Knowledge sharing in horizontal networks: The proposition of a framework

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pensamiento y gestión, N° 33
ISSN 1657-6276 (impreso)
ISSN 2145-941X (*on line*)

Resumen

El presente artículo tuvo el propósito de identificar el proceso de compartir conocimientos entre los socios que participan en la red, así como las dimensiones en el intercambio de conocimientos entre las empresas pertenecientes a las redes horizontales de cooperación. La investigación fue un estudio exploratorio y transversal, realizado a través de un estudio de varios casos en nueve redes que pertenecen al Programa de Redes de Cooperación, con sede en Rio Grande do Sul. Los resultados encontrados se realizaron a través de un análisis de contenido. Fue posible verificar la presencia de compartir el conocimiento en diferentes momentos de la relación (ciclo de vida de la red y los socios dentro de la red). Basándose en esta evidencia, el documento sugiere un marco para el análisis de intercambio de conocimientos en redes entre organizaciones de las dimensiones teóricas visualizadas.

Palabras clave: *Redes de cooperación; conocimientos interorganizacionales; compartir conocimientos ..*

Abstract

The present study aimed to identify the process of sharing knowledge between the partners involved in the network, as well as the dimensions on sharing of knowledge between enterprises belonging to the horizontal networks of cooperation. The research was an exploratory and cross-sectional, conducted through a multi-case study on nine networks belonging at Networks Program of Cooperation, located in Rio Grande do Sul. The results were done found through a content analysis. It was possible to verify the presence of sharing knowledge at different moments of the relationship (life cycle of the network and the partners within the network). Based on this evidence, the paper suggests a framework for analysis of knowledge sharing in interorganizational networks from of the theoretical dimensions visualized.

Keywords: *networks of cooperation, interorganizational knowledge, knowledge sharing.*

Fecha de recepción: Marzo de 2012
Fecha de aceptación: Junio de 2012

1. INTRODUCTION

In Japanese philosophy, knowledge is dynamic and created inside social interactions between individuals and corporations. It is also humanistic, since it is essentially related to human action. Since it is an interactive process among individuals or between individuals and their environment, knowledge is strongly connected to the value system of individuals and by the network configuration in which it is created (Balestrin, Vargas, & Fayard, 2005).

Management literature has focused on the impact of specialized knowledge and on knowledge sharing (Willem & Buelens, 2009). By doing so, several intimately related concepts were developed, such as tacit (Grant, 1996); (Polanyi, 1997); (Nonaka & Takeuchi, 1997); (Johannessen, Olaisen, & Olsen, 2001) and (Johannessen & Olsen, 2003), not encrypted (Zander & Kogut, 1995), incorporated (Nidumolu, Subramani, & Aldrich, 2001), sticky (Szulanski, 2000) and knowledge dependent (Birkinshaw, Nobel, & Ridderstråle, 2002). These concepts refer to the related context, to the knowledge and the difficulty to share specialized and scattered knowledge among individuals or groups.

From there on, some doubts came up throughout the task of knowledge sharing, such as: what is the best way to share knowledge within networks? Is it by using formal systems and a more formalised coordination? Knowledge hierarchization? Or is it by a more informal coordination? Or is it interdependence? Or is it all this and none of this?

Intending to discuss and answer these questions, this article wants to outline a framework for knowledge sharing in horizontal networks. Thus, we want to understand the way knowledge sharing happens and its similarities between different networks. Then, we will describe: the theoretical approach used the data collection method and the results. Eventually, we present the considerations about the results obtained.

2. THEORETICAL REFERENCES

Studying knowledge sharing between companies demands an accurate analysis of how some dimensions impact and/or guide relationships and also how much space really exists for that sharing to take place. We tried to verify their impact on internal knowledge sharing based on some dimensions such as: formalization, formal and informal coordination, hierarchy and interdependence suggested by Galbraith (1973); Bacharach and Aiken (1976); Mintzberg (1979); Miller and Dröge (1986); Hansen (1999); Edelman, Bresnen, Newell and Scarbrough (2003) and Willem and Buelens (2009) and obtained by reviewing literature especially of research by Lawrence and Lorsch (1969); Miller and Droge (1986) and Mintzberg (1979), Tuomi (1999) and Willem and Buelens (2009). Regarding such dimensions Tsai (2002) approaches coordination, hierarchy and formalization as being in synchronization and integrated as the task of knowledge sharing between members of companies, whereas, on the other hand, interdependence tends to cooperate towards differentiation within relationships. These dimensions were also used by Chen and Huang (2007), when we verified the relationships of these dimensions in knowledge sharing identifying that these dimensions directly related to social interactions between groups.

The concept of knowledge in this study is defined as "a product of human reflection and experience which is dependent on context and a resource that is always located in an individual or a collective, or embedded in a routine or process" (De Long & Fahey, 2000, p. 114). Knowledge sharing thus occurs "when an agent inside the network is affected by the experience of another and it manifests by changes in the performance of the receptor of such knowledge" (Argote & Ingram, 2000, p. 151).

Several of the authors that discuss the concept of knowledge sharing have focused their studies in a particular aspect of the organization factor: the role of networks (Hansen, (2002); (Scarbrough, 1995), the impact of the team factor at work (Lam, 1997), the informal coordination versus formal (Tsai, 2002), incentive structures (Osterloh & Frey, 2000), or technology (Birkinshaw, Nobel, & Ridderstråle, 2002). However, despite there be-

ing several studies related to structural dimension, there are few studies in the consulted literature that investigate the relationship between the presented dimensions and knowledge sharing (Daft & Lengel, 1986) – the focus of this study.

As far as knowledge sharing is concerned, some aspects should be approached for more efficiency and clarity of application. Among them, coordination behaviors may vary in terms of risk sharing degree. Organizations may opt to take all or most risks, or avoid decision risks, passing it to other organizations (avoiding risk), or looking for an equitable risk sharing (Friedman & Savage, 1948).

In highly centralized network, knowledge transfer is not expected from one agent to others, unless that is conferred by the network's governance (Ghoshal, Korine, & Szulanski, 1994; Inkpen & Tsang, 2005; Tsai, 2002). In other words, centralization limits the active initiative of actors when sharing knowledge with other agents, emphasizing the centrality of the organizational network headquarters. Tsai (2002) supports this hypothesis, reporting the negative effect of centralization can be aggravated by competition between internal resources sub-units (e.g., capturing resources), and/or in the market (e.g., approaching the same clients or selling similar products).

Despite of a theoretical convergence among researchers about the statement above, empirical evidence is still controversial. Tsai (2002) found support for centralization on the flow reduction of knowledge between competitive agents in the market (but not for those who compete for internal resources), whereas Ghoshal, Korine and Szulanski (1994) showed that centralization had no significant effect on interorganizational communication as a whole.

As a consequence, formalized coordination seems to be less appropriate for networks based on decentralization and weak formalization, when it concerns sharing knowledge (Chen, 2007). Besides, specialized knowledge exchange can be effective only if (centralized) coordination knows that knowledge is individual (Bogenrieder & Nooteboom, 2004). The

decision coordinator in knowledge sharing must pass on his power to someone who owns knowledge (Jensen & Meckling, 1992).

There is another aspect of knowledge sharing in hierarchy, i.e., when sorting importance and data sequence and information in knowledge generation, where data must be seen as simple facts that, when structured, can become information. Information, on the other hand, only becomes knowledge when it is interpreted or when some meaning is added. In other words, one can say that the common idea concerns the fact that data are considered less than information and information less than knowledge. Besides, we suppose that first we need to have the data before elaborating information; thus, only when we have the information can knowledge emerge (Tuomi, 1999).

This opinion is shared by several authors such as, e.g., Davenport and Prusak (1998). The authors state that:

> The data are a set of discrete and objectives facts about events… Data only describe a part of what happened but don't provide with any judgment or interpretation without a sustainable action basis… The data do not say anything about their own importance or relevance. (Davenport & Prusak, 1998, pp. 2-3)

As a consequence, we can guarantee that knowledge can only be shared after creating and sharing information within relationships, where data emerge as a sub-product of cognitive actions among individuals and suppose the existence of social practices (Tuomi, 1999). One of the aspects of knowledge management is using individual skills and network memory in order to, in other words, makes sense of the available data and for shared information.

In this sense, Davenport and Prusak (1998, p. 129) add that for knowledge management to thrive, organizations need to create a set of functions and qualifications in order to learn, distribute and use knowledge. There are many strategic tasks to perform and it is unreal

to assume that a company can simply add knowledge management activities to the existing positions.

And for knowledge management, one must attend to the existence of informal networks inside horizontal networks between different business units which is expected to push forward interorganizational knowledge flows. Horizontal informal relationships (inter-personal networks) coming from inter-relationships in social events (Tsai, 2002), are beneficial for network oxygenation. It is consensual in literature that informal bonds serve as a channel for sharing knowledge, that are not prescribed between individuals belonging to different companies of the same network, once they build trust for cooperation and reduction of perceived uncertainty. Corroborating Gulati (1995) states that the choice for governance structures depends on trust that emerges through time among organizations and their repetitive attachments.

An individual owns, besides his own information resources, a structure of his knowledge, his own ontology and is also aware of his own personal connections. However, contacts in his personal network are not treated the same way, depending on the group and the role that such contact has.

Thus, the individual also considers his subjective organizational vision, when deciding to share his information. Consistent with that perspective, Szulanski (1996) shows that the difficulty of relationship between the origin and destination of knowledge is one of the hurdles for knowledge sharing. Another contribution is provided by research carried out by Holanda, Guedes, Vasconcelos and Cândido (2008), where they verified that some formal and informal spaces provide entrepreneurs with possibilities to share their skills, experience, emotions and know-how.

On the other hand, although literature encourages results and information exchange within a network, the objective paradigm and rational optimization suggest that organizations get together to

maximize their own performance. In other situations, it is possible to observe different sharing behaviors (Eisenhardt, 1989); (Eisenhardt & Schoonhoven, 1996). Some organizations can opt to maximize their own objectives and other can objectivize the maximization of network objectives, whereas others aim to maximize objectives of one or all members.

For example, in cooperation networks funded by the Cooperation Networks in Rio Grande do Sul, we suggest opening a space for information sharing between entrepreneurs and, thus, creating the opportunity for articulations between companies, stimulating business, partnerships and alliances. As a consequence, each network, counts with the help of specialized consultants that form work-groups with the objective of managing specific knowledge, looking for a better knowledge sharing that exist within the network.

There is another technology dimension refers to interdependence, i.e., since different agents are dependent of one another to perform tasks (Thompson, 2003). Task interdependence is a determining factor when choosing coordination mechanisms (Grandori, 1997); (Heugens, 2005); (Thompson, 2003). Thus, the bigger the interdependence, the bigger the need for a more horizontal coordination (Galbraith, 1973). For example, the lesser a company is integrating and the less resources it individually has, the bigger its dependence of network and relationships is when compared to other agents. Technological interdependence and complex knowledge are similar, since technological interdependence involves knowledge dependence.

Thus, based on Davenport (1998), who mentions that the only sustainable advantage that a company owns is what it collectively knows and the efficiency of its usage and the promptness of acquiring and using new knowledge. Understanding the knowledge sharing role in several networks can help us answer why some networks can be more effective than others.

3. METHODOLOGY

Regarding methodology, we opted for a qualitative approach, since the objective is to outline a framework for knowledge sharing in horizontal networks. Easton (1995) argues that the qualitative research is the most adequate method of research in networks, considering the relationships character in networks that allows identifying causal forces that influence agents behavior and the network creation.

According to Yin (2005), "although all projects can lead to successful case-studies, if you have the choice (and the resources), it is better to prefer multiple case projects rather than single case projects". The advantage when using a multiple case study is that, besides allowing comparison, one can produce a more global and robust study, making it thus more convincing (Souza, 2008).

This research uses the multiple case studies and is based on a qualitative analysis format. Regarding these peculiarities, this research used a transversal cut, where the subjects of this research are made up of presidents of horizontal interorganizational networks and studied in a single period.

Besides, the selection of a multiple case study favors crossing of analytical conclusions coming from different stories, contexts and profiles of the subjects involved.

Collection of such evidence was done in loco. In order to collect primary data, we performed semi-structured interviews with presidents or vice-presidents of cooperation networks, thus totaling nine interviews, according to Table 01 and the data were analyzed considering the contents analysis.

Regarding the sample, and considering what Britto (1999) points out about the difficulty to define the research studies, due to the dichotomy of options. We adopted an issue-based net nominated association, which consists of the way of association based on the relationship between agents that want to cooperate in a collective question, influencing the system's evolution and structure in the case of network directors.

Brito (1999) continues saying that an issue-based net may not only affect the organization of individual agents and their strategies, but act like a power balance within the network. It may also be defined as a relationship network between agents involved in a cause through mutual interests and conflicts.

In order to define study focus networks, we initially verified that the management of Cooperation Networks Programmer, done by the Secretary of Development and Internal Affairs of Rio Grande do Sul. Based on the knowledge of the existing networks in Rio Grande do Sul and their features, we opted for networks in the central region of the State, since they are in most cases networks that provide services and are therefore more subject to knowledge exchange, which is according to the study's objectives.

The interviewees' selection occurred with an intentional non-probabilistic sample, selected by accessibility. We see this approach as the one where subjects' selection is done by the selector's judgment, considering that these may offer the solicited contributions (MATTAR, 1996). The networks chosen are further described on Table 2.

Table 2.
Networks participating in the study

Network	Foundation/ year	Partners Started	Integrantes atualmente	Interviewed	Codification
Brazil Sports Network	2004	11	18	Presidente	I 1
Ação Network	2005	19	12	Presidente	I 2
Central Pneus Network	2006	19	14	Presidente	I 3
Imobiliária Network	2006	10	13	Presidente	I 4
Network Sul Corretoras	2006	27	27	Presidente	I 5
Uniescolar Netwoek	2006	11	8	Presidente	I 6
Car Network	2010	11	11	Presidente	I 7
Induvest Network	2010	14	14	Presidente	I 8
Univans Network	2010	13	13	Vice - Presidente	I 9

Source: Made by the authors

In the contents analysis by Bardin, quoted by Godoy (1995) and Silva, Gobbi & Simão (2005), shows the use of the contents analysis in three fundamental phases: pre-analysis, exploring material and treatment of results. On the first phase the work-scheme is established with well defined, though flexible, procedures. The second phase consists of complying with decisions previously taken and, eventually, on the third phase the researcher supported by raw results aims at making them more significant and valid.

Regarding the content analysis, we can consider that it is defined in structure and elements demonstration of such content, in order to clarify different features and extract their meaning, not obeying to rigid phases, but yet to a simultaneous reconstruction with the researcher's perceptions with possible means that are not always clearly delimited (Silva, et al., 2005). Thus, we looked for an apparent significance levels unfolding, not considering the order of respondents.

4. RESULT ANALYSIS

The present chapter analyses the cases altogether. Although confronted by some limitations due to the heterogeneity of cases, the objective of this section is not to perform a comparative analysis, but yet to identify converging aspects that can help in deepening their theorizations about the theme. So, we try to identify elements that can contribute for the construction of the conceptual-analytical scheme and having the research propositions as limiting dimensions.

Note that, since it is a multiple-case study, we obeyed to the indications by Yin (2004), that states that in multiple case studies it is recommended to perform crossed (not individual) analysis between cases.

When forming a horizontal network, we point out the diversity of members' interests that can often be conflicting (Dalmoro, 2009). Thus, Balestro and Verschoore (2004) point out the importance of the existence of a coordination, i.e., the existence of an entity made up of professionals from outside companies or companies' representatives with the objective

of monitoring the relationships between companies and manage the collective decision making process.

In the analyzed networks, this role is performed in only three of them (by a management hub) and, in the other six networks, they are directly coordinated by their manager or vice-president. We would like to point out the presence of the interviewee's statement that all members have the decision power and managerial role at meetings or assemblies that take place within the network.

The knowledge sharing procedure's description within networks belonging to the Cooperation Networks Program in RS is displayed as follows, considering the respondents" point of view.

4.1 Knowledge Sharing in Cooperation Networks

In order to share knowledge close to their associates, Networks formally promote meetings with pre-scheduled plans and specific trainings with external consultants or viewed in one of the cases from internal trainings so as to exchange experiences. The knowledge shared by the Network are greatly originated from the way the market acts and the workforce qualification of both its cooperators and managers of companies belonging to the networks. In the few that already own headquarters and employees this exchange happens more frequently via the headquarters' commitment to the constant information exchange within the network. Besides, some networks disseminate their knowledge in an informal manner, though clearly related to the embedded and trust developed inside the network throughout the relationship (Argyres, Bercovitz, & Mayer, 2007).

4.2. Knowledge Sharing Satisfaction

Regarding perception and satisfaction results of the members belonging to the network for knowledge sharing, the research data demonstrated that managers belonging to organizations inserted in the networks studied are in their majority satisfied, as it can be shown by the following statements by presidents.

> "I consider knowledge sharing to be the greatest benefit we have" (president - Network 3)

> "What we get from sharing is that when we are looking for that information, is that one does not want to say everything one does here, but yet the sense that a member does not attend a meeting and does not have the time to expose everything one does." (President - Network 4)

> "Yes, nowadays… Yes. Back in the beginning of the network much of the staff was afraid of speaking, because they were afraid of saying nonsense. For instance, a member who buys less and does not speak a lot at meetings is now speaking, bringing new ideas to the table and participating of all meetings." (I7)

These results deserve to get attention from companies that integrate networks, referring to the understanding of the way that knowledge sharing generally is satisfactory and that, inside networks, some factors were understood and dealt with by managers, among which were: participation of minor companies in knowledge sharing within the group and trust relationships, which are both determining for the continuing of relationships. In other words, the satisfaction feedback can also be due to their position inside the network's management and also in general the knowledge sharing satisfaction inside the network is not among all members. These results are also supported by the results obtained by Balestrin, et al. (2005), Park, et al. (2009), and Vasconcelos, Caldas, Martins, Andrade & Cândido (2009).

4.3 The Influence of Formal Systems

Then, in order to verify the influence that managements have inside networks, especially if the formal systems contribute to a better knowledge sharing inside the network. We can see that, in studied networks, they all possess formal and programmed meetings with pre-scheduled planned items of discussion. Networks have used these formal meetings for decision making on specific issues such as: negotiation with suppliers, specific problem resolution among other subjects. Some of the following statements show this:

> "Inside the network, we have a minute and an attendance roster. Conditions state that missing three meetings without a justification may imply the member being removed from the network. Managers must go, not employees; employees are not independent. On the other hand, everything is decided collectively; Direction might even make a suggestion, if I put some ideas up for discussion at the meeting. There must be an assembly and it must be voted." (I4)

> "We have formal meetings on a monthly basis with an 80% average attendance. [...] We try to adjust the minute to support a determined timing [...] These minutes are pre-scheduled so that when associates arrive they already know what's up for discussion. If an associate has something different, he'll bring it up to the secretary to schedule and put it up on the board" (I7).

We can see from the presented statements that formal systems have little influence inside networks when it comes to sharing implicit knowledge belonging to members and a significant influence when it came to sharing knowledge about specific issues such as, e.g., competitors and performance segment of the network.

Besides, one can understand that due to not having a cooperative behavior inside networks (because they are new or small), the formalization of meetings and the mandatory aspect of attendance is more seen as incrementing the participation of members and, consequently, knowledge sharing inside the network.

4.4 Formalized Coordination

Formalized coordination inside networks happens due to the elected directories and, in some networks that coordination happens in a centralized manner, focusing on the president and on the vice-president, without the others participation; some statements justify that centralization with the fact that they are small companies and managers are from more structured companies that are more available to work harder for the network.

"I myself, as a president, am quite autonomous; and the group sees that in a positive manner also because they don't want me to leave the presidency because of that. But the regulation was made in order not to have a reelection and give others that opportunity. Inside the group, they claim that I have the structure to let someone else manage my company and to be involved with the network, which is something that others – for being minor – can't accomplish" (I2)

> "The most visible ones are the cashier and the secretary, but of course that coordination, since it's been created, it was created with me and nobody wanted to pay, so they reelected and reelected and then, if there is nobody to take charge, the network ends because nobody takes charge. And it's been this way since it's been initiated." (I3)

Regarding this more formalized coordination in literature, some studies emphasize the results that were found: "There is a greater density in the initial phase of networks, with a growing tendency for structural opening, since the execution and follow-up of activities both take place. And also, there is a slight increase in the tendency to hierarchize coordination activities, project execution and control over information/resource access flows" (Souza & Quandt, 2008).

From these results, we tried to verify the role of hierarchy in knowledge sharing.

4.5 Hierarchy and Knowledge Sharing

As far as hierarchy is concerned, we can verify that the hierarchization mode is not clearly defined by networks, i.e., at a moment during reports we can clearly view hierarchization inside networks and, in other moments, inexistence. This is clear by the authors' perception, maybe related to commitment and the sense of cooperation inside networks.

> "I'm up to my ears in management [...] also because it's a common objective, you can't delegate and let go control, because then problems occur, such as the ones that our network has had [...] the staff still have a con-

> science of not understanding the group yet. They say: "I'm not giving up on working at my company to do something for a group" (I2)
>
> "If we're putting up an event, the marketing team will follow and meetings are there to manage actions. There's not a hierarchical formalization within the network; we have created a partnership that means that if I can't represent the network as the president, someone else will go instead – it's not much of a problem." (I4)
>
> "We had it, but it never worked quite well; everybody would attend meetings and everyone would voice an opinion and everyone would make decisions as a whole. So teams were everyone. The most visible we had were the cashier and the secretary, but all the rest was up to me" (I8)

We can see in networks that there still is the individual behavior, instead of the collective one, as per stated in reports, many members are simply part of networks and are only part of it when there is an individual need to obtain knowledge and not to share it. This shows that in networks the individual benefits are more important, especially for the networks studied, than collective benefits. The research by Provan, Fish and Sydow (2007) created a division of analysis focus for networks, where it is suggested that, within networks, there are those who participate with actions and interests for the group, those that act from individual interests and, on the other hand, those who are influenced by the network and those who are influenced by other members.

Hierarchy on studied networks is present in knowledge sharing, especially due to moments where tactics and contra-tactics are put in practice by different interest groups, thus unveiling the peculiarities of the exercise of power within the network and, as a consequence, defines the hierarchy power in knowledge sharing. This political exercise assumed a circular connotation where interests groups in dispute outline their strategies, including: forming coalitions or influence networks, communication process control and privileged information and of formal structure, use of cooperators persuasion techniques, intentions' distortion and manipulation of the decision making process (Brito, Cappelle, Brito & Silva (2008).

4.6 Informal Coordination and Knowledge Sharing

Based on previous results, this study seeks to verify the role of that informal coordination within knowledge sharing, if it is an essential factor as indicated by literature. Some reports contribute for a better perception:

> "We're always in contact on the phone. Trust already exists within the group for many years now and, hence, we don't have a problem when it comes to sharing information or access to members in the company. Outside meetings, on a day-to-day basis, we call to know about an employee or to know about a market. Of course these actions happen more between those eight members that have already had a relationship between them than between those who arrived later on" (I2)

> "With some people, we have a stronger bond and people connect" (I4)

> "In fact, the most acting directory is made up of 4 members: the president, the vice-president, the treasurer and the secretary. They are the ones that are most in touch; they are the ones who keep in touch the most via e-mail." (I3)

> "We have always socialized after meetings and that has been very important to bring the group together and come up with new ideas that are not anticipated on the meeting's minute" (I6)

With the reports provided by members, we verified the presence in researched networks in their management of an informal coordination and a stronger personal relationship between members. We can understand that such coordination is directly related to performance and especially to knowledge sharing within networks. According to Pereira and Martins (2010), the informal cooperative process, developed by units has a string influence on their organizational performance and companies do not participate of that informal group, although they also participate of some types of cooperative process, knowledge sharing and performance are lower than the ones maintained by an informal group. Another considerations regarding informal coordination is that the results achieved by Kratzer, Leenders and Engelen, (2005) mean that an informal (friendly) relationship among

members is determining for a better knowledge sharing and has an influence in performance.

4.7 Interdependency for Knowledge Sharing

As far as members' interdependency is concerned, and especially if that dependency favors knowledge sharing or not, the following statements stood out at interviews:

> "There's not much; nowadays there's not any other differential within the network" (I1)

> "Minor ones are dependent, but it's not something that is dependent to administrate their business [...] I would say that nowadays I think that they see the major ones as a way for them to ascend; but of course these are technologies that you end up having." (I2)

> "Those who are organized are not that dependent. But people see that most companies are not organized, organization is lacking, follow-up is lacking and they need it." (I3)

As a consequence, we can say that the studied networks have small dependency towards the network when it comes to information sharing, staring from small companies that end up relying on knowledge sharing with other companies within the network and thus increase their competitiveness. However, on the other hand, we can see in more structured and organized companies, the inexistency of any sort of dependency regarding knowledge sharing with the network, but yet the presence in the network occurs due to the need for following up on the development of other members or the bargaining power in some cases, as opposed to sharing knowledge for their own development.

Hence, we can say that those networks that seek development must rely on knowledge sharing as an interdependency factor and a way to strengthen social relationships and also of maintaining the collective environment and decreasing the opportunistic behaviors, since by having a constant information sharing, the individual objectives become knowledge belonging to all members, and hence a network's organizational knowledge.

On the other hand, we can say that the absence of communication or of information exchange among managers indicates a strong centralization with verticalized activities and, as a consequence, there is no indication of interdependency between the networks' members (Barbosa & Medeiros, 2005). There is another study that also shows that for the members' interdependency with networks and with knowledge sharing, it essentially happens due to the potential benefits that cooperation networks may bring for the economical agents that make it up and for the society as a whole that surrounds it. It is hence about evaluating, before implementing actions (a) whether the results achieved by companies (when organized as a network) are superior to those that companies achieve if they were operating alone or not; and (b) how these benefits overflow to a group in society (Cavalcante & Fagundes, 2007).

4.8 Suggestion of a Framework for Analysis of Knowledge Sharing in Cooperation Networks

We show on Image 1 the way knowledge sharing evolves within the interorganizational relationships that were studied from interviews.

	Dimension	Inducing Agent	Knowledge Source	Competitive Edge
Stage 1	Formal	External or Agent Member of recognized competence in the network	Knowledge for the structuring of the network	Yes, but easily copyable
Stage 2	Hierarchy	Formation of internal groups	Exchange of experience between partners Pre - Networks	Yes, but in the short term
Stage 3	Informal Coordination	Training of internal groups	Creation of new knowledge between the partners after the network, from informal relationships	
Stage 4	Interdependence	Network Management as a whole	A structured and systematic creation of new knowledge (Post - Network) for the governance of the network	Yes, constant creation of benefits, ensuring the sustainability of businesss

Source: Made by authors

Image 1 – Knowledge Sharing Framework in Cooperation Networks

From our results and from Image 1, we can show how knowledge sharing happens in different moments in interorganizational relationships, which offers an understanding of the subject or a subject's refute, within the relationships since their creation until their maturity and interdependence.

Initially, we can see knowledge sharing happening from meetings and assemblies that foster formalized networks; this is managed and coordinated by consultants who are bonded to Universities linked to the Cooperation Networks Program and/or members who are recognized by members inside the network as being more skilled to structure the network. Knowledge sharing happens more often by coordinating agents that by other members because there still is an uncertainty regarding this relationship.

Afterwards, there is a structuring performed by network coordinators based on the individual skills of each member and mainly by private experiences pre-network, thus creating a knowledge hierarchy where the most involved and committed ones stand out. At this point, we can see groups being born that are more centralized and have a greater power over the network, which is going to be decisive for decision making and relationships management. Regarding knowledge sharing, we can see that it happens between members belonging to minor organizations that only observe and observe at an initial phase. Then, there is symmetry between members from structured organizations and proxemics as far as the management modes of each member is concerned, as well as the networks.

Thus, it is possible to point out that in Phase 2 there is a development of intra-network trust relationships, resulting in a greater implicit and subjective knowledge sharing, better described in Phase 3. In the networks that were studied we eventually understand that, in relationships, when Phases 1 and 2 are clear and assimilated by members, the proxemics between members is greater and relationships become more informal, i.e., on a day-to-day basis, where more direct and more frequent contacts take place between members, thus generating more

knowledge sharing and further development of the contact network. Another consideration that is perceived in relationships at the moment they become more informal is knowledge sharing by certain members and, consequently, reaching both collective and individual goals. For Phase 4, we can say that interdependency happens within networks due to two different ways. One, for more structured companies, and another, for companies with organizational struggles. Companies that are Structured companies inside the network end up – despite that during interviews nothing is said about the existence of dependency inside the network – not saying that there is dependency inside the network, thus becoming interdependent regarding the network and knowledge sharing, due to the fact that they can have a stronger influence due to hierarchical legitimacy or due to informal relationships in the group. And these companies that have organizational struggles are completely dependent of the network in order to survive. This happens by sharing knowledge with structured companies thus managing to be sustainable inside the network and in the market they act on.

Regarding knowledge sharing satisfaction, we can say that satisfaction is found throughout all steps of this relationship and it is determining for the evolution and development of relationships. It has been possible to see in interviews that if the participants are not satisfied regarding knowledge sharing, for each phase, the network and the group will paralyze their actions and knowledge sharing. Besides, we can see a much greater dependency of relationships by knowledge sharing than by other factors, such as, for instance, bargaining power or marketing sharing.

We also emphasize a situation that is not viewed on this study: the behavior of some networks and needs further deepening. It is a variation regarding the sequence of phases, according to the degree of relationship existent among members of networks before the networks' pre-formalization that contributes, in practice, for a more informal structuring within relationships, even if the operationalization id formally defined, thus making it more difficult for new members to participate and, as a consequence, to share knowledge on a long-term basis. For instance,

even if it configured and defined that management will be carried out by a specific member, this formalization ends up not happening in practice due to hierarchy and especially due to the personal relationships and knowledge sharing occurs in a more limited manner.

5. FINAL CONSIDERATIONS

This research sought to define a framework for sharing of knowledge within horizontal networks. It is justified that the knowledge about this framework could contribute for network development and of their knowledge sharing practices. And also, as stated by Vanhaverbeke (2001), cooperation between small and medium sized companies in strategic networks can be dangerous if members overestimate the strength of the network configuration and underestimate the importance of the contact with the client. This can be avoided as long as there is a diversification and a stimulus of new ideas between companies.

Despite Varamäki and Vesalainen (2003) saying that there is not a unique model and that the way interorganizational networks varies according to its members features and that a cooperation deal often leads to a new one, the interviews that were performed show the presence and the impact of the dimensions suggested in this study as being determinant for knowledge sharing throughout the development of interorganizational relationships and we can understand these dimensions in phases.

In this context, a clear understanding of these phases can be better explored if some important issues are taken into consideration, such as the role of governance in the transition of one phase onto another. On the other hand, the role of the individual performance towards the collective can be considered as an inductor of change during knowledge sharing. Knowledge sharing actually happens inside networks independently from the phase where the network is; this is related to the conditions companies are in and the conditions that are made available in the relationship. A topic that emerges from results is that some networks can absorb knowledge and information in a more efficient manner than others, so as to have a determined heterogeneity in networks that would

theoretically have the same conditions of development. In other words, the longevity of a network, its size or number of participants is not necessarily related to its phase of development. Several years' old networks can also be characterized as in phase 1, e.g. The evolution/development factor is related to its management skills, given the objectives of the agents involved.

This research brings theoretical contributions for the knowledge management field in interorganizational networks, emphasizing it via the suggestion of a framework for knowledge sharing inside networks through the acknowledgement of the phase where the relationship is by its members. This contributes for a greater efficiency as far as information exchange and benefits management is concerned.

There are some limitations in this research that must be pointed out. One of them concerns the respondents' profile, which is very homogenous, since they are network managers. Besides, this research was restricted to a context of networks located in Rio Grande do Sul and there are cultural factors of this region that influence knowledge sharing, apart from the limited number of members in each network, which prevented us from evaluating the degree of reliability of the associates, for instance in operationalization with a greater number of associates.

Besides these limitations, and the fact that it is a multi-case study, this research presents a subject that is of great importance and exposes some situations that are interesting for participants of networks in general, considering the growing number of business networks acting in this country. This opens out several research options that can eventually explore objects of research that are not contemplated in this research.

Eventually, the conclusions of this research demand explanations regarding other contexts so as to be proved or refuted. Nevertheless, the focus of this research, almost exclusively in cooperation networks and their benefits prevented other aspects on the phenomenon from being deepened. Another suggestion is applying the phases suggested regarding the

performance basis that was reached for each phase by the network as a whole throughout the suggested period.

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