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Linking knowledge management, organizational learning and memory

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ABSTRACT

The objective of this research is to understand the link and evolution between the concepts of knowledge management, organizational learning and memory. Seeking a better clarification of concepts, discussing them in the theoretical field, understanding their evolution in the last decades. A systematic literature review was developed by synthesizing concepts. From two databases, a total of 2511 scientific articles between 1960 and 2017 were analyzed, divided into two studies. Organizational learning is seen as a dynamic process based on knowledge and is translated through various levels of activity. The ability of an organization to use and leverage the knowledge is heavily dependent on its Human Resources, which are effectively who creates, shares and uses that knowledge. Knowledge management is seen as the management of the processes of creation, storage, access, and dissemination of the intellectual resources of an organization. Organizations must consider your main objective as increasing the capacity of individuals and organizational knowledge enhancers. Managers should pay special attention to the more general knowledge associated with the context of the firm, as it supports the introduction of various types of innovation. Knowledge can be encouraged by a set of collaborative practices of HRM. We can consider organizational learning as a process and organizational memory as the corresponding output. Thus, establishing the relationship that the organizational memory is a consequence of organizational learning.

Key concepts that can be used in the new future research are summarized, highlighting its application and diagnosis for organizations, fomenting the strategic decision-making.

Introduction

Since the 1990s, the economy is marked by the opening of new markets and advances in technologies. There are major challenges in the field of organizational sciences where yesterday's organizational knowledge and strategies cannot guarantee tomorrow's success (Senge, 1990). Organizational challenges in companies require learning and creativity to increase resources, skills and learning in business organizations to sustain the company's competitive advantages (Barney, 1991; De Geus, 1988; Garvin, 1993; Mahoney, 2001; Peteraf, 1993; Wernerfelt, 1984).

In this research, the learning of organizations is highlighted, due to its role to improve results and performance (Fernandes, 2007). Organizational learning had its development in the field of business sciences, research, and the become an important research topic from the 1990s. The organization that continually expands its capabilities creates its own future (Senge, 1990).

It is necessary to analyze and diagnose the current state of an organization, as a basis that should guide its change (Marsick & Watkins, 2003). Learning must be guided and integrated into the systems, practices, and structures of the organization, to be shared, causing changes in performance. So, one should not consider only the individual learning to support organizational learning system (Marsick & Watkins, 2003).

Although the definitions of organizational learning vary considerably, there is a consensus that the organizational learning

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represents a special model of organizational culture promoted by the attention given to the change and the way in which it occurs (Cox, Irby, & Bowen, 2006), the flexibility and openness to new ways of work, depending on the goals of the Organization and of its performance targets (Marsick & Watkins, 2003).

The two growing theoretical lines of organizational learning and learning organization emerge by considering the individual knowledge perspective for organizational knowledge i.e. the shift from the levels of action of individual knowledge to organizational knowledge (Fiol & Lyles, 1985; Shrivastava, 1983). The learner organization appears, the continuous increase of the skills and knowledge of individuals, promoting collective learning conditioning organizational learning (Senge, 1990), and also building organizational memory as Huber as suggested in 1991.

The main theoretical lines of organizational learning are the behavioural approach in companies (Cyert & March, 1963); theories of action (Argyris & Schon, 1978, 1996; Argyris, 1977) and the theory of cognitive and behavioural changes (Fiol & Lyles, 1985).

Senge (1990) proposes and identifies the difficulties that organizations encounter in order to develop new learning, identifies seven types of difficulties identified in managers: (i) confusion of identity; (ii) avoid assuming responsibilities; (iii) not face problems immediately; (iv) analyze events on a case-by-case basis; (v) nervousness; (vi) lack of information about decisions; (vii) involvement in power relations (Senge, 1990).

Huber (1991) identifies in his research work four organizational learning processes: (i) acquisition of knowledge, how it is obtained; (ii) distribution of information; (iii) information interpretation, and (iv) organizational memory, as the process of information sharing, is the transition from the individual to the collective level, building organizational memory (Huber, 1991). However, we must emphasize that organizational learning and its difficulties, knowledge management in the company and organizational memory have a relatively recent development in their area of study. It is necessary to continue researching, deepening concepts and disseminating information, questioning the forms of learning, their sharing of content, the form of this storage in organizations and the contribution to the successful business.

The objective of this research is to understand the link and evolution between the concepts of knowledge management, organizational learning and memory. Seeking a better clarification of concepts, discussing them in the theoretical field, understanding their evolution and its linkage in the last decades.

In first section, we introduce and list the ideas that define the problem of study and the conceptual framework. In section two a literature review considering the concepts, its evolution and interaction with organizational topics. synthesis with the methodological options, a systematic review of the literature. In section three is presented the methodology. In section four the results are discussed. Finally, section five is presented the final considerations, limitations to the study and future research lines.

Literature

Management and knowledge processes in organizations

In this study, we follow the definition knowledge management as the management of the processes of creation, storage, access and dissemination of the intellectual resources of an organization (Song, Nerur, & Teng, 2007). Knowledge management in organizations, according to Garcia-Perez and Mitra (2008) is defined as a set of four types of processes: (1) acquisition of knowledge. Involves the processes of creation and knowledge-building; (2) conversion of knowledge. The storage of useful information in repositories that facilitate access of individuals to the attention; (3) application of knowledge. This is the way is explored and applied knowledge; (4) Protection of knowledge (Garcia-Perez and Ayres, 2009, 2015).

Huber (1991) also describes four constructions of knowledge management: knowledge acquisition; the distribution of information; the interpretation of information and organizational memory. In organizations that bet on the implementation of knowledge management systems and practices to monetize and improve existing knowledge in the organization. The predominant trend has been the focus on supporting information sharing technologies, assuming the importance of studying social networks, knowledge flows and identifying strategies to improve them (Cross, Borgatti, & Parker, 2002; Storberg-Walker & Gubbins, 2007). Schwier, Campbell, and Kenny (2004) argue that the use of the term knowledge management sometimes is not adequate, show that many knowledge management projects are information management projects. This is because they are only focused on coding, storage, and distribution of information (Schwier et al., 2004). The ability of an organization to use and leverage the knowledge is heavily dependent on its Human Resources, which are effectively who create, share and use knowledge (Ipe, 2003). The use of knowledge is only possible when individuals can share their knowledge and can generate new, from the knowledge of others (Devezas, Linstone, & Santos, 2007). It is also recognized the importance of sharing for the interconnection between the knowledge at the individual level and organizational level, knowledge and learning both levels (Ipe, 2003).

On the other hand, since much of the organizational knowledge lies in the individual level, that acquires and complements its daily activities and functions. If not promoted a culture of knowledge sharing, the risk, if the individual leaves the Organization, to lose this specific knowledge or the risk of this knowledge not being properly taken advantage of since it is no longer accessible to others (Ipe, 2003). Knowledge is the result of learning, can manifest itself in changes in behaviour or lack of cognitions (Argote, 2013). Knowledge can be characterized along various dimensions (Windhager et al., 2013), from explicit knowledge to tacit knowledge (Kogut & Zander, 1992; Nonaka & Von Krogh, 2009; Nonaka, 1994; Polanyi, 1962).

Knowledge creation theory describes knowledge as meaning where individuals for personal sensitivity and experience, the ability to define a situation and act accordingly. The organizational knowledge creation theory proposes that the new knowledge is created through processes of tacit and explicit conversion: socialization, externalization, combination, and internalization (Erden, Von Krogh, & Nonaka, 2008; Nonaka, Toyama, & Konno, 2000; Nonaka, 1994). Andrews and Delahaye (2000) in their study of psychosocial processes of filter creation of knowledge suggest that individuals intuitively adopt filtering strategies. In his study, the researchers describe situations where individuals did not share their own knowledge lightly. The perceived reliability was distinctly perception-based than the colleagues were likely to do, with commercially sensitive information. The psychosocial factor emerges clearly as that which determines who were willing to share their own knowledge in the production of its research services (Andrews & Delahaye, 2000).

Additionally, Nielsen and Nielsen (2009) examined results related to international strategic alliances (ISAs) knowledge, demonstrate that learning and innovation can occur simultaneously but result from different combinations of partner characteristics, knowledge characteristics, and relational quality. While tacit knowledge can inhibit knowledge transfer and learning, it can also increase firms' ability to innovate (Nielsen & Nielsen, 2009)

The concept of memory and organizational improvisation

The concept of organizational memory appears fragmented by several authors like Walsh and Ungson (1991), Anand, Manz, and Glick (1998), Moorman and Miner (1998) or Barnier and Sutton (2008), with great potential for development in the field of study. The structure of the organizational memory appears linked to information processes, acquisition, retention and recovery (Walsh & Ungson, 1991). Organizational memory is defined as how organizations store knowledge for future use (Cyert & March, 1963; Huber, 1991; Levitt & March, 1988; Stein & Zwass, 1995). Individual cognitive activities translated by the acquisition of knowledge within an organization, contribute to the construction of organizational memory (Walsh & Ungson, 1991). The processes of sharing organizational interpretation systems outperform the individual level. This is one of the reasons why an organization preserving the knowledge of the past even when key staff leave the Organization (Weick & Gilfillan, 1971). Replace the lost knowledge gained by experience, raises new challenges (Dunham & Burt, 2011; Strack, Baier, & Fahlander, 2008). The concept of organizational memory, clarify the locus of organizational memory, the retention structure; the processes of acquisition, storage and retrieval on retention structure; and the memory usage as a consequence on performance and results (Walsh & Ungson, 1991).

The transactional memory model was developed by Wegner, Giuliano, and Hertel (1985), Wegner (1987), Wegner, Erber, and Raymond (1991), Barnier and Sutton (2008). Integrated the information retained in memory of a group into two components, the information stored by the members of the group in their individual memories and the directories held by members of the group that identified the existence, location and recovery media the information held by other individuals (Anand et al., 1998).

The model proposes that the encoding, storage and retrieval of information of the group are provided by various communication interactions or transactions between members of the group. The information stored in the memories of individual members of the group can be grouped into internal and external components. The internal component consists of information known personally by the members of the group. The external component consists of information, not known personally by the members, but that can be retrieved when needed (Anand et al., 1998).

Organizational improvisation depends not only on what happens but also about the temporal order in which things happen. The time interval between events tends to the composition and limit converges with the implementation (Moorman & Miner, 1998). When the improvisational activity involves some degree of innovation, happens when the activity goes beyond the automatic repetition of an existing routine (Vera & Crossan, 2004).

The memory is suggested to analyse collective improvisation (Cohen, 1991; Huber, 1991; Walsh & Ungson, 1991). Procedural memory is a memory "for how things are done" (Cohen & Bacdayan, 1994) or memory to "things you can do" (Berliner, 2009). Thus, the procedural memory involves skills or routines, often represents tacit knowledge for individuals and organizations (Cohen & Bacdayan, 1994; Cohen, 1991; Nonaka, 1990; Winter, 1987).

Declarative memory in improvisation is "memory for facts, events or propositions" (Anderson, 1983; Cohen, 1991). So, unlike procedural memory involves the memory of routine or skill, the declarative memory may be more general. Considering the suggestion of Anderson (1983) in the declarative knowledge stems from a base of transfer between different uses of the same knowledge.

The organizational procedural and declarative memory shows effects on results of improvisation. It is suggested that the procedural memory must enhance the improvisation, efficiency and speed, reducing your news. Declarative memory, however, should increase the effectiveness of organizational correlation and novelty, while reduces your speed (Moorman & Miner, 1998).

Knowledge flows and business performance

Considering the theory of resources (RBV), the company is a unique set of features and capabilities that can sustain your competitive advantage (Barney, 1991; Mahoney, 2001; Peteraf, 1993; Wernerfelt, 1984). When resources are valuable, rare, inimitable, and irreplaceable, can generate sustained competitive advantage (Barney, 1991). The stock of the company's assets results of strategies of choices made over time by its managers, so specific, strategic spending should be viewed as investments in strategic assets (Hall, Griliches, & Hausman, 1984; Telser, 1961). The focus on resources and strategic assets has led to an extension of RBV, towards the knowledge-based opinion of the firm (KBV). Thus, knowledge is the strategically most important intangible resource of the company (Spender & Grant, 1996). How the company creates, transfers and uses knowledge, manufactures impacts on your performance and your ability to compete within a sector (Grant, 1996; Nonaka, Byosiere, Borucki, & Konno, 1994; Nonaka, 1994; Spender & Grant, 1996).

The model of stocks and flows of organizational knowledge is an important contribution to KBV (DeCarolis & Deeds, 1999). The model has significant value in the management of a company, as it offers concrete ideas about a profile of strategic investments in knowledge, to succeed in each sector. The model of stocks and flows of knowledge provides a competitive advantage depends on the continuous accumulation of stocks of knowledge (DeCarolis & Deeds, 1999). Erden, Klang, Sydler, and von Krogh (2014) develop a study that tests a new model in biopharmaceutic companies, showing how the flow of knowledge has an impact on the company's performance and results. The results of the study show that managers to avoid performance losses must make a prudent investment in R&D, strategic alliances that improve the quality of services and may grant to the company a better financial performance. To try a strategy of pursuing various alliances, this may prove to be more effective, to get better and different types of knowledge flows (Erden et al., 2014).

The flow of knowledge and information stored are central issues for many authors ranging from the resource-based view (Barney, 2001) for features and capabilities (Eisenhardt & Martin, 2000a; Grant, 1996), learning organization (Huber, 1991; March, Sproull, & Tamuz, 1991), or socio-cognitive approaches (Akgün, Lynn, & Byrne, 2003). These lines of action recognize the flows of information and memory as related concepts embedded in a broader approach to organizational learning. Knowledge stocks and flows of information are the two entries to the processes (acquisition of information, dissemination, interpretation, use and storage) of organizational learning (Kyriakopoulos & de Ruyter, 2004). Organizational memory considered as a strategy, gain focus on processes (Hargadon & Sutton, 1997). The "five internal Bins", that contribute to the ease of organizational memory retention, varying on your ability to retain information decision (Walsh & Ungson, 1991), or the shapes associated with memory retention (Moorman & Miner, 1998) In addition to the stored knowledge, gather and use the information for the innovation in process is also important, according to the information of product innovation and research on the adoption of innovations (Rogers, 1985). Information from internal sources mirrors existing assumptions and, thus, the scope of information will probably be limited to the set of partners or competitors, or supply chain of organization (Huber, 1991; Day, 1994). Access to external sources, instead, can provide new contexts of information challenging the assumptions established (Kyriakopoulos & de Ruyter, 2004). Internal information flows occur when a team project is based on the company's internal sources information,

including internal experts, or R & D or the sales force (Huber, 1991). The transmission of information to the team has been noted as a factor in the positive impact on company performance (Jaworski & Kohli, 1993; Katz & Tushman, 1981; Moorman, 1995). The investigation showed that the parties external information has a positive impact on financial performance or innovation in the company (Jaworski & Kohli, 1993; Katz & Tushman, 1981; Moorman, 1995).

Kyriakopoulos and de Ruyter (2004) established in your work a curvilinear relationship between procedural memory and new results on the product, as well as a positive relationship between declarative memory and financial performance. This approach allows you to isolate the effect of two different types of memory. The role of memory such as recording, file, recent product review objectives and management measures support declarative memory are not linked to previous definitions of the concept of declarative memory (Kyriakopoulos & de Ruyter, 2004). Internal information flows to enhance financial success, however also restrict the creativity in the presence of strong procedural memory. In addition, while external information flows promote both financial success and creativity, also diminish the creativity in the presence of strong procedural memory (Kyriakopoulos & de Ruyter, 2004). The authors underscore the importance of designing memory systems that allow less use of standard procedural memory, as well as the rapid deployment of declarative memory. Companies can use procedural memory to access prior knowledge General and quickly use it in new applications (Kyriakopoulos & de Ruyter, 2004).

Human Resource Management (HRM) plays a key role in helping to achieve organizational desired results through your possible weight on the behaviour and employee skills (Bowen & Ostroff, 2004). So the perspective of knowledge and HRM appear to be highly complementary approaches, and integrate them must be a priority on the agenda of any investigation (Minbaeva, Foss, & Snell, 2009). Thus, organizations obtain efficient value by managing their knowledge, at the same time, as they generate new knowledge or creative combinations of existing knowledge, leading to new products or services (Ebbers & Wijnberg, 2009).

Organizational learning as a dynamic capabilities, collaborative practices or Human Resource Management (HRM)

The individual perspective based on the investigation of individual learning is developed by (Shrivastava, 1983). Several models have emerged pointing the individual learning processes and transferred later to the organizational learning. Fernandes (2007) considers two perspectives can be identified in individual learning approach: behaviourists theories and cognitive theories.

Argyris and Schon (1978) conclude that there is no organizational learning without individual learning, whereas organizations only learn thanks to the experiences and actions of individuals. However, it may be that individuals learn and not an organization. Simon (1991) also emphasized the individual role in the processes of knowledge, points out that all the organizational learning this on "head of the individual" (Ipe, 2003; Simon, 1991). In Table 1 we develop two lines of the learning organization and organizational learning.

Organizational learning it's seen as a dynamic process, based on knowledge. It's translated through the various levels of action, from the individual level to the group and organizational level, retaking the initial process (Crossan, Lane, & White, 1999; Jerez-Gomez, 2005; Simon, 1991). Considering the dynamic capabilities, the organizational learning concept can be treated as how to incorporate dynamic capabilities in the internal processes of the company. In historical perspective, organizational learning is well recognized as an essential element for sustained competitiveness. The impact of dynamic capabilities in the company's performance is mediated

by internal processes within the organization or more tangible resources that can be reconfigured by the dynamic capabilities (Giniuniene & Jurksiene, 2015).

Eisenhardt and Martin (2000b) suggest that dynamic capabilities become more evident through the learning process that generates new knowledge. Considering the internal environment of the company, organizational learning is one of the main internal processes within the organization, contributes to mediate the relationship between dynamic capabilities and performance of the company (Eisenhardt & Martin, 2000b). The resource and the ability to change defines the dynamic capabilities and can manifest themselves through processes of organizational learning (Breznik & Hisrich, 2014). In this way, the dynamic capabilities through the mediation of organizational learning processes become the main source of competitive advantage (Shane & Venkataraman, 2000).

The positive impact of organizational learning and dynamic capabilities, in the performance of the company, is also mediated by innovation (Giniuniene & Jurksiene, 2015). Breznik and Hisrich (2014) argue that innovation is a result of the learning process. Other authors also suggest that organizational knowledge, and organizational learning, allow the strengthening of innovation through the acquisition, sharing, development and transformation of knowledge (Huber, 1991; Jiménez-Jiménez & Sanz-Valle, 2011).

Collaborative practices of HRM refer to a set of practices intended to encourage the exchange of knowledge between the various members of an organization. They include the selection of candidates with skills of teamwork, enabling the sharing of knowledge to solve problems or create new ideas and organizational incentives to achieve group results. Organizational knowledge refers to the amount of experience and information accumulated during the life of a company that can be brought on current activities (Moorman & Miner, 1997).

Knowledge and information are usually found in different individuals. This means that organizations must consider your main objective as increasing the capacity of individuals and organizational knowledge enhancers, which will involve the development of strict strategic management of people (Theriou & Chatzoglou, 2009). Encourage internal collaboration between the members of an organization can be a powerful resource for the generation of organizational knowledge, as interaction allows the knowledge of several individuals to be combined, which is essential for the conversion of knowledge individual in collective knowledge.

Nieves, Quintana, and Osorio (2016) in your study analyse the results of innovation in service organizations, combining two theoretical approaches: HRM and perspective of knowledge. Although HRM and knowledge of resources have been studied in knowledge-intensive service organizations, few studies have addressed these constructs in other organizations in the service sector. The objective of this study was to help solve this empirical gap and thus contribute to the knowledge about drivers of innovation in the field of services. The results show the important role of the collaborative practices of HRM innovation activity of hotel companies. These practices of product innovation influence directly and indirectly, but do not have a direct influence on the innovation process.

Managers should pay special attention to the more general knowledge associated with the context of the firm, as it supports the introduction of various types of innovation. Both types of knowledge can be encouraged by a set of collaborative practices of HRM (Nieves et al., 2016).

The relationship between learning and organizational memory pointed out that organizational memory is a consequence of organizational learning. Therefore, we can consider organizational learning as the process and organizational memory as the corresponding output (Huang, 2013; Huang, Chuang, & Cheri, 2016).

Table 1
Organizational learning versus learning organization or learner.

Mainlinesandtheoriesoforganizationallearning	Authors	Main lines and theories of learning organization	Authors
The process of organizational learning enables organizations to change decision-making rules, introducing a model that is responsible for changes in organizations causing changes in developmental stages.	(Cyert & March, 1963)	Proposes a kind of organization he called learner organization, characterized by having more success than other organizations, learning faster, showing a capacity to adapt by creating future alternatives. The five disciplines for building learning organizations: (i) systemic thinking, showing the global and collective thinking, pointing out the perceptions of the Organization; (ii) personal domain, valuing the real personal aspirations, with more open to others, taking into account the commitment and the growth of the Organization; (iii) mental models by encouraging people to put aside the old ways of thinking; (iv) the shared vision, promoting plans in which all participate and agree, and (v) group learning, involving work teams, allows groups to create a mindset that follows the principles of each Member	(Senge, 1990; Kofman & Senge, 1993)
The process of organizational learning, the simple level of organizational learning, enabling the Organization to detect the errors and fix them, where bodies have the capacity to maintain stability in changing contexts. The most complex level, double-loop learning is proposed, which allows the detection of errors and strategies, and also relate these errors with the norms that put into question the functioning of the organization. Known as the theories of action.	(Argyris, 1977; Argyris & Schon, 1978; Argyris & Schon, 1996)	The perspective of systemic thinking, propose three characteristics so that the learning organizations maintain a high yield: the commitment to knowledge; the mechanism of renewal and openness in relation to the external environment	(Mills & Friesen, 1992)
Four situations that reflect the organizational learning: (i) a few cognitive and behavioral changes; (ii) a few changes to the cognitive level and major changes to the behavioral level; (iii) major changes and few cognitive behavioral changes and (iv) major changes to the cognitive level and major changes to the behavioral level, where companies can learn more quickly.	(Fiol & Lyles, 1985)	The strategic perspective that considers that learning organizations have more ideas than other organizations. The learner is the organization able to generate, acquire and transfer knowledge by changing your behaviour	(Garvin, 1993)
Proposes and identifies the difficulties that organizations are to develop new learning, identifies seven types of difficulties identified in the managers: (i) mistaken identity; (ii) avoid assuming responsibilities; (iii) do not face immediate problems; (iv) analyze events on; (v) nervousness; (vi) lack of information about decisions; (vii) involvement in power relations	(Senge, 1990; Senge, Cambron-McCabe, Lucas, Smith, & Dutton, 2012)	Inductive typology of learning organization based on four possible understandings and characterizations of learner organization: the organizational learning and learning at work, emphasizing the processes in organizations; the learning climate and structure as forms of organization	(Örtenblad, 2002)
Organizational learning processes: (i) acquisition of knowledge, the way it is obtained; (ii) distribution of information; (iii) interpretation of the information and (iv) the organizational memory, as the information sharing process, is the transition from the individual level to the collective by building organizational memory	(Huber, 1991)	The Dimensions of the Learning Organization Questionnaire (DLOQ), as an instrument of measurement where change must occur at all levels, individual, group, organizational and engaging, improving performance. several studies that measure the dimensions of learner organization organizations, demonstrated a correlation between the dimensions and the knowledge and financial performance, based on a lack of individuals. Some studies have demonstrated and validated the DLOQ, where the dimensions of organizational culture explain the variance of the results in the knowledge and financial performance variables	(Watkins & Marsick, 1993; Hernandez, 2003; Marsick & Watkins, 2003; Yang, 2003; Yang, Watkins, & Marsick, 2004; Song, Joo, & Chermack, 2009; Menezes, Guimarães, & Bido, 2011; Mbassana, 2014)

Own source.

Organizational memory processes include the acquisition, preservation, maintenance and recovery (Stein & Zwass, 1995).

Methodology

This study followed a methodology of a systematic review of the literature (Wright, Brand, Dunn, & Spindler, 2007). Two studies were elaborated with different research equations with the terms of Organizational Learning, Knowledge and Organizational Memory. In the first study (S1) we used a search equation with the terms "Organizational Learning" and "knowledge" as research topics in Web of Knowledge, we found 1582 results applied to the search filters, by research areas, so the area was chosen business economy with 1335 references of scientific articles.

In the second study (S2), we used a search equation with the terms "Organizational Memory" as a search topic (Jenkin, Madhvani, Signal, & Bowers, 2014). We found 1716 results for search filters by search area, so we chose the area of social sciences with 1176 references of scientific articles in Web of Knowledge. With study 1 and study 2, analyzes were performed using the software Nvivo and VOSviewer, based on the repetition and similarity of terms and words.

During our analysis, the items were copied/sent to the EndNote X8 software, articles from study 1 and study 2. Duplicates were eliminated, and the titles and abstracts of the scientific papers were analyzed, considering the research objectives and quality (Q1, Q2 and Q3), resulting in a total of 289 articles and references (Jenkin et al., 2014). At this stage, the Scopus database was also included. 57 articles were chosen, which were analyzed considering the
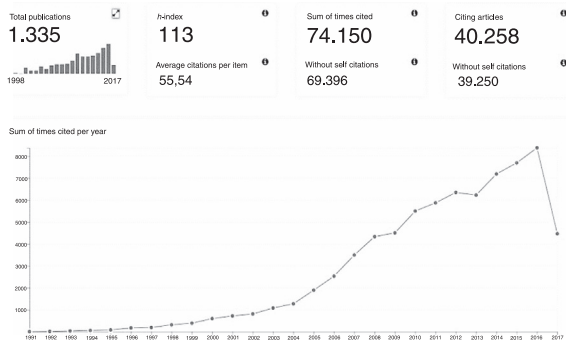
Fig. 1. Total of citations per the year of 1335 articles analyzed (1991–2017).
Source: Web of Science.

concepts of the field of study and a conceptual synthesis between theoretical and empirical articles (Wright et al., 2007).

After synthesizing themes and analyzing texts of scientific articles, a total of 95 references examined, treated and referenced in this study (Jenkin et al., 2014) resulted in the present study. The included articles, which were added in view of the quality criteria to reinforce the concepts, constructed new equations with the main theme "Organizational Learning", "knowledge" and "organizational memory".

Data collection

In the first study (S1) we found 1582 results applied to the search filters, by research areas, so was chosen the area of business economics with 1335 references of scientific articles. Fig. 1 shows the total number of citations per year in the period of 1991–2017.

With the help of the VOSviewer software, an analysis based on the titles and abstracts of authors. Based on the total count of words, with the occurrence of repetition exceeds 10, VOSviewer were selected in a total of 26 terms with a view to splitting words in association for clusters. So, 5 clusters have been detected with items identified in Table 2.

The networking of the clusters and the visualization of density per item were analyzed, can be seen in Fig. 2.

Through, NVivo software was also made an analysis based on exact match of 100 words more repeated words, Fig. 3.

Table 2
Division of terms for clusters by Association. VOSviewer Source.

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Firm	Process	Article	Case	Learning
Innovation	Paper	Concept	Effect	Model
Knowledge	Project	Framework	Experience	
Management	Relationship	Knowledge Management	Learning Organization	
Strategy	Research	Organizational Learning	Organization	
Study Theory	Role	Practice		

Based on the frequency of 25 most repeated words, a cluster analysis was elaborated, illustrated in Fig. 4. Based on this division by clusters, the keywords of this article were chosen and articulated the following thematic areas of literature review were compared the two clusters options in two different programs and analyzed the pie chart having by criterion the coefficient of Pearson shown in Fig. 4.

In the second study (S2) with the concept of organizational memory, we found 1716 results applied to the search filters, by research areas, so was chosen the area of Social Sciences with 1176 references of scientific articles. We analyze the total publications and number of citations per year in the period of 1991–2017.

With the help of the VOSviewer software, an analysis based on the titles and abstracts of authors 1176 articles from the field of study. Based on the total count of words, with the occurrence of repetition exceeds 10, VOSviewer were selected in a total of 22 terms with a view to splitting words in association for clusters. So, 3 clusters have been detected 5.The networking of the clusters and the visualization of density per item is illustrated in Fig. 5.

Through, NVivo software was also made an analysis based on exact match of 100 words more repeated words.

Results

In the continuation of our analysis, we compared and contrasted our results in study1 (S1) and study 2 (S2) considering the objective of the research.

Research on organizational learning has been under development since the 1960s while this study conveys the expansion in this field of study especially since 2009.

Fig. 2. Visualization of the density of each item.

Source: VOSviewer.

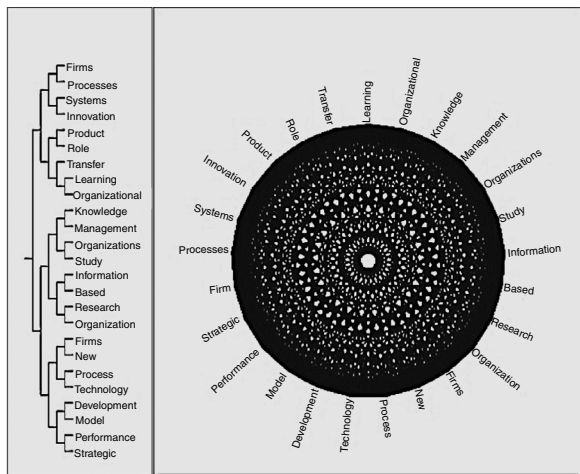**Fig. 3.** 100 exactly most repeated words.

Source: NVIVO.

Fig. 4. Cluster analysis, the frequency of 25 most repeated words, the Pearson correlation coefficient.
Source: NVIVO.

In the period analyzed between 1991 and 2016, the total number of citations of 1335 publications also increased steadily to reach an overall total of 40,248 articles citations (39,250 excluding the citations themselves).

For the period under review, the three countries with more publications the USA with 36% of the group of scientific articles, England with 9.8% followed by Spain with about of 7.8%. The journals with more publications were: Management Learning 4.8%; Organization Science with 3.6%; Industrial Marketing Management with 2.4% and Strategic Management Journal with 2.3%.

Knowledge management spans the processes of creation, storage, access and dissemination of the intellectual resources of an organization. When resources are valuable, rare, inimitable, and irreplaceable, they are able to generate sustained competitive advantage.

There is no individual organizational learning whereas organizations only learn thanks to the experiences and actions of individuals. The ability of an organization to use and leverage its knowledge is heavily dependent on its Human Resources, which are effectively those who create, share and use that knowledge.

The stock of knowledge stems from the results, as assets of the company, and from the strategic choices made over time by its managers. The focus on resources and strategic assets has led to an extension of the theory of organizational resources (RBV), towards knowledge-based opinions of firms (KBV). Thus, knowledge is the most strategically important intangible resource of any company.

Knowledge is sustained by sharing and supporting technologies. The processes and constructions, the interconnections between the acquisitions of knowledge align with its distribution and interpretation while retention takes place through the organizational memory. Networks and knowledge flows surround knowledge and learning as well as organizational learning as a dynamic capability. Knowledge and learning, framed by their management and sharing, determine the creation of new knowledge. Technologies to enable better access to information and provide better identification of organizational organizations, thus facilitating the study of social networks and knowledge flows.

The most repeated and used terms and words in the first study were aggregated into five clusters of association, with the terms "organizational learning" and "knowledge" displaying the greatest density or the highest exact repetition of words. Following the terms "organization", "knowledge management", "process",

Fig. 5. Visualization of the density of each item.
Source: VOSviewer.

"study" and "learning organization" may also serve as keywords and as equations for future research in this field of study.

Our results suggest that the two growing theoretical lines continues to exist in the present state-of-the-art, we suggest as a synthesis for future studies works on the main trends and evolution, the works and authors presented in Table 1.

The structure of the organizational memory appears linked to information processes, acquisition, retention and recovery. The information stored in the memories of individual members of the group can be grouped into internal and external components.

Knowledge and information are usually found in different individuals. This means that organizations must consider your main objective as increasing the capacity of individuals and organizational knowledge enhancers, which will involve the development of strict strategic management of people.

We emphasize the important role of the collaborative practices of HRM innovation activity. Managers should pay special attention to the more general knowledge associated with the context of the firm, as it supports the introduction of various types of innovation. Both types of knowledge can be encouraged by a set of collaborative practices of HRM.

Conclusions

The main aim of this research is to understand the link and evolution between the concepts of knowledge management, organizational learning and memory. Seeking a better clarification of concepts, discussing them in the theoretical field, understanding their evolution in the last decades.

This work was divided into two major analyzes exploring three concepts that are interconnected in the research. This work also follows other empirical studies where the authors needed to analyze the three main concepts (Organizational Learning, Knowledge and Memory) their evolution and interconnection in the context of business organizations. To achieve this, we did a systematic review of the literature. Two databases were chosen. We analyzed a total (S1 + S2) of 2511 scientific articles between 1960 and 2017, between theoretical and empirical articles.

The research on organizational learning has developed since the 1960s, as evidenced in this work in recent years, peaking mainly from 2009. It is necessary to analyze and diagnose the current state of an organization and guide the change, exploring the organizational learning and the memory, knowledge and performance of the company.

An organization's ability to use and leverage knowledge is highly dependent on its human resources, which effectively create, share, and use that knowledge. Human Resource Management (HRM) plays a key role in helping achieve the desired organizational results through its possible bearing on employee behaviour and skills; organizations gain efficient value by managing knowledge, generating new knowledge or creative combinations. From existing knowledge leading to new products or services.

There is no individual organizational learning, however, organizations only learn thanks to the experiences and actions of individuals. The focus on resources and strategic assets led to an extension of organizational resource theory (RBV) toward the knowledge-based enterprise (KBV). Thus, knowledge is the most strategically important intangible resource of the company. The technologies support the sharing of information, providing the best identification of organizational strategies, facilitating the study of social networks and knowledge flows.

The structure of organizational memory appears to be linked to processes of information, acquisition, retention and retrieval. Organizational memory is defined as organizations store knowledge for future use. It replaces the lost knowledge gained by experience,

creates new challenges. The concept of organizational memory clarifies the locus of organizational memory, its retention structure, acquisition, storage and retrieval processes. The use of memory will consequently influence the performance and results of the organization.

Organizational improvisation depends not only on what happens but also on the temporal order in which things happen. When the improvisation activity involves some degree of innovation, it happens when this activity goes beyond the automatic repetition of an existing routine.

Organizations should consider their main objective as increasing the capacity of individuals and organizational knowledge promoters, which will involve the development of strict strategic management of people. Encouraging internal collaboration among members of an organization can be a powerful resource for generating organizational knowledge because interaction allows the knowledge of several individuals to be combined, which is essential for the conversion of individual knowledge into collective knowledge.

Managers should pay special attention to the more general knowledge associated with the company context as it supports the introduction of various types of innovation. Both types of knowledge can be encouraged by a set of collaborative HRM practices.

The relationship between learning and organizational memory has pointed out that organizational memory is a consequence of organizational learning. Therefore, we can consider organizational learning as a process and organizational memory as the corresponding output. Organizational memory processes include acquisition, preservation, maintenance, and retrieval.

Limitations

The study has certain limitations. In addition to the limitations inherent in this type of study, are the number of articles reviewed and consulted databases, as well as the equations and search filters, which led to the results.

Future research

In future research, we suggested greater evidence of empirical studies in organizations, positioning and different activity sectors, as well as groups of employees. Also, suggests further development of instruments for measurement of organizational learning, adapted considerably to the human element with its own characteristics.

We also consider important case studies on how organizations use memory as a vehicle or learning, unlearning and relearning.

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10 H.d.J.G. Antunes, P.G. Pinheiro / Journal of Innovation & Knowledge xxx (2019) xxx–xxx

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