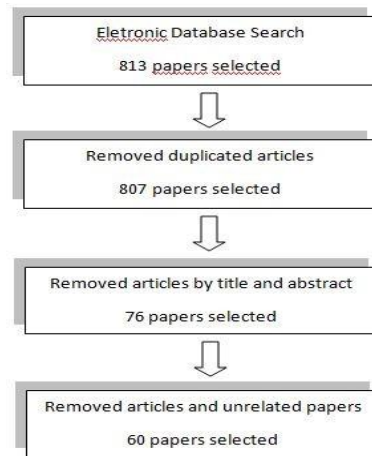


Figure 5 – Paper screening
Source: Made by Author

Articles type must be from journals or conferences

* Exclusion criteria

- Remove duplicates
- Thesis, prefaces, article summaries, interviews and reviews
- Remove studies those not contemplate Ambidexterity subject

These results will be presented and discussed on this section. The overview of selected studies will be presented. We will demonstrate the review findings related to each research question. We will also provide some related works to support and justify the findings during the discussion.

2.2 Research Hypothesis

The Figure 6 is showing the proposed Structural Model where KM and OL has a correlation between them two. They are related with Exploration and Exploitation capability, and consequently all of them are related to Export Performance, that is the dependent construct.

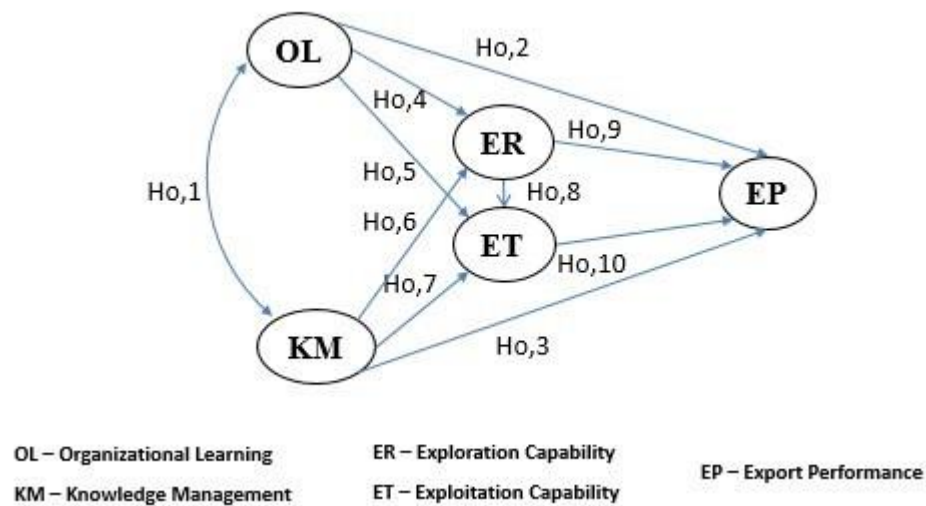


Figure 6 – Conceptual model

Source: Made by author

The hypothesis presented in this research are intended to identify the KM and Ambidexterity relations on Export performance and Organizational Learning. In this sense, hypothesis is a supposed answer to the problem that will be investigated. The origin hypothesis could be in the unsystematic observation of the facts, in the results of other research, in existing theories or in simple intuition (GIL, 1999).

The hypothetical model of the research was developed using five constructs main areas: Organizational Learning, Knowledge Management, Exploration Capability, Exploitation Capability and Export Performance (Figure 4). The research starts from the assumption that the KM and Ambidexterity are directly related on Export performance and Organizational Learning, based on literature support (**Appendix - II**). For Therefore, the following research hypothesis were formulated:

- **H1** - Organizational Learning is positively correlated with Knowledge Management.
- **H2** - There is a positive effect of Organizational Learning on Export Performance.
- **H3** - There is a positive effect of Knowledge Management on Export Performance.
- **H4** - There is a positive effect of Organizational Learning on Exploration Capability.
- **H5** - There is a positive effect of Organizational Learning on Exploitation Capability.
- **H6** - There is a positive effect of Knowledge Management on Exploration Capability.
- **H7** - There is a positive effect of Knowledge Management on Exploitation Capability.
- **H8** - There is a positive effect of the Exploration Capability on the Exploitation Capability.

- **H9** - There is a positive effect of the Exploration Capability on the Export Performance.
- **H10** - There is a positive effect of the Exploitation Capability on the Export Performance.

2.3 Knowledge Management

Knowledge is the central element in the learning process, which consists of the acquisition, integration and exploitation of knowledge (Cohen and Levinthal, 1990). Knowledge management is essentially the creation and application of knowledge as a resource (Grant, 1996), whilst learning is a process of acquisition, assimilation, and exploitation of this knowledge (Cohen and Levinthal, 1990).

In information technology, knowledge is differentiated from data and information. Data can be termed as a collection of facts, measurements and statistics. Knowledge management systems support the creation, transfer and application of knowledge in organizations (Alavi and Leidner, 2001). Knowledge management systems collect these abilities and the know-how sustaining the foundations of distinctive activities (Alavi and Leidner, 2001).

Therefore, Knowledge Management Practices (KMP) are considered organizational routines (Nelson and Winter, 1982) oriented towards its exploitation. In short, efficient KMP deals with the application of knowledge: it facilitates the development of routines and capabilities, given that even if a firm can afford different resources, effective KMP will be needed to better exploit them. Alegre and Lapiedra (2011) consider two main KMP: knowledge dissemination and storage practices. The former deals with the application, while the latter entails the systems to retrieve relevant knowledge in the organization.

Knowledge Dissemination Practices (KDP) includes those processes that enable the application of knowledge through formal and informal channels (Zahra and George, 2002). This valuable knowledge is then distributed both inside and outside the firm. These include systems to codify tacit into explicit knowledge, as in many cases, ineffective knowledge transfer arises from problems in encoding knowledge.

Information distribution systems for employees, customers and suppliers are included (Alavi and Leidner, 2001). It comprises as well as techniques to foster employees' motivation to share knowledge and participation through quality circles or multidisciplinary teams (Alavi and Leidner, 2001). Knowledge Storage Practices (KSP) are information based systems developed to support the processes of operational knowledge retrieval and storage (Alavi and Leidner, 2001): global gathering and information processing systems, control and revision procedures, and systems allowing the use of the stock of knowledge created.

This structure allows gathering and transforming the relevant information and applying it for further operations, providing with a valuable feedback. Many times knowledge is retained at the individual level, mostly in a reduced number of managers, so the creation of a formal structure for knowledge storage is an important challenge for companies (Wong and Aspinwall, 2005).

Over the last decade and more a plethora of technologies have emerged that have been associated with knowledge management; and specifically with the articulation, storage, transfer, creation, and retrieval of knowledge (Lyles, 2011a). Though not exhaustive, Table1 highlights the most notable IT artifacts and platforms associated with knowledge management projects (Alavi and Leidner, 1999).

From a relational perspective, knowledge is viewed as circulating easily when people work within a similar domain of practice or have experience of working with other knowledge domains (Lyles, 2011b). This provides for a shared sense of what practice is and what the standards for judgment are (Brown and Duguid, 1998).

Baumgartel and Jeanpierre (1972) found that managers who believed a training program was beneficial in providing the development of skills and techniques related directly to their jobs were more likely to attempt to transfer knowledge. By processing external and internal data, decision making cycles are applied on the individual and interpersonal levels (Firestone and McElroy, 2004). The firm's management is always on the lookout for new opportunities for the Unit/department/organization (Podsakoff, MacKenzie, and Bommer, 1996).

In fact, knowledge management is the mechanisms that creates and stores data to increase an organization's response time and create innovation through the collection, storage, and study of organizational information (Frappaolo, 2006). Jennex (2005) believed that institutions or organizations become more effective if they are capturing, sharing, retaining, and reusing organizational knowledge to create a successful business environment. Davenport and Klahr (1998) also noted that the effective application of knowledge has helped firms improve their innovation performance and reduce costs.

2.4 Organizational Learning

Organizational learning (OL) and knowledge management (KM) research has gone through dramatic changes in the last twenty years and, without doubt, the field will continue to change in the next ten years. Our research suggests that Cyert and March were the first authors to reference organizational learning in their publication of 1963 (Lyles, 2011c). Organizational learning represents the development of knowledge that influences behavioral changes and leads to enhanced performance (Crossan and White, 1999 ; Fiol and Lyles, 1985).

Also according to Lyles (2011c), since that time we have seen a rapid expansion in the number of journal articles - both academic and practitioner devoted to organizational learning. Fields such as information technology, marketing and human resources have also jumped on the bandwagon. During these years, the term Organizational Ambidexterity (OA) has been also widely debated in literature and has increasingly attracted the attention of different lines of research (Bastiani and Gutierrez, 2016). Together with this growing demand for research and work in OA, the concepts of Exploration and Exploitation emerged.

Doctoral programs are including seminars on organizational learning, and MBA courses on organizational learning. All of this, reflects acceptance of the concept that organizations have knowledge, do learn over time, and consider their knowledge and social capital as valuable assets. It also reaffirms the legitimacy of research on organizational learning and its practical applications to organizations. Lyles (2011d) says that, the idea that an organization could learn and knowledge could be stored over time was the key breakthrough, which have been first articulated in the book by Cyert and March (1963). Evidently the book was the product of much discussion and debate which had been going on among the team at Carnegie Tech during the 1950s (Augier, 2001) and it was foreshadowed, but not explicitly, by March and Simon (1958).

Cyert and March propose a general theory of organizational learning as part of a model of decision making within the firm, and emphasize the role of rules, procedures, and routines in response to external shocks and which are more or less likely to be adopted according to whether or not they lead to positive consequences for the organization. A number of specific ideas were outlined in their book, which were subsequently developed further by other scholars.

Motivation to transfer learning is one of the key concepts in the HRD literature. It can be described as trainees' desire to use the knowledge and skills mastered in training or associated learning activities on the job (NOE and SCHMITT, 1986). Knowledge that resides within individuals is frequently called tacit knowledge. Inferred from individual action, and being difficult to verbalize and codify, tacit knowledge is obtained through imitation and practice (I. Nonaka, 1994).

Some believe organizational learning and knowledge management can be both cause and effect; while some others regard either of the variables being the cause of the other (Liao S, 2009). Additional insight into how organizations can create and improve workplace environments, as well as recognition of the potential impacts of such environments on employees, is crucial for practice, research, and theory building (Kontoghiorghes, 2001).

Organizational learning style is a function of how organizations learn as represented by the different learning activities that they undertake (DiBella and Nevis, 1998). An organization's pattern of learning activities reflects its learning style (Shrivastava, 1983). Such styles do not indicate how well an organization is learning nor judge the value of what is learned, but they do indicate a great deal about what is learned and how learning takes place. In aggregate, a complex organization is bound to support numerous learning practices that represent different learning styles. These practices and styles constitute the raw elements of an organization's learning portfolio. By recognizing a range of learning styles within an organization, we can focus on how certain styles are matched to work demands and provide complementary or strategic advantages (DiBella, 2011).

Learning styles represent an organization's acquired capability. To use that capability for competitive advantage, organizational members must first recognize what that capability consists of. Identifying current capability provides a starting point for strategic action to change, augment, or enhance one's style or portfolio of styles.

Rather than presume no existing competence and dictate its development top down, managers work with, what already exists (DiBella, 2011).

Tables 2 shows a set of characteristics about learning and organizations. Let's start with the major presumption that learning is an essential process of all organizations. From this core, a set of related characteristics can be derived.

<i>Integrative IT Artefacts</i>	<i>Interactive IT Artefacts</i>
Document management	Email
Knowledge databases	Collaborative authoring
Data mining	Discussion forums
Electronic bulletin boards	Social networking tools
Knowledge repositories	Blogs
Knowledge directories (Yellow Pages)	Wikis
Expert systems	Information provision
Workflow systems	Real time interactions
	Incremental categorization
<i>IT Platforms</i>	
Groupware	
Intranet	
Enterprise 2.0	

Table 2 – Key technologies associated with knowledge management
Source: Lyles (2011a)

All organizations learn: Rather than face a bimodal world consisting of organizations that learn and those that do not, I make the presumption that all organizations learn. Hence the notion of the learning organization is as redundant as the notion of hot steam or the mammal's breathing. Organizations doesn't have to be developed so they can learn, they already do. Source of learning to learn: occurs through the natural social interaction of people being and working together (Brown and Duguid, 2000). Organizations as contexts for social interaction naturally induce learning. Learning occurs through the very nature of organizational life.

Learning is rooted in culture: As cultures, all organizations have embedded learning processes. For example, acculturation, which every organization must have to integrate new employees (Van Maanen and Schein, 1979), is an embedded learning process. As the organizational culture evolves, too the nature and learning process. Organizations are differentiated structures: Different organizational units promote different behaviors and forms of interaction. There is differentiation in behaviors and social interaction both vertically and horizontally in organizations (Trice and Beyer, 1993).

Types and forms of learning vary between these different units. The cacophony of differences is consistent with a view of complex systems as organized anarchies (Cohen et al., 1972). Learning styles: Organizations learn in divergent ways. There is no one way to learn or better ways for organizations to learn. Learning styles will vary across an organization that may house multiple styles in different organizational units.

Managerial focal point: Managers need to understand the nature of social interaction in their organizations and how existing behavior and routines engender learning. Once management understands how their organizations learn, they can direct those learning processes towards what is strategically desirable.

In the 1990s, the learning organization became synonymous with long-term success. As elaborated by Arie deGeus (1988) and Peter Senge (1990), the learning organization is a template for an organization that continually creates its future by adapting to environmental change and proactively shaping its environment. The learning organization is a powerful vision and metaphor for change (Calhoun and Starbuck, 2003), but what does this juxtaposition of the words 'learning' and 'organization' represent (DiBella, 2011)?

Basically, three distinctions have been suggested in the literature to differentiate between organizational learning and learning organization. All of them imply "either-or", i.e. organizational learning has one definition while learning organization has another, and they are mutually exclusive. The two most common ways to distinguish between organizational learning and learning organization in existing literature are that learning organization is a form of organization while organizational learning is activity or processes (of learning) in organizations, and that learning organization needs efforts while organizational learning exists without any efforts. These two distinctions often appear together.

Table 3 contains a set of characteristics derived from some of the writing on learning organizations. The key point is that presumptions may be derived from the connotations of the term itself.

Bi-modal world: There are organizations that learn and those that do not
Source of learning: Strategic action promotes the prerequisite conditions
The role of culture: Organizations must have the right culture for learning to occur
Organizations are homogeneous: Organizations learn systemically or they do not
Learning style: Learning processes are singular and specific
Managerial focal point: Innate organizational disabilities which prevent learning

Table 3 – The learning organization
Source: DiBella (2011)

Bimodal world: By conceiving of ‘learning organizations’ and advocating for their creation or development, theorists effectively bifurcate the world of organizations. When learning is used as an adjective to describe a particular type of organization, one underlying assumption is that some organizations learn and others do not. Such a division suggests that learning is optional and not indigenous to the life of organizations.

Source of learning: Why do some organizations learn and others do not? Learning, as a mechanism to foster organizational improvement, does not occur through chance or random action but through the development and use of specific skills. Without disciplined action or intervention from their leaders, organizations fail to learn due to the impact of the many forces that constrain learning. For example, Senge (1990) states that it takes five component technologies or disciplines to establish a learning organization - personal mastery, mental models, shared vision, team learning, and systems thinking.

What distinguishes learning organizations (from non-learning organizations) is their mastery or focus on these five disciplines. Another normative modeler (Garvin, 1993) claims that learning organizations are skilled at systematic problem solving, experimentation, learning from their own experiences and from others, and transferring knowledge.

Culture and learning: For organizations to learn, they must have the right culture, a learning culture. Mayo and Rick (1993) claim that a learning organization can be recognized by the interdependence of language and culture. In a similar manner, Beckhard and Pritchard (1992) discuss building a learning organization by creating a culture that values learning and rewards progress not just results.

Organizations as homogeneous, structured systems: Duncan and Weiss (1979) explain that learning occurs when organizations match their structures to their environments in order to maximize the understanding of members of action outcome relationships.

Purser and Pasmore (1992) claim that learning is dependent on the design of knowledge work. To maximize learning, the design of knowledge work must be formalized and aligned with the influence of decision makers. These theoreticians base their argument on the presumption that becoming a learning organization is predicated on having the right organization structure or design. Adler and Cole (1993) argue that this is so empirically as well.

Learning style: An often cited theoretical distinction in learning styles is Argyris and Schön's (1978) familiar contrast between single and double-loop learning. More recently, 'triple-loop learning,' learning about learning, has been identified as yet another learning style (Bartunek and Moch, 1987; Torbert, 1994). Learning organizations promote double and triple-loop learning since those styles are considered more advanced.

Managerial focal point: Learning disabilities occurs due to the fundamental ways in which individuals have been trained to think and act (Argyris and Schön, 1974, 1978; Senge, 1990) and from organizational barriers to discover and utilize solutions to organizational problems (Tucker et al., 2002). Snyder and Cummings (1992) identify the problems of amnesia (lack of organizational memory), superstition (biased interpretation of experience), paralysis (inability to act), and schizophrenia (lack of coordination among organizational constituencies).

Watkins and Marsick (1993) address three barriers to learning - learned helplessness, truncated learning, and tunnel vision—with the latter paralleling Senge's call for a systems perspective. To avoid or solve learning disabilities, organizational leadership must establish the normative conditions essential for learning to take place. The focus may be on enhancing competencies of individual members or teams, changing the organizational culture, or redesigning structure or systems (Edmondson, 1996).

2.4.1 Dynamic Capabilities

Dynamic capabilities are very critical for a company to balance international exploitation and exploration in practice. Different structures are needed for its development.

Basically, exploitation refers to the deployment of the existing knowledge on markets, products and abilities, whereas exploration implies the development of new knowledge in these areas (Levinthal and March, 1993).

Dynamic capabilities help to deal with rapidly changing environments, considering the evolving nature of firms' resources and capabilities to adapt to changes in their environment (Lavie, 2006). While there is a general consensus on the theoretical importance of dynamic capabilities in this landscape, this arises several challenges for firms affected by the lack of resources to compete in areas such as marketing, production, innovation and international strategy (Villar, Alegre, and PlaBarber, 2014). Dynamic capabilities in internationalization have been recently addressed by scholars (Hsu and Chen, 2013).

Through exploitation the firm consolidates knowledge and prepares it for future use, yet an extensive focus in the exploitation of organizational routines might lead firms to strategic myopia (Levinthal and March, 1993). Companies can achieve new combinations of knowledge internal from both internal (Lavie, 2006) and external sources, which are mainly related to exploitation and exploration, respectively. Nonetheless, some academicians suggest that explorative learning, as double-loop learning, can be originated as well from internal sources, because new knowledge combinations can also arise as a result of the learning process inside the firm (Kogut and Zander, (1992).

Indeed, when a firm has been operating in a mature industry for long, exploitation becomes highly relevant to maintain competitive positions, as these firms have usually a strong organizational basis in terms of resources and capabilities. In this situation, successful exploitation requires an efficient and effective process to increase and extend the usage of existing internal assets (Hsu and Chen, 2013).

Building on basic systems, knowledge management dynamic capabilities are configured as the formula to achieve a constant fit of these resources; in other words, the hub through which the organization can adapt their skills to the changing foreign environment (Villar et al., 2014). The framework proposed by Alegre and Lapiedra (2011) was based to talk about two dimensions of KMDC: Internal Knowledge Development and External Knowledge In- tegration, which support the exploration of new knowledge in the organization, from both internal and external sources. Internal Knowledge Development (IKD) involves creation and dissemination of new knowledge within the firm, requiring the existence of a previous exploitation process.

It requires abilities to organize resources for exporting, such as qualified personnel coordinating organizational processes with the rest of areas, as well as the capability to be positioned in the technological front line and the capability to manage innovative efforts.

This accumulation of internal knowledge is crucial for value creation, as it enhances the ability to exploit new opportunities outside the firm through the existence of prior knowledge as a requirement for the existence of absorptive capacity (Cohen and Levinthal, 1990). External Knowledge Integration (EKI) enables the creation of a broader knowledge base through exploration outside firm boundaries. This process helps the firm to recombine their current knowledge with new knowledge from their environment into new knowledge and capabilities, offering a global perspective on the competition basis in foreign countries regarding customers or competitors' actions.

It includes the ability to enhance knowledge through cooperation, as well as the acquisition of technology; the role of industry associations or public entities is here noteworthy, as they are especially helpful in supporting the competitiveness and collaboration of firms in industries with low technological inputs or fewer resources.

2.4.2 Knowledge Life Cycle

Knowledge is “not a self-contained substance waiting to be discovered and collected. Knowledge is created by people in their interactions with each other and the environment” (T. R. Nonaka I. and Hirata, 2008). Hence, a company requires a “process in which a firm creates its future by changing itself and its environment through knowledge creation”, as addressed through the double loop. However, this process does not run isolated.

In According to T. R. Nonaka I. and Hirata (2008), knowledge creation requires context, Phronesis, which could be defined as context-sensitive practical wisdom. Hence, it needs to be coupled to the actual (work) environment (phronesis differs from other types of knowledge, in particular, episteme, context-independent knowledge and techne, the practical skill required to be able to create). In the KLC, the single and double loops are tightly coupled, indirectly through beliefs and claims and directly through the DOKB and the problem formulation.

According to Firestone and McElroy (2004), the KLC can be considered exemplary for knowledge life cycle models, as it recognizes KM located beyond knowledge processing. Such an understanding allows interfacing concepts of triple loop or deuterio learning (Tosey and Saunders, 2012).

Capturing “to learn how to carry out single- and double-loop learning” (Argyris and Schön (1978)) enables referring to substantial values, enabling profound changes (Senge et al. 1999) and the ground of (context-sensitive) practical wisdom as addressed by (T. R. Nonaka I. and Hirata, 2008). Such a layer might also be required for conceptualizing recent management developments, such as ambidexterity, simultaneously focusing on knowledge and adaptation (Rothaermel and Alexandre, 2009)).

KLC’s two broad knowledge processing phases, knowledge production and knowledge integration, comprises several processes for generating knowledge, such as problem claim formulation, individual and group learning, knowledge claim formulation, information acquisition and knowledge claim evaluation. Learning on the organizational level requires formulating the produced and acquired knowledge.

This knowledge is continuously refined through reflective feedbacks (knowledge claim evaluation) to prepare for integration. Knowledge integration allows proceeding towards actually changing business processes based on the produced or acquired knowledge (Stary, 2014). The described dynamics of creating, mobilizing and diffusion of knowledge has been recognized to be essential for developing organizations (Birkinshaw and Sheehan, 2002), only few methodological guidelines can be found on how knowledge and process management needs to be intertwined for non-disruptive organizational development.

Ideally, surviving knowledge claims can be implemented in a seamless way, i.e. grasping relevant process information, such as stakeholder roles and activities, thus, creating or modifying a business process model and executing it after validation (Weske, 2012).

2.4.2.1 Focussing on the single-loop (Business Processing)

Many developers and researches took the conceptual works on the KLC as input to develop individual life cycle models (Stary, 2014). A typical example is given by Sanya and Al-Ashaab (2011). In their approach, they referred to the capabilities of semantic technologies, as they took them as a basis for their staged semantic knowledge life cycle.

The eight stages are:

1. Understand the domain;
2. Structure;
3. Enrich vocabulary;
4. Capture;
5. Represent;
6. Interpret the “know-how”;
7. Share; and
8. Develop knowledge-based engineering applications.

Stages (2), (3) and (6) refer to what the authors term “semantic KM KLC”. Defining the scope requires understanding the addressed domain. Completing this step allows identifying relevant knowledge sources. Then an initial structure/construct of domain knowledge can be developed. It comprises different chunks of knowledge, revealing the modular structure building of a domain.

Beyond the structure, the involved stakeholders need to agree on an appropriate vocabulary. Based on this “universal” vocabulary knowledge, including new knowledge, can be captured and represented, which is fed back to structural development already addressed in Stage (2), eventually leading to modified or novel domain knowledge constructs. This approach demonstrates the assumption of being able to identify a common vocabulary for a set of stakeholders, which can be used for modular knowledge representations, without reflecting on human-centred methods.

Castillo and Cazarini (2013) propose an integrated model for implementation and development of KM introducing the enterprise knowledge development modelling methodology. Their model is composed of sub-models referring to goals, rules, concepts, processes, actors, resources, requirements and technical components.

It is intended to provide a holistic and systemic vision of KM, guiding organizations to implement or improve their KM activities. The model does not differentiate between business and knowledge processing activities, although KM is supposed to support business operation driven by dedicated KM activities.

Based on concrete field studies in Professional Construction Management, Chen and Chang (2013) have applied the single- and double-loop learning concept for fundamental process analysis and reengineering. Their model of project-oriented process reengineering for professional construction management utilizes business processes as baseline, as it incorporates enterprise process reengineering and knowledge management learning. Its function is supporting promptly meeting outside customers' needs by internal capability management.

The knowledge subject process target achievement matrix and the contribution degree of process target to knowledge subject as a mathematical model are facilitators for knowledge interpretation, highlighting reengineering knowledge. In that context, the process efficiency is analyzed for service problems. A performance result list serves to clarify the required knowledge for identified process efficiency problems. The target estimated achievement is used to represent the process efficiency, and discusses the process value based on unit labour costs. This index supports performance evaluation and allows continuous improvements.

Empirical tests have revealed the model's capacity by gaining process value after reengineering processes up to 20 per cent. Besides proving the model to be operational, the process execution inside the professional construction management enterprise allowed applying the model before putting it to actual work practice.

The model is based on five main processes:

1. Determining the process targets as perceived by customers;
2. Process representation focusing on operation roles and activities, related documents and knowledge;
3. Process evaluation in terms of process performance;
4. Process design: hereby, single- and double-loop learning are addressed according to the process evaluation result – a learning outcomes table is generated to gradually strengthen the process performance;

5. Process validation to measure the effect of performance improvements, in terms of process efficiency and costs.

As described by Stary (2014), Double-loop learning occurs along two phases:

1. Knowledge generation: Typically, novel data structures and functions are generated, such as sub-contractor data, standard labour and material analysis and current market condition analysis data, plus the price inquiry knowledge evaluation and maintenance operation.

2. Knowledge integration: Here, the knowledge created in the knowledge generation step is categorized for operational data management. For instance, sub-contracting partner contact lists are enriched with sub-contractors' current and future business developments to elevate the unit price inquiry operation with speedy efficiency.

These changes might even trigger novel workflows, such as inferences on this data. Although knowledge processing in this case requires social interaction and formats for feedback collection on change proposals, it remains open, in which way, double-loop processes need to be designed for effective claim and integration management.

The nature of learning loops and influence factors of organizational developments are reviewed. So far, most researchers have considered the concept of organizational learning as a dichotomy. In its basic, primary form, organizational change has been described as action-oriented, routine and incremental in existing processing environments, occurring within existing (mental) frameworks, norms, policies and rules. In the face of profound change in organizational environments, learning processes change the (mental) frameworks, norms, policies and routines underlying day-to-day actions and routines (Cope, 2003). This dichotomy has been expressed in a variety of terms:

- . Single- and double-loop (Argyris and Schön, 1974);
- . Lower- and higher-level (Argyris and Schön, 1974);
- . First- and second-order (Arthur and Aiman-Smith, 2001);
- . Exploitation and exploration (Levinthal and March, 1993; March, 1991)
- . Incremental and radical (Miner and Mezias, 1996); and
- . Adaptive and generative learning (Senge, 1990).

Although these dichotomous terms stem from different perspectives on organizational learning, a reasonable consensus seems to have been established that they refer to comparable learning processes and outcomes (Argyris and Schön, 1996 ; Arthur and Aiman-Smith, 2001; Miner and Mezias, 1996).

Thus, as defined by Argyris (1999), single-loop learning occurs “whenever an error is detected and corrected without questioning or altering the underlying values of the system”, and double-loop learning occurs “when mismatches are corrected by first examining and altering the governing variables and then the actions”. Hence, double-loop learning addresses reflexivity about processes of learning at either single or double-loop levels, which Argyris (2003) characterizes as “going meta” beyond “how to do things better”, once basic aspirations, assumptions and principles themselves become subject of learning.

As double-loop learning involves questioning and perhaps letting go, the basic certainties, goals and values that one acted upon previously, the exit point from single-loop learning, namely, formulating knowledge problems and claims when implementing the KLC could become crucial. As Yoon (2012) found out, the type of knowledge being processed and the KM practice of stakeholders could influence implementing the KLC. User expertise and the epistemic nature of a problem could be tested and validated as influencing stakeholder behaviour: KM practitioners use different KM practices, depending upon their level of proficiency and the type of problem they encounter. Typical examples given in the study by Yoon are:

- * Tacit knowledge of experienced decision makers enables them to look at problems differently than novices. This can significantly enhance their ability to solve problems.

- * The type of problem encountered by decision makers influences the various stages of the decision-making process.

- * Primary responsibility for KM practises seems to influence KM practices.

The study showed that expertise influences the behaviour of KM practitioners, and the type of problem influences the approach KM workers use. The results do not only have an impact on the explanatory power of the KLC but rather shifts the focus towards human understanding of KM and its practices.

Hummelbrunner and Reynolds (2013) addresses the types of learning loops in organizational development referring to Bateson (1972) and Argyris and Schön (1978). With respect to the purpose and extent of learning, three types of learning could be distinguished:

1. “Single loop learning (Learning to adapt): Results in a change of strategy or tactics without questioning the underlying goals or assumptions. It helps to control individual behaviour within existing decision-making protocols; provides short-term solutions to implementation problems and deals with symptoms more than root causes. The core question is Are we doing things right?”

2. Double loop learning (Learning to change): By reflecting on goals and assumptions, one probes the generative mechanisms of problems, their underlying causes and their consequences. This leads to adjustments in strategy and to better mid- and long-term course corrections in response to contextual changes. The core question is Are we doing the right things?”

3. Triple loop learning (Learning to learn): By reflecting on the learning mechanisms, existing rules are challenged and possibly changed in ways that affect knowledge acquisition and behaviour, i.e. by identifying different patterns of recognizing and handling problems or coping more effectively with contextual changes. The core question is “What makes this the right thing to do?” (Figure 7).

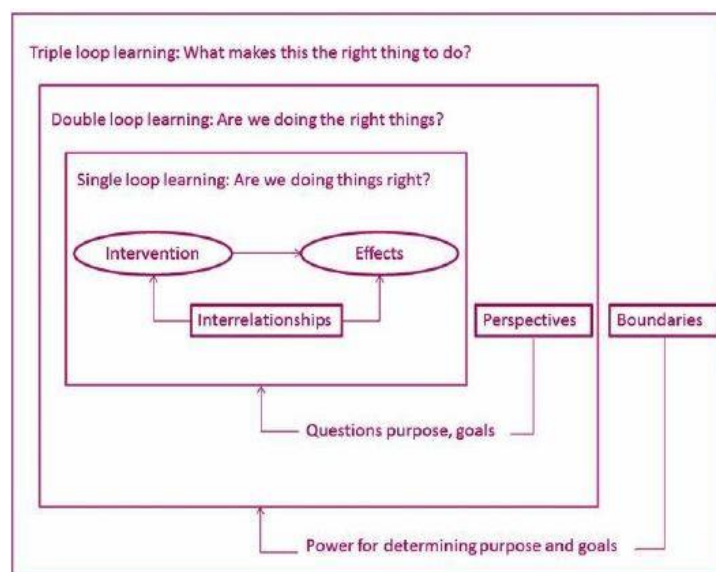


Figure 7 – Three loops of learning for organizational development
Source: Firestone and McElroy (2004)

According to Hummelbrunner and Reynolds (2013), the progression from single- to double- and triple-loop learning is expected to lead to deeper and more sustainable

learning. Each of the three system concepts has been associated with a specific loop of learning, with respect to evaluating the effects of an intervention:

* Single-loop learning: The focus is on interrelationships, primarily between the intervention and its effects, but also within them (e.g. between the actions of an intervention or the various effects produced). In case of divergence from original plans, adaptive recommendations are made; for example, modifying a strategy or activities to better achieve stated aims and objectives. Significantly, the purpose of the intervention is not questioned.

* Double loop learning: Assumptions underpinning an intervention can only be reflected if multiple perspectives are taken into account. When acknowledging that a situation can be framed in different ways, this also questions the purpose and goals of an intervention.

* Triple-loop learning: Here, the focus is on the boundaries inevitably made with any intervention and its evaluation. Reflecting on boundary judgments is very helpful (and needed) for critically reflecting on the rules and relations of power that affect behaviour and cognition patterns (Flood and Romm, 1996). This notably involves looking at the power relations that determine the boundaries of an intervention and its evaluation, including the role of evaluation commissioners and evaluators themselves. The key role of the evaluator is in assigning value” (Flood and Romm, 1996).

Accordingly, each of the learning loops can be associated with a different set of values:

- Double-loop learning is based on the intrinsic value underpinning the various framings of an intervention and/or the wider situation being evaluated. They can include personal, organizational or social values. Intrinsic values inform evaluative measures regarding issues of “relevance” (why is it important that the intervention works and works well?) and “effectiveness” (are the right things getting done?).

- Triple-loop learning is based on critical value; that is, value in reflecting on the rules and customs that govern dominant behaviour and cognition patterns in a particular context. Critical values inform valuative measures regarding issues of equity and emancipation (what and who determines the importance of some measures of success over others?) (Flood and Romm, 1996).

According to Stary (2014), Hummelbrunner's framework reveals a contingent handling of values, distinguishing interrelationship, perspectives and boundaries referring to the extent and depth of systemic practice. It indicates for value-driven change and learning processes successively wider ranges or measures of value. However, this does not imply that all layers are always touched or can be reached: "Often only one specific level might be feasible or can be appropriately attained given the actual circumstance and conditions of an evaluation" (Flood and Romm, 1996). The framework helps to determine the focus of change including critical values that might trigger double and single-loop processes, and could be taken into account for knowledge life cycle development, including the suggested relationships between layers.

2.5 Ambidexterity

It is possible to identify a great amount of available data on a huge range of diverse areas where Ambidexterity (Exploration and Exploitation) is being seeking on high-tech and software companies around the world. Some areas like marketing, projects, strategy, finances, business and knowledge management, and many others. From 1999 to nowadays the studies on Organizational Ambidexterity are growing year by year in different areas of study.

In accordance with BIRKINSHAW and GUPTA (2013), currently the research on ambidexterity is in a moment of consolidation of the diverse findings of the last decade and search of consensus in the academy. Special editions on the subject are frequent in important journals in the area, such as the *Organization Science* and *Academy of Management Perspectives*.

Researchers generally agree that pursuing an ambidextrous orientation, that is, the ability to attend to both exploration and exploitation-type opportunities is highly desirable as it helps dynamically balance the short and long-term needs of the company (O'Reilly and Tushman, 2008).

At the same time, such an “ambidextrous” orientation is also difficult to achieve because exploratory and exploitative opportunities often compete for the same scarce resources and place somewhat conflicting demands on organizational processes (March, 1991). Ambidexterity allows executives to pioneer innovations while also pursuing incremental gains (O’Reilly and Tushman, 2008).

SIMSEK (2009) proposed a classification typology of different ways of generating ambidexterity in organizations, based on the crossing of a temporal vector (if conflicting objectives are pursued at the same time or sequentially) and a structural vector (if there are different units of Business for each of the conflicting objectives), according to Figure 8.

	Exploitation	Exploration
Definition	Incremental development, designed to meet the needs of existing customers	Radical developments to meet needs of emerging customers
Tasks	Refinement, efficiency, implementation, execution	Search, experimentation, variation, flexibility
Knowledge base	Existing knowledge	New knowledge, departure from existing knowledge
Outcomes	Improvements to existing competencies	Development of new competencies
Strategic intent	Profits, costs, efficiency	Innovation, growth, adaptability
Time horizon	Short-term	Short-term

Figure 8 – Ambidexterity forms
Source: SIMSEK (2009)

2.5.1 Cyclical Ambidexterity

Cyclic Ambidexterity is also known as "Sequential", according to BOUMGARDEN, NICKERSON, and ZENGER (2012), is based on adaptive movements that organizations undertake in their structures and processes to better respond to changes in their business environment without representing the last strategic change. These movements, in theory easier than changes in the inter-organizational culture of the organization, can be so quick and contradictory that some authors call "vacillations".

2.5.2 Partitional Ambidexterity

Partitional or Structural ambidexterity preaches the existence of separate units to follow each of the conflicting objectives of the organization.

The differentiation between units goes beyond the organization chart, involving the entire management system - competencies, systems, incentives, processes and even subcultures (O'Reilly and Tushman, 2008).

2.5.3 Reciprocal Ambidexterity

According to SIMSEK (2009), reciprocal ambidexterity is based on the "synergistic fusion of complementary streams of exploitation and exploration occurring in different units at different times". The most common occurrence of this kind is in strategic alliances and joint ventures, in which one organization extends its experience to another in a complementary way.

2.5.4 Harmonic Ambidexterity

The harmonic ambidexterity changes the focus of the structure to the individuals within the organization. This model, is based on the behavioral capacity that individuals can potentially demonstrate alignment and adaptability throughout a business unit. This behavior would be stimulated by an organizational context characterized by an interaction of elements such as extension, discipline and trust, in order to encourage people to make decisions at the individual level on how to divide their time between conflicting demands (Gibson and Birkinshaw, 2002).

2.5.5 Parallel Ambidexterity

Parallel ambidexterity differs from traditional exploitative forms where SDOs focus on improving and formalizing their operational knowledge and improving efficiency. It also differs from traditional explorative forms where SDOs focus on identifying and grafting and distributing external abstract knowledge by expanding knowledge scope, flexibility. Most importantly, parallel ambidexterity differs from the widely recognized forms of sequential and structural ambidexterity because exploration and exploitation take place at the same time within the same unit in holographic ways to address volatility (Lyytinen, Rose, and Yoo, 2010).

2.5.6 Exploration and Exploitation

As mentioned by Bastiani and Gutierrez (2016), in 1991, Professor James March published another article with great impact on the academic community, retaking Duncan's problematic and framing it from the point of view of Organizational learning. By coding the concepts of exploration and exploitation, March typified them as intrinsically different activities and equally fundamental to the success of organizations making aware of the potential for destruction of value if an organization chooses to follow only one of two paths.

As Dupouet (2013) says, exploration, in essence, produces new knowledge from which organizations will be able to launch new activities remote from the skills currently mastered by the organization. Explorative knowledge can thus in essence potentially change the structure and strategic positioning of the firm.

Exploration entails the ability to fetch knowledge of great diversity, both within and outside the firm. Exploration also requires that the firm has the ability to compare, and eventually combine these different pieces of knowledge in order to produce newness. Below, the Figure 9 shows Exploration and Exploitation characteristics.

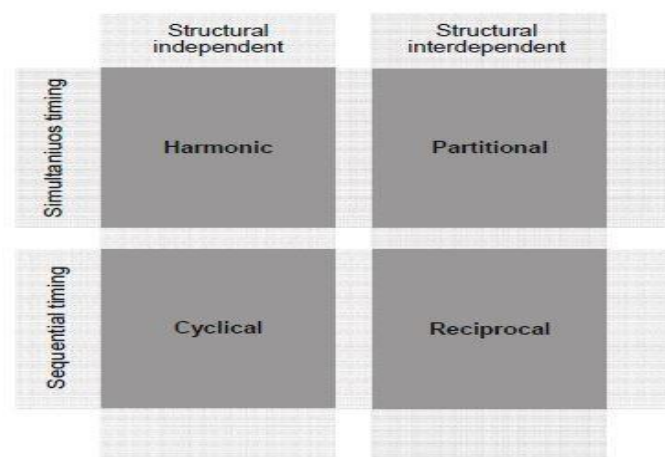


Figure 9 – Features of Exploration and Exploitation
Source: Dupouet (2013)

In general, ambidexterity in an innovative organization refers to its ability to develop structures and processes, which allows them to carry out both "exploitation" and "exploration" activities sequentially or simultaneously – either at an individual or at an organizational level (Raisch, 2009).

Exploitation activities produce knowledge that answers to concrete and immediate problems that arise in the organization's functions. This knowledge concerns best practices and is directly related to the organization's routines and processes (Turner and Makhija, 2006).

The shift to an exploitative orientation leads to a performance improvement by process innovation. This shift between periods of exploration and periods of exploitation signifies a possible way to avoid competency traps (too much exploitation) and failure traps (too much exploration) (Siggelkow and Levinthal, 2003). Exploitative innovation builds and replicates the firm's prior knowledge to leverage existing products through technology efficiency's and cost control (Levinthal and March, 1993).

These new product refinements can generate competitive advantages through product differentiation or cost based advantage; both capable of helping the firm to maintain its international market position Filipescu, Prashantham, Rialp, and Rialp (2013). Only if firms could continually create new products, systems, and service items to every department meet the demands of the customer will be able to obtain long-term success (Chang and Lee, 2008). Many authors believe innovative organizations are intelligent and creative, and have high capacity for learning effectively as well as building up new knowledge (I. Nonaka, 1994).

Firms with a strong customer orientation has a competitive advantage because they consider the creation and maintenance of customer value a top priority (Narver and Slater, 1990; Zhou et al., 2005). A customer orientation provides the necessary skills for identifying current and latent needs, uncovering new market opportunities, searching for unserved markets, and establishing relationships with existing and new customers (S. F. Slater and Narver, 1998).

Exploration implies firm behaviors characterized by search, discovery, experimentation, and risk taking. Thus, exploration involves radical innovation, entry to new technology fields, and creating new products and markets. In contrast, exploitation firm behaviors imply refinement, implementation, efficiency, production and selection. Hence, exploitation involves incremental innovation based on routines and efficiency (Raisch and Birkinshaw, 2008).

In a sense of value chain, exploration focuses on upstream and exploitation on downstream activities (Kauppila, 2010). Some capabilities influence both streams, they have dual nature (Rungi and Ida, 2015). For example, export, on the one hand, March (1991) sees searching for new markets as explorative, on the other hand, keeping presence abroad is seen as exploitative activity (Morgan, Vorhies, and Mason (2009)). In constantly changing globalized world, the export has tendency to face explorative challenges all the time (Rungi and Ida, 2015).

Exploration and exploitation are opposites in many ways, while exploration's focus is on long-term then exploitation concentrates on short-term perspective (Hoffmann, 2007); exploration is more expensive and riskier than exploitation (Bierly, Damanpour, and Santoro, 2009); and exploration focuses on upstream and exploitation on downstream activities (Kauppila, 2010).

2.6 Export Capability

Export performance is defined as the extent to which the export venture contributes to the firms' strategic and financial objectives. We view export performance at the strategic level, i.e., the contribution of the export venture to the firm's overall competitiveness, strategic position, and global market share (Zou, C., and Osland, 1998).

Looking at export performance, literature reveals that this concept's measurement is one the most controversial aspects in international business primarily because of its multi-dimensional nature. However, Sapienza, Smith, and Gannon (1988) argue that subjective performance measures (such as those designed to enlist the opinion or attitude of the respondent) such as "Compared to our competitors, our exports have rapidly penetrated into various foreign markets" are more useful when studying new companies, as they may often be uncomfortable about providing objective performance measures such as absolute export sales volume. Moreover, self report measures of performance have also been widely used in previous research on export performance and found to be highly consistent with how firms actually performed as indicated by objective measures (Singh and Mahmood, 2013).

Holistic view of export operations of the firm may be divided into two different schools of thought: gradual expansion and global operations from inception (Rungi and Ida, 2015). Through exploratory innovation, firms develop new competences and thus achieve superior export performance by attaining positions of market and technological leadership (Teece, Pisano, and Shuen, 1997). Hortinha et al. (2011) adapted the measure of technology orientation from the work of Zhou et al. (2005) to assess the orientation of firms' export operations toward using sophisticated technologies in new product development. Several empirical studies support the positive effect of innovation capabilities on firms' export activities (Cho and Pucik, 2005 ; Filipescu et al., 2013) because firms with a technological and R&D based advantage can expand into overseas markets at little or no marginal cost of developing these advantages at home (Hortinha et al., 2011).

Export operations of the firm are frequently described by Uppsala gradual expansion model (Johanson and Vahlne, 1977). Framework focuses on company being able to work its way through to global markets by pursuing step-by-step exporting from ad hoc exporting to intermediaries to heavy FDI (Johanson and Vahlne, 1977).

Later enhanced model focused on gradual expansion in the network grid of relationships, where existing relationships play crucial role and form the basis for further expansion into designated markets (Johanson and Vahlne (2009)). Firms can leverage their innovations by acting on business opportunities in international markets (Knight and Cavusgil, 2004).

The second school of thoughts that tends to explain other segment of companies that start their operations in multiple regions or worldwide from inception are described by INV Oviatt and McDougall (2005) and born globals (Knight and Cavusgil, 2004). The INV has internationalized transactions, alternative government structure, foreign location and competitive advantage (Oviatt and McDougall, 2005). At the same time born globals are driven by international entrepreneurship and marketing.

They leverage technological competence, unique products, quality, focus and foreign distributors for outstanding performance (Knight and Cavusgil, 2004). Most significant difference in the models is in magnitude of operations where INV tends to target a region or multiple geographical sectors (Oviatt and McDougall, 2005) and born globals targeted market is not bound by any geographic restrictions (Knight and Cavusgil, 2004).

3 RESEARCH METHODOLOGY

In this section, it is described the methodological procedures those were used in this the following parts: characterization, procedures, instrument data collection and analysis plan adopted to achieve the objectives of this study. "To provide the means by which current best evidence from research can be integrated with practical experience and human values in the decision-making process regarding the development and maintenance of software" (Dyba, Kitchenham, and Jørgensen, 2005).

3.1 Research design

This research is classified as survey. According to GIL (1999), it is a research strategy that is characterized "by direct interrogation from people whose behavior one wishes to know". It also applies to qualitative / interview studies. A quantitative method was applied and data was collected from some selected IT companies. The data collection was made through publicly available sources. This research, regarding its purpose, can be classified as explanatory, as it investigates the managers' / employees' perception regarding KM / OL / Ambidexterity and how they contribute to the export performance of IT companies.

A questionnaire was sent to employees / managers from these IT companies to obtain the response about the KM / OL situation and export performance. A questionnaire (survey) has been done and conducted behalf a set of closed questions. The people responded through online survey by Survey Monkey. This research, regarding its purpose, can be classified as explanatory, as it intends to identify, to confront and to describe KM / OL / Ambidexterity and how they contribute to the export performance of IT companies.

This research is a quantitative in nature, since it aggregates other information to the study. In accordance with RICHARDSON (2011) quantitative research is defined by use of quantification, "both in the information collection modulates and in the treatment of them, by means of statistical techniques, from the simplest, percentage, mean, standard deviation, to the most complex, such as correlation coefficient, regression analysis, etc".

Quantitative research focuses on objectivity. Influenced by positivism, she believes that reality can only be on the basis of the analysis of raw data collected from the aid of standardized and neutral instruments. Quantitative research mathematical language to describe the causes of a phenomenon, the relationships between variables, etc FONSECA (2002). To develop this research, the contacts and survey sharing with employees / managers from IT companies were made through Email, LinkedIn, Whatsapp and personally (in some cases).

3.2 Study sample

The research sample has been drawn for IT companies located at metropolitan area of Belo Horizonte (Brazil). The aspired profile of firms to participate in the research is IT companies with any size and no minimum employees with Exportation as one of the major field of expertise. They should have to be international or currently exporting. After online research / email and an approach via phone, the suitable firms were identified.

In case the company is interested to participate an online five-page interview with more detailed information regarding research process was sent out to prepare the firms to the interviews. After that, 5 employees were chosen from a big company (more than 150.00 employees around the world) located at Belo Horizonte to respond the draft survey aiming to validate the affirmatives (questions) to proceed to official survey. After sending the instrument of data collection, via electronic mail and direct link to access the online survey at Survey Monkey website, the sample of the study by the number of managers and employees who, in fact, responded to the search.

It should be noted that the data collection instrument was Survey Monkey, which facilitated the handling of the respondent. Subsequently, contact was done through Survey Monkey collectors, which sent the link by e-mail / LinkedIn to access survey. Beyond this, some contacts were made with some people who are working on IT export companies to share the survey internally. We could get respondents from around 15 different companies.

3.3 Data Collection

In accordance with SAMPIERE, COLLADO, and LUCIO (2006), the data collection is composed of three activities: to build an instrument or method of data collection, to apply the instrument for data collection and, finally, to prepare the records obtained for analyze.

As proposed by Martina et al. (2017), to estimate potential late response bias, we compared early and late respondents with respect to various characteristics, including number of full-time employees, years of exporting, annual sales volume, age of the venture, number of export markets, key informant self-reported competency evaluation indicators, and the construct measures.

The survey was conducted from November to December 2017. Data collection was done by online questionnaire consisting of structured questions, to obtain on the profile of the interviewees and to fulfill the objectives stipulated in this research. First, was checked if firms has exported in the previous year and after if their exports operations were regular (eligibility for participating in the study). Most of the companies are exporting services like IT support / process, Project Management, Software development and Business Analysis.

Then, it was established contact with the manager and employees from the companies. Then, an e-mail invitation has been sent to prospective subjects to explain the academic purpose of this dissertation, to ensure confidentiality of the responses, and to send the respective link to the survey. An e-mail reminder was sent one week later to non respondents and a final reminder 5 days after that.

The questionnaire was separated into six parts, as being shown on Appendix. The first one were prepared to obtain information about the respondent and the company and to identify OL artifacts and issues associated with employee's knowledge and learning; the second one, to attribute the degree's importance of these artifacts according to the employees / managers 'view; the third one, to ascertain the employee's / manager's perception regarding the product innovation, R&D, Business development and new technologies exploration; the fourth one has explored items like R&D on export activities, new products on new markets, customer needs and process automation; the fifth one (last) is only aimed to evaluate the intensity of Export performance and Firm internationalization.

Below, it is demonstrated the authors' affirmatives of each part of the questionnaire, starting from first part (**Appendix - II**).

- **First part (Organizational Learning):** (Noe and Schmitt, 1986); (Egan et al, 2004); (Nonaka, 1994); (Hsiu-Fen Lin, 2007) ; (Liao S, Wu C, 2009); (Noruzy et al. 2012); (Dose, 1997); (Hogan, 2014); (Kontoghiorghes, 2001); (Egan et al, 2004); (Khazanchi et al, 2007); (Mumford et al, 2002); (Watkins and Marsick, 2004).
- **Second part (Knowledge Management):** (Firestone and McElroy, 2004); (Stary, 2014); (Podsakoff et al, 1996); (Noruzy et al, 2012); (Frappaolo, C, 2006); (Jennex, 2005); (Baumgartel and Jeanpierre, 1972); (Egan et al, 2004); (Kuchinke, 1996); (Davenport and Klahr,1998); (Hsiu-Fen Lin, 2007).
- **Third part (Exploration Capability):** (Francis D, Bessant J, 2005); (Noruzy et al, 2012); (Hortinha et al, 2011); (Costa, 2015); (Cassiman and Golovko, 2011); (Garvin, 1993); (Sinkula,J. et al, 1997); (Chang S, Lee M, 2008); (Nonaka I, Takeuchi H, 1995); (Woodman RW, Sawyer JE, Griffin RW, 1993);
- **Fourth part (Exploitation Capability):** (Lages, Jap, and Griffith 2008; Lages, 2006; Lages and Montgomery,2004); (Hortinha et al, 2011); (Slater, Hult, and Olson 2007; Zhou, Yim, and Tse 2005); (Narver and Slater 1990; Olson, Slater, and Hult 2005); (Knight and Cavusgil, 2004); (Hulland's, 1999); (Kleinschmidt, De Brentani, and Salomo, 2007).
- **Fifht part (Export Performance):** (Zou, Taylor, and Osland, 1998); (Hortinha et al, 2011); (Crossan, Lane, and White 1999; Fiol and Lyles, 1985); (Teece, Pisano, and Shuen, 1997); (Zhou, Yim, and Tse ,2005); (Cho and Pucik, 2005; Filipescu et al, 2013); (Knight and Cavusgil, 2004).

Prior to the questionnaire's final application, a pre-test was performed (Appendix) to verify the clarity of the questions and the existence of unnecessary questions. The pre-test was performed in person by the researcher with managers of a big multinational company (200,000 employees around the world / 300 employees in Brazil), who were selected by accessibility. After that, the questionnaire underwent some to make it more comprehensible to respondents.

3.4 Statistical Treatment and Data Analysis

In order to evaluate the relationships between the constructs, the structural equations model was used using the PLS approach. The PLS (Partial Least Square) approach (Vinzi (2010)) was developed as an alternative to the traditional approach based on the co-variance matrix (CBSEM), being a technique that offers greater flexibility in data modeling since it does not it is necessary to satisfy some harder assumptions such as multivariate normality of the data, independence between observations and high sample size.

In the descriptive analysis of the characterization variables of the sample, the absolute and relative frequencies were used. In the description of the items of the constructs, position, central tendency and dispersion measures were used, one of the measures being used the bootstrap percentage interval with 95% confidence.

The process of modeling structural equations is divided into two parts: Model of Measurement and Structural Model. In order to verify the validity of the measurement model, that is, the ability of the set of indicators of each construct to accurately represent its respective concept, dimensional, reliability and convergent validity were evaluated.

In the evaluation of the convergent validity, the criterion of the Average Extracted Variance (AVE) proposed by Fornell and Larcker (1981) which represents the average percentage of shared variance between the latent construct and its items. This criterion guarantees convergent validity for AVE values above 50% Henseler, Ringle, and Sinkovics (2009) or 40% in the case of exploratory research (Nunnally, 1994).

Cronbach's alpha (A.C.) and Compound Reliability (C.C.) indicators (Chin (1998)) were used to verify reliability. According to Tenenhaus, Amato, and Esposito Vinzi (2004), the indicators A.C. and C.C. should present values above 0.70 for an indication of construct reliability, or values above 0.60 in the case of exploratory research (Hair, Black, Babin, Anderson, and Tatham, 2009).

For discriminant validity the criteria of Fornell and Larcker (1981) were used which guarantees discriminant validity when the extracted variance (AVE) of a construct is greater than the shared variance of this construct with the others. The cross-factor loading method (Barclay (1995)) was also used to verify discriminant validation. By the criterion of crossed factorial loads, the discriminant validity is reached when the factorial load of the item is higher than all its crossed factorial loads. To check the dimensionality of the constructs was used the criterion of Kaiser (1958) that returns the amount of dimensions of the construct.

The bootstrap method (Efron and Tibshirani, 1993) is widely used in making inferences when the probability distribution of the variable of interest is unknown. It should be noted that the items were recoded for the likert scale of agreement ranging from -1 (Totally Disagree) to 1 (Totally Agree). In the evaluation of the quality of fit of the model, R2 and GoF were used (Tenenhaus et al. (2004)). R2 represents on a scale of 0% to 100% how much the independent constructs explain the dependents, and, in general, values less than 25% represent weak explanatory capacity, values between 25% and 50% indicate moderate explanatory capacity and values above 50% show substantial explanatory capacity (Hair Jr, Hult, Ringle, and Sarstedt, 2014).

The GoF is a geometric mean of the AVEs of the constructs and R2 of the model and also varies from 0% to 100%. The GoF in PLS can not discriminate valid and invalid models, nor does it apply to models with formative constructs (Henseler and Sarstedt, 2012), it only allows a synthesis of AVEs and R2 of the model in a single statistic, and may be useful for future comparisons of adhesion of different samples to the model.

The software used in the analyzes was R (version 3.3.2).

3.5 Measurement Model (Outer Model)

In the analysis of the measurement model the convergent validity, the discriminant validity and the reliability of the constructs are verified. Convergent validity ensures that the indicators of a construct are correlated enough to measure the latent concept. The discriminant validity verifies if the constructs measure different aspects of the phenomenon of interest effectively. Reliability reveals the consistency of measurements that they intend to measure.

In order to test the convergent validity of the constructs, the criterion proposed by Fornell and Larcker (1981). In order to measure the reliability of the constructs, the Cronbach's alpha (A.C.) and Compound reliability (C.C.) indicators were used again. For discriminant validity we used the criterion of Fornell and Larcker (1981), which guarantees the discriminant validity when the extracted variance (AVE) of a construct is greater than the shared variance of this construct with the others. The cross-factor loading method (Barclay, 1995) was also used to verify discriminant validation. By the criterion of crossed factorial loads, the discriminant validity is reached when the factorial load of the item is higher than all its crossed factorial loads.

In addition, Kaiser's criterion was used to verify the dimensionality of the constructs. According to Hair et al. (2009), items with factor loads less than 0.50 should be eliminated, since they do not contribute significantly to the formation of the latent variable, impairing the scope of the basic assumptions for the validity and quality of the indicators created to represent the concept of interest.

In addition, the Bootstrap method was used to calculate the confidence intervals for the weights of the measurement model and the coefficients of the structural model, providing information about the variability of the estimated parameters, thus providing an important validation of the results. The bootstrap method (Efron and Tibshirani, 1993) is widely used in making inferences when the probability distribution of the variable of interest is unknown.

3.6 Structural Model (Inner Model)

In accordance with Hair et al. (2009) to SEM (Structural Equations Modeling) is a continuation of some multivariate analysis techniques, mainly the multiple regression analysis and factorial analysis. What differs from the other multivariate techniques is that the SEM allows to examine several dependency relations at the same time, while the other techniques are able to verify and examine a single relationship between the variables at a time.

The measurement model and regression model were performed using the PLS (Partial Least Square) method. Structural Equation (SEM) models are very popular in many disciplines, with the PLS approach being an alternative to the traditional approach based on covariance.

The PLS approach has been referred to as a smooth modeling technique with minimal demand when considering measurement scales, sample size and residual distributions (Monecke and Leisch, 2012).

To verify the quality of the adjustments, R2 and GoF were used (Tenenhaus et al. (2004)). R2 represents on a scale of 0% to 100% how much the independent constructs explain the dependents, and, in general, values less than 25% represent weak explanatory capacity, values between 25% and 50% indicate moderate explanatory capacity and values above 50% show substantial explanatory capacity (Hair Jr et al., 2014).

The GoF is a geometric average of the AVEs of the constructs and R2 of the model and also varies from 0% to 100%. The GoF in PLS does not have the ability to discriminate valid and invalid models, nor it applies itself models with formative constructs (Henseler and Sarstedt, 2012), it only allows a synthesis of the AVEs and R2 of the model in a single statistic to be useful for future comparisons of adherence of different samples to the model.

4 DISCUSSION AND RESULTS

The database consisted of 37 variables, 3 of which characterization variables and 34 variables related to 5 constructs (Organizational Learning, Knowledge Management, Exploration Capacity, Exploitation Capacity and Export Performance). The survey was performed with 109 individuals and no missing data were observed. The Figure 10 illustrates the results presented in Table 4.

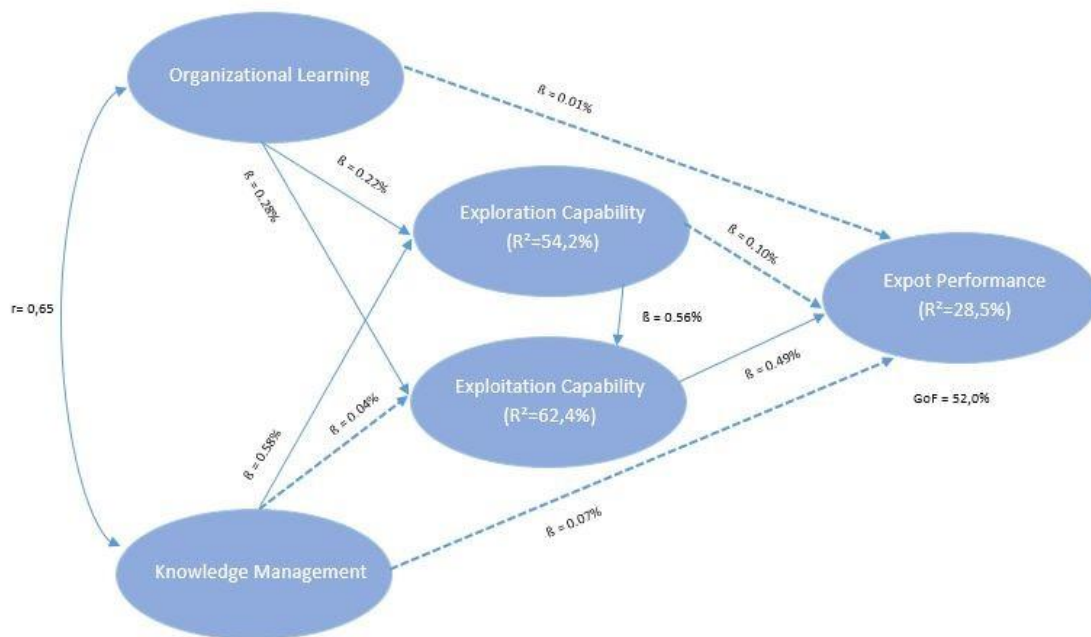


Figure 10 – Structural Model
Source: Made by Author

Endogenous	Exogenous	β	E.P. (β)	I.C.-95%	Valor-p	R ²
Exploration Capability	Organizational Learning	0,22	0,09	[0,06; 0,40]	0,014	54,2%
	Knowledge Management	0,58	0,09	[0,40; 0,74]	0,000	
Exploitation Capability	Organizational Learning	0,28	0,08	[0,12; 0,46]	0,001	62,4%
	Knowledge Management	0,04	0,09	[-0,17; 0,22]	0,670	
Export Performance	Organizational Learning	0,01	0,12	[-0,25; 0,26]	0,933	28,5%
	Knowledge Management	-0,07	0,13	[-0,35; 0,19]	0,590	
	Exploration Capability	0,10	0,14	[-0,16; 0,38]	0,490	
	Exploitation Capability	0,49	0,14	[0,26; 0,75]	0,000	

¹ Standard Error; ² Bootstrap Interval; GoF = 52,0%.

Table 4 – Structural Model
Source: Made by Author

It should also be noted that the model presented a GoF of 52.0% (Figure 10) and, in addition, the bootstrap confidence intervals were in agreement with the results found via p-value, thus evidencing a greater validity of the presented results.

4.1 Descriptive Analysis

Table 5 presents a descriptive analysis from the characterization variables of the individual. Thus, it can be observed that:

- Most of the individuals (31.2%) worked as Analyst.
- Most of the individuals (45.0%) worked in the area of Information Technology.
- The number of employees per company presented a high variability (D.P. 73783,87), registering an average of 34362,18 per company.

	Variables	N	%
Job Role	Analyst	34	31,2%
	Consultant	8	7,3%
	Manager	16	14,7%
	Others	51	46,8%
Occupation Area	Consulting/Development	19	17,4%
	Engineering/Management	11	10,1%
	IT	49	45,0%
	Others	30	27,5%
Employee's Number (Average) - (D.P.)		34362,18	73783,87

Table 5 – Descriptive analysis of characterization variables

Source: Made by Author

As shown on Table 6, the employee's number of company respondent's, an average of 34362,18 employees per company is observed. Related to to their role in companies, it is observed that most of the (46.8%) were categorized as "others", followed by Analysts (31,2%), Managers (14.7%) and Consultants (7.3%).

Regarding Occupation Area, most of respondents (45,0%) are categorized as IT, followed by Others (27,5%), Consulting / Development (17,4%) and Engineering / Management (10,1%).

4.2 Outlier's Analysis

On the present research, no value was found outside the range of the their respective variable, thus not evidencing the type of outlier related to error in the tabulation of the data. In addition, we sought to verify the existence of outliers univariate, which consists in the verification of some divergent response based on each of the variables of the model, and of multivariate, that present a pattern of different answer considering all the variables at the same time.

4.3 Construct Variables Description

The analysis was intended to identify, confront and describe KM / OL / Ambidexterity and how they contribute to the export performance on IT companies was performed using 37 variables related to the constrcuts should respond at the levels from 1 to 7 of Likert's scale. Remember that the items were recoded to -1 (I Totally Disagree) to 1 (Totally Agree). The Tables 6 presents the variables and Table 7 presents a descriptive analysis of the variables of the constructs. Therefore, it should be noted that:

- **On the Organizational Learning construct** individuals tended to agree on all items. There was no significant difference between the items, since the confidence intervals overlap.
- **On the Knowledge Management construct** individuals tended to agree with items KM2 ("Our organization maintains ways to create new knowledge"), KM3 ("Our organization retains in an accessible manner the important knowledge identified"), KM5 ("Our organization facilitates the sharing of knowledge internally ") and KM7 ("Our organization selectively applies knowledge with broadness in the necessary areas ") and did not show a tendency of agreement in the other items. There was no significant difference between the items, since the confidence intervals overlap.
- **On the Exploration Capacity construct**, the individuals did not show a tendency of agreement in item ER2 ("In our company the R&D challenges are understood by the different areas") and tended to agree with the other items. There was no significant difference between the items, since the confidence intervals overlap.

Constructs	Items	Item Description
Organizational Learning	OL1	Our employees are regularly trained to carry out the work.
	OL2	In our organization tacit knowledge evolves through communication between people and teams.
	OL3	Our employees demonstrate understanding of the standards to coordinate and carry out the work.
	OL4	Our employees demonstrate competences to interpret and correct the effects of their work.
	OL5	Context changes influence the knowledge our employees use at work.
	OL6	Changes in the level of skills of our employees are evaluated.
	OL7	Our organization often introduces innovations that improve performance in business areas.
Knowledge Management	KM1	Our organization periodically identifies the main knowledge it holds.
	KM2	Our organization maintains ways to create new knowledge.
	KM3	Our organization retains in an accessible way the important knowledge identified.
	KM4	Our organization maintains structured activities to capture knowledge from other external sources.
	KM5	Our organization facilitates knowledge sharing internally.
	KM6	Our organization provides formally lessons learned from the actions it performs.
	KM7	Our organization selectively applies the knowledge to the necessary areas.
Exploration Capability	ER1	Our company is recognized as an incentive for the innovation of its products.
	ER2	In our company the R & D challenges are understood by the different areas.
	ER3	R & D personnel support the Business Development process.
	ER4	Our company seeks out new technological ideas thinking "out of the box".
	ER5	Our company seeks creative ways to meet the needs of our customers.
	ER6	Our company seeks to create products or services that are innovative to customers.
	ER7	Our company bases our success on its ability to exploit new technologies.
Exploitation Capability	ET1	In our company the relevance of Research and Development in its export activities is low.
	ET2	In our company the forms of action proposed by the Business Development staff are accepted by the Research and Development staff.
	ET3	To what extent our company enters with current products well accepted in new markets.
	ET4	In our company we constantly monitor the satisfaction of existing customers.
	ET5	In our company we increase the level of automation in our operations.
	ET6	At our company we continually improve the reliability of our products and services.
	ET7	In our company the area of guarantee and customer service is structured for export.
Exportation Performance	EP1	In our company, export performance is regularly evaluated.
	EP2	In our company we had to change the business model to meet international customers (export).
	EP3	Export performance indicates the knowledge acquired throughout the organization structure.
	EP4	The way the information is used in our company is significantly and positively related to export performance measures.
	EP5	In our company the activities of Research and Development is important for export activities.
	EP6	In our company one of the first steps towards internationalization is export.

Table 6 – Variables Research Relations
Source: Made by Author

Constructs	Items	Average	D.P.	I.C.-95%
Organizational Learning	AO1	0,39	0,48	[0,30; 0,47]
	AO2	0,42	0,41	[0,34; 0,50]
	AO3	0,33	0,45	[0,23; 0,41]
	AO4	0,35	0,43	[0,27; 0,43]
	AO5	0,48	0,40	[0,40; 0,55]
	AO6	0,20	0,56	[0,10; 0,31]
	AO7	0,18	0,60	[0,07; 0,29]
Knowledge Management	GC1	0,00	0,55	[-0,11; 0,10]
	GC2	0,15	0,53	[0,06; 0,25]
	GC3	0,11	0,56	[0,00; 0,21]
	GC4	-0,01	0,57	[-0,10; 0,10]
	GC5	0,26	0,58	[0,15; 0,37]
	GC6	-0,07	0,66	[-0,20; 0,04]
	GC7	0,10	0,53	[0,00; 0,19]
Exploration Capability	CR1	0,21	0,58	[0,10; 0,32]
	CR2	-0,03	0,53	[-0,12; 0,07]
	CR3	0,03	0,52	[-0,06; 0,14]
	CR4	0,18	0,60	[0,07; 0,29]
	CR5	0,29	0,52	[0,19; 0,39]
	CR6	0,33	0,57	[0,23; 0,44]
	CR7	0,20	0,56	[0,10; 0,29]
Exploitation Capability	CT1	0,12	0,57	[0,00; 0,22]
	CT2	0,06	0,46	[-0,02; 0,15]
	CT3	0,23	0,47	[0,14; 0,32]
	CT4	0,42	0,57	[0,32; 0,53]
	CT5	0,35	0,50	[0,24; 0,44]
	CT6	0,41	0,41	[0,33; 0,48]
	CT7	-0,09	0,52	[-0,18; 0,01]
Export Performance	EP1	-0,05	0,48	[-0,14; 0,04]
	EP2	-0,07	0,51	[-0,17; 0,02]
	EP3	0,08	0,50	[-0,02; 0,17]
	EP4	-0,12	0,47	[-0,20; -0,03]
	EP5	0,05	0,48	[-0,04; 0,14]
	EP6	-0,09	0,52	[-0,18; 0,01]

[†] Bootstrap Interval

Table 7 – Descriptive analysis of the construct variables
Source: Made by Author

- On the construct Exploitation Capacity the individuals did not show a tendency of agreement in item ET7 ("In our company the area of guarantee and services to the client is structured for the export") and tended to agree with the other items. There was no significant difference between the items, since the confidence intervals overlap.
- On the Export Performance construct, individuals tended to disagree with item EP4 ("The way information is used in our company is related to export performance measures") and did not present a tendency of agreement in the other items. There was no significant difference between the items, since the confidence intervals overlap.

The Figure 11 (below) illustrates the information already seen in the table 8.

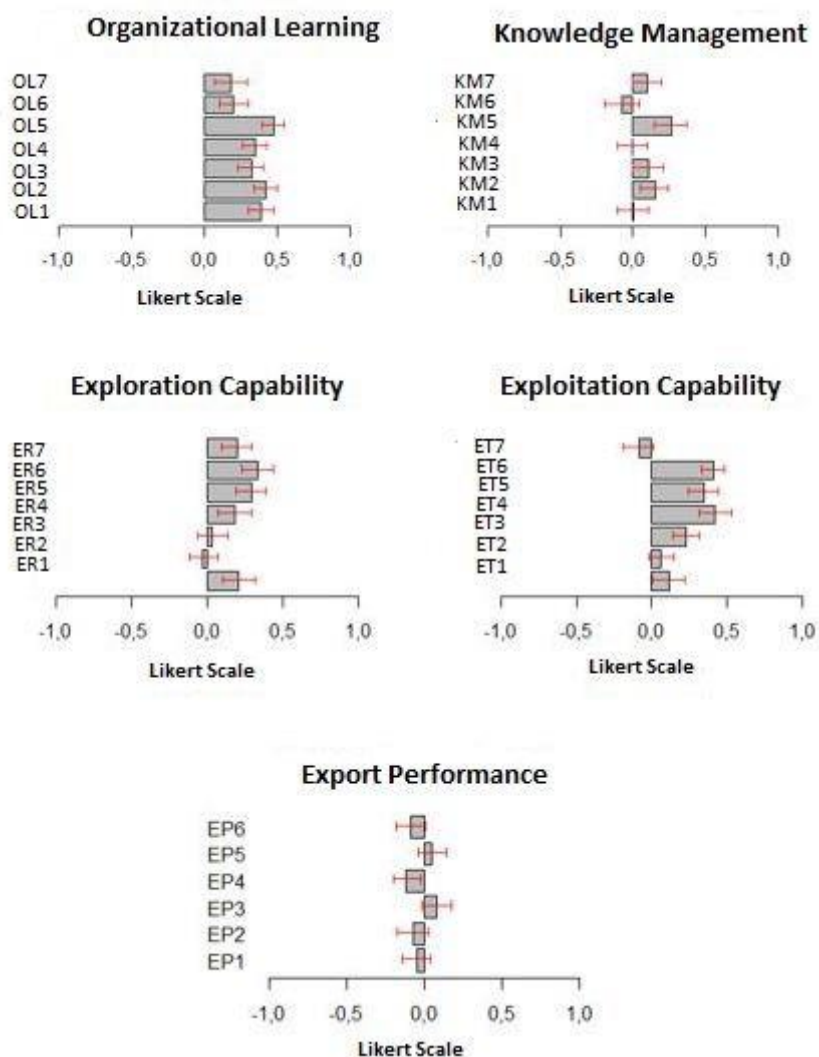


Figure 11 – Confidence intervals to the construct items

Source: Made by Author

4.4 Measurement Model Analysis (Outer Model)

Table 8 shows the weights, factor loads and commonalities of the measurement model. In this way, it can be emphasized that:

- The item OL5 ("Context changes influence the knowledge that our employees use at work") of the Organizational Learning construct presented a load lower than 0.50 and was removed from the analyzes.
- Item ET1 ("In our company the relevance of Research and Development in export activities is low") of the Construct Capacity construct presented a factorial load less than 0.50 and was removed from the analysis.

- In the final model, all items had factorial loads above 0.50

Constructs	Items	Initial model				Final model			
		weight(α)	I.C.-95% ¹	C.F. ²	Com. ³	weight(α)	I.C.-95% ¹	C.F. ²	Com. ³
Organizational Learning	OL1	0,28	[0,20; 0,36]	0,75	0,57	0,29	[0,22; 0,36]	0,76	0,58
	OL2	0,18	[0,08; 0,27]	0,54	0,29	0,18	[0,08; 0,28]	0,55	0,31
	OL3	0,22	[0,13; 0,27]	0,74	0,54	0,22	[0,15; 0,29]	0,74	0,55
	OL4	0,19	[0,08; 0,28]	0,60	0,36	0,20	[0,09; 0,29]	0,58	0,34
	OL5	0,12	[0,00; 0,23]	0,32	0,10	-	-	-	-
	OL6	0,26	[0,17; 0,32]	0,70	0,49	0,26	[0,19; 0,34]	0,71	0,50
	OL7	0,27	[0,19; 0,36]	0,76	0,58	0,27	[0,19; 0,35]	0,77	0,59
Knowledge Management	KM1	0,15	[0,08; 0,19]	0,69	0,48	0,15	[0,08; 0,19]	0,70	0,48
	KM2	0,20	[0,17; 0,24]	0,85	0,73	0,20	[0,17; 0,24]	0,85	0,73
	KM3	0,19	[0,16; 0,23]	0,82	0,67	0,19	[0,16; 0,24]	0,82	0,67
	KM4	0,19	[0,15; 0,23]	0,77	0,60	0,19	[0,15; 0,23]	0,77	0,60
	KM5	0,18	[0,14; 0,23]	0,80	0,65	0,18	[0,14; 0,23]	0,81	0,65
	KM6	0,20	[0,16; 0,25]	0,78	0,60	0,20	[0,16; 0,25]	0,78	0,60
	KM7	0,17	[0,12; 0,21]	0,75	0,56	0,17	[0,11; 0,20]	0,75	0,56
Exploration Capability	ER1	0,19	[0,16; 0,22]	0,84	0,71	0,19	[0,16; 0,22]	0,84	0,71
	ER2	0,16	[0,14; 0,19]	0,77	0,59	0,16	[0,13; 0,19]	0,77	0,59
	ER3	0,17	[0,14; 0,20]	0,68	0,47	0,17	[0,14; 0,20]	0,68	0,47
	ER4	0,17	[0,15; 0,19]	0,81	0,66	0,17	[0,15; 0,19]	0,81	0,66
	ER5	0,19	[0,16; 0,21]	0,86	0,74	0,19	[0,16; 0,22]	0,86	0,74
	ER6	0,20	[0,18; 0,23]	0,86	0,75	0,20	[0,18; 0,23]	0,86	0,75
	ER7	0,17	[0,14; 0,20]	0,78	0,61	0,17	[0,14; 0,20]	0,78	0,62
Exploitation Capability	ET1	-0,04	[-0,15; 0,07]	-0,09	0,01	-	-	-	-
	ET2	0,23	[0,17; 0,28]	0,65	0,43	0,23	[0,17; 0,29]	0,66	0,43
	ET3	0,20	[0,12; 0,26]	0,65	0,42	0,20	[0,12; 0,26]	0,65	0,43
	ET4	0,23	[0,18; 0,29]	0,67	0,45	0,24	[0,18; 0,29]	0,67	0,45
	ET5	0,27	[0,22; 0,32]	0,75	0,56	0,27	[0,22; 0,32]	0,76	0,57
	ET6	0,28	[0,23; 0,35]	0,76	0,57	0,29	[0,23; 0,35]	0,75	0,57
	ET7	0,22	[0,17; 0,29]	0,68	0,46	0,22	[0,17; 0,28]	0,67	0,45
Export Performance	EP1	0,32	[0,22; 0,47]	0,78	0,60	0,32	[0,22; 0,48]	0,78	0,61
	EP2	0,20	[0,10; 0,28]	0,74	0,55	0,20	[0,09; 0,29]	0,74	0,55
	EP3	0,16	[0,01; 0,28]	0,71	0,50	0,16	[0,01; 0,28]	0,71	0,50
	EP4	0,20	[0,09; 0,30]	0,69	0,48	0,20	[0,09; 0,29]	0,69	0,47
	EP5	0,22	[0,12; 0,30]	0,80	0,64	0,23	[0,12; 0,31]	0,80	0,65
	EP6	0,23	[0,14; 0,32]	0,74	0,55	0,23	[0,13; 0,32]	0,74	0,55

¹ bootstrap Interval; ² Factorial load; ³ Communality.

Source: Made by Author

Table 8 – Measurement model

- In the final model, through the confidence intervals (CI - 95%) it can be concluded that all weights were significant, thus evidencing the importance of all items for the formation of indicators that represent the constructs.

Tables 9 and 10 presents the result of the analyses of the convergent validity, discriminant validity, reliability and dimensionality of the constructs of the measurement model. Therefore, it is concluded that:

Constructs	Items	A.C.	C.C.	Dim.	AVE	VCM
Organizational Learning	6	0,78	0,85	1	0,48	0,42
Knowledge Management	7	0,89	0,92	1	0,61	0,52
Exploration Capability	7	0,91	0,93	1	0,65	0,57
Exploitation Capability	6	0,79	0,85	1	0,48	0,57
Export Performance	6	0,84	0,88	1	0,56	0,28

¹ Cronbach's alpha, ² Compound Reliability, ³ Dimensionality, ⁴ Average Extracted Variance; ⁵ Maximum Shared Variance.

Table 9 – Measurement model validation

Source: Made by Author

- All constructs reached the required levels of reliability, since the reliability indexes A.C. and C.C. were higher than 0.70.
- By the Kaiser criterion, all constructs were one-dimensional.
- AVE values were higher than 0.40 in all constructs, thus showing the convergent validation of the same.

According to the criteria of Fornell and Larcker (1981), there was no discriminant validation in the Exploitation Capacity construct, since the maximum shared variance was greater than its respective AVE. However, by the cross-factor loading method (Barclay, 1995) there was discriminant validation in all constructs, since the factorial loads of the items were higher than their respective maximum cross-factor loads.

4.5 Structural Model Analysis (Inner Model)

Table 10 presents the results of the structural model. Thus, it can be concluded that:

Regarding to Exploration Capability:

- There was a significant (p -value = 0.014) and positive (β = 0.22 [0.06; 0.40]) influence of Organizational Learning on Exploration Capability, so the greater the Organizational Learning, the greater it tends to be the Exploration Capacity.

- There was a significant (p -value = 0.000) and positive (β = 0.58 [0.40; 0.74]) influence of Knowledge Management on Exploration Capability, thus, the greater the knowledge management, the greater the tendency be the Exploration Capacity.

· Organizational Learning and Knowledge Management were able to explain 54.2% of the variability of Exploration Capability.

Regarding to Exploitation Capability:

· There was a significant (p -value = 0.001) and positive (β = 0.28 [0.12; 0.46]) influence of Organizational Learning on Exploitation Capacity, so the greater the Organizational Learning, the greater it tends to be the Exploitation Capacity.

Constructs	Items	C.F. ¹	Máx(C.F.C.) ²
Organizational Learning	OL1	0,74	0,52
	OL2	0,50	0,34
	OL3	0,77	0,40
	OL4	0,63	0,36
	OL6	0,70	0,53
	OL7	0,76	0,66
	Knowledge Management	KM1	0,70
KM2		0,84	0,64
KM3		0,81	0,63
KM4		0,76	0,60
KM5		0,82	0,54
KM6		0,80	0,59
KM7		0,77	0,49
Exploration Capability	ER1	0,83	0,61
	ER2	0,80	0,57
	ER3	0,65	0,61
	ER4	0,80	0,58
	ER5	0,85	0,66
	ER6	0,86	0,67
	ER7	0,77	0,60
Exploitation Capability	ET2	0,67	0,52
	ET3	0,63	0,51
	ET4	0,63	0,50
	ET5	0,76	0,58
	ET6	0,73	0,61
	ET7	0,68	0,58
	Export Performance	EP1	0,77
EP2		0,73	0,31
EP3		0,71	0,28
EP4		0,73	0,31
EP5		0,78	0,38
EP6		0,75	0,39

¹ Factorial Load; ² Cross Factorial Load.

Table 10 – Cross-factorial loadings - Measurement model

Source: Made by Author

- There was no significant influence (value- p = 0.670) of Knowledge Management on Exploitation Capacity.
- There was a significant (p -value = 0.000) and positive (β = 0.56 [0.40, 0.72]) influence of the Exploration Capacity on the Exploitation Capacity, so the higher the Exploration Capacity to be the Exploitation Capacity.

- Organizational Learning, Knowledge Management and Exploration Capacity were able to explain 62.4% of the variability of Exploitation Capacity.

Regarding to Export Performance:

- There was no significant influence (p-value = 0.933) on Organizational Learning on Export Performance.
- There was no significant influence (value-p = 0.590) from the Export Performance Knowledge Management.
- There was no significant influence (p-value = 0.490) of the Exploration Capability on the Export Performance.
- There was a significant (p-value = 0.000) and positive ($\beta = 0.49$ [0.26, 0.75]) influence of the Exploitation Capability on the Export Performance, so the higher the Exploitation Capability, the greater the be the Performance of the Export.
- Organizational Learning, Knowledge Management, Exploration Capability and Exploitation Capability were able to account for 28.5% of the Export Performance variability.

The results of the study indicate that Organizational Learning is positively correlated with Knowledge Management ($r = 0,65$). It was also verified that there is a positive effect of Organizational Learning on Exploration and Exploitation Capability (P-value = 0,014) and ($\beta = 0,22$ [0,06; 0,40]); (P-value = 0,001) and ($\beta = 0,28$ [0,12; 0,46]). Was also observed that there is a positive effect of Knowledge Management on Exploration Capability (Value-p = 0,000) and ($\beta = 0,58$ [0,40; 0,74]). Another observation is that there is a positive effect of the Exploration Capability on the Exploitation Capability (P-value = 0,000) and ($\beta = 0,56$ [0,40; 0,72]). Lastly, there is a positive effect of the Exploitation Capability on the Export Performance (P-value = 0,000) and ($\beta = 0,49$ [0,26; 0,75]). In this way, the above cited observations, confirms the research hypothesis, as presented in the Table 11.

In general, by only relating Exploitation capability and Export Performance, both are related, as demonstrated in Table 11. The other constructs did not present a significant trend and also has not a positive effect on the Export Performance.

Hypothesis	Hypothesis Description	Verification
H1	Organizational Learning is positively correlated with Knowledge Management.	Confirmed
H2	There is a positive effect of Organizational Learning on Export Performance.	Not Confirmed
H3	There is a positive effect of Knowledge Management on Export Performance.	Not Confirmed
H4	There is a positive effect of Organizational Learning on Exploration Capability.	Confirmed
H5	There is a positive effect of Organizational Learning on Exploitation Capability.	Confirmed
H6	There is a positive effect of Knowledge Management on Exploration Capability.	Confirmed
H7	There is a positive effect of Knowledge Management on Exploitation Capability.	Not Confirmed
H8	There is a positive effect of the Exploration Capability on the Exploitation Capability.	Confirmed
H9	There is a positive effect of the Exploration Capability on the Export Performance.	Not Confirmed
H10	There is a positive effect of the Exploitation Capability on the Export Performance.	Confirmed

Table 11 – Study Hypothesis Verification

Source: Made by Author

Analyzing the above considerations, it is not fully confirmed that most of constructs contribute to the Export Performance into IT companies.

5 CONCLUSION

This dissertation had as general objective to analyze the impacts of the relationship of Organizational Learning and Knowledge Management with the export performance in the metropolitan region of Belo Horizonte in IT companies.

As specific objectives, we sought: Assess which ambidexterity forms and levels are further addressed in the literature as mechanisms for exploring and exploiting on IT organizations; To analyze how the exploration and exploitation process are most addressed on IT companies; To analyze what is the influence of KM and OL on Export Performance; Identify what is the connection between KM and OL. To achieve these objectives, a survey was conducted with 109 employees / managers from IT companies at Belo Horizonte.

The results showed that Organizational Learning is positively correlated with Knowledge Management; There is a positive effect of Organizational Learning in the Exploration Capability; There is a positive effect of Organizational Learning in the Exploitation Capability and also there is a positive effect of Knowledge Management on Exploration Capability. It was possible to confirm 60% of the suggested hypothesis. Few scenarios could not be confirmed as according employees / managers, there was no significant influence on Organizational Learning on Export Performance, there was no significant influence from the Export Performance on Knowledge Management, there was no significant influence of Exploration Capability on the Export Performance and also there was no significant influence of Knowledge Management on Exploitation Capacity.

The research raises important questions, since it has shown that the respondents tend to agree with the importance of Organizational Learning and recognize the influence of this in the Knowledge management within the activities of the company, but they disagree in some points, for example, as regards the questions concerning on Export Performance, with respect to the influence that this construct suffers from Organizational Learning and Knowledge Management. This shows that most of employees / managers use Knowledge Management in some way, but in the way they understand, as they may have little knowledge and clarity as to the terms used in KM / OL / Export Performance or companies are in the development cycle in which do not need to use them.

Was possible to identify that on the Organizational Learning construct, the employees / managers tended to agree in all items. Regarding the Knowledge Management construct they tended to agree with items KM2 ("Our organization maintains ways to create new knowledge"), KM3 ("Our organization retains in an accessible manner the important knowledge identified"), KM5 ("Our organization facilitates the sharing of knowledge internally") and KM7 ("Our organization selectively applies knowledge with broadness in the necessary areas "), showing that companies are worth creating, sharing and applying the knowledge internally. On the Exploration Capacity construct, the individuals did not show a tendency of agreement in item ER2 ("In our company the R&D challenges are understood by the different areas"), but agree with all the others.

This shows that respondents agree that companies are thinking "out of the box", incentives the products innovation, the R&D helps Development process and create innovative ways to meet customer expectations. Regarding Exploitation Capability the individuals did not show a tendency of agreement only with item ET7 ("In our company the area of guarantee and services to the client is structured for the export") and tended to agree with the other items. This shows that they only disagree that guarantee and customer service is not structured to export.

Regarding Export performance, it was only possible to confirm that Exploitation capability has a positive effect on Export Performance, showing that Export Performance is not directly influenced by Knowledge Management, Organizational Learning and Exploration Capability.

In this way, it can be seen that, at the end, the general research question and the general and specific objectives were answered as well as most of the hypothesis were tested and confirmed.

5.1 Limitations and recommendations for future research

The definition of the sample can be a limiting factor, since these are companies located only in the metropolitan area of Belo Horizonte and with a small sample analyzed.

Another limiting factor concerns the performance evaluation, since it was measured in a subjective way, according to the employees / managers perception.

It is assumed that possible biases could be present and have influenced the responses, which may sometimes be distinct from reality. Thus, the questionnaire also limits the validity of the results at a certain point, as there may be other variables that influence the performance of involved companies and were not considered. Unfortunately was not possible to get the Foreign Sales and Total Sales information from the companies those participated of questionnaire, to have a better measurement of exportation quality / performance.

The current study also did not differentiate firms by sub-sector. It would be interesting to have a sectorial study that analyzed the managerial practices and the behavior found in the different sectors to be compared. Beyond this, the companies did not authorized to have too much further information of them to be shown on this study, then there was a restriction.

For future research, maybe as doctorate degree it is suggested to increase the sample of companies and that the survey reach companies outside the metropolitan area of Belo Horizonte, to compare in more detail the relationship of organizational learning and knowledge management to export performance, expanding the current model. In addition, there is a need to change the relationship of Technology companies with the export performance and the improvement of the services offered by these technology companies.

It is necessary to broaden the view of managers, since the organizational learning and knowledge management can also contribute to business decision-making processes. Professionals and technology companies together must provide their customers with more quality of service by providing all learning and knowledge internally, which will optimize management and, consequently, business performance.

In addition, it is hoped that the present study may contribute to the development of technology exporting companies, for their growth and longevity in the market.

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APPENDIX I - QUESTIONNAIRE

QUESTIONNAIRE PART 1 - PRESENTATION

Universidade FUMEC

Faculdade de Ciências Empresariais

Programa de Pós-Graduação em Sistemas de Informação e Gestão do Conhecimento

ORGANIZATIONAL LEARNING ON EXPORT PERFORMANCE: KNOWLEDGE MANAGEMENT AND AMBIDESTERITY RELATIONS

Eu, Rodrigo Lopes Sibalszky Silva, convido você a participar de uma pesquisa de mestrado sobre as relações Ambidestria e Gestão do conhecimento na aprendizagem organizacional e desempenho de exportação, que está sendo realizada por mim, sob orientação do professor Dr. Ronaldo Darwich Camilo, no âmbito do Programa de Mestrado em Sistemas de Informação e Gestão do Conhecimento da Universidade FUMEC (Fundação Mineira de Educação e Cultura). Sabe-se que a ética no desenvolvimento de pesquisas científicas, bem como a legislação vigente, garante o caráter confidencial das informações coletadas, as quais devem se destinar exclusivamente para a realização da pesquisa. Portanto, as informações aqui coletadas são de caráter sigiloso e confidencial.

Coloco-me à disposição para esclarecimentos: sibalszky@gmail.com

Current job Function: _____

Company employee number: _____

Job Area: _____

The questionnaire is presented on the likert scale (1 to 7). Below is the legend to fill in according to the understanding of the question to be filled.

1 – *Totally Disagree*

2 – *Strongly Disagree*

3 – *Partially Disagree*

4 – *Neutral*

5 – *Partially Agree*

6 – *Strongly Agree*

7 – *Totally Agree*

QUESTIONNAIRE PART II – ORGANIZATIONAL LEARNING

1. Our employees are regularly trained to carry out the work.
1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/>
2. In our organization tacit knowledge evolves through communication between people and teams.
1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/>
3. Our employees demonstrate understanding of the standards to coordinate and carry out the work.
1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/>
4. Our employees demonstrate competences to interpret and correct the effects of their work.
1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/>
5. Context changes influence the knowledge our employees use at work.
1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/>
6. Changes in the level of skills of our employees are evaluated.
1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/>
7. Our organization often introduces innovations that improve performance in business areas.
1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/>

QUESTIONNAIRE PART III – KNOWLEDGE MANAGEMENT

8. Our organization periodically identifies the main knowledge it holds.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
9. Our organization maintains ways to create new knowledge.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
10. Our organization retains in an accessible way the important knowledge identified.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
11. Our organization maintains structured activities to capture knowledge from other external sources.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
12. Our organization facilitates knowledge sharing internally.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
13. Our organization provides formally lessons learned from the actions it performs.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
14. Our organization selectively applies the knowledge to the necessary areas.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>

QUESTIONNAIRE PART IV – EXPLORATION CAPABILITY

15. Our company is recognized as an incentive for the innovation of its products.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
16. In our company the R & D challenges are understood by the different areas.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
17. R & D personnel support the Business Development process.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
18. Our company seeks out new technological ideas thinking "out of the box".													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
19. Our company seeks creative ways to meet the needs of our customers.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
20. Our company seeks to create products or services that are innovative to customers.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
21. Our company bases our success on its ability to exploit new technologies.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>

QUESTIONNAIRE PART V – EXPLOITATION CAPABILITY

22. In our company the relevance of Research and Development in its export activities is low.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
23. In our company the forms of action proposed by the Business Development staff are accepted by the Research and Development staff.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
24. To what extent our company enters with current products well accepted in new markets.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
25. In our company we constantly monitor the satisfaction of existing customers.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
26. In our company we increase the level of automation in our operations.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
27. At our company we continually improve the reliability of our products and services.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>
28. In our company the area of guarantee and customer service is structured for export.													
1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input type="checkbox"/>	6	<input type="checkbox"/>	7	<input type="checkbox"/>

APPENDIX II – LITERATURE SUPPORT

Construct	Source	Hypothesis	Indicators (Questionnaire Affirmatives)
Organizational Learning	OL	Ho,1: OL \leftrightarrow KM Ho,2: OL \rightarrow EP Ho,4: OL \rightarrow ER Ho,5: OL \rightarrow ET	<ol style="list-style-type: none"> 1. Our employees are regularly trained to carry out the work. 2. In our organization tacit knowledge evolves through communication between people and teams. 3. Our employees demonstrate understanding of the standards to coordinate and carry out the work. 4. Our employees demonstrate competences to interpret and correct the effects of their work. 5. Context changes influence the knowledge our employees use at work. 6. Changes in the level of skills of our employees are evaluated. 7. Our organization often introduces innovations that improve performance in business areas.
Knowledge Management	KM	Ho,3: KM \rightarrow EP Ho,6: KM \rightarrow ET Ho,7: KM \rightarrow ER	<ol style="list-style-type: none"> 1. Our organization periodically identifies the main knowledge it holds. 2. Our organization maintains ways to create new knowledge. 3. Our organization retains in an accessible way the important knowledge identified. 4. Our organization maintains structured activities to capture knowledge from other external sources. 5. Our organization facilitates knowledge sharing internally. 6. Our organization provides formally lessons learned from the actions it performs. 7. Our organization selectively applies the knowledge to the necessary areas.

Construct	Source	Hypothesis	Indicators (Questionnaire Affirmatives)
Exploration Capability	ER	Ho,8: ER \rightarrow ET Ho,9: ER \rightarrow EP	<ol style="list-style-type: none"> 1. Our company is recognized as an incentive for the innovation of its products. 2. In our company the R & D challenges are understood by the different areas. 3. R & D personnel support the Business Development process. 4. Our company seeks out new technological ideas thinking "out of the box". 5. Our company seeks creative ways to meet the needs of our customers. 6. Our company seeks to create products or services that are innovative to customers. 7. Our company bases our success on its ability to exploit new technologies.
Exploitation Capability	ET	Ho,10: ET \rightarrow EP	<ol style="list-style-type: none"> 1. In our company the relevance of Research and Development in its export activities is low. 2. In our company the forms of action proposed by the Business Development staff are accepted by the Research and Development staff. 3. To what extent our company enters with current products well accepted in new markets. 4. In our company we constantly monitor the satisfaction of existing customers. 5. In our company we increase the level of automation in our operations. 6. At our company we continually improve the reliability of our products and services. 7. In our company the area of guarantee and customer service is structured for export.
Exportation Performance	EP	-	<ol style="list-style-type: none"> 1. In our company, export performance is regularly evaluated. 2. In our company we had to change the business model to meet international customers (export). 3. Export performance indicates the knowledge acquired throughout the organization structure. 4. The way the information is used in our company is significantly and positively related to export performance measures. 5. In our company the activities of Research and Development is important for export activities. 6. In our company one of the first steps towards internationalization is export.

Source	Hypothesis	Indicators	Literature Support (author, year)
OL	<p>Ho,1: OL \leftrightarrow + KM Ho,2: OL \rightarrow + EP Ho,4: OL \rightarrow + ER Ho,5: OL \rightarrow + ET</p>	<ol style="list-style-type: none"> 1. Our employees are regularly trained to carry out the work. 2. In our organization tacit knowledge evolves through communication between people and teams. 3. Our employees demonstrate understanding of the standards to coordinate and carry out the work. 4. Our employees demonstrate competences to interpret and correct the effects of their work. 5. Context changes influence the knowledge our employees use at work. 6. Changes in the level of skills of our employees are evaluated. 7. Our organization often introduces innovations that improve performance in business areas. 	<p><i>OL1. (Noe & Schmitt, 1986) / (Egan et al, 2004)</i> <i>OL2. (Nonaka,1994) / Hsiu-Fen Lin, (2007)</i> <i>OL3. Liao S, Wu C (2009) / Noruzy et al. (2012)</i> <i>OL4. (Dose, 1997) / (Hogan, 2014)</i> <i>OL5. (Kontoghiorghes, 2001) / (Egan et al, 2004)</i> <i>OL6. Khazanchi et al. (2007); Mumford et al. (2002) / (Hogan, 2014)</i> <i>OL7. Watkins and Marsick (1993, 2003) / (Egan et al, 2004)</i></p>

Source	Hypothesis	Indicators	Literature Support (author, year)
KM	<p>Ho,3: KM \rightarrow + EP Ho,6: KM \rightarrow + ET Ho,7: KM \rightarrow + ER</p>	<ol style="list-style-type: none"> 1. Our organization periodically identifies the main knowledge it holds. 2. Our organization maintains ways to create new knowledge. 3. Our organization retains in an accessible way the important knowledge identified. 4. Our organization maintains structured activities to capture knowledge from other external sources. 5. Our organization facilitates knowledge sharing internally. 6. Our organization provides formally lessons learned from the actions it performs. 7. Our organization selectively applies the knowledge to the necessary areas. 	<p><i>KM1. (Firestone and McElroy, 2004) / (Stary, 2014)</i> <i>KM2. Podsakoff et al.(1996) / Noruzy et al. (2012)</i> <i>KM3. Frappaolo, C. (2006) / Noruzy et al. (2012)</i> <i>KM4. Jennex (2005) / Noruzy et al. (2012)</i> <i>KM5. Baumgartel and Jeanpierre (1972) / (Egan et al, 2004)</i> <i>KM6. (Kuchinke, 1996) / (Egan et al, 2004)</i> <i>KM7. (Davenport and Klahr,1998) / Hsiu-Fen Lin, (2007)</i></p>

Source	Hypothesis	Indicators	Literature Support (author, year)
ER	Ho,8: ER →+ ET Ho,9: ER →+ EP	<ol style="list-style-type: none"> 1. Our company is recognized as an incentive for the innovation of its products. 2. In our company the R & D challenges are understood by the different areas. 3. R & D personnel support the Business Development process. 4. Our company seeks out new technological ideas thinking "out of the box". 5. Our company seeks creative ways to meet the needs of our customers. 6. Our company seeks to create products or services that are innovative to customers. 7. Our company bases our success on its ability to exploit new technologies. 	<ul style="list-style-type: none"> - ER1. Francis D, Bessant J (2005) / Noruzy et al. (2012) - ER2 / ER3. (Hortinha et al., 2011) / (Costa, 2015) - ER4. (Cassiman & Golovko, 2011) / (Costa, 2015) - ER5. Garvin (1993) / Sinkula, J. et al (1997) - ER6. Chang S, Lee M (2008) / Noruzy et al. (2012) - ER7. (Nonaka I, Takeuchi H (1995), Woodman RW, Sawyer JE, Griffin RW (1993)) / Noruzy et al. (2012)

Source	Hypothesis	Indicators	Literature Support (author, year)
ET	Ho,10: ET →+ EP	<ol style="list-style-type: none"> 1. In our company the relevance of Research and Development in its export activities is low. 2. In our company the forms of action proposed by the Business Development staff are accepted by the Research and Development staff. 3. To what extent our company enters with current products well accepted in new markets. 4. In our company we constantly monitor the satisfaction of existing customers. 5. In our company we increase the level of automation in our operations. 6. At our company we continually improve the reliability of our products and services. 7. In our company the area of guarantee and customer service is structured for export. 	<ul style="list-style-type: none"> - ET1. (Lages, Jap, and Griffith 2008; Lages, Lages, and Lages 2006; Lages and Montgomery 2004) / (Hortinha et al., 2011) - ET2. (Slater, Hult, and Olson 2007; Zhou, Yim, and Tse 2005). - ET3. (Slater and Narver 1998) / (Hortinha et al., 2011) - ET4. (Narver and Slater 1990; Olson, Slater, and Hult 2005) / (Hortinha et al., 2011) - ET5. (Knight and Cavusgil 2004) / (Hortinha et al., 2011) - ET6. Hlland's (1999) / (Hortinha et al., 2011) - ET7. role (Kleinschmidt, De Brentani, and Salomo 2007) / (Hortinha et al., 2011)

Source	Indicators	Literature Support References (author, year)	Reference Citations (author text)
OL	OL1. OL2. OL3. OL4. OL5. OL6. OL7.	<p>OL1. (Noe & Schmitt, 1986) / (Egan et al, 2004)</p> <p>OL2. (Nonaka,1994) / Hsiu-Fen Lin, (2007)</p> <p>OL3. Liao S, Wu C (2009) / Noruzy et al. (2012)</p> <p>OL4. (Dose, 1997) / (Hogan, 2014)</p> <p>OL5. (Kontoghiorghes, 2001) / (Egan et al, 2004)</p> <p>OL6. Khazanchi et al. (2007); Mumford et al. (2002) / (Hogan, 2014)</p> <p>OL7. Watkins and Marsick (2004) / (Egan et al, 2004)</p>	<p>OL1. Motivation to transfer learning is one of the key concepts in the HRD literature. It can be described as trainees' desire to use the knowledge and skills mastered in training or associated learning activities on the job (Noe & Schmitt, 1986).</p> <p>OL2. Knowledge that resides within individuals is frequently termed tacit knowledge. Being inferred from individual action, and being difficult to verbalize and codify, tacit knowledge is obtained through imitation and practice. (Nonaka,1994)</p> <p>OL3. Some believe organizational learning and knowledge management can be both cause and effect; while some others regard either of the variables being the cause of the other. Liao S, Wu C (2009)</p> <p>OL4. Values espoused within an organizational environment are defined as evaluative standards relating to work, or the work environment, by which individuals discern what is considered "right" or "wrong". (Dose, 1997)</p> <p>OL5. Additional insight into how organizations can create and improve workplace environments, as well as recognition of the potential impacts of such environments on employees, is crucial for practice, research, and theory building (Kontoghiorghes, 2001).</p> <p>OL6. increases employees' motivations to find novel solutions to organizational problems; improves innovative performance. Khazanchi et al. (2007); Mumford et al. (2002)</p> <p>OL7. A learning organization is viewed as one that has capacity for integrating people and structure to move an organization in the direction of continuous learning and change. Watkins and Marsick (2004)</p>
	KM1. KM2. KM3. KM4. KM5. KM6. KM7.	<p>KM1. (Firestone and McElroy, 2004) / (Stary, 2014)</p> <p>KM2. Podsakoff et al.(1996) / Noruzy et al. (2012)</p> <p>KM3. Frappaolo, C. (2006) / Noruzy et al. (2012)</p> <p>KM4. Jennex (2005) / Noruzy et al. (2012)</p> <p>KM5. Baumgartel and Jeanpierre (1972) / (Egan et al, 2004)</p> <p>KM6. (Kuchinke, 1996) / (Egan et al, 2004)</p> <p>KM7. (Davenport and Klahr,1998) / Hsiu-Fen Lin, (2007)</p>	<p>KM1. By processing external and internal data, decision-making cycles are applied on the individual and interpersonal levels (Firestone and McElroy, 2004)</p> <p>KM2. The firm's management is always on the lookout for new opportunities for the Unit/department/organization. Podsakoff et al.(1996)</p> <p>KM3. In fact, knowledge management is the mechanisms that creates and stores data to increase an organization's response time and create innovation through the collection, storage, and study of organizational information. Frappaolo, C. (2006)</p> <p>KM4. Jennex (2005) believed that institutions or organizations become more effective if they are capturing, sharing, retaining, and reusing organizational knowledge to create a successful business environment.</p> <p>KM5. Baumgartel and Jeanpierre (1972) found that managers who believed</p>

Source	Indicators	Literature Support References (author, year)	Reference Citations (author text)
ER	ER1. ER2. ER3. ER4. ER5. ER6. ER7.	<p>- ER1. Francis D, Bessant J (2005) / Noruzy et al. (2012)</p> <p>- ER2 / ER3. (Hortinha et al., 2011) / (Costa, 2015)</p> <p>- ER4. (Cassiman & Golovko, 2011) / (Costa, 2015)</p> <p>- ER5. Garvin (1993) / Sinkula, J. et al (1997)</p> <p>- ER6. Chang S, Lee M (2008) / Noruzy et al. (2012)</p> <p>- ER7. (Nonaka I, Takeuchi H (1995), Woodman RW, Sawyer JE, Griffin RW (1993)) / Noruzy et al. (2012)</p>	<p>ER1. Innovation has become widely recognized as a key to competitive success. Francis D, Bessant J (2005)</p> <p>ER2 / ER3. Firms with a technological and R&D based advantage can expand into overseas markets at little or no marginal cost of developing these advantages at home (Hortinha et al., 2011).</p> <p>ER4. They can access novel resources and information as well as technological and market knowledge from the foreign market that can be used in the firm's innovation process (Cassiman & Golovko, 2011).</p> <p>ER5. "Garvin (1993) defined a learning organization as "an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights".</p> <p>ER6. Only if firms can continually create new products, systems, and service items to make every department meet the demands of the customer will they be able to obtain long-term success. Chang S, Lee M (2008)</p> <p>ER7. Many authors believe innovative organizations are intelligent and creative, and have high capacity for learning effectively as well as building up new knowledge. (Nonaka I, Takeuchi H (1995), Woodman RW, Sawyer JE, Griffin RW (1993))</p>
	ET1. ET2. ET3. ET4. ET5. ET6. ET7.	<p>- ET1. (Lages, Jap, and Griffith 2008; Lages, Lages, and Lages 2006; Lages and Montgomery 2004) / (Hortinha et al., 2011)</p> <p>- ET2. (Slater, Hult, and Olson 2007; Zhou, Yim, and Tse 2005).</p> <p>- ET3. (Slater and Narver 1998) / (Hortinha et al., 2011)</p> <p>- ET4. (Narver and Slater 1990; Olson, Slater, and Hult 2005) / (Hortinha et al., 2011)</p> <p>- ET5. (Knight and Cavusgil 2004) / (Hortinha et al., 2011)</p> <p>- ET6. Hlland's (1999) / (Hortinha et al., 2011)</p> <p>- ET7. (Kleinschmidt, De Brentani, and Salomo 2007) / (Hortinha et al., 2011)</p>	<p>ET1. Poor past export performance is associated with strategic reorientation of exporting firms (Lages, Jap, and Griffith 2008; Lages, Lages, and Lages 2006; Lages and Montgomery 2004).</p> <p>ET2. A technology-oriented firm is committed to research and development (R&D) and is proactive in acquiring and integrating new and sophisticated technologies in the new product development process (Slater, Hult, and Olson 2007; Zhou, Yim, and Tse 2005).</p> <p>ET3. A customer orientation provides the necessary skills for identifying current and latent needs, uncovering new market opportunities, searching for unserved markets, and establishing relationships with existing and new customers (Slater and Narver 1998).</p> <p>ET4. Firms with a strong customer orientation have a competitive advantage because they consider the creation and maintenance of customer value a top priority (Narver and Slater 1990; Olson, Slater, and Hult 2005).</p> <p>ET5. Firms can leverage their innovations by securing business opportunities in those markets and thus increase their innovative capabilities (Knight and Cavusgil 2004).</p> <p>ET6. Following Hlland's (1999) suggestion, we analyzed the reliability and validity of the measurement model first and then the structural model.</p> <p>ET7. International markets are turbulent and diverse with respect to customer needs, cultures, and competitiveness; therefore, innovation assumes a primary role (Kleinschmidt, De Brentani, and Salomo 2007)</p>

Source	Indicators	Literature Support References (author, year)	Reference Citations (author text)
EP	EP1. EP2. EP3. EP4. EP5. EP6.	EP1. Zou, Taylor, and Osland (1998) / (Hortinha et al., 2011) EP2. (Crossan, Lane, and White 1999; Fiol and Lyles 1985). / (Hortinha et al., 2011) EP3. (Teece, Pisano, and Shuen 1997) / (Hortinha et al., 2011) EP4. Zhou, Yim, and Tse (2005) / (Hortinha et al., 2011) EP5. (Cho & Pucik, 2005; Filipescu et al., 2013) / (Hortinha et al., 2011) EP6. (Knight and Cavusgil 2004) / (Hortinha et al., 2011)	EP1. We used three items (profit, sales, and sales growth) from Zou, Taylor, and Osland (1998), which are indicators of financial export performance. EP2. Organizational learning represents the development of knowledge that influences behavioral changes and leads to enhanced performance (Crossan, Lane, and White 1999; Fiol and Lyles 1985). EP3. Through exploratory innovation, firms develop new competences and thus achieve superior export performance by attaining positions of market and technological leadership (Teece, Pisano, and Shuen 1997). EP4. We adapted the measure of technology orientation from the work of Zhou, Yim, and Tse (2005) to assess the orientation of firms' export operations toward using sophisticated technologies in new product development. EP5. Several empirical studies support the positive effect of innovation capabilities on firms' export activities (Cho & Pucik, 2005; Filipescu et al., 2013) because firms with a technological and R&D based advantage can expand into overseas markets at little or no marginal cost of developing these advantages at home (Hortinha et al., 2011). EP6. Firms can leverage their innovations by acting on business opportunities in international markets (Knight and Cavusgil 2004).