



Knowledge sharing between companies and its consequences: a study in coworking spaces

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ABSTRACT

Knowledge sharing is a process for companies to acquire knowledge and remain competitive and adaptable. At the same time, sharing can compromise the uniqueness of a company's repository of knowledge, affecting its exclusivity. This research analyzes knowledge sharing between companies in *coworking spaces* and its consequences, considering the features of this type of organization. A case study was conducted in 5 of these spaces, in which 31 interviews, documents and observations were made for subsequent content analysis. The practices identified show that the *coworking* environment favors the management of information and knowledge and are associated with: performance of managers and employees of the spaces in interactions; parallel initiatives of the spaces; internal structure and distribution; characteristics of the external environment; own digital platforms and interactive media for communication; contact with external professionals; frequency and content of the formal events promoted. The management of these businesses is facilitated when it is evidenced that self-employed professionals and small teams are more aligned with the dynamics of *coworking spaces*; formal events are more favorable for interactions, and facilitation by managers is essential; own digital platforms, *Instagram* and *WhatsApp* support the practices identified, highlighting that emails are no longer used.

Keywords: knowledge sharing; coworking; information systems and technologies.

INTRODUCTION

Organizations face several technological changes over the years, which create opportunities and challenges (Tongur; Engwall, 2014). On the one hand, technology allows new business relationships to be developed, mainly by reducing the distances between companies and customers (Vrontis *et al.*, 2017). On the other hand, this scenario amplifies the consumer's power of choice and makes the market more demanding, competitive and dynamic, by providing different options and connecting companies and customers all over the world. The global context of competition and available knowledge causes managers to reconsider their commercial approaches and redefine their businesses, seeking to achieve sustainable competitiveness in the market (Vrontis *et al.*, 2017). Different studies show that, in order for there to be alignment between the market, emerging demands and internal changes in organizations, one must invest in the management of an important organizational asset: knowledge (Grant, 2013; Loebbecke; Van Fenema; Powell, 2016).

Due to the growing amount of available knowledge, one of the biggest challenges for companies is related to the effectiveness of knowledge management strategies, tools and techniques that assist in organizational learning (Soto-Acosta; Cegarra-Navarro; Garcia-Perez, 2017). Oliveira *et al.* (2015) identify the need for research that provides support for managers to use knowledge management practices, in order to favor innovation and maintain competitiveness in the market. Considering the complexity of knowledge management practices, segmenting its flow is necessary. In this sense, knowledge sharing is one of the knowledge management processes that is most highlighted in the literature (Lin, 2007; Chang; Hsu; Lee, 2015; Zimmermann *et al.*, 2018; Simeonova, 2018), being positively related to organizational learning and business innovation (Im; Rai, 2014; Iglesias-Pradas; Hernández-García; Fernández-Cardador, 2017; Martínez-Conesa; Soto-Acosta; Carayannis, 2017; Zimmermann *et al.*, 2018).

Despite this prominence in the literature, interorganizational knowledge sharing still represents a paradox in conducting business. Loebbecke, Van Fenema and Powell (2016) argue that knowledge sharing increases organizational learning and innovative performance, providing business opportunities and adding value to the company. At the same time, sharing can compromise the uniqueness of a company's repository of knowledge, affecting its exclusivity and competitive advantage. The authors suggest that this paradox be analyzed in order to highlight the position of entrepreneurs regarding sharing or protecting their knowledge from external organizations.

Broadening this discussion, today new information technologies are transforming business. Professionals have greater flexibility and mobility to develop their work, favoring the emergence of shared work spaces, such as coworking spaces (Kojo; Nenonena, 2017). Coworking spaces are considered incubation spaces, which favor the connection between their members and the external community, in addition to reducing start-up and administrative costs (Nesta, 2015; Cashman; 2017). The possibility of interaction created by these spaces

favors knowledge sharing between companies (Moriset, 2013; Boucken; Reuschl, 2018). Despite the growth of coworking spaces, this phenomenon is still little explored in the management literature, with a gap regarding the internal processes of these spaces and the improvement of the businesses of participating companies (Boucken; Reuschl, 2018; Leclercq-Vandelannoitte; Isaac, 2016).

Considering the need for companies to acquire new knowledge for sustainable competitiveness and to adapt to market demands, as well as the growth of coworking spaces as an alternative for interaction in search of these benefits, we aim to analyze knowledge sharing between companies in these spaces and its consequences. To this end, a multiple case study was conducted in 5 coworking spaces in Santa Catarina, in the city of Florianópolis, which is a reference in entrepreneurship, innovation and technology (Endeavor Brasil, 2017). To obtain the data, 31 interviews were conducted with participants in these spaces, documents collected and observations made.

Knowledge sharing has been investigated in management literature, and the cognitive factors of this practice have been analyzed (Zimmermann *et al.*, 2018). This research was conducted from a managerial perspective, with a view to contributing to an operational understanding of knowledge sharing between companies. Furthermore, this research aims to fill the gap highlighted by Oliveira *et al.* (2015) on the elucidation of the results of knowledge sharing practices for companies. This analysis contributes to highlighting the importance of the topic in literature and in practice, considering that the discontinuity in investments in knowledge management processes is generally justified by the difficulty in demonstrating the results of this process (Oliveira *et al.*, 2015). Regarding the context of application of this research, we sought to analyze the coworking spaces and their relevance for knowledge sharing practices, following the suggestion of Boucken and Reuschl (2018) on studies with this type of organization.

Knowledge Sharing and its Dimensions

Knowledge sharing is recognized in the literature as one of the main knowledge management processes for contemporary organizational arrangements (Zimmermann *et al.*, 2018). Different dimensions of knowledge sharing are suggested for exploration. Initially, sharing can be configured at the intraorganizational and interorganizational levels. The intraorganizational level addresses knowledge sharing between employees of the same organization. And cognitive ties between employees create better conditions for such sharing to take place (Zimmermann *et al.*, 2018). This is because, at the interorganizational level, knowledge is shared between organizations, including suppliers, customers, competitors and partner channels (Saraf; Langdon; Sawy, 2013; Oliveira *et al.*, 2015). At the same time, knowledge sharing between organizations contributes to the survival of the organizations involved, by reducing the costs of coordinating activities, refining existing products and services and improving the performance of routine activities (Im; Rai, 2008). Martelo-Landroguez

and Cegarra-Navarro (2014) also highlight that the ability to combine internal and external knowledge bases is relevant for the alignment between an organization's processes, products and services, adding value to what is delivered to consumers.

Such observations highlight the paradox of interorganizational knowledge sharing and the relevance of its practical analysis (Loebbecke; Van Fenema; Powell, 2016). For the analysis of knowledge sharing, Steffen, Oliveira and Balle (2017) suggest four dimensions, which can be applied both at the intraorganizational and interorganizational levels: i) actors who share knowledge; ii) type of knowledge shared; iii) mechanisms used; and iv) expected benefits of these actions. These factors are investigated to understand the knowledge sharing process in organizations in a holistic manner, contributing to a consistent and applicable theoretical framework.

In the interorganizational context, the dimension of the actors addresses organizations in which knowledge is shared, analyzing the areas of activity of the institutions involved, the size, type of organization and the relationship between them (Steffen; Oliveira; Balle, 2017). In this dimension, Gupta *et al.* (2009) highlight, for example, that periodic meetings help with alignment between employees.

Regarding the type of knowledge, we seek to analyze the content shared between the actors, which can vary between managerial, technical or both. Market analysis, trends and strategies, for example, are managerial knowledge; while product and service development information is technical in nature (Takeuchi; Nonaka, 2008). Steffen, Oliveira and Balle (2017) note that companies involved in a synergy environment tend to share more managerial knowledge than technical knowledge.

Regarding mechanisms, they are analyzed based on the way in which knowledge is shared by the actors involved. Bollinger and Smith (2001) analyzed some mechanisms and highlighted 'face-to-face', such as in meetings and informal contacts, and the forms 'supported by information technologies'. Information technologies play an important role in making and maintaining contacts dynamically, aiming to transfer knowledge from those who originally created and experienced it to other potential beneficiaries of this information (Alavi; Leidner, 2001). However, the ease of use of information technologies and the structure of organizations are decisive for this purpose (Steffen; Oliveira; Balle, 2017). Considering the benefits and complexity of this type of mechanism, information technology is identified as an important facilitator, and its role is increasingly significant as technologies evolve and enable new possibilities for knowledge transfer (Asrar-UI-Haq; Anwar, 2016).

Finally, the benefits address the motivations for sharing knowledge, such as increasing the productivity of operations, improving organizational processes and prospecting new customers, in addition to supporting decision-making (Al-Busaidi; Olfman, 2005). In this dimension, an important discussion addresses trust between the actors involved in the sharing process (Davenport; Prusak, 1998; Huang; Davison; Gu, 2011; Hsu; Chang, 2014; Chang; Hsu; Lee, 2015; Simeonova, 2018). Huang, Davison and Gu (2011) emphasize that, when there is trust between actors, the intention to share knowledge, both tacit and explicit,

increases. Moreover, perceived cost, career progression, job security, reputation, reciprocity and altruism can motivate sharing among individuals (Davenport; Prusak, 1998; Chang; Hsu; Lee, 2015; Zimmermann *et al.*, 2018).

The increased interest in knowledge sharing in management literature lies within investigating its impacts on organizations. According to Huang, Davison and Gu (2011), knowledge sharing, when efficient, directly facilitates the creation of knowledge among individuals, supporting the maintenance of the company's competitive advantage over its competitors. For Cisne, Arasaki and Santos (2015), by means of sharing, one can develop a more intelligent, collaborative and even competitive organization, as learning will be increasingly greater, changes can be made more quickly, there is reduced errors, and the maximization of successes, through the recording of sharing of lessons learned and best practices.

Wang and Noe (2010) state that lack of knowledge sharing can cause inefficiency in production processes, delays in decision-making, information asymmetry and knowledge retention. Fernandes *et al.* (2019) adds the fact that knowledge sharing is related to innovation, by bringing provocations, creating insights, rethinking solutions and identifying new paths that can result in incremental or radical innovations. Hu, Lin and Chang (2013) indicate that diversity in knowledge sources reinforces the production and innovation performance of technology-based companies. In line with other authors, Hsu and Chang (2014) state that this sharing has become a critical success process for organizations, as it both increases innovation skills and provides performance gains and sustainable competitive advantage.

Within coworking spaces, knowledge sharing is a natural process, considering that one of the main objectives of these environments is to support this action. Schopfel, Roche and Hubert (2015) state that many people decide to participate in these spaces to meet other people, learn from them and work in a stimulating and creative environment, in an efficient and friendly manner. Coworking spaces represent a place for people to meet, explore, experiment, learn, teach and share topics about creative practices in various areas (Bilandzic; Foth, 2013). Such aspects encourage the understanding of these spaces in knowledge sharing (Boucken; Reuschl, 2018).

Moriset (2013) finds that the rooms and equipment in a coworking space are designed to encourage and promote meetings, collaborations and discussions among entrepreneurs who have projects and ideas and who wish to share them, creating interactions both within and outside the community of coworkers. However, the primary factor for sharing knowledge, both tacit and explicit, is the physical proximity of individuals in the space, which stimulates the creation, transfer, review and implementation of business ideas (Boucken; Reuschl, 2018). This way, users of coworking spaces tend to build relationships of trust among themselves, engaging in different forms of collaboration for the benefit of their businesses (Gandini, 2015).

Coworking spaces tend to function not only as divided environments, where collaboration is incidental, but primarily as relational environments, purposefully accessed by entrepreneurs to build and maintain network relationships, in a context in which social and professional interaction is both physical and digital (Gandini, 2015). Moriset (2013) argues

that coworking spaces are rooted in four basic principles that favor knowledge sharing: i) openness; ii) flexibility, iii) usability; and iv) accessibility. Despite the contribution that these spaces represent for business, management literature hardly explores the internal processes of coworking spaces, including knowledge sharing (Boucken; Reuschl, 2018; Leclercq-Vandelannoitte; Isaac, 2016).

METHODS

This article seeks to analyze knowledge sharing between companies in coworking spaces and its consequences. To meet the proposed objective, qualitative research was developed and an exploratory multiple case study was chosen. The case study is an empirical research method used to understand contemporary phenomena in depth. The definition of multiple case study refers to the individual study of each coworking space analyzed, allowing the verification of similarities and differences between them. The exploratory case study concerns preliminary investigations, prior to large-scale surveys (Yin, 2015).

To define the units of analysis, it was decided to examine companies in organizational environments related to the context of knowledge sharing. The coworking spaces are suitable, considering their contemporaneity and the growing interest in literature and the market, in addition to the proposal for social interaction and guidance for entrepreneurship, innovation and technology. The choice of the city where the research was conducted is also justified. Florianópolis is considered one of the main hubs of entrepreneurship, innovation and technology in Brazil, being considered the second most entrepreneurial city and the third most innovative in the country, according to the Entrepreneurial Cities Index (Endeavor, 2017).

In the capital city of Santa Catarina, the different innovation habitats stand out, including: a creative district initiative, two technology parks, two innovation centers, two incubators, two pre-incubators, two *FabLabs*, three accelerators and seventeen coworking spaces (Azevedo; Teixeira, 2017). Invitations to participate in the survey were sent to all coworking spaces in Florianópolis, of which 5 responded positively regarding participation in this survey. Next, it was decided to collect data from users of coworking spaces, from the perspective of entrepreneurs, managers and employees.

After defining the units of analysis, data collection began, performed by means of semi-structured interviews with entrepreneurs, managers and/or employees of companies participating in the selected coworking spaces; field observation; and document collection (Flick, 2009; Yin, 2015). For the interviews, a semi-structured script was used, prepared based on the literature on knowledge sharing. To determine the number of interviews, the guidelines of Sarker, Xiao and Beaulieu (2013) were followed, who argue that the average number of interviews in qualitative research is 40, considering research in Information Systems conducted by four important journals in the field since 2000. We sought to conduct 40 interviews, in order to obtain a level of significance that is considered adequate. In total, 31 people were interviewed, as a means to reach data saturation.

Additionally, observations of the coworking spaces analyzed were made, with attention to the following aspects: location, size, neighborhood characteristics, presence of companies in the surrounding area, internal physical structure, physical distribution of members and possible interactions between companies during the interviews. Appendix B presents the direct observation script used for this research.

Finally, documents relating to coworking spaces selected from websites, social media, articles and their own digital platforms were collected in order to characterize and verify how these spaces operate. Appendix C presents the document collection script used. All data were collected in the first semester of 2019.

After collecting this material, data processing and analysis were conducted. The interviews were recorded and transcribed to allow better treatment and manipulation of the material in software *Nvivo12*. The observation and documentary data were also processed and handled in the aforementioned software, in order to enable a contextual analysis of the characteristics of the coworking spaces. For data analysis, content analysis was adopted, which supports the collection techniques used and allows greater rigor in the identification, interpretation and systematization of significant data points (Bardin, 2011).

We sought to describe the meaning of the qualitative data by assigning categories to the material collected in a coding framework that presents all aspects of data description and interpretation, as presented in Appendix D. The coding framework presents the initial categories, defined based on the literature of Steffen, Oliveira and Balle (2017): 'actors', 'mechanisms and type of content', and 'perceived benefits'.

RESULT ANALYSIS AND DISCUSSION

Initially, the description of coworking spaces and the profile of the interviewees is presented. After contacting the managers, visits were scheduled to observe the spaces and interview their users. **TABLE 1** presents the description of the profile of the visited coworking spaces.

TABLE 1 – Profile of the coworking spaces

Coworking	Users	Interviews	Description
A	60	5	Coworking space and acceleration program. Located in a business center.
B	150	10	Multinational coworking space. Located in a business center.
C	50	9	Coworking space and bar. Located in the city center.
D	30	3	Coworking space. Located in a residential district.
E	50	4	Coworking space and cultural center. Located in a tourist area, in contact with nature

Source: prepared by the authors (2019).

Coworking A, in addition to being a coworking space, is an acceleration program for its resident companies. Companies in the acceleration program are those in the early stage in the market and that receive cash infusion from investors and consulting from mentors for their expansion and development. It should be noted that, even after the acceleration period, many of these companies continue in coworking spaces, taking advantage of the benefits that a shared workspace provides. The location has the infrastructure to host several companies and hold events, providing a favorable environment for sharing knowledge. The transparent glass wall and door structures allow individuals to be visually accessible, even when structurally divided.

Coworking B is a branch of an internationally recognized coworking franchise, with more than 110 units worldwide. When visiting, it can be observed that this coworking space is inserted in the same environment of business conglomerates as coworking A. Furthermore, another branch of this network can be found in a more distant part of the city. During visits to the spaces, it was observed that the two spaces have similar structures, with transparent glass walls and rooms, a large number of people and interactions, desks that are close to one another and space managers in constant contact with the users present.

Coworking C is quite peculiar as it holds two businesses in the same environment: a themed bar, on the first floor, and a coworking space, on the second floor. When visiting, it was observed that the internal structure of the coworking space has rooms with transparent glass walls; and the coworkers are distributed around a large table, with a few more tables distributed throughout the same room, leaving participants in physical proximity and in visual contact. The bar is business themed, and creates an opportune environment for events and interactions between its members.

Coworking D, in turn, is located in a residential area of Florianópolis, with few shops and companies in the surrounding area. It is aimed at preserving the privacy of its users, distributing them internally in different rooms, closed with non-transparent doors and walls, as observed during our visit to the space.

When visiting Coworking E, it was possible to observe that it is located in a tourist area, with attractions such as lagoons, beaches, bars and nightclubs. However, the surrounding environment has no business initiatives that favor the sharing of knowledge with other companies. As a parallel initiative, coworking E holds cultural events and art exhibitions, defining itself as a coworking space and cultural center. **TABLE 2** displays the profile of interviewees and the description of their businesses.

TABLE 2 – Profile of interviewees and description of their businesses

Coworking	Participating company	Interviewee number	Interviewee age	Business description
A	Company A	#1	27	4 employees/ 1 year and 3 months in the market/ 6 months in the space. Technological solution for recruiting and engaging candidates in selection processes.
		#2	26	
		#3	27	
	Company B	#4	31	5 employees/ 2 months in the market/ 2 months in the space. Software for customer relationship management.
Company C	#5	36	4 employees / 5 years in the market / 3 months in the space. Soccer club product licensing platform.	
B	Company D	#6	39	3 employees/ 4 months in the market/ 4 months in the space. Platform for developing and publishing chat-bots.
	Company E	#7	28	4 employees/ 3 years in the market/ 5 months in the space. Digital marketing. Helps micro and small businesses to build a visual identity and attract customers online.
	Company F	#8	52	5 employees/ 10 years in the market/ sporadically in the space. Organic food trade.
	Company G	#9	31	6 employees/ 1 year in the market/ 1 year in the space. Electricity trade.
	Company H	#10	23	7 employees/ 1 year in the market/ 1 year in the space. Cryptocurrency bank.
	Company I	#11	23	7 employees/ 3 years in the market/ 1 year and 4 months in the space. Offers people management courses.
	Company J	#12	34	Self-employed/ 3 months in the market/ 2 months in the space. Screenwriter.
	Company K	#13	44	2 employees/ 4 years in the market/ 3 months in the space. Printed newspaper and digital marketing consulting.
	Company L	#14	46	Self-employed/ 18 years in the market/ 1 year in the space. Attorney and legal mediator.
	Company M	#15	26	4 employees/ 8 months in the market/ 8 months in the space. Software for communication in the health sector.
C	Company N	#16	44	Self-employed/ 5 years in the market/ 1 month in the space. Legal digital marketing.
	Company O	#17	40	Self-employed/ 4 years in the market/ 5 months in the space. People management solution.
	Company P	#18	42	Self-employed/ 15 years in the market/ 4 months in the space. Professional and family profile photo.
	Company Q	#19	31	Self-employed/ 6 months in the market/ 1 month in the space. Civil engineering and architecture.
	Company R	#20	37	3 employees/ 5 years in the market/ 7 months in the space. Travel agency.
		#21	37	
		#22	39	
Company S	#23	29	4 employees/ 2 years in the market/ 9 months in the space.	
	#24	27	Architecture.	
D	Company T	#25	30	9 employees/ 7 years in the market/ 5 years in the space. Supplement technology for fitness centers.
	Company U	#26	36	4 employees/ 2 years in the market/ 1 year in the space. Telecommunications material importer.
	Company V	#27	36	5 employees/ 10 months in the market/ 5 months in the space. Rotary parking technology.
E	Company X	#28	26	8 employees/ 7 years in the market/ 5 months in the space. Consulting and technology for fundraising for non-governmental organizations.
	Company Y	#29	27	2 employees/ 3 years in the market/ 1 year and 4 months in the space. Digital marketing.
	Company Z	#30	26	2 employees/ 5 years in the market/ 8 months in the space. Photography and digital marketing.
	Company @	#31	32	Self-employed/ 3 months in the market/ 2 months in the space. Big data analyst.

Source: Prepared by the authors (2019).

When observing the profile of the 31 interviewees and their companies, it is clear that there is a great diversity of areas within the coworking spaces: from more traditional businesses (engineering, architecture and law, for example) to more contemporary businesses (linked to marketing, technologies and digital platforms). There is also great diversity regarding the time that companies have been operating in the market, ranging from companies under development to more mature companies. Regarding the time they have been in such spaces, it is clear that most have only been there less than a year, which is a feature of the turnover of companies in these spaces.

Dimensions of knowledge sharing in coworking spaces

The coworking spaces are analyzed considering five main categories: 'contribution of the coworking space' (derived from the data), 'actors' (Steffen; Oliveira; Balle, 2017), 'mechanisms and type of content' (Steffen; Oliveira; Balle, 2017), 'role of information technology' (derived from the data), and 'perceived benefits' (Steffen; Oliveira; Balle, 2017). In a preliminary analysis, based on the frequency count of terms found in the transcribed interviews, a word cloud was systematized in order to highlight the main key points that emerged on theme 'knowledge sharing' in the observed context (**FIGURE 1**).

FIGURE 1 – Profile of interviewees and description of their businesses



Source: prepared by the authors (2019).

When analyzing the terms, it is noticed that 'knowledge' and 'information' appear more frequently, as they are keywords for the topic analyzed. Words that indicate knowledge sharing actions, such as 'conversation', 'talk/talking', 'knowing', 'helping', 'communication' and 'exchanging', also appeared prominently, illustrating actions of transmitting and receiving knowledge, according to Lin's definition (2007), which characterizes it for the transmission and/or reception of knowledge.

It can also be observed that word 'technology' was frequently mentioned by the interviewees, a factor that transitions between more than one category of this analysis, as

technology can be both a mechanism for sharing knowledge, and can be linked to the benefits of its practices, such as the updating of new technologies (Asrar-UI-Haq; Anwar, 2016). Another word related to technology was 'platform', illustrating the technological platforms used in the space, which will be analyzed in depth in the 'role of information technology' category.

Other terms associated with knowledge sharing mechanisms are clear in the cloud. The word 'coffee', for example, may indicate the occurrence of various knowledge sharing practices in relaxed moments or spaces, suggesting informal company meetings; while the word 'events' may indicate the holding of more formal meetings (Bollinger; Smith, 2001). Finally, the term 'innovation' also appears as relevant in the word cloud, pointing to innovation as a possible benefit perceived by participants in knowledge sharing. This relationship corroborates the findings of Gandini (2015), which, despite being evidenced in academic literature, requires further investigation, especially concerning its practical findings among organizations.

Contributions of coworking spaces

The first category analyzed addresses the 'contributions of coworking spaces', illustrating the contextual factors that contribute to interactions between companies. Regarding how spaces contribute to knowledge sharing among their users, it can be inferred that their structure and physical distribution favor knowledge sharing among companies. Large rooms and structures with transparent glass walls and doors keep professionals physically close to one another and allow visual contact, making it easier to identify moments that are conducive to informal interactions between users.

Parallel initiatives of spaces, such as acceleration programs, bars and cultural centers, can stimulate interactions between users of the spaces, proposing formal interactions and serving as environments for people to meet. Furthermore, it is noted that the frequency and content of other formal gatherings – workshops, lectures, debates, thematic meetings, coffee get-togethers, presentations – are also factors that engage companies in knowledge sharing practices.

The external environment of where companies are located can favor the interaction of users with other companies and events, such as spaces located in business centers (or innovation centers), which are considerably superior to the quantity and diversity of events that the users of these spaces can attend to share knowledge with other professionals.

Thus, it can be inferred that the greater the frequency of events, the greater the assimilation of interaction practices between professionals in that space as part of the work routine. In addition, the more diverse the content of the events, the greater the chances of meeting the demand for knowledge sought by different professionals. **TABLE 3** systematizes the end categories raised from the data analyzed in the initial category 'contributions of coworking spaces'.

TABLE 3 – Contributions of coworking spaces

End categories
Structure and physical distribution of the space; Parallel initiatives of the space; Frequency and content of formal events; and Relationship with the external environment.

Source: prepared by the authors (2019).

It can be seen that knowledge sharing is not an essential condition of the coworking spaces visited. Therefore, it diverges, in part, from the statement by Schopfel, Roche and Hubert (2015) that people decide to participate in coworking spaces to meet other people, learn from them and work in a stimulating and creative environment. This is because, for more established companies with less flexible work routines, such as the companies in coworking D, knowledge sharing is not a priority when choosing these environments. In this case, the choice to cowork is made due to administrative cost factors, and there is also a preference for individualizing the space.

However, when analyzing the other coworking spaces, it is clear that there is a concern among the managers of the spaces in providing structure and moments of interaction between users for sharing knowledge, which is also a demand of the professionals who work in these spaces. Moreover, shared space allows self-employed workers (mainly) to stop attending places where isolation is involved (their own homes or business rooms), working in an environment that motivates the user to act in a more professional manner and feel integrated with other people with similar work routines.

In addition to the interviews, observation of the structure and physical distribution of the spaces corroborates Moriset's (2013) statement about the role of the room and equipment layout in sharing knowledge. In this sense, the structurally larger and more open spaces, where users are visually accessible, were the places where knowledge sharing was found to be most relevant by the interviewees.

It is therefore concluded that the lack of visual contact between participants creates a barrier to knowledge sharing. Parallel initiatives of spaces, such as an accelerator (coworking A) or a cultural center (coworking E), also influence knowledge sharing activities, making them more structured and formalized, and providing predefined business and non-business objectives and specific content.

Another contribution of the spaces is the frequency and content of the events organized by the space managers. At this point, it was noted that it was important for users or potential users to know the dynamics of the premises to analyze whether that environment is compatible with their ambitions, considering that interactions in these spaces can be focused on more business-related matters or leisure and entertainment – furthermore, there is the possibility of there being no routine with regard to these interactions.

For some interviewees, the moment of interaction is more beneficial when it goes beyond routine matters and allows the exchange of experiences on different subjects; while

others prefer technical exchange focused on business matters. Therefore, it is important for professionals to be familiar with the available spaces to know what best suits their way of working and their motivational factors.

This conclusion corroborates the statement by Boucken and Reuschl (2018), which reveal that the specificity of spaces can attract certain groups of individuals, making the environment more homogeneous and developing shared sets of norms and behaviors that build a culture (or community).

Actors

Regarding category 'actors', it was observed that companies present similar characteristics, depending on the context in which they are inserted. Each space can lead to the integration of certain similar segments, such as professionals in the arts, culture and health sectors; startups; more established companies in the market; self-employed professionals or small teams; who work in different areas, both traditional and contemporary.

When analyzing spaces with greater dynamic interactions, it can be inferred that self-employed professionals, small teams and businesses in the initial stages are more aligned with the dynamics of knowledge sharing practices and their benefits, as they tend to have more flexible processes and structures; while businesses with more consolidated processes and specific machinery have more difficulty in participating in activities that are different from their routine and in making changes to their organization. This finding contributes to the identification of company profiles that are most willing and that benefit most from knowledge sharing practices.

In relation to the other actors involved, when comparing the cases studied, it was found that the employees of these spaces play the role of mediators and facilitators of interactions between companies, as they become more familiar with the activities of each professional and interconnect the needs of one company with the solutions of another.

Employees organize formal events, hire external professionals for events and act as motivators to ensure engagement among users of the space. In this sense, it was found that the greater the engagement of the spaces' employees in these activities, the greater the motivation of their users to participate and share their knowledge.

Thus, it can be inferred that interorganizational knowledge sharing is facilitated by third parties who are engaged in the practices of the companies involved and who motivate their participation in networking and interactions. With the absence of these employees, companies may not interact with each other, as they do not identify an appropriate time to do so, even if both are eager to share knowledge and obtain its benefits.

Finally, invited professionals and companies located in the external environment of the spaces also play an important role in knowledge sharing practices. This factor was

recognized in spaces located in business centers, which constantly enable interaction with professionals from the external environment in events organized for this purpose. These factors are shown in **TABLE 4**.

TABLE 4 – Actors

End categories
Network of space users; Space managers and employees; Invited professionals; and Companies close to the external environment.

Source: prepared by the authors (2019).

As mentioned by Cashman (2017), coworking spaces were launched by Information Technology (IT) professionals, who decided to share their workspace to save on set-up costs. However, according to the author, several other fields have integrated these shared spaces, such as professionals in public relations, marketing, sales and consultants.

Corroborating these findings, the presence of several business areas in the spaces visited is verified, from areas linked to technology (business with cryptocurrencies, technologies for human resources, digital marketing and data analysis), more traditional areas (law, architecture, design and consulting), to more distinct areas (healthy nutrition and organic products). However, in accelerated companies, there was a predominance of teams defined by three sectors: sales, support and programming.

Another relevant point in the analysis of actors, in addition to their areas, is the size of the organizations that interact with one another (Steffen; Oliveira; Balle, 2017). In this sense, it was observed that the companies analyzed were predominantly small, mostly composed of self-employed professionals and small teams, with rare participation of large companies.

Mechanisms and type of content

Regarding 'mechanisms and type of content', based on the intermediate categories identified, three main in-person factors of knowledge sharing are considered: observational learning, informal moments and formal events.

Learning by observing the routines of other professionals is a common practice among members of coworking spaces, who highlight the motivation to follow successful professionals in their activities, their schedules and their ways of working. Therefore, by observing the practices and habits of other professionals, one can internalize this knowledge and improve their task routine and attitude towards work.

It should be noted that sharing workspaces with other professionals, in itself, allows companies to improve their activities by internalizing the routines of other companies. The importance of visual access among professionals in environments where they are carrying out their activities is highlighted so that other users of that space can visualize and internalize the routine of their peers.

In shared spaces, informal interactions, in common areas and at different times, allow companies to interact and create bonds with each other; however, they tend to favor shorter and less complex ideas and dialogues. On the other hand, formal events present themselves as an opportunity for companies to share their knowledge more efficiently, and these practices are common in spaces more dedicated to fostering interactions between their members.

Professionals often wish to share knowledge with other professionals, however, they do not feel comfortable interacting in a spontaneous manner. This way, formal events grant permission for interaction, mainly facilitating the first contact with other companies. Another factor highlighted regarding the events was the intention to share knowledge that the moment provides, since, far from their routine activities, they allow members to introduce themselves and participate with the purpose of interacting, sharing and learning from other professionals.

Admitting the importance of knowledge diversity, it is concluded that diversifying the content of formal events – from more technical and/or managerial topics to topics unrelated to business, such as health, art and culture in general – can favor the engagement of companies and attract more heterogeneous professionals to share their knowledge with one another. These aspects are shown in **TABLE 5**.

TABLE 5 – Mechanisms and type of content

End categories
Observational learning; Informal interactions: dialogue with professionals sitting nearby, meetings for coffee and lunch, leisure areas and outdoor environments; Formal events: meetings, happy hours, coffee breaks, internal presentations, internal dynamics and themed events; and Business (technical and managerial) and non-business (art, culture, health) content.

Source: Prepared by the authors (2019).

It is identified that each space has its own characteristics concerning knowledge sharing practices. The practices described above corroborate Gandini's (2015) statement about the interest of coworking space users in interacting with their colleagues, sharing knowledge and learning from one another, creating a sense of community.

Furthermore, the practices described contribute to the description of a coworking environment and its processes, given that there is little academic literature on this phenomenon of expansion and acceptance of coworking spaces, which have grown in recent years in Brazil and around the world (Boucken; Reuschl, 2018; Leclercq-Vandelannoitte; Isaac, 2016). By analyzing such data, it is perceived that some spaces have more structured planning regarding the practices performed, which favors the holding of events and interactions among members.

Role of information technologies

In turn, the analysis of the 'role of information technologies' sought to address the research gap identified by Simeonova (2018) and Zimmerman *et al.* (2018), who state that the role of information technology in knowledge sharing is little evidenced in the current

context of interactive technologies and with a focus on networking. It is observed that the use of technologies is not an essential practice in the interactions of professionals in coworking spaces, either because interaction in these spaces is not a common practice, because there is no engagement of professionals in the available tools, or because the space represents a moment for people to interact outside the technological environment, due to the physical proximity between them.

In coworking spaces in which technology was considered a frequently used tool for sharing interorganizational knowledge, the spaces' own digital platforms were highlighted for creating a network between their users, allowing contact even with former users and members of branches in other cities and countries, in addition to the dissemination of exclusive opportunities for members of the space.

Thus, it can be concluded that the technologies inherent to shared workspaces promote a sense of community among users, allowing connections between professionals who do not know each other, only due to their connection with the space they are part of, contributing to the use of technologies for sharing interorganizational knowledge.

Moreover, interactive technologies, such as WhatsApp and Instagram, have surpassed traditional technologies, such as e-mail, for knowledge sharing, allowing greater connection between members of the coworking space and overcoming space and time barriers, since flexible companies can change physical space and the connection with other professionals can be maintained even if they are not present.

However, due to physical proximity, many professionals prioritize face-to-face contact with other companies, as their work routine is already immersed in technology as a means or end. **TABLE 6** shows the observed results.

TABLE 6 – Role of information technology

End categories
Frequent use (coworking spaces A, B), little relevant (coworking spaces C and E) and not relevant (coworking D);
Connection with former members of the space and members of other branches (in-house platform);
Contact with professionals on remote work days (WhatsApp and e-mail);
Knowledge of internal business (in-house platform and Instagram);
Publicizing job vacancies/opportunities (in-house platform);
Internal and external event information (WhatsApp groups , e-mail and Instagram);
Announcements regarding the structure of the space (WhatsApp groups and e-mail); and
Content for in-person interactions (Instagram).

Source: Prepared by the authors (2019).

According to Simeonova (2018) and Zimmerman *et al.* (2018), new technologies, with networking and connectivity characteristics, have contributed to knowledge sharing between companies, overcoming barriers of traditional information technologies.

Analyzing the data obtained, it was identified that the coworking spaces' platforms, WhatsApp groups and *Instagram* were the most used tools among them, surpassing traditional

email - which was little evidenced by the interviewees -, thus converging with the statements of Simeonova (2018) and Zimmerman *et al.* (2018) regarding the predominance of interactive tools for knowledge sharing today.

However, simply investing in technology is not enough to achieve effective results in knowledge sharing and management; engagement by users and managers is necessary. The data collected reveals that the coworking spaces with the greatest dynamic interactions had their own platforms, considered efficient and important for sharing knowledge; while other spaces had digital platforms that fell into disuse, due to the lack of participant engagement.

User engagement on the platform, according to Iglesias-Pradas, Hernández-García and Fernández-Cardador (2017) and Soto-Acosta, Cegarra-Navarro and Garcia-Perez (2017), is what defines the value of an interactive information and communication technology, as it depends on the actions of its users to be active and generate interactions and results for them.

Compared to the research by Steffen, Oliveira and Balle (2017) in technology parks, the results diverged concerning the most used technologies for knowledge sharing. According to the authors, e-mails were the most significant technology in sharing, followed by social media, electronic folders, companies' own websites and technology park websites. When comparing the results obtained, it is clear that e-mails were not considered the main technological mechanism in this research, corroborating Simeonova's (2018) statement about the rise of contemporary technologies, such as WhatsApp and Instagram, due to their focus on interactivity.

Perceived benefits

After investigating the context and practices of interorganizational knowledge sharing, the benefits resulting from these practices perceived by the interviewees were analyzed. The aim was to corroborate and improve the results obtained by Steffen, Oliveira and Balle (2017), who listed the following benefits of interorganizational knowledge sharing in technology parks: new opportunities; new products; connections; improvement in processes; cost reduction; training; strengthening of the business environment; attraction and retention of professionals; and customers.

This way, one contributes to the advancement in understanding the results of interorganizational knowledge sharing, while complementary and also distinct factors resulting from its practices were identified, namely: stimulating creativity; knowing local demand; reflecting on the business itself; keeping up-to-date on new technologies, techniques and work metrics; opportunity to change business area; networking; team building; generating new business among colleagues in the space; referring business with external clients; and sense of integration.

This contributes to the verification of the empirical effectiveness of the topic, as it provides several organizational benefits for companies, favoring organizational learning and engagement with the environment.

Based on the benefits listed, it can be concluded that companies that share knowledge with other companies obtain a greater competitive advantage over companies that are in isolated workplaces, allowing greater adaptability and, consequently, greater chances of survival in the long term. However, it is important to highlight that being in a shared space is not enough to obtain these benefits, and that managers and the structure of that space must favor knowledge sharing practices and encourage the participation of its members. **TABLE 7** shows the observed results.

TABLE 7 – Perceived benefits

End categories
Stimulating creativity/Generating ideas/Innovation; Knowing local demand; Reflecting on one's own business; Keeping up-to-date on new technologies, techniques and work metrics; Networking; Approaching different cultures and languages; Team building; Generating new business among members; Arousing interest in other areas; and Introducing business to external clients.

Source: Prepared by the authors (2019).

For Cisne, Arasaki and Santos (2015), shared lessons and practices develop a more efficient, intelligent and collaborative organization, assisting in assertive decision-making and favoring its adaptability in the market.

At this point, it is clear that companies in the spaces analyzed become more efficient, as they share their work techniques and technologies used with different professionals, as well as reflecting on their processes. This is because these companies share their routines and receive feedback from other participants regarding their ideas and projects, thus favoring more assertive decision-making and developing greater adaptability of the company regarding aspects of the external environment, corroborating the statement of the aforementioned authors (Cisne; Arasaki; Santos, 2015).

In addition, Hu, Lin and Chang (2013) reinforce that knowledge sharing strongly influences the innovation process of technology-based companies, being interorganizational sharing the main source for driving innovations. In this sense, factors such as stimulating creativity, knowing other areas and work methods, and keeping up-to-date regarding tools and technologies were highlighted by participants as benefits, being them factors that can provide innovation in the companies' work methods, tools and technologies, and even in their areas of activity.

As stated by Fernandes *et al.* (2019), knowledge sharing is related to innovation by bringing provocations, creating insights, rethinking solutions and identifying new paths that can result in organizational innovations. Knowledge sharing between companies has also proven to be an important practice for keeping up-to-date on business technologies, since

professionals are linked to it as a means and/or end activity and can share new trends among themselves, according to their efficiency and usability, to stay up to date and competitive in the market.

CONCLUSIONS

This research aimed to analyze knowledge sharing between companies in coworking spaces and its consequences. To meet this objective, a multiple case study was carried out in 5 of these spaces located in the city of Florianópolis, in Santa Catarina, with 31 interviews, document collection and observation, using and expanding the categories of analysis defined by Steffen, Oliveira and Balle (2017).

The choice of the unit of analysis – companies in coworking spaces – proved to be favorable for addressing the central theme of the research, knowledge sharing, as they are predominantly places with great representation and dynamism concerning the practices of the topic; however, some of these places did not favor such practices. With this, it is possible to suggest, based on the comparison of cases, the factors and characteristics that facilitate interactions between users, demonstrating good practices concerning the topic, which contribute to the theoretical development of the topic, in addition to allowing the adaptation and replication of practical factors by companies and different shared workspaces.

Based on the initial categories of analysis, defined by Steffen, Oliveira and Balle (2017), it was possible to illustrate knowledge sharing in its key points. Category 'contributions of the coworking spaces', developed in this study to fill the gap declared by Boucken and Reuschl (2018) and Leclercq-Vandelannoitte and Isaac (2016) regarding the investigation of the benefits of coworking spaces for entrepreneurs, can be used as a category of analysis in other contexts of knowledge sharing between companies, such as incubators, technology parks, technology hubs, accelerators, commercial centers, events and other initiatives that bring together companies in one environment, contributing to the theoretical development of the topic in the management literature. As a theoretical implication, researchers can use this to identify which contextual factors favor knowledge sharing between companies in other initiatives with this same purpose.

Regarding the features of the companies and professionals identified in the field, this research extends the results and contributions of Steffen, Oliveira and Balle (2017) to the context of coworking spaces. In this sense, there is a predominance of self-employed professionals and small teams interacting with each other, with little presence of large companies. This fact can be explained by the greater flexibility to change their processes and products/services compared to more rigid and consolidated companies, which occupy spaces without knowledge sharing practices between companies.

Thus, the results differ from those obtained by the authors, who identified the occurrence of interactions between small and large companies, and little interaction between similar companies due to the feeling of competition. One contributes to the knowledge sharing

literature by expanding the understanding of the profiles of companies and professionals that interact in different contexts of shared spaces. As an implication, researchers can use these considerations to map the profile of companies that share knowledge in different organizational contexts and identify the factors that lead to the differences found in each context.

Based on the verification of the key moments of interaction described by the participants, it was concluded that the formal moments, organized by the space managers, provide greater legitimacy and motivation for professionals from different companies to interact with one another. It was noted that company professionals aim to engage in activities that are different from their usual work routine, and that these events help in the transmission and reception of knowledge.

Furthermore, contact through formal events facilitates subsequent informal interactions, breaking down introduction barriers and creating bonds between people. This way, one contributes, in a practical manner, by observing the key moments of interaction between companies in the spaces visited, presenting some of these practices. As an implication, researchers on the subject can deepen their analyses of these sharing practices, identifying the positive and negative factors and the relationships with the context that offer greater benefits to companies.

When analyzing the benefits of knowledge sharing from the perspective of company professionals, the importance of the topic for the development and improvement of companies is highlighted, since it brings several advantages to professionals and their companies, such as stimulating creativity, driving innovation, updating contemporary metrics and technologies, among others.

This result fills the gap of Oliveira *et al.* (2015) regarding the elucidation of the results of knowledge sharing practices, allowing a greater understanding of the advantages for companies when engaging in practices related to this topic. As an implication, the relevance of knowledge sharing as an organizational tool in the dynamic context of the current market is reinforced, given that it adds benefits that make companies more adaptable to external changes, a factor of extreme relevance for the survival of a company in the long term.

In practical terms, this research contributes in different manners. With the growth in demand and supply for shared workspaces, managers of these locations can use the results and contributions of this study to plan and organize their spaces, guided by the main factors highlighted in this work, such as distribution and physical structure of the internal space, characteristics of the external environment, use of proprietary digital platforms, hiring employees to facilitate interactions between companies and structuring a continuous agenda of themed events.

Moreover, self-employed professionals and small businesses may, based on the results and contributions, consider joining shared workspaces in search of the benefits identified in this research, such as prospecting clients, keeping up-to-date on new technologies, work methods and techniques, team building, among others.

Finally, in order to fill the gap of lack of justification for investments in knowledge sharing (Oliveira *et al.*, 2015), it is suggested that companies that have the flexibility to improve their processes and products/services can become more competitive in the long term as they invest in knowledge sharing practices, since they can result in the generation of new business between companies or referrals of external customers, integration of new employees, keeping up-to-date on technologies that make the business more productive, in addition to increasing professional satisfaction due to the feeling of integration and constant learning, among other benefits identified in this study.

This research has limitations regarding its application, which can be overcome with future studies. Regarding the city's context, Florianópolis has been considered an important business, innovative and technological hub. Similar studies in different regions of the country and in other countries can demonstrate a comparative panorama to know whether the results converge or diverge, illustrating the impact of the city in the context of analyzing the topic.

Five categories were used for this analysis, two of which were proposed for the context in question: 'contributions of coworking spaces' and 'the role of information technologies'. Future research may add new categories of analysis to verify other factors that may favor or create barriers to knowledge sharing between companies. In addition, future studies can direct their efforts to a specific category of analysis, potentially obtaining more in-depth results and contributions regarding a given factor.

Finally, the research has limitations regarding the ability to generalize the results, since case studies do not have this purpose (Yin, 2015). Thus, research with a quantitative approach, conducted with larger samples, can complement the understanding developed in this work. To this end, the initial categories of this study can be used as the main thematic axes, and the end categories developed in this research can be used as analysis factors for the quantitative questionnaire.

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