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Knowledge sharing between subsidiary and headquarters: A framework proposal

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Abstract

The pharmaceutical industry (PI) is recognized as a knowledge-intensive industry. Based on the perspective of managers in the subsidiary, this research proposes actions to facilitate knowledge sharing in the relationship between subsidiary and headquarters in a multinational pharmaceutical company. An exploratory case study was conducted. Data were collected from documental content analysis and fourteen interviews with managers from various areas and departments. The benefits include the possibility of participating in global projects and the resultant positive exposure accrued by the subsidiary. While the predominant knowledge flow is from the headquarters to the subsidiary, there is an opportunity to expand the flow in the opposite direction. Based on this study, actions designed to mitigate this point of disruption can be undertaken. This research offers a framework that encompasses the flow of knowledge, the main facilitators and barriers to knowledge sharing between geographically dispersed multinational units, as well as the knowledge sharing mechanisms.

Keywords

Headquarters, knowledge sharing, pharmaceutical industry, subsidiary

Introduction

Knowledge sharing (KS) is considered one of the most important processes in knowledge management (Hooff and De Rider, 2004) and more meaningful than other KM activities, because it allows organizations to leverage and capitalize on knowledge-based resources (Perotti et al., 2022), being fundamental for transforming individual learning to collective learning (Omotayo and Babalola 2016) and is a crucial issue for geographically dispersed teams (Silva et al., 2022). An organization can be understood as a knowledge network in which teams send and receive knowledge (Lee et al., 2019). For multinational companies, the transferability and application of these skills and knowledge within their global networks are important in maintaining quality and achieving high levels of customer satisfaction (Guo et al., 2020).

Among organizations that are highly dependent on knowledge, and, therefore, on its proper application, is the Pharmaceutical Industry (PI). The PI is classified as knowledge intensive (Munjal et al., 2021; Parsons et al., 2006), dependent on high technology, in need of specific technical knowledge, has a great capacity for innovation and is constantly seeking competitive advantage. Among all the industrial sectors, it has the highest level of investment in Research and Development (R&D) (Dimasi et al., 2016; Melnychuk et al., 2021). The PI is a high-risk industry, where the intellectual capacity of the employees is its greatest asset and has potentially high financial risks of knowledge leakage when collaborating with other firms in the same sector (O'Dwyer et al., 2022).

The departure of an employee from a company does not only mean a reduction in the workforce, but also the accompanying knowledge. If that knowledge has not been transferred to the organization, it will lose human capital. One way of dealing with this situation is to transform individual knowledge into organizational knowledge (Shariq et al., 2019). Ganguly et al. (2020) conducted a survey of 97 mid-level managers in the Indian pharmaceutical industry, and identified that KS and quality of knowledge have

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a significant effect on promoting innovation in the organizations studied.

An aggravating factor for multinational companies is that in the next ten to fifteen years there will be more experienced and skilled workers going into retirement than young skilled workers to replace them (Joe et al., 2013). To face this challenge, companies need to develop knowledge sharing facilitators, such as an organizational culture that supports KS, technology and appropriate mechanisms (Stendahl et al., 2022; Joe et al., 2013; Islam et al., 2018). Organizational culture must be considered once have influence over business competitiveness (Azeem et al., 2021).

The physical distance between the employees at the headquarters and in subsidiaries decreases the chance of effective KS (Qureshi and Evans, 2015; Stendahl et al., 2022). Given this finding, there is a need to identify actions that can reduce barriers and facilitate KS. Knowledge is often incorporated in the context of sub-units or projects, complicating its transfer to other locations (Erkelens et al., 2015). The challenge for multinationals is to carry out KS that is relevant from a local point of view, but which can also be integrated within other parts of their companies, once each subsidiary has some specific requirements on a practice to be appropriate and hence more likely adopted (Stendahl et al., 2022).

Brazil is the sixth largest pharmaceutical market in the world and is expected to pass Italy and become the fifth largest market by 2023 (Interfarma, 2021). The taken time for a new drug to reach pharmacy shelves is approximately ten years (IFPMA, 2021). This industrial sector is extremely sensitive to KS, because the intellectual capital is often spread across the globe rather than located exclusively in the headquarters of these multinationals.

The study aims to develop a framework to facilitate knowledge sharing between a subsidiary and the headquarters of a multinational pharmaceutical company from the perspective of the subsidiary's managers. From a practical perspective, this study provides a means of diagnosing KS process failures and identifying possible improvements that may be implemented, as well as detecting knowledge retention behaviors that may be occurring unbeknown to the company. From theoretical perspective, this study offers a framework that encompasses the flow of knowledge, the main facilitators and barriers to knowledge sharing between geographically dispersed multinational units, as well as what mechanisms are used for this knowledge sharing to occur.

Following this introduction, this article is structured as follows: literature review; research method; analysis and discussion of data; conclusion, limitations and suggestions for future research.

Knowledge sharing

KS is described as vital for organizations, as it contributes to the creation of new ideas, products and processes (Oliveira et al., 2014; Perotti et al., 2022). Knowledge can be divided between Tacit and Explicit, respectively associated with Personalization and Codification strategies (Hansen et al., 1999). Tacit knowledge (knowing how) is that which is personal and difficult to formalize, while explicit knowledge is that which is documented (Nonaka, 1994).

Wanberg et al. (2017) demonstrated that knowledge is not consistently distributed within organizations. Fundamentally, this is attributed to macro and micro level factors. At the macro level, a multinational can create and use governance mechanisms (compliance) that guide employees on how to use their information and knowledge for daily work. For example, organizational divisions provide formal communication channels that affect how knowledge is shared (Wanberg et al., 2015). Likewise, the organization can form specific strategies and provide technologies to drive KS across projects, business units and subsidiaries. There is also the human aspect that cannot be controlled by the organization (micro level), such as individual motivations and culture that also affect the distribution of information and knowledge. Organizations have increasingly diversified their workforce to improve their adaptability and responsiveness to changing environments (Kim, 2017).

Knowledge sharing mechanisms

For either individual or organizational knowledge sharing to be effective, it is necessary to choose an effective means, that is, a mechanism that makes such sharing possible. The effectiveness of mechanisms is a dimension that affects knowledge sharing (Miao et al., 2011). Conceptually, a knowledge sharing mechanism is a deliberate intervention designed to support the creation, storage, sharing and application of knowledge (Oliveira et al., 2014).

When selecting a mechanism, an organization also chooses a certain mode of knowledge. This choice has consequences, since the mechanisms that support the conversion of tacit and explicit data are relevant to the organization's performance (Wang et al., 2008). Mechanisms can be technological, such as web conferencing and wiki, and non-technological, such as meetings and happy hour (Oliveira et al., 2014). "The ease of IT-based sharing mechanisms and company structure are determining factors in the choice of how companies share knowledge" (Steffen et al., 2017).

Knowledge sharing facilitators and barriers

The factors that influence KS (both facilitators and hindrances) can be divided into three categories: individual,

organizational and technological (Sandhu et al., 2011). Individual factors are those related to the people involved in the process that can interfere with the sharing of knowledge between the people who provide and those who receive the knowledge, in order to facilitate or hinder its implementation. One factor that frequently recurs in the literature is the motivation to share (Siemsen et al., 2008). Lin et al. (2009) highlight that trust between the knowledge provider and receiver also contributes considerably towards KS, while lack of trust is an important barrier. Another important individual factor is reciprocity, as those who share expect to receive (Lilleoere and Hansen, 2011). Altruism is another important factor identified by Salim et al. (2011).

In the literature, culture is identified as an organizational factor because of its great influence on individual behavior (Bures, 2003; Goswami and Agrawal, 2020). Organizational norms, together with incentive (Riege, 2005) and reward (Yusof et al., 2012) programs are seen as important organizational factors. Lin (2007) highlights management support as another factor that positively influences knowledge sharing. By supporting the sharing attitude, leaders act as sponsors of knowledge sharing, supporting collaborators and institutionalizing the knowledge sharing behavior in the organization (He and Wei, 2009). Another factor with both positive and negative effects is the organizational climate (Bock et al., 2005). A good organizational environment helps to establish trust among the employees and, consequently, increase commitment, working as a group motivator (Witherspoon et al., 2013). "Harnessing motivations to facilitate collaboration to enriching overall expertise and access unique resources such as technology, knowledge, and capabilities involves careful navigation of barriers and optimal use of enablers" (O'Dwyer et al., 2022).

Regarding technological factors, new communication and data access technologies can facilitate work and increase productivity and thereby play an important role in KS (Hendriks, 1999). However, a system alone does not ensure knowledge is shared, the quality of the content is also important (Cabrera et al., 2006). And finally, factors such as availability (Senthil Velmurugan et al., 2010), maintenance (Riege, 2005), compatibility (Lin et al., 2009) and infrastructure (Senthil Velmurugan et al., 2010) complete the list of technological factors that can act as facilitators or barriers to KS.

Another important point is: "The lack of studies specifically addressing knowledge sharing at the inter-organisational network level is surprising, as there are even networks that have been established solely for the purpose of sharing knowledge" (Vuori et al., 2019).

Research method

According to Yin (1989), a case study can be used to investigate a contemporary phenomenon using its real-life context. Here, a qualitative approach was chosen due to the research objectives and the study is cross-sectional, being characterized by data collection in a single moment (Pinsonneault and Kraemer, 1993).

The unit of analysis, according to Yin (1989), is directly related to the structuring of the research question. Thus, the unit of analysis in this study is the knowledge sharing between the different areas and departments of a subsidiary and the company headquarters. The multinational pharmaceutical company in question is large (among the 50 largest in the world). The departments chosen for this study belong to the company with around 6000 employees spread over 30 subsidiaries. It specializes exclusively in research and innovation and therefore is suited to the aims of this study. The company focuses on several medical areas. Other factors influencing the choice of this company as an object of research were the fact it is family-controlled, and, therefore does not have shares traded on the stock exchange; it has a strong organizational culture; and has branches spread across countries as diverse as Brazil, China, Russia, Pakistan and Norway. The employees in many areas of the Brazilian subsidiary interact directly with the headquarters daily, thereby exchanging knowledge in the most varied areas.

Setting

The Pharmaceutical Industry is one of the most innovative sectors in the world (IFPMA, 2021). It plays a unique role in the development of new drugs and vaccines to prevent and treat disease. The cost of developing new drugs has long been the object of interest and study by developers, regulatory agents and public policy makers interested in the structure and productivity of the pharmaceutical industry and its contributions to social well-being. Interest has grown strongly in recent years, especially due to frequent cost-containment pressures for new drugs. Several concerns have been raised about the productivity of the pharmaceutical industry in an evolving environment (Pammolli et al., 2011). The ever-changing industrial landscape has seen consolidation among large companies, growing alliances between companies of all sizes and the growth of smaller companies in the sector.

Despite often challenging business and regulatory conditions, the industry makes considerably riskier investments than those in most high-tech sectors. By investing billions of US dollars and thousands of hours of research, it pushes the limits of science, promotes medical progress and contributes to the prosperity of society (IFPMA, 2021).

To achieve the research objective represented in Figure 1, the staff members in the subsidiary that maintain contact with the headquarters will be interviewed regarding the flow

of knowledge sharing, the type of knowledge, the mechanisms used and the degree of formality in the KS. Finally, barriers and facilitators for knowledge sharing will be investigated.

Data collection

From July to November 2019, fourteen interviews were conducted with managers from the Brazilian subsidiary's office. In line with the study aims, the chosen respondents represented those areas of the subsidiary that interface with the headquarters. All the interviews were conducted individually, recorded and transcribed.

After coding and analysis, the statements collected in the interviews were found to be suitable for the purposes of the study, according to the saturation criteria used in the literature (Guest et al., 2006).

These professionals were chosen according to their position in the subsidiary and level of interaction with the headquarters, to ensure their answers would provide significant contributions towards the study. Since all the employees were Brazilian, having Portuguese as the official language, there was no need to adapt to English (the official corporate language of the Company). Respondents were selected according to the following criteria: (1) the respondent must have a relationship with the headquarters, so that they can answer questions relevant to the study; (2) the interviewees must be part of different hierarchical levels (but all managers) and areas of the company.

The interview script was prepared based on the literature review. Then, content validation was carried out with two experts, followed by face validation by a manager with the necessary characteristics to participate in the research (frequent dialogue with the head office and management position).

Data analysis

Respondent characteristics. Of the fourteen respondents, eight were female. Regarding age, one respondent was under 30, five aged between 30 and 40, six aged from 40 to 50, and two over 50 years old. The average length of time working at the company was five and a half years, with four having been there for 1 year and only three for more than ten years. The analysis of the interviews suggests the managers with longer service find it easier to interact with the headquarters.

The fourteen employees represent different areas of the company, including information technology, production, human resources, and marketing, among others.

Content analysis. Content analysis, according to Bardin (2011), was used to examine the data. The categories adopted in the analysis emerged from reading the interview transcripts. Coding involved three phases (Wolfswinkel et al., 2013): open coding - where the texts were coded without the concern to create similar codes or assign different codes for the same type of content; axial coding - where the codes were revised and grouped when necessary, and a hierarchical structure was created; and selective coding – where the "conductor thread" was identified, and when necessary some codes were discarded.

Five blocks related to the study objectives were stipulated: knowledge flow, type of knowledge, knowledge sharing mechanisms, barriers and facilitators, and benefits.

Results and discussion

Knowledge flow and type

All the respondents, representing fourteen different areas of the company, stated that knowledge flows first (and with

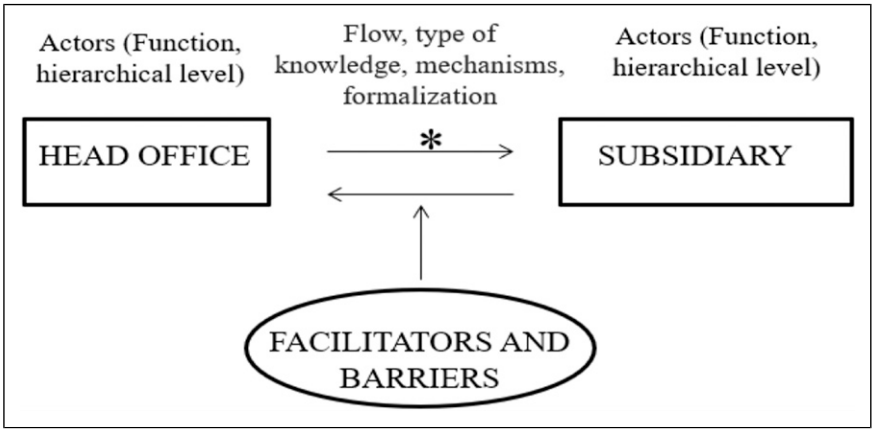

Figure 1. KS between a subsidiary and the headquarters.

greater intensity) from the headquarters to the subsidiary, and only in five areas is there a concomitant flow from the subsidiary to the headquarters. Analyzing the interviews from this point of view, it is noted that the more technical the area, the greater the control exerted by the headquarters. With the exception of areas such as the Legal and Compliance Department, which necessarily have to follow the rules of the country, the other areas need to follow the decisions made at the headquarters. Knowledge can and should also flow from the subsidiary. Its managers and other collaborators are more aware of the needs and preferences of local customers, projects and cultural factors and this information can flow to the headquarters (Kang and Lee, 2017).

The object of this study is a pharmaceutical company that focuses on the research and development of unique and innovative products, in which, therefore, technical knowledge plays a fundamental role. In addition, all the respondents are managers in their areas (Coordinators, Managers and Directors). Thus, it was decided to divide the type of knowledge into tacit or explicit; formal or informal; and, managerial or technical. Among the fourteen interviewees, although all types of knowledge appeared, the explicit, technical and formal knowledge types were more common. This is to be expected since this field of business, which in addition to being highly regulated, is guided by many processes and technical issues. As one respondent stated: "Process, but we have an opening, a very close channel with them, it is very simple for us to share ideas, knowledge and also give suggestions for improvements" (E6).

When asked about the type of knowledge he shared the most, one respondent said: "Explicit: There are written and formal policies and procedures for virtually every activity in the plant. This is a requirement of what we call "Good Manufacturing Practices" and of all the certifications we have already obtained" (E14). Only four respondents referred to the existence of tacit knowledge sharing. Likewise, informal knowledge sharing was mentioned by only four respondents.

Figure 2 presents a summary of sharing considering the flow and type of knowledge between the headquarters and the subsidiary.

Knowledge sharing mechanisms

Email is the primary knowledge-sharing mechanism for all fourteen respondents. Skype® has been used by only two interviewees, while the Microsoft Teams®, which came to replace it, is used by four of the interviewees. One of the interviewees suggested that, although Microsoft Teams® is the Company's new official communication tool, few people at headquarters use it yet:

> There is the system by which we make official reports, we have to feed it, as I told you at the beginning, we have to put the information into this system to make the submission and there they do the consolidation. Lots of email, Skype, call, Teams, although they still aren't using Teams properly. They're still on Skype, they haven't fully switched to Teams yet, but it's there. **(E9)**

Another respondent pointed to an ongoing technological shift: "Same tool, as if it were a Skype® and OneDrive® for document storage. We are trying to create this e-mail avoidance culture. I think that office 365 will help a lot in that too. All done by video". **(E11)**

Most respondents (13 respondents) mentioned the use of Web Conference. One of the interviewees even stated that the company's culture values the "eye to eye", which is why several of the subsidiary's meeting rooms are equipped to facilitate such meetings. For effective knowledge sharing, suitable mechanisms are required (Joe et al., 2013).

The three most commented mechanisms were: email – 14 respondents; webconference – 13 respondents; and, face-to-face meeting – 8 respondents. This shows the use of technological and non-technological mechanisms, even considering the geographic distance.

Barriers and facilitators

When analyzing the barriers and facilitators mentioned by the interviewees, five categories were identified (language, culture, time zone, deadlines and resources), and the respondent's answer was coded in barrier, facilitator or indifferent. Interestingly, what was considered a barrier to knowledge sharing by some respondents (e.g. language or culture) was considered a facilitator by others. Nonetheless, the biggest barriers to KS are seen to be time zone and deadlines, while language was identified by the majority as a facilitator. Table 1 is a summary of the interviewees' perceptions of the barriers and facilitators to KS.

Language. Of the fourteen managers interviewed, most of them (eight) considered language a facilitator (because English is the official corporate language). Those respondents that considered language a facilitator argue that communication in English is easier in meetings where people from various countries, such as Russia, China and Mexico, are participating: "The company has always made it clear that the language is English, I don't see a big problem" (E1).

For one manager, the language was indifferent, while five people considered it a barrier. One of whom claimed:

> Although we are a multinational, the biggest barrier is language. The company has been working to have documents considered global in English, but documents considered local

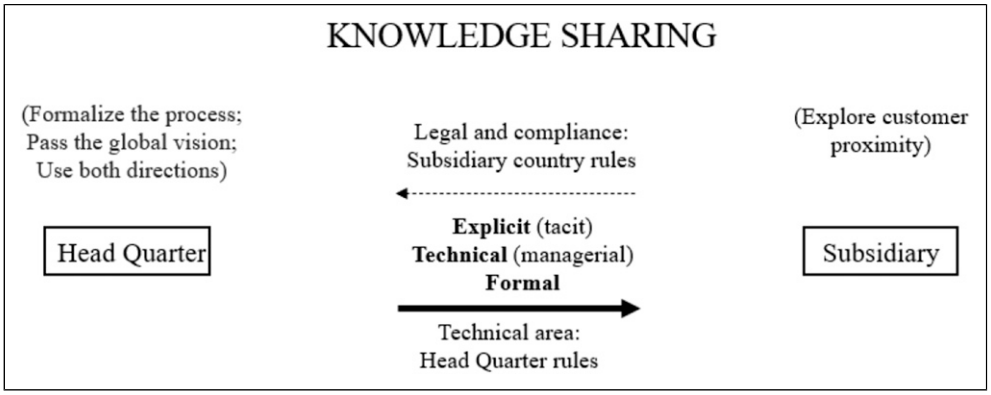

Figure 2. Knowledge flows and types.

Table 1. Barriers and facilitators.

Categories	Barriers (number of respondents)	Facilitators (number of respondents)	Indifferent (number of respondents)
Language	5	8	1
Culture	5	3	6
Time zone	6	2	6
Deadlines	6	0	8
Resources	5	3	6

> are in their language. Little by little, the company is also migrating the most important documents, even if for local matters, in English (E14).

In general, knowledge is mainly shared via language. Multinational companies therefore need to adopt a common corporate language for the parent and its subsidiaries. This means many employees often need to share knowledge in a language that is not their native language. This is cause for concern, because the proficiency and confidence people enjoy in their native language is often far greater than that in an acquired language, making non-native language a relatively less efficient way of sharing knowledge (Schomaker and Zaheer, 2014).

Interpreting the findings of the interviews, managers whose interactions have a greater technical content are more likely to consider language a barrier, which is perfectly understandable given the nature of the interactions (technical jargon, questions about standards and processes, diverse programs and projects...). By contrast, the managers whose interactions with the headquarters are more focused on managerial or informal content classified language either as a facilitator or as indifferent.

Culture. Of the fourteen managers interviewed, six indicated culture plays an indifferent role, five suggested it was a barrier and only three saw it a facilitator. Here's a comment from an interviewee who considers culture a barrier: "Culture is really something that impacts because I don't know if it's from them, I haven't found out yet but must be done by yesterday (i.e., very urgent), and it seems like that's normal. So, I don't know if it's a culture of doing things at the last minute or there's less programming or a lot of work." **(E9)**. While an interviewee who considers culture a facilitator said: "Culture, based on our experience with the people there, their culture is very similar to ours, even in the things that sometimes aren't so good." **(E1)**.

Market globalization has led to a growing need for geographic dispersion among organizations. In this context, national culture emerged as one of the main issues in the knowledge transfer process. How to access, explore and leverage knowledge resources are some of the main challenges for multinationals today (Pauluzzo and Cagnina, 2017).

For other scholars, culture, rather than being a barrier, is a facilitator that can and should be used by organizations to increase their level of integration in these markets. It is believed that learning from other cultures over time allows multinational companies to manage the dynamic balance and integration of the knowledge assets that support creativity and innovation (Fang, 2012).

Regarding culture, a close analysis of the content of the interviews reveals managers who work with processes are more likely to consider it a barrier. The obligation to do things according to the rules of the subsidiary's country (in this case Brazil) creates friction with the parent company,

which according to most of the reports often misunderstands the working practices of the country where the affiliate is located. This may end up generating discord during interactions, since what is seen as fundamental by the subsidiary's managers may not be considered important by those at the headquarters.

Time zone. Of the fourteen respondents, six stated the difference in the time zones between the subsidiary and headquarters is a barrier to knowledge sharing. Six other interviewees considered the time zone to be indifferent, while only two considered it a facilitator. According to some interviewees:

> I think that with some hours of difference, the time difference is something that is sometimes complicates participation in web conferences. Something they schedule for two whole days, at some point their morning will be our dawn, so sometimes you can't participate. So sometimes you participate in our morning part of their afternoon part. So, they have to schedule something for the morning that doesn't depend on sharing it with anyone who isn't there, like a physical presence. **(E4)**

Without the specific knowledge that the means of communication necessary to accomplish a task require, performance for groups with members spread across multiple time zones can be difficult. For example, if the work is very interdependent and members need synchronous communication to do their job effectively, time zone differences can hinder coordination because they force members to communicate primarily via asynchronous technologies (Espinosa and Carmel, 2003).

The time zone factor is considered a barrier for those managers who have greater interaction with the headquarters, especially from a strategic and managerial point of view. Particularly, not always being able to participate in important meetings due to different schedules causes some apprehension among the subsidiary's employees, who would like to see more flexibility on the part of those who schedule the meetings at headquarters. By contrast, those managers working with fixed projects, that have a beginning, middle and an end, and who, therefore, are not so subject to meeting schedules tended to consider the time zones made little difference.

Deadlines. Another point about barriers and facilitators that emerged from the analysis of the interviews concerned the issue of the deadlines the headquarters gives the subsidiary. Of the fourteen respondents, none considered deadlines facilitators, the majority (eight) considered them indifferent, and six respondents suggested deadlines represented a barrier to knowledge sharing. As one interviewee commented:

> It further complicates our life. Like the example I was giving you: a job that we took 15 days to prepare (and then I'm talking about the entire company because I'm not the only one doing it) and then the headquarters came to us and said: look, it's not like that anymore. It needs to be done another way, and you have three days to report it. So, we had to trigger activities for everyone, people had other demands, other tasks, for everything they're doing... It was difficult. **(E6)**

The classification of deadlines as being a barrier or making little difference to knowledge sharing is very closely related with the interviewee's area of activity. Managers working in areas considered strategic have tighter deadlines than those working in technical areas. This is due to the fact the technical areas usually have pre-defined deadlines and processes that tend to be repeated, so they do not usually surprise to managers. Those working in areas considered strategic are subject to last-minute requests that do not always fit into the manager's day-to-day delivery schedule.

Resources. Regarding resources, all the projects involving the subsidiary and headquarters were considered. For three of the respondents, the resources are a facilitator, that is, they are adequate, for six the resources make little difference, while for five managers the resources are a barrier to knowledge sharing. As suggested by one interviewee: "So this is insufficient if you want to have a work communication that is a little more structured, stronger. So, I would say it's a bit of that: culture/governance as well as the limited resources to some extent." **(E2)**

The managers involved in global projects tend to see the resources as a barrier. To carry out and implement projects in the subsidiary, they depend greatly on resources that come from the headquarters. There is also a relationship between the length of time with the company and the classification of resources as a barrier. Notably, managers with more time at the company seem to attribute less value to resources, classifying them as facilitators or indifferent. This occurs due to the fact managers with more time at the company are more familiar with the organization's way of doing things, knowing what can and cannot be expected from resources coming from the headquarters.

Benefits

The full list of benefits highlighted by the respondents includes: improved organizational culture (1 respondent); international exposure (7 respondents); more resources (4 respondents); participation in innovative projects (3 respondents); and improved processes (2 respondents). For example, as one interviewee stated, "With the Development Department, the benefit is to have an area that is centralizing projects, so we are not only negotiating with Brazil, but we are also negotiating with three or four countries and then the

bargaining power is greater than when we are only negotiating with Brazil". **(E5)**

Two interviewee saw no benefit in the way knowledge is shared between the subsidiary and the headquarters: "Today I don't identify many benefits, because the interaction is very low". **(E12)**

The benefits of knowledge sharing in organizations are well established in the literature (Hansen et al., 1999). However, they need to be better explored regarding the relationship between subsidiaries and headquarters, perhaps showing that benefits for the subsidiary can be transformed into benefits for the headquarters.

Research propositions

The analysis of the collected data enabled the construction of the framework presented in Figure 3. This overview of the results allowed the elaboration of propositions, which are presented below.

Clearly, the interviewees considered the knowledge flow to be largely one-way, from headquarters to subsidiary. This fact may well contribute towards the occurrence of knowledge retention behaviors, even if involuntarily. In order to reduce this possibility and improve the flow in the opposite direction (subsidiary-headquarters), the following actions are suggested.

Proposition 1. Holding face-to-face meetings at the subsidiary with the presence of participants from the headquarters with the aim of achieving a better understanding of the local situation. Perhaps, taking advantage of the presence of those participants to visit local clients in order facilitate greater alignment of global projects to possible local needs:

> But they get to know the reality of Brazil, which is a completely third world country, Latin America. I think they need to understand this reality, maybe to see how much we are doing in an environment like this. **(E3)**

Proposition 2. The submission in advance of abstracts/dossiers on global projects, so that local stakeholders have enough time to prepare and adapt their inclusion into local projects. The purpose is change the scope of projects to reduce the possibility of the subsidiary working on something that is already in progress at the headquarters:

> If you had the complete package. For example, thinking about the medical field. Receive a complete package in which the head office would take the Best Practices from various branches, assemble the package and say: folks, here's the toolbox. You would have a toolbox: look, Brazil did this, Ukraine did this...what do you want to use instead? Do you want more information? Here is the email of the person in Ukraine who is responsible. **(E4)**

Proposition 3. The headquarters should use the knowledge acquired at the subsidiary as a kind of market research in order to develop projects more focused on local needs. "And then there are internal projects that have nothing to do with the headquarters, which are the local actions where we develop the partner, there can also be a national company a multinational and/or a company from outside Brazil to assess this project for Brazil". **(E5)**

Most respondents consider the mechanisms used to be adequate, but there is room for improvement and, consequently, better knowledge sharing.

Proposition 4. Decrease the use of e-mail and slide presentations to enable more agile communication. The excessive use of e-mails and slide presentations leads to pile ups and delays in decision making. "Same tool, as if it were a Skype® and OneDrive® for documentation storage. We are trying to create this e-mail avoidance culture; I think that office 365 will help a lot in that too. All done by video". **(E11)**

Proposition 5. To replace the item above, the suggestion is to increase the adoption of online tools such as Teams® and Skype® that allow face-to-face, more agile and personalized interaction: "Lots of email, Skype®, calls, Teams®. Although they still aren't using Teams® properly. They're still on Skype®, they haven't fully switched to Teams® yet, but it's there". **(E9)**

Proposition 6. Create an intranet repository of the subsidiaries' best practices and lessons learned. The purpose being to identify the mistakes and successes of global projects and thus avoid wasting time and rework:

> Today, sharing takes place via email, meetings and presentations. I believe we could use the resources we already have, such as intranet and things like that. We could have documents available for viewing and that could only be changed with authorization. It could be that way, I believe anyone could access, anyone in the group with a license could access. **(E1)**

The gaps found in this study are mainly concentrated around the issues of time zone and culture.

Proposition 7. Improve online meeting scheduling, considering the subsidiary's time zone. One suggestion is to place countries with similar time zones in the same meeting (for example the Americas (Brazil, Mexico and USA), or only Europe, or countries in the east (China, Russia, Pakistan, Turkey):

> Distance is a problem, we realize that for people in Europe, right, an hour and a half, two hours you take a train, and you get there, you have a meeting in person and the issues are resolved

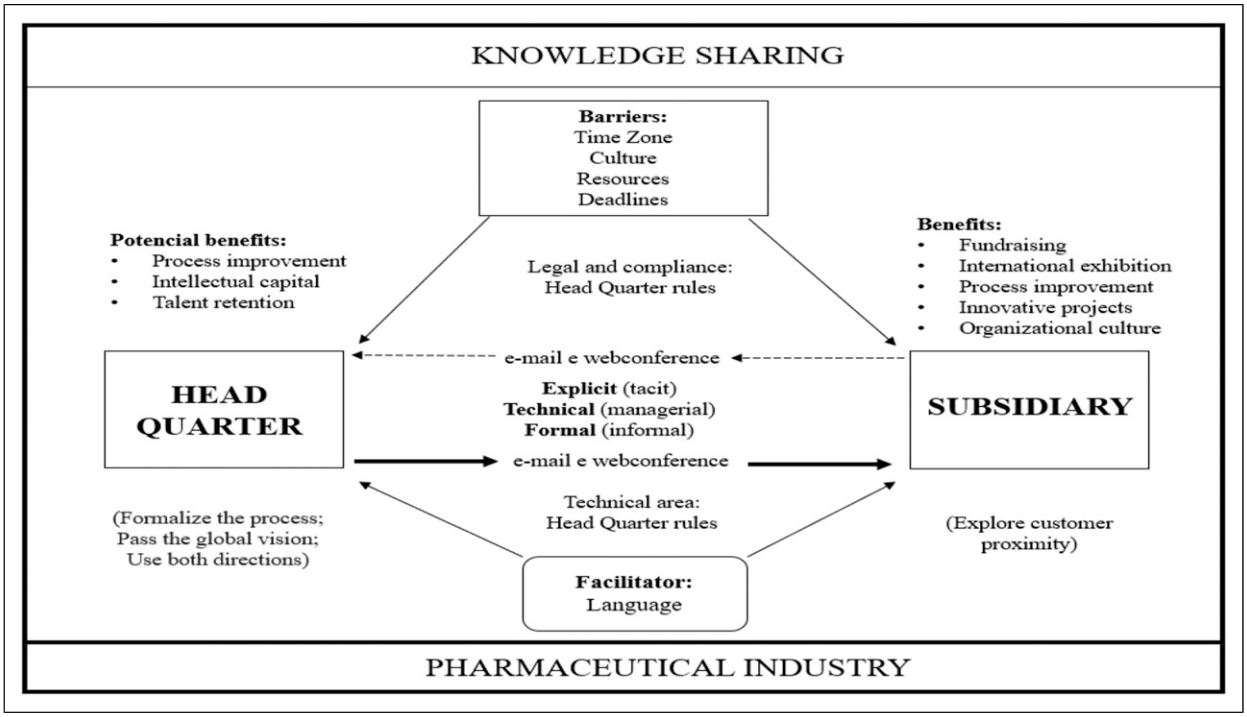

Figure 3. Proposed framework.

in a better way. From here, if we need to go there, sometimes they invite us to go there for a one-day meeting. In other words, you're going to make a 16-hour trip to get there, there's the time zone issue, you have to arrive a day in advance, then you attend the meeting, it ends, and you have to go back again... that's a problem. **(E9)**

Proposition 8. The headquarters should have an understanding of the local culture. Although culture is inherent to people, being aware of it and seeking to adapt to it is a successful way of dealing with this diversity:

I think there's a big cultural barrier there, because it's no use, there are different countries, different expectations, people are not necessarily able to understand some problems we have here, both from the point of view of access, sales, and from the point of view of production, new investments. **(E8)**

Proposition 9. When creating global projects, the headquarters needs to consider the resources and deadlines available in the subsidiary:

Like the example I was giving you: a job that we took 15 days to prepare (and I'm talking about the entire company because I wasn't the only one doing it) and then the headquarters came to us and said: look, it's not like that anymore. It needs to be done another way and you have three days to complete it. So, we had to trigger activities for everyone, people had other demands, other tasks, for everything they're doing. **(E9)**

Contributions and future developments

The work carried out in this study has enabled the construction of a framework that presents the analysis of knowledge sharing in the relationship between subsidiary and headquarters in a multinational pharmaceutical company from the perspective of subsidiary's managers. Regarding the direction of the knowledge flow, in this case study the findings conformed to those reported in the literature which demonstrate larger volumes of knowledge naturally flow from the headquarters to the subsidiaries (Hwang et al., 2015), given the amount of information, strategies and guidelines produced in the headquarters and sent to affiliates.

The researched literature shows knowledge sharing mechanisms must be implemented according to the stage of implementation of knowledge management in the organization (Oliveira et al., 2014), which is consistent with the results found in the interviews. The analyzed company is in a knowledge management stage where email and videoconferences are the almost unanimous mechanisms reported by the interviewees.

Using a non-native language can make knowledge sharing an ambiguous and expensive process, eroding some of the benefits of knowledge sharing (Ahmad, 2015). Unlike what is found in the literature, in this research, language was not considered a barrier, but on the contrary, it was considered a facilitator. On the other hand, several articles

(Cavaliere and Lombardi, 2015; Pauluzzo and Cagnina, 2017) show that country culture is an important barrier to adequate knowledge sharing, both among employees and the leadership.

The respondents cited the benefits from the point of view of the subsidiary rather than for themselves, for example, greater fundraising and participation in innovative projects. The researched literature demonstrates that the benefits are, in most cases, motivators for the employees of an organization to continue practicing knowledge sharing (Erkekens et al., 2015). Figure 4 presents the framework for analysis of KS between a subsidiary and the headquarters.

Since the systematic review of the literature available so far did not present articles that shed light on the research problem in this study, one academic contribution of this research was to analyze the knowledge flow, mechanisms, facilitators and barriers to knowledge sharing between the subsidiary object of the study and its European headquarters from the point of view of the subsidiary's managers. The framework presented in Figure 4 can be used to replicate this analysis in other subsidiaries and even in other multinationals.

In terms of managerial contributions, these are summarized in the described propositions as well as in the framework for the analysis of knowledge sharing proposed by the research. The importance of the topic lies in the challenges faced by any knowledge-intensive organization that has ventured into other countries: how to ensure there is

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In terms of managerial contributions, these are summarized in the described propositions as well as in the framework for the analysis of knowledge sharing proposed by the research. The importance of the topic lies in the challenges faced by any knowledge-intensive organization that has ventured into other countries: how to ensure there is sufficient knowledge sharing among its employees in an environment that is known to change frequently and where, when more experienced employees leave organizations, they take years of learning with them.

One limitation of this study was the fact that it considered knowledge sharing in one of the more than twenty international subsidiaries of the analyzed pharmaceutical company. Perhaps factors such as language, culture and time zone are viewed differently in other countries, as well as project resources and deadlines. It would be useful to extend this study by applying the proposed framework in two or three subsidiaries in countries with different languages and cultures so that a comparison can be made between them. Also, the characteristics of the sector may also have influenced the results obtained, since the pharmaceutical industry is knowledge intensive and product research and development requires considerable time. Therefore,

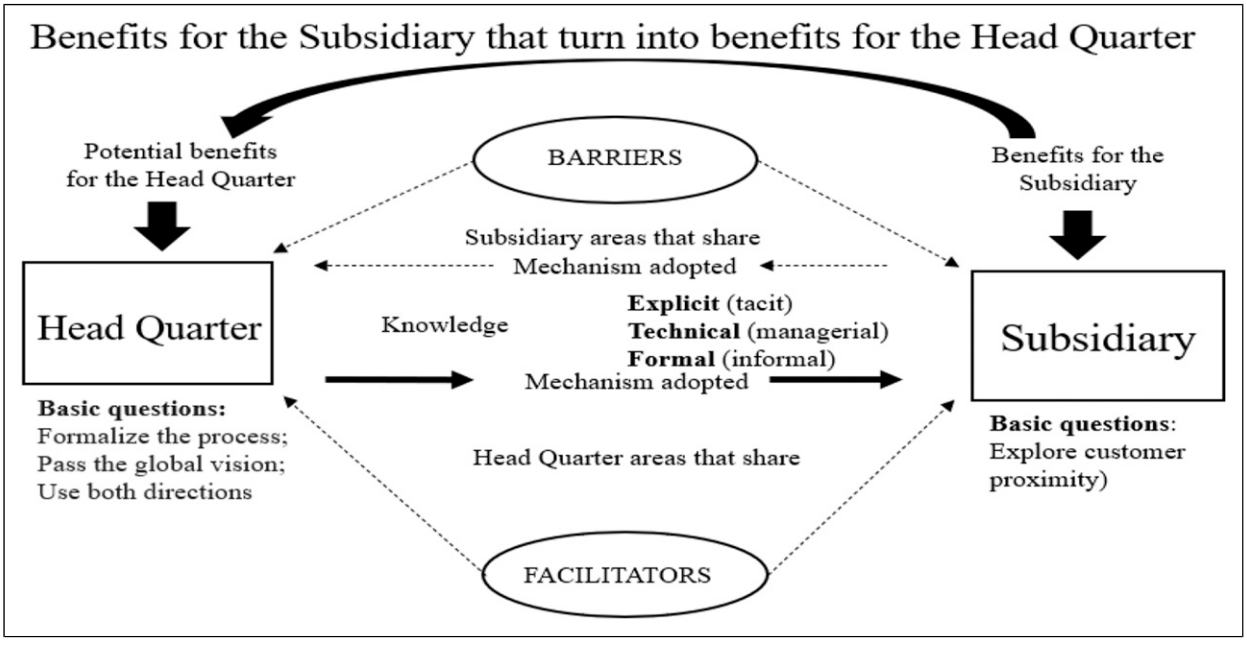

Figure 4. Framework for analysis of knowledge sharing between a subsidiary and the headquarters.

conducting similar studies in other business sectors might also shed light on the state of knowledge sharing in them.

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Data Availability Statement

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

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