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Article

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Knowledge Sharing: A bibliographic Report on the Research Developed during 2008 – 2019

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Abstract: This article aims to provide a bibliographic report on the research developed during 2008 – 2019 regarding knowledge sharing. In order to achieve this goal, a multi-stage methodology is developed. First of all, a documentary study is employed; this focuses on 3820 articles published on SCOPUS and Web of Science, during 2008 – 2019. Secondly, a quantitative analysis is developed in order to emphasize the chronological evolution of the research topic and the main journals that served as a vehicle for propagating the research regarding knowledge sharing. Last but not least, a qualitative analysis is performed in order to create a knowledge map. The results prove that: (i) the analyzed articles regarding knowledge sharing are published in 461 different journals but more than a quarter can be found in 19 journals; (ii) the number of studies increased considerably, especially in the last five years; (iii) 75% of the research production is concentrated in 16 countries and the main research polls are represented by the United States of America (18.34%), United Kingdom (9.47%), and China (6.48%); (iv) the knowledge sharing research concentrates on topics, such as: moderation, mediation, intrinsic and extrinsic motivation, environmental management, innovation, absorptive capacity, and community; and (v) the research gaps that should be filled by the future studies focus on: supply chain management, crisis management, corporate venturing, and human resource management. The results have both theoretical and practical implications. On the one hand, they extend the literature on knowledge sharing by providing a bibliographic report on how the research regarding knowledge sharing evolved during 2008 – 2019, and they also bring forward the main research gaps. On the other hand, they provide a knowledge map for the policy-makers which can help them decide how to foster knowledge sharing inside and outside the organization.

Keywords: knowledge sharing; documentary study; international approach; research networks; research gaps.

Introduction

The knowledge management literature is dominated by two schools of thought that influence the perspective from which knowledge sharing is approached. The scholars from the first school of thought adopt a cognitivist perspective (Von Krogh, 1998) and argue that knowledge is a refillable object, capable of being extracted from people's minds and transformed into an organizational resource. They assume that, by using a set of codes and codebooks, knowledge can be easily packed-up, owned, and shared inside and outside the organization's boundaries. As a result, knowledge is collected from employees' minds and interactions, and incorporated into organizational databases, documents, procedures, norms, statements, and products / services. Against this backdrop, knowledge sharing is defined as "the movement of knowledge across individual and organizational boundaries, into and from repositories, and into organizational routines and practices" (Bock, Zmud, Kim, & Lee, 2005, p.88) and it depends on information technologies (IT) applications; a dependence that although increases knowledge availability and sustainability, causes several misunderstandings. On the one hand, it increases the confusion between knowledge and information due to the fact that most of the IT applications are more suitable for information processing and sharing than knowledge sharing (Albino,

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Garavelli, & Gorgoglione, 2004; Cross & Baird, 2000; McDermott, 1999). On the other hand, the focus is mainly on cognitive knowledge, especially on explicit knowledge which is easier to codify and share once the context is specified (Cacciatori, Tamoschus, & Grabher, 2012).

The scholars from the second school of thought adopt a constructivist approach (Swan, Newell, Scarborough, & Hislop, 1999) and argue that knowledge is a human process that occurs in social interactions (Alvesson & Kanneman, 2001; Sveiby, 1996). They assume that knowledge cannot be stored and re-used since it is a subject of interpretation; depending on the experience of the knower, the same reality may have different significances. As a consequence, they are skeptical not only to the concept of organizational knowledge but also to the occurrence of organizational knowledge sharing. In line with this, they define knowledge sharing as a process where people "mutually exchange their (implicit and explicit) knowledge and jointly create new knowledge" (Van Den Hooff & De Ridder, 2004, p.118).

Although these perspectives seem to contradict one another, in reality, they tend to complement each other, and present knowledge sharing as a critical, indispensable, significant and central process for growth of the organization (Cavaliere & Lombardi, 2015; Goswami & Agrawal, 2019; Grant, 1996; Wu & Lee, 2016; Zahedi, Shahin, & Babar, 2016). The first one focuses on explicit knowledge while the second one concentrates on tacit cognitive, emotional, and spiritual knowledge. Besides, both of them use codes and codebooks; the former involves a voluntary / direct effort for creating organizational databases, documents, procedures, etc. while the latter occurs involuntarily / indirect effort by encouraging a specific organizational culture, work climate, and leadership.

Taking these into account and also the advances in knowledge management that occurred in the last years, the current research aims to provide a bibliographic report on the research developed during 2008 – 2019. Hence, it aims to determine whether the two schools of thought are still disputing their "territory" or a consensus has been reached.

The content of the paper is organized around 4 sections. Section two emphasizes the research methodology, shedding light on the research goal, and the steps followed in order to achieve it. Further, the main research results are brought forward. Thus, section three presents, on the one hand, the chronological evolution of the analyzed research topic and the journals that served as a "dissemination hub", and on the other hand, it provided a knowledge map of the knowledge sharing topic. Section four closes this article by highlighting the theoretical and practical implications of the main findings and also some further research directions.

Methodology

This article aims to provide a bibliographic report on the research developed during 2008 – 2019 regarding knowledge sharing. In order to achieve this goal, a multi-stage methodology is developed and an etic approach is employed. Unlike the emic approach, the etic perspective generates "descriptions and analyses expressed in terms of the conceptual schemes and categories regarded as meaningful and appropriate by the community of scientific observers" (Lett, 1990, p.130). Furthermore, Mott-Stenerson (2008, p.432) claims that "the etic approach is exemplified through a review of literature for thematic frameworks" while Fram (2013, p.7) states "the theoretical framework is a process at the abstract level using relative theories and definitive concepts as comparisons to gain understandings in order to describe, explain, or predict social phenomena, which occurs when the etic perspective is maintained".

First of all, a documentary study is employed. This is a systematic procedure which "requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge" (Bowen, 2009, p.27). Thus, it is a

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research method suitable for "uncovering meaning, developing understanding, and discovering insights relevant to the research problem" (Merriam, 1988, p.118). Taking these into account, the instructions of Calabro et al. (2019) and Pak, Kooij, De Lange, and Van Veldhoven (2019) are followed. In other words, the following steps guide the search and selection process:

1. *The search of the relevant sources*: In line with previous literature (Keupp, Palmie, & Gassmann, 2012; Leon, 2020; Pak et al., 2019), the first step concentrates on searching for the articles published on SCOPUS and Web of Science, during 2008 – 2019, that include the keyword "knowledge sharing" in the title or abstract. A total of 20076 articles are found.
2. *Removing the duplicates*: The duplicates are removed as suggested by Boon, Den Hartog, and Lepak (2019), Langley et al. (2019), and North (2019). After cleaning the list, the sample is reduced to 14246 articles.
3. *Title and abstract analysis*: In order to assess articles relevance for the research goal, all the titles and abstracts are analyzed and those which fall out of scope are eliminated (Adams, Jeanrenaud, Bessant, Denyer, & Overy, 2016; Pukall & Calabro, 2014; Rashman, Withers, & Hartley, 2009). An article is considered to be relevant if it considers knowledge sharing to be a continuous process that occurs inside and outside the organization's boundaries. In other words, an article is relevant if knowledge sharing is perceived as "a form of citizenship behavior, being a voluntary act that helps contribute to an organization's competitive advantage" (Casimir, Lee, & Loon, 2012, p.741). Against this background, a total of 4246 articles are selected.
4. *Full-text assessment*: The full text of the 4246 articles is read and based on a comprehensive assessment (Bakker, 2010; David & Han, 2004; Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017), the sample is reduced to 3820 articles.

Secondly, a quantitative analysis is developed in order to emphasize the chronological evolution of the research topic and the main journals that served as a vehicle for propagating the research regarding knowledge sharing.

Last but not least, a qualitative analysis is performed in order to create a knowledge map. Content analysis is employed; this has analytical flexibility, it is non-intrusive and it entails the specification of category criteria for reliability and validity tests (Duriau, Reger, & Pfarrer, 2007). Further, data are processes using NVivo 11 which proved to be a viable tool for qualitative analysis in previous studies (Devereux, Wadsworth, & Bhattacharya, 2020; Santos, Steil, & Delgado-Hernández, 2020; Virdi, Kalro, & Sharma, 2020).

Research on knowledge sharing: chronological evolution and topics of interest

Descriptive results

The analyzed articles regarding knowledge sharing are published in 461 different journals but more than a quarter can be found in 19 journals (Table 1). Thus, the main vehicles for promoting the knowledge sharing research are represented by the *Journal of Knowledge Management* (published 7.77% of the analyzed articles), *Knowledge Management Research & Practice* (published 3.92% of the analyzed articles), *Journal of Business Research* (published 1.91% of the analyzed articles), *Research Policy* (published 1.75% of the analyzed articles), and *Technological Forecasting and Social Change* (published 1.33% of the analyzed articles). These can be considered as the main academic outlets when it comes to promoting new perspectives on knowledge sharing. Furthermore, given the fact that these are top-tier journals in the business and management category proves not only the increased interest of the academics in analyzing how and why knowledge sharing occurs inside and outside an organization's boundaries but also the quality of the research developed so far.

Table 1. The main academic outlets for disseminating information about knowledge sharing, during 2008 - 2019

Journal	*Number of articles*	*Impact Factor*	
		Clarivate	*Scopus*
Journal of Knowledge Management	297	4.745	1.75
Knowledge Management Research & Practice	150	1.583	0.46
Journal of Business Research	73	4.874	1.87
Research Policy	67	5.351	3.25
Technological Forecasting and Social Change	51	5.846	1.82
Management Decision	48	2.723	0.86
Industrial Marketing Management	45	4.695	2.08
Journal of Product Innovation Management	43	5.000	3.13
International Journal of Project Management	39	6.620	2.66
Information & Management	39	5.155	2.40
International Journal of Human Resource Management	39	3.040	1.26
Organization Science	38	2.790	5.56
Knowledge and Process Management	34	-	0.33
Journal of Business & Industrial Marketing	33	1.961	0.69
Strategic Management Journal	32	5.471	8.43
International Journal of Knowledge Management	32	-	0.22
International Journal of Innovation Management	32	-	0.49
Technology Analysis & Strategic Management	31	1.867	0.63
International Journal of Contemporary Hospitality Management	30	5.667	2.20

The increased interest in knowledge sharing is also reflected by the distribution of articles per year and research type (Figure 1). Thus, the number of articles increased considerably, especially in the last five years; the number of studies almost doubled in 2015 compared to 2014 and the average annual growth rate increased from 11.38%, in 2008 – 2013, to 19.64%, in 2014 – 2019. Besides, the fact that almost 87% of the published articles are empirical studies proves that the knowledge sharing domain is in a mature stage of development; the researchers no longer focus on conceptualization (defining, describing, and categorizing concepts) but on identifying either the factors of influence (Hong Telvin Goh & Hooper, 2009; Kim, 2019; Sedighi, Lukosch, Brazier, Hamedi, & van Beers, 2018) or the consequences of knowledge sharing (Du, Ai, & Ren, 2007; Kang & Lee, 2017; Wu, Ming, He, Li, & Li, 2014).

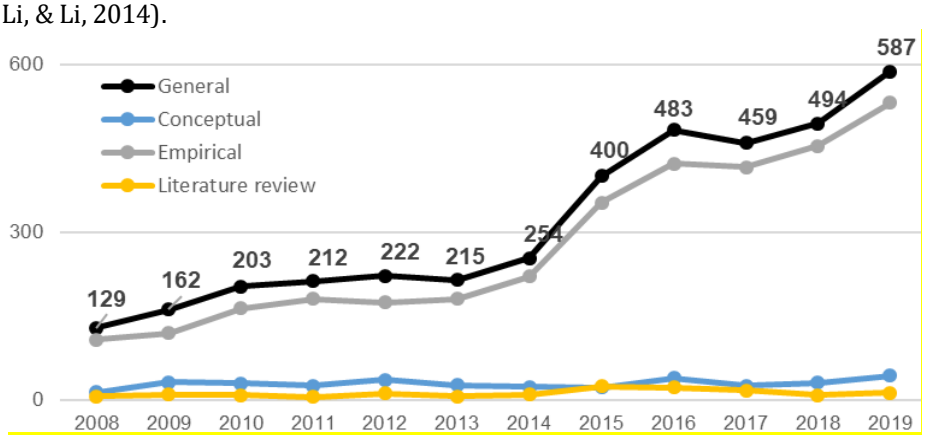

Figure 1. The distribution of articles based on the year of publication and research type

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Furthermore, if authors' geographic distribution is considered, it must be mentioned that 75% of the research production is concentrated in 16 countries (Table 2) and the main research polls are represented by the United States of America (18.34%), the United Kingdom (9.47%), China (6.48%), Australia (5.01%), Italy (4.12%), Taiwan (3.97%), Netherlands (3.90%), Canada (3.55%), Germany (3.16%), and Spain (2.99%). Besides, although they analyze the concept of "knowledge sharing", their perspective is somehow limited to the national boundaries; thus, only 32.44% of the analyzed article is the result of an international collaboration.

Table 2. The main research polls for the knowledge sharing topic, during 2008 – 2019

Country	*Share of authors (%)*
USA	18.34
UK	9.47
China	6.48
Australia	5.01
Italy	4.12
Taiwan	3.97
Netherlands	3.90
Canada	3.55
Germany	3.16
Spain	2.99
South Korea	2.75
France	2.58
Finland	2.56
Sweden	2.15
Denmark	1.99
India	1.99

The knowledge networks that have been developed around the topic of "knowledge sharing" are presented in Figure 2. As can be observed, most researchers tend to collaborate on an international level when they analyze the concept of knowledge sharing; the only countries that are somehow isolated from the rest are represented by Costa Rica, Brunei, North Ireland, and Syria.

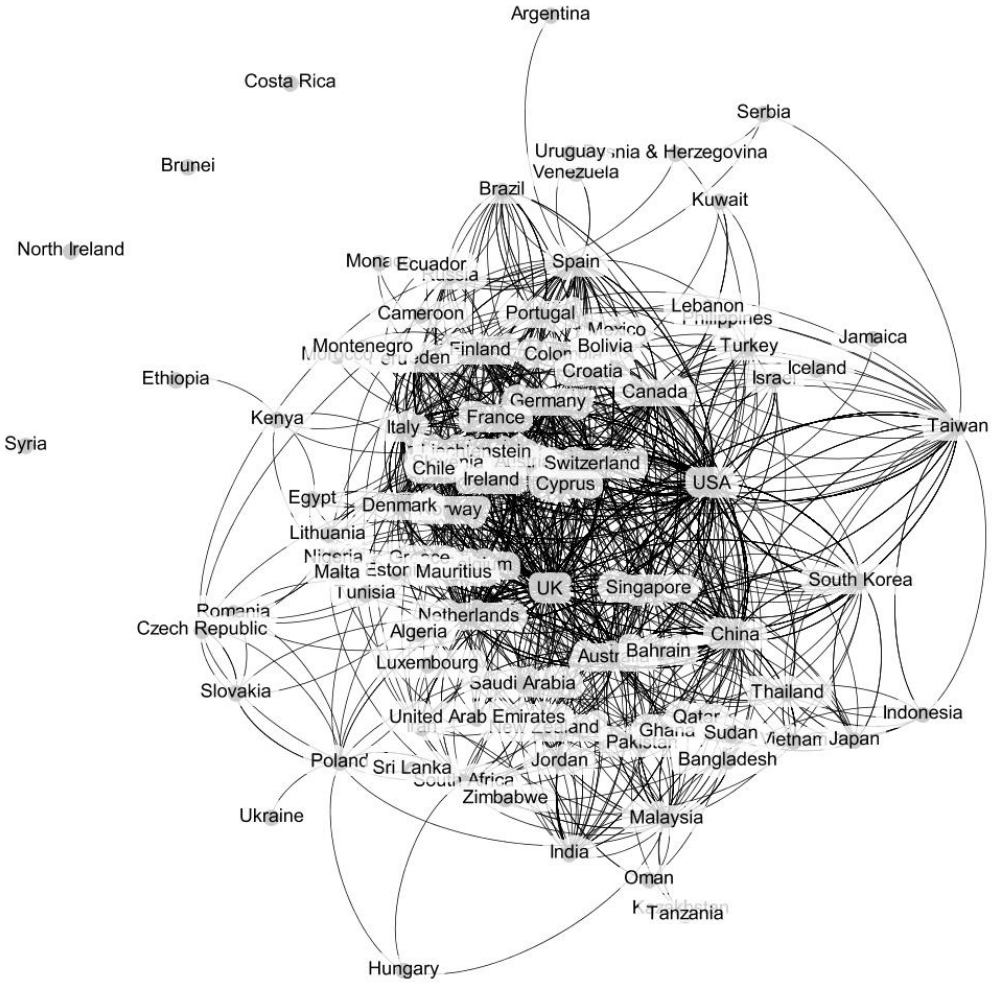

Figure 2. The international knowledge networks developed around the "knowledge sharing" topic

Furthermore, the countries that collaborate intensively in determining how and why knowledge sharing occurs are represented by the USA, China, Taiwan, Austria, and Spain (Figure 3) which basically represent the "heart" of the knowledge sharing research. Due to their international research collaborations, the network is extended to various layers, achieving an average degree of 96.716, an average path length of 2.263, and an average clustering coefficient of 0.484.

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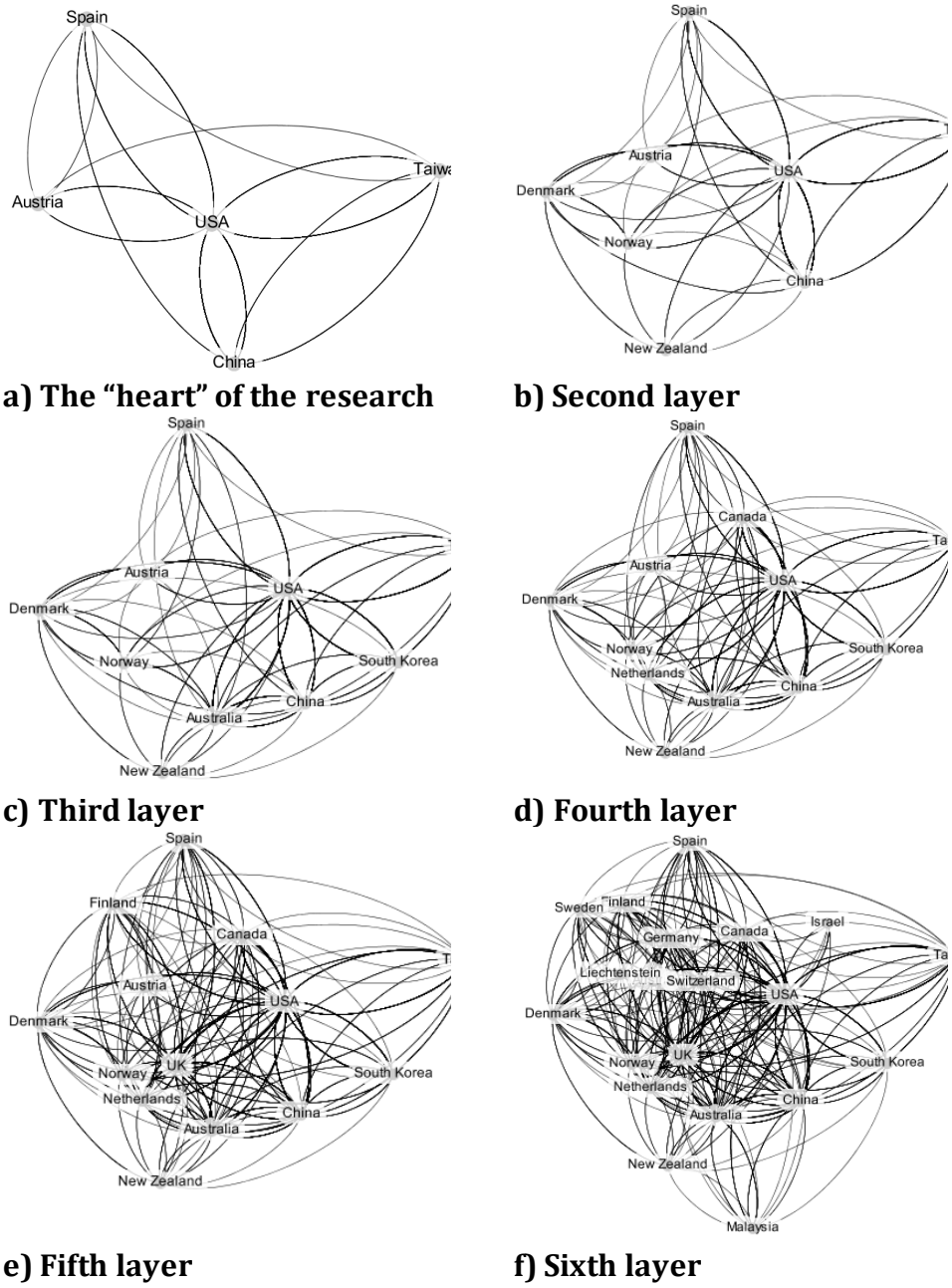

a) The "heart" of the research **b) Second layer**

c) Third layer **d) Fourth layer**

e) Fifth layer **f) Sixth layer**

Figure 3. The international knowledge networks developed around the "knowledge sharing" topic from a multi-layer perspective

Synthesizing, it can be stated that the interest in analyzing the concept of knowledge sharing is growing exponential at the international level, and the main knowledge flows are generated by three economic powers (USA, China, and Taiwan – an Asian Tigre) and two European polls of research, namely: Austria and Spain. These manage to foster the research at the cross-cultural level.

Knowledge map: Core research and several research islands

As reflected in Figure 4, the concept of knowledge sharing is directly connected with moderation, mediation, intrinsic and extrinsic motivation, environmental management, innovation, absorptive capacity and community, and indirectly with information technology (seen as an industry, and also as a mean for knowledge sharing), autonomy, individual level, competitiveness, and knowledge creation. Thus, the core research brings

forward both the inputs and outputs of knowledge sharing; on the one hand, it emphasizes the importance of motivation, community, and absorptive capacity in fostering knowledge sharing, and on the other hand, it highlights the effects that the latter could have on competitiveness and innovation.

Figure 4. The main topics with which the concept of "knowledge sharing" is connected

Within this framework, Joshi, Chi, Datta, and Han (2010) show that knowledge capabilities that are enhanced through the use of IT contribute to firm innovation while Ritala, Olander, Michailova, and Husted (2015) analyze 150 Finnish technology-intensive firms and claim that external knowledge sharing has a positive effect on innovation performance, but high levels of accidental and intentional knowledge leakage by a firm's employees negatively moderate this relationship.

Nevertheless, the classical dispute regarding the knowledge owners is still present; the distinction between human knowledge and organizational knowledge within the firm's boundaries keeps attracting scholars' attention. Therefore, the human character is highlighted in relation to innovation, motivation, and absorptive capacity while the organizational perspective is linked to competitiveness, knowledge creation capacity, information technology, and business value. Hence, Foss, Minbaeva, Pedersen, and Reinholt (2009) confirm that job characteristic, such as autonomy, task identity, and feedback, determine different motivations to share knowledge, which in turn predict employees' knowledge sharing behaviors while Camelo-Ordaz, Garcia-Cruz, Sousa-Ginel, and Valle-Cabrera (2011) argue that human resources management practices contribute to knowledge creation and innovation through the generation of the affective commitment necessary for employees to be willing to share their knowledge. On the other hand, Hernandez-Espallardo, Rodriguez-Orejuela, and Sanchez-Perez (2010), Ho and Ganesan (2013), and Jiang and Li (2009) focus on the organizational knowledge and prove that: (i) joint ventures, as opposed to contractual alliances, are more effective and influential in facilitating knowledge sharing and creation (Jiang & Li, 2009), (ii) when levels of both customer participation and customer value are high, knowledge base compatibility between supplier partners leads to greater knowledge sharing (Ho & Ganesan, 2013), and (iii) from more influential to less, social mechanisms of governance, hostages and

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behavioral control favor knowledge sharing, learning, and performance in supply chains (Hernandez-Espallardo et al., 2010).

However, several research islands can be identified and these tend to concentrate on supply chain management, crisis management, corporate venturing, and human resource management. These adopt a more specific approach to the concept of "knowledge sharing" and manage to bring forward the research gaps that should be filled by future studies.

Research island 1: Supply chain innovativeness

The first research island is represented by supply chain innovativeness (Figure 5) which according to Inemek and Matthyssens (2013) is not sufficiently addressed in the specialized literature, despite its increasing importance in the business environment. This represents "the ability of a supplier firm to generate and implement new ideas, new ways of doing things, or new methods of operation, as well as investments in new products, processes, and technologies" (Inemek & Matthyssens, 2013, p.581), and it fosters company's adaption to market demands (Azadegan & Dooley, 2010), competitiveness (Kim & Chai, 2017), capability widening (Hsiao, Tan, & Chiou, 2020), customer satisfaction (Jean, Sinkovics, & Kim, 2017; Trang & Tho, 2019), and performance (Azadegan & Dooley, 2010; Cheng & Krumwiede, 2018).

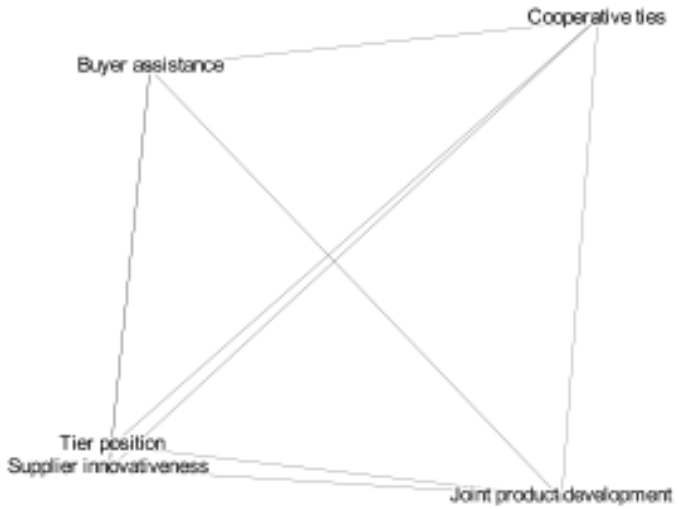

Figure 5. Supply chain innovativeness: the first island in the "knowledge sharing" research

Within this framework, knowledge sharing is seen as the pillar that supports the business triple helix, namely: supplier – manufacturer – customer / buyer. Therefore, concepts like "cooperative ties" and "joint product development" are brought forward. These enhance "co-opetition" and encourage innovativeness among suppliers and sellers. However, only a few attempts have been made in this direction, and they proved that; (i) interfirm knowledge sharing routines, relation-specific investments, and governance mechanisms may promote supplier innovativeness (Inemek & Matthyssens, 2013), (ii) knowledge-sharing routines mediate in the effect of idiosyncratic investments on innovation performance (Charterina, Basterretxea, & Landeta, 2016), and (iii) the impacts of customer participation as an information resource and as a co-developer on new product development performance are mediated by inter-organizational relationships (Lin, & Huang, 2013).

Research island 2: Forecasting and crisis management

The second research island is represented by forecasting and crisis management (Figure 6). Only a few researchers (Del Giudice, Della Peruta, & Maggioni, 2015; Kaklauskas, Amaratunga & Haigh, 2009; Opiła, 2019; Shamir & Shin, 2016) address this challenge. Thus, Kaklauskas et al. (2009) develop a knowledge model for post-disaster management based upon multiple criteria decision-making theory; this has six stages that help to determine rational alternatives by evaluating the life cycle, stakeholders, micro and macro environment. Del Giudice et al. (2015) prove that the model of Easingwood, Mahajan, and Muller (1983) allows obtaining interesting predictions on the future evolution of the sector performances in terms of the increasing use of knowledge-sharing technologies within the taxi drivers' community of practice. Shamir and Shin (2016) model a market comprising an incumbent supply chain facing the possible entry of a competing supply chain, and demonstrate that when the information is shared with the competitor, the incumbent retailer faces the trade-off between the desire to secure an ample capacity level and the fear of intense competition. Last but not least, Opiła (2019) states that in order to enhance knowledge sharing, special care must be devoted to clarity, the optimal level of details, and information density in order to avoid obfuscation.

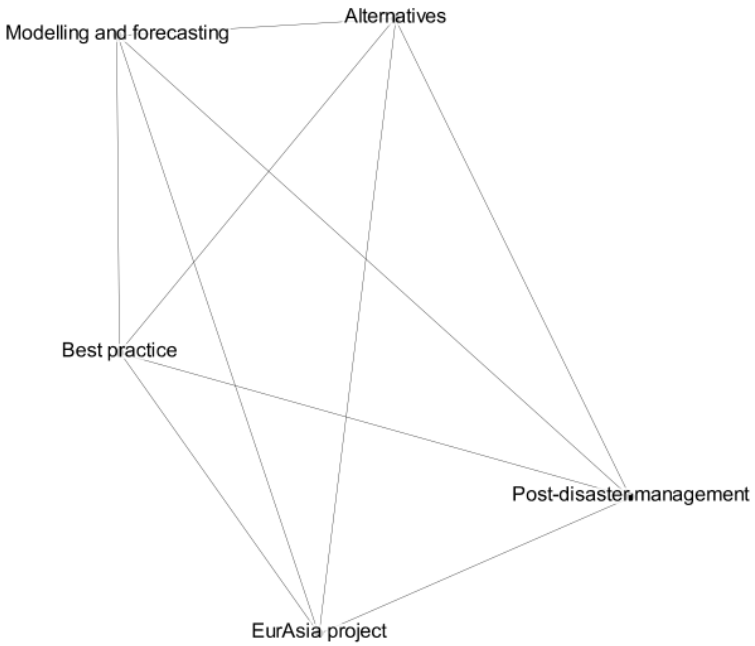

Figure 6. Forecasting and crisis management: the second island in the "knowledge sharing" research

At this level, two aspects must be discussed. On the one hand, the studies developed so far emphasize the strategic importance of sharing best practices inside and outside the organization's boundaries. On the other hand, they highlight managers' need for anticipating future challenges and using quantifiable tools. As Kim (2014, p.37) states "although there are many valuable research products available which have tremendous potential to improve the organization from research, many of them have not been implemented to a significant extent on real-world projects […] due to the fact that they do not provide a quantitative evaluation index". Hence, in order to manage crises and develop scenarios, managers need data; they have a psychological need for numbers and tools that could help them to model and forecast the future.

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Research island 3: Corporate venturing and integration mechanisms

The third research island is represented by the need of using the integration mechanism in the context of corporate venturing (Figure 7). As Burgers, Jansen, Van den Bosch, and Volberda (2009, p.206) argue "research has suggested that corporate venturing is crucial to strategic renewal and firm performance, yet scholars still debate the appropriate organizational configurations to facilitate the creation of new businesses in existing organizations".

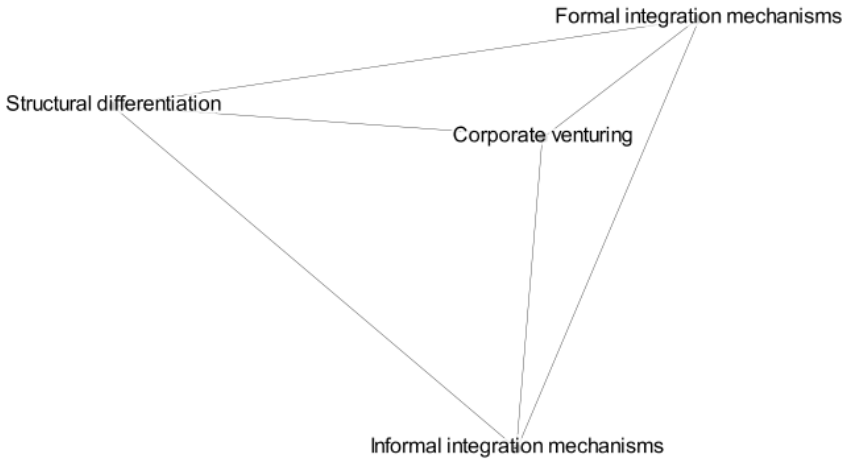

Figure 7. Corporate venturing and integration mechanisms: the third island in the "knowledge sharing" research

The studies developed so far take into consideration both the formal and informal character of knowledge sharing and demonstrate that: (i) a shared vision has a positive effect on venturing in a structurally differentiated context (Burgers et al., 2009); (ii) a firm with a broad knowledge base is more likely to achieve radical innovation in the presence of internal knowledge sharing rather than market knowledge acquisition (Zhou & Li, 2012); (iii) formal and informal mechanisms have significant influence on knowledge sharing motivation and opportunity (Huang, Chiu, & Lu, 2013); (iv) transformational leadership promotes within-team knowledge sharing and team innovative performance through an integration mechanism manifest as team cooperative norms (Jiang & Chen, 2018); and (v) there is a complementarity between the use of search practices and practices used to facilitate horizontal cross-functional integration and to encourage, address and manage employees' efforts in generating new solutions to technical or market issues in the front-end of innovation processes (Martini, Neirotti, & Appio, 2017).

Research island 4: Intercultural human resources and profitability in the service industry

The fourth research island is represented by the link between intercultural human resources and profitability in the service industry (Figure 8). This approach is in line with the increased growth of the tertiary sector which accounts for about 70% of the total value added of overall economic activity in the euro area (Forsells, Kennedy, & Timm, 2019) and it also sheds light the challenges raised by managing multi-cultural human resources. Thus, the managers have to find the most appropriate organizational tools and practices in order to foster knowledge sharing among multicultural employees. Against this backdrop, concepts like "workplace context / relationships", "cultural differences", and "retention" are brought forward, and the latter seems to act as a bridge between the internal environment (defined by the characteristics of the work climate) and external environment (which reflect the business domain and customer profitability).

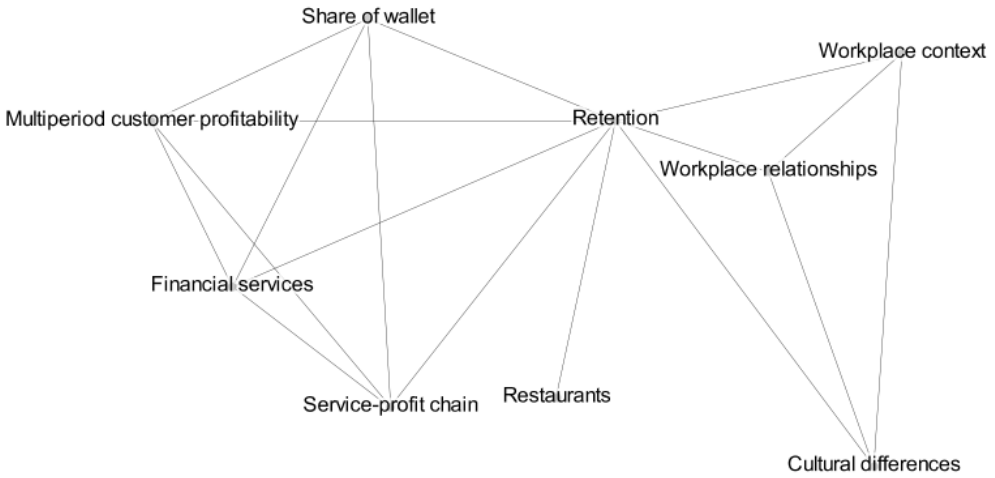

Figure 8. The link between intercultural human resources and profitability in the service industry: the fourth island in the "knowledge sharing" research

Several attempts have been made in this area and the results seem to be complementary. Some scholars focus on emphasizing the influence factors (Burmeister, Fasbender, & Deller, 2018; Ma, Huang, Wu, Dong, & Qi, 2014;) while others concentrate on knowledge sharing outcomes (Kianto, Vanhala, & Heilmann, 2016;); only a few researchers combine both perspectives (Naim & Lenkla, 2016). Hence, Ma et al. (2014) concentrate on knowledge sharing factors and state that intrinsically and extrinsically motivated individuals tend to share more knowledge with their team members. Kiano et al. (2016) focus on the outcomes of knowledge sharing in the context of a Finnish municipal organization and demonstrate that intra-organizational knowledge sharing is a key knowledge management process that promotes satisfaction with one's job in most employee groups. Naim and Lenkla (2016) go further and prove that knowledge sharing in the organization has a great potential to foster competency development and generate a sense of affective commitment and intention to stay of employees of Gen Y. Burmeister et al. (2018) remain concentrated on the age-related culture dimension and show that the age of one's colleague has a positive effect on one's knowledge receiving behavior and a negative effect on one's knowledge sharing behavior.

Conclusions

The current research concentrated on providing a bibliographic report on the research developed during 2008 – 2019 regarding knowledge sharing. Thus, 3820 articles were analysed and the results proved that: (i) the analyzed articles regarding knowledge sharing were published in 461 different journals but more than a quarter could be found in 19 journals; (ii) the number of studies increased considerably, especially in the last five years; (iii) 75% of the research production was concentrated in 16 countries and the main research polls were represented by the United States of America (18.34%), United Kingdom (9.47%), and China (6.48%); (iv) the research concentrated on topics such as: moderation, mediation, intrinsic and extrinsic motivation, environmental management, innovation, absorptive capacity, and community; and (v) the dispute regarding who owns the knowledge created and shared within the company boundaries (the individual or the organization) was still present; and (vi) the research gaps that should be filled by the future studies focused on: supply chain management, crisis management, corporate venturing, and human resource management.

These findings provide valuable insides for both scholars and practitioners. On the one hand, they extend the literature on knowledge sharing by providing a bibliographic report on how the research regarding knowledge sharing evolved during 2008 – 2019. As aforementioned, the research is growing but it seems to be concentrated in the USA, UK,

China, Australia, Italy, Taiwan, and the Netherlands; they own almost half of the current research production. Besides, the research developed in Costa Rica, Brunei, North Ireland, and Syria is somehow isolated from the rest of the world; no international knowledge flows go in or out of these countries. Last but not least, the current article brings forward the main research gaps, the areas on which future research should concentrate on when knowledge sharing is taken into account. On the other hand, they provide a knowledge map for the policy-makers which can help them decide how to foster knowledge sharing inside and outside the organization.

Despite its valuable insights, the current research is limited by the analysis framework. Thus, it focuses only on the articles that have been published during 2008 – 2019 in the international journals indexed in SCOPUS and Web of Science and neglects the research production published in other databases and timeframes. The results could have been different if more databases would have been analyzed or if the timeframe would have been increased. Taking these into account, the following research directions are identified: (i) replicating the current research on a larger scale, by extending the analyzed databases and timeframe; (ii) developing an industry-based analysis in order to determine the best practices from each industry, and the business areas that remained unexplored; and (iii) developing a cross-cultural analysis in order to establish how cultural specificity influences collaboration among the academics.

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