CONSIDERING AN UNPLUGGED IT WITHIN THE ORGANIZATIONAL MEMORY

José Manuel Cárdenas Medina (USP)
ppcardenas777@gmail.com
Ana Daneida Villanueva LLapa (USP)
daneida777@yahoo.com.br
Mauro de Mesquita Spínola (USP)
mauro.spinola@usp.br

Organizational memories are partially created by social networks. However, is not all the knowledge generated by those relationships that is able to be contained into physical means or Organizational Memory Systems. Thus, exists a part of tthe organizations that need to learn how to solve the concern about recovery of this important information. This paper aims to introduce the existence of a gap in the knowledge management in the limits of the technology information in an environment where is impossible to being able by it, because it is the low-hand-fruit to understand this lacuna. We understand this gap like an "unplugged IT", once this kind of knowledge is like the idea of a tacit knowledge, but with a different concern. A case research reveals an atypical behavior of the information to explain how the unfamiliarity is managed within a commodity chain. The results present our view about the strategically understanding and driving of this new view about the unaware capabilities of the knowledge.

Palavras-chaves: IT unplugged, governance, knowledge flow, commodity chain

1. Introduction

Information technology (IT) has been greatly welcomed not only by the enterprise world, but also in the common daily activities. Thus, it is difficult to think about somebody that is unaware of what to do with a computer or how to perform a search on the Internet. The knowledge is spread out at a great speed in a wave called "democratization of information" or digital inclusion. In this way, the efficiency and the time gains from routine activities, like communication, became an essential factor in the day-to-day. However, this does not indicate that the knowledge about the technology has been standardized. That is, in the great majority of the cases, the people use this technology with a specific purpose and are unaware of its other particularities; whilst others use the same technology, requesting for similar characteristics to their primary goal, but also aiming for others, and some, a different scope. This indicates that our knowledge of the technology contributes to satisfy necessities and our unfamiliarity of it corresponds to the creation of new necessities.

From the entrepreneurial point of view, the technology should help support other kind of needs and its contribution to efficiency should also be greater. Nevertheless, the criterion will not change and the unfamiliarity of other scopes for the technology used within enterprises contributes towards other necessities that are yet to be created. Thus, if we think in the opposite way: to be unaware of the functionalities of IT could mean strategic niches yet to be explored. In the interconnection of organizations with one another, the communicative flows could disclose these niches since one organization is able to see the needs and the scopes that the other organization is adding to the technology. However, knowledge flow and a certain level of reliance between the organizations are required before the benefits can be perceived. Considering this, we studied the behavior of the connections within a commodity chain, aiming to verify how the information flow among links happens, and how the use of IT within an organization or each link of the chain is perceived by the other links.

In this paper, a case research method was used to describe the decision making process in each link of the chain. In order to accomplish the case research two approaches were considered: research from the point of view where the productive chain is perceived as a conjunction of agents in search of a common objective and whose interdependence operates through a bond founded on reliance, remaining at the same level with the cultural and social aspects and, secondly, from perceiving the chain as a network of relationships governed by economic interests where the theme of the governance is strengthened by the participation of some agents.

IT, which was initially used for communication, is currently used as a tool to store and to spread knowledge since the characteristics of this technology make it possible to interact with others; due to its ubiquity. However, considering the supply chain topic, it was observed that it is still necessary to cross a gap between what IT can do to create relationships with the links of the chain who do not use it due to unfamiliarity or culture. In this way, the flows between the components of the chain are not through IT, but through means created by the agents (or links) to communicate and to learn from one another. Nevertheless, the existence of a governance within the chain was confirmed. The stated governance does not only respond to technological knowledge, but also to the management of the relationships with the raw material producers and the fact that cultural distances are overlooked.

Finally, the concept of "unplugged IT" can be proposed as a result of the comments obtained

from the bibliography and the findings prior to the accomplishment of the case research. This tool could explain processes of knowledge management that are difficult to observe despite the fact that they exist and that could show how to use what is not yet known to bridge the links that exist outside the organization.

2. Governance and supply chains

2.1. How the supply chain works?

The existence of a commodity chain emerges from the wide range of activities involved in the design, production and commercialization of a product (GEREFFI, 2001). Thus, the analysis of a chain should be explained as the existing relationships between the collaborators in each processing step of the product, from the production of raw materials to the purchase of the product by the final consumer. This means that supply chains emerge like a connection between agents who have common interests and also when the goods and markets are compatible. In this way, it is possible to affirm that a supply chain is also a form of organization and a hierarchy of functions through the chain could therefore exist.

For thinkers and policy makers, it is important to examine the type of governance of the valuable global chains. Gereffi (1999), developed a typology of governance focusing on the development of global chains where the new global purchasers are mainly retailers and brand manufacturers. Gereffi refers to them as chains promoted by the global purchasers to emphasize how global buyers explicitly use coordination to create a highly competitive supply base embedded into a global scale system of production without property rights. Five types of governance are described: (a) Markets: the links in the market can persist through time. In this type of governance the basic presumption is that the costs to change suppliers are low for both parts. (b) Modular value chains: typically the suppliers manufacture the products in accordance with the specifications. (c) The relational value chains: in these networks complex relationships between salesmen and purchasers, who mostly create relationships of interdependence and high levels of asset specificity, are observed. These interdependencies are mostly conducted through familiar and/or ethnic ties: geography has an important role in the formation of this type of governance. (d) Captive value chains: in these networks the bargaining power of the small scale suppliers is dependent on the large scale buyers. The suppliers are confronted with higher costs to change customers and this gives the buyers a certain degree of control and power in the network. (e) Hierarchy: is a form of network characterized by a vertical integration and control is one of the main characteristics.

In Gereffi's perspective, two types of productive chains exist: producer-driven commodity chains and b) buyer-driven commodity chains. The difference is found in the main company or main axis of the chain. In the former, the importance is given to large companies as a nexus between small producers and the global market. In the latter, the retailers, traders and brand manufacturers are the nexus.

This approach determines that the productive chains satisfy the requirements of customers in terms of specific preferences, colors, fashion or other aspects where the customer can decide; or requirements resulting from technological factors, like complex mechanisms, inbuilt machineries or technologies where the customer loses the control over the production. However, in face of this approach, the exchange of information that happens within the chain cannot be justified. Therefore, in order to try and understand what happens, we focused on the chain as a social network for contacts.

2.2. Supply chains as a social network

Even though a consensus does not exist when talking about social networks, it can be argued that it represents to a set of independent participants with common values and interests, putting together ideas and resources (MARTELETTO, 2001). Hence, a commodity chain could be understood as a connection of agents with common economic interests and who develop communication mechanisms, creating participation hierarchies. These hierarchies are not only understood as governance but as a bargaining power in the commercial opportunities (or opportunities of any sort). However, "hierarchy" should not be understood in the strict sense of the word, but from the dimension of information ownership.

As Colonomos (1995 apud. MARTELETO, 2001) affirms, the difference between the institutions and the networks does not presume a hierarchic character or vertical organization, and different members determine the associative logic. Its structure is extensive and horizontal without power relationships within the formations and in the external relations that the networks create.

We therefore do not understand a commodity chain as an entailing of economic, producing, transforming and trading agents, but as a big social network created by internal necessities and external demands. However, it is important to discriminate the relationships within the network, through the understanding of established forms of communication and how the barriers that the links encounter in the knowledge flow are overcome. This last comment compels to a reduction in the study of the networks. We thus discriminate two perceptions about the networks: constellations of partnerships or networks, which is the classic classification of social networks and, secondly, the perception that we use in the context of commodity chains being networks that make reference to the contacts generated from bigger networks (MOLLER; SVAHN, 2003). These networks have a particularity of not being spontaneous, but develop from the particularities of the agents who create them (LORENZONI; LIPPARINI, 1999).

The commodity chains considered to be social networks are related to the knowledge flow, in the sense that each link requires an adequate development of the previous one. Thus, the networks explain the need for the main company to maintain an adequate relationship with the others. In this sense, IT is an important tool when it comes to diminishing the attritions in the conformation of the specified networks.
According to Bou-Llusar and Segarra-Ciprés (2006), the knowledge flow that results from the created communications could strategically be used to develop the essential capacities of the organizations. Our perspective presents a similar proposal:

P1: The knowledge flows created between agents or links of a commodity chain are strategically managed by the main company.

In such a manner that the governance within the chain would not only be related with the individual behavior of each link or the dominant culture in this behavior, but also with the demands of the consumer. These characteristics mold the strategies of the main company in order to negotiate with the productive agents. From this point, the knowledge prior to the formation of the chain constitutes an important and relevant factor to the conformation of the social networks and in the implicit acceptance of the governance.

3. Organizational Memory and Unplugged IT

In the text of Walsh and Ungson (1991), Organizational memory is understood like knowledge deposits: a) the people; b) the culture; c) the procedures; d) the organizational structure and; e) the physical atmosphere of the work place. Argote and Ingram (2000) identify three elements: a) the people; b) the software tools and hardware and; c) the tasks. The authors consider as well that in the interrelations generated by these three elements they are another kind of knowledge repositories. For instance: in the person-person interrelations, everything what constitutes a social network is long-suffering to store knowledge, as well as the interrelations of process tasks generating a routine that also is a repository and; finally the interrelations between person-tasks that shape the division of the work, also are of knowledge repositories. The construction of memory, on the other hand, talks about the process to store information with base in the history of the company, which can be, of that form, recovered and to help the decision making. The information are stored, and as much the successful experiences as the failure situations must easily be recovered and should be available for the organization as a whole (HACKBARTH; GROOVER, 1999). This construction takes place naturally but it is necessary that it is administered suitably so that therefore the company is saved of problems like: the retirement of personal key for the company and with her its knowledge. We intended organizational memory like a social repository of knowledge due we explore another form of knowledge repository creation, in the way that the human relations emerge from their social ties to share technical and non-technical information, but that that it's so difficult to storage.

Thus, in order to explain the meaning of unplugged IT we make an analogy with a tool used in IT to facilitate the knowledge flow and to delineate the specializations scope to a standardization in the language: ontology.

Grubber (1995) indicates that ontology is an explicit specification of a conceptualization, and that conceptualization is a simplified representation of a certain particularity of the world that we, for some reason, desire to represent. The ontologies are usually used in the scope of artificial intelligence to create a common language for distinct intentions, that is, ontology is like an Esperanto for communication of people or machines with common interests. In our case, ontology serves to explain unplugged IT, which is the necessity to improve the language that passes the knowledge generated from the market's demands to the main company and from the main company to the productive agents. Thus, these necessities and demands generate the capacity to transfer knowledge about improvements of the products and the raw materials. In this article we mostly focused on the construction of an ontology without IT in the improvement of the raw materials.

Considering the knowledge flow through the model proposed by Szulanski (1996): the metaphor of sending a message through a medium or context, considering a receiver of the knowledge and a source, in the case of networks, the flow of information (or knowledge) could happen through an IT context. However, even if IT could always be the context, there are still unanswered questions: What would happen if an organization that belongs to the network (or all of them) is unaware of the existence of IT or simply does not believe that it could be a solution per se? How could an ontology between the links be developed? And finally, how would strategies to establish the governance by the main company be defined?

Still within this approach, Gao et. al. (2008) implicates the different types or forms of knowledge within two wide arguments: a "hard" and a "soft" argument. The hard argument includes knowledge that is difficult to transfer, as tacit and implicit knowledge and culture,

and also knowledge transferred with the aid of IT as a tool. The soft argument includes knowledge that is within the people, environments, patents and copyrights. This vision aids the understanding of why a strategy would de directed to knowledge diffusion without the aid of IT, depending on the organization being considered, the person's inherent knowledge could be more important for development than for storage.

P2: The ontology developed between the main company and the raw material producers will be strategically more directed towards a "soft" argument of knowledge.

Upon evaluation, we consider the concept of unplugged IT to be a bargaining environment where the organizations cannot use their governance of IT to influence the behavior of third parties (and to transfer or to exchange knowledge) and whose "power" is consolidated in leading the governance to reconsider the objectives and to yield space to the absence of knowledge and information whose result is a strategic alignment with the environment and not over the environment. That is, unplugged IT constitutes everything that is found between the limit of what the organizations know that IT does (e.g. artificial intelligence) and all they know that IT can do (Fig. 1) (e.g. Organizational Memory Systems) and the use of this "non-technology" to exchange and to transfer knowledge between the participating agents of the networks.

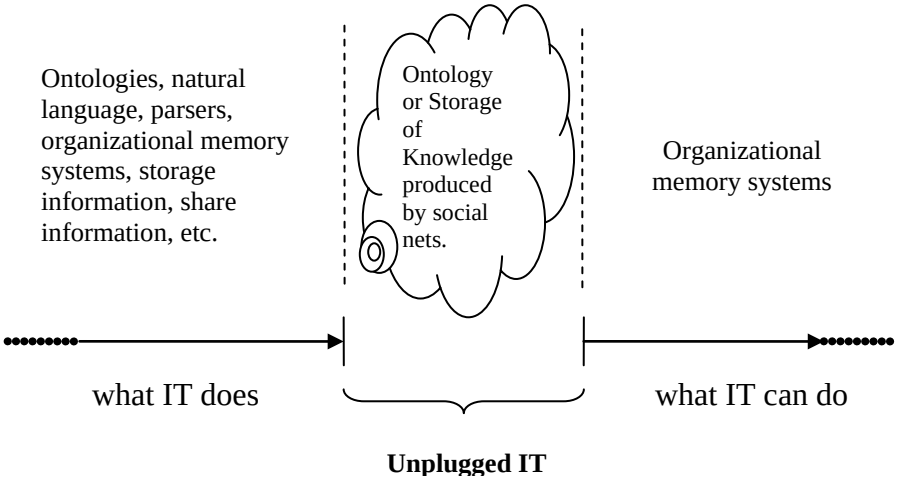

Figure 1 - Unplugged IT behavior

P3: The importance of the unplugged IT environment is evident not only when means of communications with the receiver do not exist, but also when connecting two distinct organizational cultures.

4. Methodology

4.1. Case research

The case research involves a commodity or supply chain from a textile sector in the southern region of Peru. This chain was chosen because it does not have a strong dependence on IT

aspects and also due to the fact that the creating links represent a sector whose cultural and language characteristics create a gap in the transfer of knowledge. This fact revealed many important considerations. Successive interviews using semi-structured questions were held with some chain stakeholders: workers from the main company, from de production and design areas, weavers and knitters, middle-men (acopiadores) and alpaca breeders, etc. Only the international clients were not interviewed so that the knowledge flows within the chain could be well-appreciated. Since one interview ended up giving rise to new speculations that needed to be evaluated, each agent was consulted more than once, whenever it was possible.

4.2. Goods flow

The chain being studied is in the textile sector. The raw material that forms the chain comes from alpaca, a quadruped mammal that is included into the South American classification of camelids. The wool from this animal is processed to get yarn from which high-standard clothes are made. The first link of the chain comprises the alpaca breeders, both private and independent ones who breed these animals to obtain wool. The wool is all taken by someone who is familiar with the regional language and ethos. In this way, he can bargain the prize of the wool or exchange this with other products that the breeders need. This person is called an acopiador; he is a broker between the breeders and the processing company, although the acopiador works for the processing company. This company constitutes a main company as was described by Gereffi (2001). It transforms the wool into yarn that is then used for knitting, the core business of the company. The clothes are exported, linking the sub-product with the final good. This happens in the following ways:

a) The company that produces the yarn sells it to the tailors or small scale knitters and afterwards buys the final good for exportation.
b) The company gets or buys demands for clothes through independent knitters and freelance retailers to complete the demand for exports.
c) The company produces yarn and has machines that manufacture clothes, or just partly manufactures them, such that the final good is produced in-house or by hiring third party services.

Fig. 2 shows the behavior of the commodity chain. The main company is represented by the manufactures as suggested by Gereffi (2001), indeed, the manufacturer also has a small amount of animals for production of his own raw material and invests in genetic research. The breeder or raw material producer has a close relationship with the main company through the hired person whose function is to bargain with the breeders.

The knitter has a special position within the chain. His role is to buy and sell for the main company, without maintaining any business relationships with this company, what is achieved in the follow ways:

a) He needs to buy yarn from the manufacturer in order be able to work.
b) He receives orders from the manufacturer to work with the yarn and produce specific clothes packages.
c) He sells the yarn at a retail level when familiar with the market, when is not familiar with it, then he works with designers who point out the destination for the clothes.

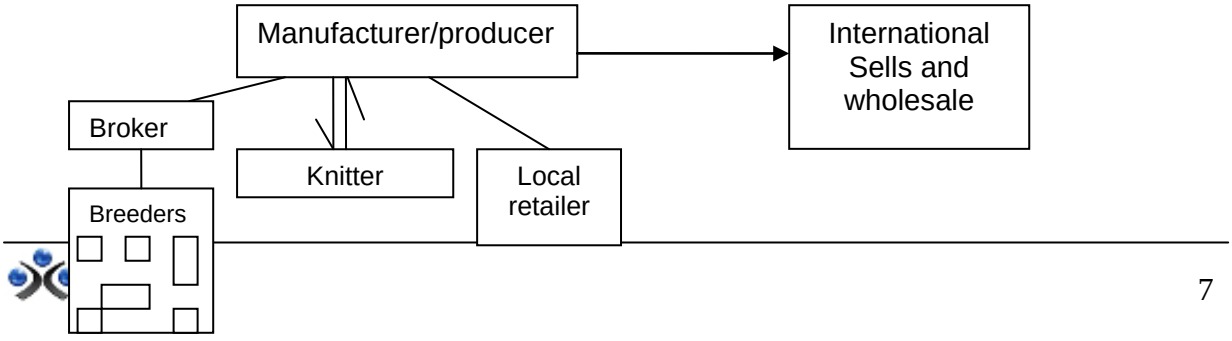

Figure 2. Textile productive chain being studied.
Source: Adapted from Gereffi (2001) for the case research.

Commercialization is less at the local level, but attends to many foreign orders. Without the local sales, the chain is closer to Gereffi's concept of a buyer-driven commodity chain, except that the nexus of interest with the manufacturers continues to be local. The relationships with the buyers appear in three ways: a) the orders are made directly to the company by old clients; b) the clients are contacted by international agents (not in a trading manner, but through workers of the company) who are looking for information about the trends and offer them; c) the clients visit the facilities and make orders. In this case, we can say that the buyers have great power over the needs and strategies that the main company will consider for each space-time especially because trends usually demand radical changes. This can be art for the designers, but in terms of mass production with colors that do not exist in the market (or only exist in the designer's mind), or with a different knitting style from the standard, a strong alignment with the existing technology as well as ability to perform modifications in a short time span are strongly required since trends only last for a season.

4.3. Knowledge flow

The axis of the discussions about how the supply chain works is in the cooperative flow of information and materials, in time, space or distance. This cooperation is related with the way in which the information is shared and used to make better decisions about the supply, distribution and shipping strategies (BALLOU, 2001**)**. Thus, the flow of the information within the supplies (Fig. 3) in our chain also comprises several relationships that involve the exchange of knowledge.

Trends imply a "soft" kind of knowledge that could only be understood by the people that generate ideas relative to the trends or by those who understand the people's desires. Nevertheless, trends generate the flow of demand for the production of new goods to satisfy the market; sometimes these demands are not tangible goods because the technology has color and shape limitations. These limitations are also linked with the characteristics of the material, the alpaca yarn.

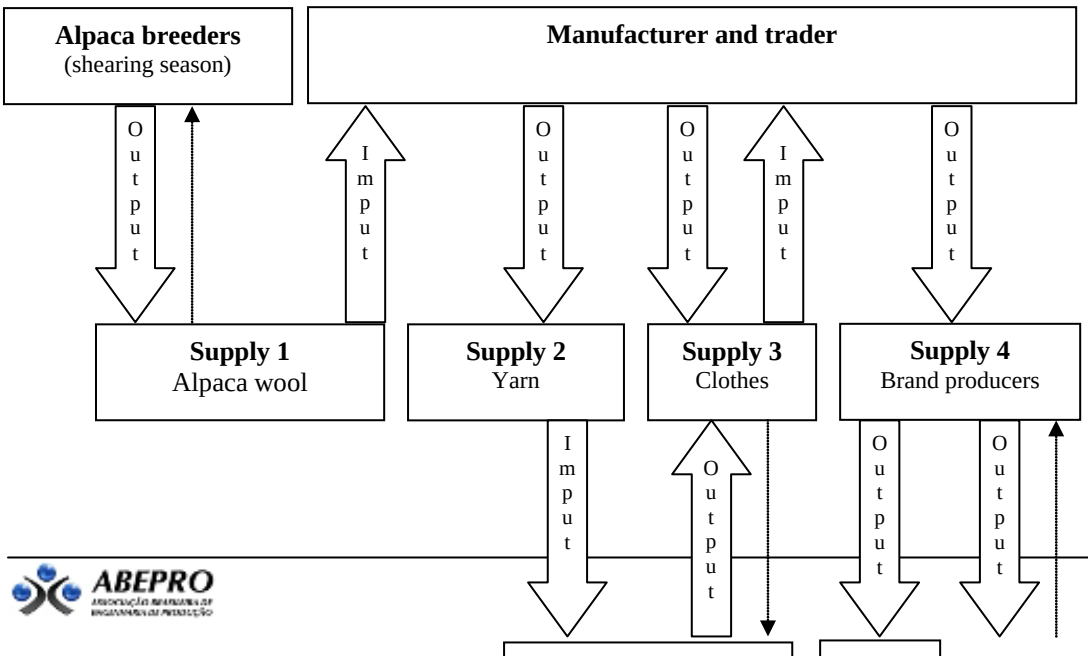

Figure 3: Information flows in the textile chain from the case research.

Assuming that the flow starts at the beginning of the season, this flow could appear in any link of the chain, or in this case, of the network. Trends have absolute governance over the behavior of the chain; however it is only nominal governance. Thus, the main company can wait to receive a large amount of orders so as to know the trend or ask their designers what can be produced according to situations of the market. The knowledge flow is almost formally established between the international clients and the main company, but sometimes the specifications of the international clients are too difficult to fulfill and the technologic limitations do not permit some colors or knitting styles, unless this is hand made. When this is not the case, the main company negotiates with the local knitters to obtain customized goods and then tries to adapt the installed technology to this kind of production. That is the type of knowledge flow that is supported by IT.

Nevertheless, demands from international clients also affect the raw material producers since the yarn must have some characteristics where the quantity and quality are in accordance to specifications of the main company. Therefore, the most important flow of the chain occurs: the relationship between the alpaca breeder and the yarn producing company. Generally, the alpaca breeder is a lone person who is far from civilization, he usually lives far from the main cities in mountainous regions and only visits the cities to purchase food and other commodities. Meanwhile, the habits of these people imply an isolated and suspicious culture, such that any nexus with them must be formed through intermediation or a broker; acopiador as was mentioned before.

The supply of raw materials occurs through many breeders to one or more acopiadores. This relationship is based on the reliance that these breeders have on the acopiador, such that the intermediation accepted by the breeders conforms to an IT investment because the acopiador outlines the company's requirements, bargains the prizes and payments and is the voice of the company in places where the company's governance does not exist. This "non-governance" may be seen as the company buying from outside brokers, but this does not happen because then the company would not gain any advantages from the chain and would be exposed to search for demand 0. Thus, the strategy implies that the main company has a knowledge flow based on the commitment of the acopiador and that the breeders have faith in the acopiador, so that the company has no governance over the acopiador, but over the breeders so as to establish knowledge flows with them. Another communication line with the breeders occurs through genetic enhances. The breeders' culture enables them to create friendship ties with their animals, what creates a setting (or channel) that enables negotiation of behavior through the transfer of better practices. Henceforth, similar cycles are created.

5. Results

This aim of this paper is to delineate the productive chain study as a social network. In face of the case study, the comments were made according to the lines of evidence, that is, the person

who wanted to maintain a relative tie with this initiation and this helped in the understanding of the behavior of the network. As a result, we can affirm the existence of governance within the chain, although this governance does not obey the classic concept of the existence of a dominator and the dominated (WEBER, 2003), but the need for change due to pressure from the fashion requirements or trends or due to the technology or know-how limitations in relation to the inbuilt capacities of the people and, in our case, the skill to make fabrics that can only be "hand made". This partially confirms our first proposal because the governance of the main company is not only established per se but also by the characteristics of the environment.

On the second proposal, it has been observed that the role of the intermediating agents within the productive chains is important to describe the success in reaching the market scope. In the case, the acopiador or mediator is a physical body that not only establishes bonds between the main company and the breeders, but is also an ontology for transfer of information linking these two hubs of the social network. However, the existence of the acopiador creates a paradox for ontology as an IT tool. In the metaphor of the knowledge flow as a message, the acopiador should be the context, although the information he has cannot be activated without the existence of ontology for understanding the receiver's culture. This means that whatever the acopiador knows cannot be used strategically because his behavior is an ontology that cannot be reproduced. The second proposal is not valid since the main company cannot fire the acopiador nor create a context to communicate with the producer.

Regarding the third proposal, it is difficult to imagine where a trend bound to become fashion in a specific season originates. This premise also serves to imply that it is difficult to imagine what IT can do for us in the near future. However, the case showed that the necessities created by the users can "extrapolate" the conventional, but IT and other productive technologies impose limits as to what is possible and what is only thinkable. On the other hand, the fact that a social network created an ontology without using IT indicates that it is possible to link two totally distinct organizational cultures even though it is impossible to ignore the human factor used as context.

6. Concluding remarks

The case of the breeders portrays the idea of a totally disconnected environment and one that not only needs internal as well as external alignment that establishes its own dependence on unfamiliarity to be able to exist and to subsist. It is also interesting to perceive that transfer of information without necessity of specific architectures is possible, only with the existence of a person who creates a context and an ontology in order to originate the flow.

The case research also revealed that knowledge from exterior demands as well as from the limitations created by technology as it tries to imitate skills that are still strongly linked to the physical abilities of the human beings, that is, part of the knowledge management by the main company means learning new forms of work developed by the knitters or inherited through generations, to be able to transform this into mass production. This discussion is not on extraction of tacit knowledge for the conversion of this knowledge into the work of automatons.

Finally, the strategic behavior of the main company makes us think about management of the "unfamiliar". This means that the tacit knowledge of the acopiador cannot be transferred to another person or machine because it implies a fusion of culture, language and interaction with people to whom he/she is familiar, and the company can use the unfamiliarity of how this is done to obtain raw material. We therefore conclude that it is valid to think that this

person's knowledge is an example of "unplugged IT" since his specialization is beyond the knowledge management of the company. In later studies, this type of tacit knowledge could generate specific characteristics for strategic use, a way to use unfamiliarity to create new knowledge.

References

ARGOTE, L. & INGRAM, P. "Knowledge Transfer: A Basis for Competitive Advantage in Firms", Organizational Behaviour and Human Decision Processes, Vol. 82 (1), 150-169, 2000

BALLOU, R. H. "Gerenciamento da cadeia de suprimentos". Porto Alegre: Bookman, 2001.

BOU-LLUSAR, J.C. & M. SEGARRA-CIPRES. "Strategic knowledge transfer and its implications for competitive advantage: an integrative conceptual framework". Journal of Knowledge Management. Vol. 10 no 4, 2006

COLONOMOS, A (ORG.) "Sociologie des réseaux transnationaux; communautés, entreprises et individus: lien social et système international". Paris : l'Harmattan, 1995

GAO, F.; M. LI AND S. CLARKE. "Knowledge, management, and knowledge management in business operations". Journal of Knowledge Management. vol. 12 no. 2, pp. 3-17, 2008

GEREFFI, G. "International trade and industrial upgrading in the apparel commodity chain". Journal of International Economics. No 48, pp. 37-70, 1999.

GEREFFI, G. "Las cadenas productivas como marco analítico para la globalización". Problemas del Desarrollo, vol 32, num 125, Mexico, IIEc – UNAM, april – june, 2001.

GRUBER, R.T. Toward principles for the design of ontologies used for knowledge sharing. International Journal Human-Computer Studies. Vol 43, pp. 907-928, 1995

MARTELETO, R. M. Analise de redes sociais – aplicação nos estudos de transferência da informação. Ci. Inf. Vol. 30 no.1 Brasília Jan./Apr, 2001

MOLLER, K. & SVAHN S. Managing strategic nets: a capability perspective. Marketing Theory. Vol. 3 No. 2, pp. 209-34, 2003

LORENZONI, G. & LIPPARINI A. The leveraging of interfirm relationships as a distinctive organizational capability: a longitudinal study. Strategic Management Journal, Vol. 20, pp. 317-38, 1999

RYALL, M. & SORENSO O. Brokers and Competitive Advantage. Management Science. Vol. 53, No. 4, 2007

SZULANSKI, G. Exploring internal stikness: impediments to the transfer of best practice within the firm. Strategic Management Journal. Vol. 17, pp. 27-43, 1996

WALSH, J. & UNGSON, G., "Organizational memory", *Academy of Management Review*, Vol. 16 No.1, pp.57-91, 1991

WEBER, M. Ciência e política: duas vocações. São Paulo: Martin Claret, 2003.