Knowledge Management: The Eastern Theory of Organizational Knowledge Construction

Henrique Guilherme Scatolin

PUC-SP (Pontifical Catholic University of São Paulo), São Paulo, Brazil

This article focuses on the knowledge management in organizations from the theory developed by the Japanese managers Nonaka and Takeuchi. Beginning with a contextualization about this management, this article aims to conduct a literature review on the work titled *Knowledge Creation in the Company* (*Criação de Conhecimento na Empresa*), focusing on these authors vision on organizational knowledge concept, how it can be used and how it is critical to the competitive advantage of any organization. Throughout this discussion, on the results of this survey, the knowledge spiral and its four phases or dimensions are shown. It is concluded that an organization by itself cannot create knowledge without the individual initiative and the interaction that occurs within the group. Therefore, the teamwork is critical for companies that aim at success.

Keywords: organizational knowledge, knowledge spiral, tacit and explicit knowledge, teamwork

Introduction

According to Probst and Romhardt (2002), “To survive and compete in the knowledge-based society, the companies must learn to manage their intellectual assets, since knowledge is the only resource that increases with the use” (p. 16). We know that knowledge as a competitive factor arrived noisily to the business headlines, leading companies to make greater use of the hidden treasure of their employees’ minds. Many companies that invest in intensive knowledge conquered a spectacular success in recent years, a success that is reflected even in their performance on the stock exchange. Thus, the size of industrial facilities and management buildings of a company no longer is a reliable measure of its importance or industrial capacity.

This way, the “knowledge economy” is emerging as a tangible reality. The main management theorists argue that for a company it is much more profitable to invest a certain amount in their knowledge assets than spending the same amount on material assets. James Brian Quinn (as cited in Oliveira, Goldoni, & Constantino, 2011) pointed out that, in many companies, three-quarters of their added value are attributable to the possession of specific knowledge. Charles Handy (as cited in Oliveira et al., 2011) believed that we are already at a stage in which the intellectual capital value of a company is much larger in relation to its material assets.

The organizational managers and psychologists need to analyze how the increasing importance of knowledge can affect the company competitive position. The knowledge environment in which companies must operate is much more complex than those that existed for several centuries. This is due, mostly, to three closely related trends: the impressive rate of knowledge growth, the degree to which it became fragmented, and its increasing globalization.

Currently, most companies operate in an environment of increasingly dynamic knowledge. Products and processes are more knowledge intensive. Furthermore, the company intellectual assets can be analyzed, evaluated, and managed.

For Robst, Raub, and Romhardt (2002), “Knowledge is the complete set which includes cognition and skills that individuals use to solve problems” (p. 30). Knowledge is based on data and information, but, unlike these, it is always related to people. The data, information and knowledge management must, therefore, always be coordinated. The knowledge base of an organization consists of individual and collective knowledge assets that an organization can use to carry out its activities. Thus, the company potential to solve its problems depends on its workers, the highly skilled knowledge, and collective organizational skills.

But what is knowledge management? For Oliveira et al. (2011), “We can conceptualize knowledge management as the process to obtain, manage and share knowledge within the same organization”. This process involves technological and human aspects, such as creation, storage, dissemination, use, and measurement. The interest in its study has increased a lot lately due to the competitive advantage pursuit considering a globalized market, with high competitiveness and constant changes in the external environment.

The great wealth of knowledge management is not in the occident with its taylorist/fortist inheritance; but in the orient. This means that it is in the taylorism birthplace that we find the great development of this approach. And from a detailed reading of the book *Knowledge Creation in the Company (Criação do Conhecimento)* of Nonaka and Takeuchi that this article starts discussing the advantages of knowledge use for the organizational growth.

Knowledge Management

As this article aims at a literature review on the work of Nonaka and Takeuchi on knowledge management, a contextualization of this theory is necessary.

It is worth highlighting that Japanese companies remain an enigma to most occidentals. They are not extremely efficient, entrepreneurs, or liberals. Still, they get a growing space in international competition.

The Japanese companies’ success is supported in its capacity and expertise in the “organizational knowledge creation”. Organizational knowledge creation is understood by Nonaka and Takeuchi as “The ability of a company to create new knowledge, spread it in the organization as a whole and incorporate it into products, services and systems” (1997, p. 1). The organizational knowledge creation is the key to the characteristic ways that Japanese companies innovate. They are experts in promoting innovation in a continuous, incremental, and spiral way.

This perspective is incoherent compared to what most occidental observers think about Japanese organizations. Many believe that Japanese companies, although they are extremely successful in imitating and adapting, that they are not innovative, and especially when “knowledge” plays an important role in the search for competitive advantage.

According to Nonaka and Takeuchi (1997), “During at least the last fifty years, the Japanese companies have existed in an environment where the main certainty was uncertainty” (p. 2). We should remember that Japan suffered the devastating effects of World War II, had two wars in their own region (the Korea War and the Vietnam War) and numerous economic crises, including the two oil crises, the Nixon Government crises, the yen crises, etc.. Face the instability was a matter of life or death even for the successful Japanese companies. Honda, for example, could not be present in the automotive industry today if they had not developed a

high-performance engine before the oil crisis.

Nonaka and Takeuchi (1997) pointed out that the Japanese companies entered in the international competition with great determination, often facing difficult obstacles and adversities. Until recently, they could not afford the relaxation or complacency. The fear of losing and the hope to be ahead impulsed them to predict changes and invent something new—a new technology, a new product design, a new production process, a new marketing strategy, a new distribution form, or a new way to serve customers. But innovation was not a one act pay for the Japanese companies. An innovation led to another, providing continuous improvement and advances. But how did Japanese companies achieve continuous innovation? This occurs by knowledge creation.

According to Nonaka and Takeuchi (1997), “What is singular in the way Japanese companies provide continuous innovation is the connection between external and internal” (p. 4). The externally accumulated knowledge is broadly shared within the organization, stored as a part of the company knowledge base and used by the ones involved in new technology and products development. There is a kind of conversion and this conversion process—from outside to inside and to outside again, under the form of products, services or systems—is the key to understand the reasons for the Japanese companies success. It is exactly this dual activity, internal and external, that supplies the continuous innovation within Japanese companies. Continuous innovation, in turn, leads to competitive advantages, such as pointed out by the schema as: knowledge creation → continuous innovation → competitive advantage.

And the occident, how do they position to pursuit the competitive advantage? The finding that the knowledge is a new competitive resource reached the occident like a lightning. Despite all the attention of the leading business observers and the society, none of them actually examined the mechanisms and processes by which knowledge is created. This distinction is what separates the Japanese approach from the occidental approach as a result of a taylorist heritage. And it is for this reason that the Japanese experience is especially interesting and useful, and became the target for studies of these Japanese managers.

There is a reason for the occident observers' tendency of not going through the organizational knowledge creation topic. They always go to organization vision as a machine for information processing. This vision is deeply rooted in the occidental management traditions, of Frederick Taylor and Herbert Simon. (Nonaka & Takeuchi, 1997, p. 7)

Both Nonaka and Takeuchi (1997) pointed out that occidental managers recognize the knowledge as being necessarily explicit, i.e., something formal and systematic. This knowledge can be expressed in words and numbers, and it easily communicated and shared in the form of raw data, scientific formulas, coded procedures, or universal principles.

The Japanese companies, however, have a different way of understanding knowledge. They admit that knowledge expressed in words and numbers is just the tip of the iceberg. They see knowledge as being basically “tacit”—something hardly visible and expressible. Tacit knowledge is highly personal and hard to formalize, which makes its transmission and sharing with others difficult. Conclusions, insights and subjective guesses are included in that category of knowledge. In addition, the tacit knowledge is deeply supported in the actions and experiences of an individual, as well as his emotions, values or ideals.

Nonaka and Takeuchi (1997) divided the tacit knowledge in two dimensions. The first dimension is technical and coves a type or informal and hard to define capacity. These are skills captured in the term “know-how”. An artificer, for example, develops the skills wealth, but often he is unable to articulate the

technical or scientific principles underlying what he knows. And the second dimension is the cognitive. This means that the tacit knowledge consists of schemas, mental models, beliefs, and perceptions so ingrained that we take them for granted. The tacit knowledge cognitive dimension reflects our image of reality (what it is) and our vision of future (what it should be). Although they cannot be very easily articulated, these implicit models shape the way we perceive the world around us.

And from this differentiation, what is so special in the oriental knowledge management? The answer lies in the distinction between explicit and tacit knowledge; since this is the key to understand the differences between the occidental and Japanese approaches in relation to the knowledge management. The explicit knowledge can be easily “processed” by a computer, electronically transmitted or stored in a database. However, the subjective and intuitive nature of tacit knowledge makes the acquired knowledge processing or transmission difficult through any systematic or logical method, since to be transmitted or shared within the organization, the tacit knowledge will have to be converted in words or numbers that anyone can understand. It is exactly during the time when this conversion occurs—from tacit to explicit and again to tacit—that the organizational knowledge is created.

According to Nonaka and Takeuchi (1997), “Although many occidental managers are very used to dealing with the explicit knowledge, the tacit knowledge recognition and its significance have several implications of paramount relevance” (p. 8). There is a thought in the occident that the knowledge can be transmitted through education and training; but the richest knowledge cannot be taught, or transmitted; since the very powerful learning comes from the practical experience of the individual.

The second implication of tacit knowledge is the result of the first. Namely, once the importance of tacit knowledge is noticed, innovation starts to be considered in an entirely different manner, since the employees’ personal commitment and their identification with the company, and their mission become indispensable. In this sense, the new knowledge creation involves both ideals and ideas. That is what serves as a fuel for innovation. Creating new knowledge means recreating the company and everybody inside it in a continuous process of organizational and personal self-renewal.

Creating new knowledge is also not only a matter of learning from the others or acquiring external knowledge. The knowledge must be built by itself, often requiring an intense and laborious interaction between the organization members. (Nonaka & Takeuchi, 1997, p. 10)

But how could an interaction between the members of a company occur? The key is with the management; since any manager needs to forget that knowledge can be acquired, transmitted or trained by means of manuals, books or conferences. It is up to the managers to pay more attention to the less formal and systematical side of knowledge and start focusing on the highly subjective insights, intuitions and hints of their employees obtained by the use of metaphors, images or experiences. In the case of the occidental managers, it allows to understand what the successful Japanese companies are doing.

Nonaka and Takeuchi (1997) highlighted the important role of mid-level managers, because these serve as a link between the top management ideals and the reality almost always chaotic of front-line employees of the company. The mid-level managers are mediators between the mentality of “what could be” the top management and the “line employees” mentality, creating product concepts.

The mid-level managers play a key role in the knowledge creation process. They summarize the tacit knowledge both from front-line staff and the senior executives, making it explicit and incorporating it into new products and technologies.

(Nonaka & Takeuchi, 1997, p. 17)

It was the Japanese companies skills of systematically creating the organizational knowledge what allowed, again and again, to innovate in the way out of the crisis. Knowledge creation occurs continuously, in spiral and at all organization levels. For occurring this continuous innovation, Nonaka and Takeuchi (1997) banished the two traditional management styles: the top-down model and the bottom-up model, because both are not so efficient in the sense of stimulating the necessary interaction to create organizational knowledge.

They propose a new management style that is called “middle-up-down management”. This model overcomes the two traditional models mentioned above. In this new model, the mid-level managers have the central role, managing the knowledge creation process, taking the initiative to involve both the high positions managers in the organizational scale, and the line employees, from the lower hierarchical levels of the organization.

They reiterate that for the occidental companies to be transformed into a knowledge creating companies, these should treat each employee as a knowledge team member and transcend the dichotomy that exists in the occident, as body versus mind, tacit versus explicit, individual versus organization, etc..

In the Japanese companies this dichotomy does not exist; since no department or experts group is responsible for the creation of the new knowledge. This means that the new knowledge creation is the product of a dynamic interaction between the front-line employees, mid-level managers and top managers. Employees do not receive a new knowledge in a simply passive way; they actively interpret it, adapting it to their own situations and perspectives.

Transforming Tacit Knowledge Into Explicit Knowledge: The Honda City Example

All new knowledge innovation and creation in Japanese companies are supported by the tacit knowledge conversion into explicit knowledge. Presenting a highly personal insight or hint has little value to the company, unless the individual can convert it into explicit knowledge, thus allowing it to be shared with other individuals. Japanese companies are particularly good at performing this exchange between tacit and explicit knowledge during the product development phase.

Nonaka and Takeuchi (1997) used the Honda example. In 1978, Honda top management initiated a concept in cars with the slogan “let’s gamble”. The slogan expressed the senior executives’ conviction that Honda Civic and Honda Accord models were very familiar. They wanted to innovate and these managers noticed that jointly with a new postwar automobile market generation came a new young designers’ generation who were reaching adulthood with unconventional ideas about a good car.

The business decision made after the release of the slogan “let’s gamble” was forming a new product development team with young engineers and designers, whose average age was 27 years. The senior management only gave two instructions: Firstly, create a product concept fundamentally different from everything that was already present on the market, and then, they had to build a cheap car, but not of inferior quality.

Thus, the project team leader created another slogan to express the notion of the team ambitious challenge: “automobile evolution”. And based on this slogan, a response appeared in the form of another slogan: “Maximum for the man, minimum for the machine” (Nonaka & Takeuchi, 1997, p. 12). In this way, the evolutionary trend articulated by the team finally materialized in the image of a “small” car (in length) and

“big” (in height). A car like that, they reasoned, would be lighter and cheaper, but also more comfortable and more solid than the traditional car. Thus was born a product concept that the team named “tall boy” and that finally led to Honda City, the company passenger car. This car initiated a completely new design proposal in the Japanese automobile industry, based on the concept of maximum for the man, minimum for the machine and which led to a new generation of “compact” cars that today prevail in Japan.

This story demonstrates the Japanese managers approach in the tacit knowledge transformation process into explicit and pointed out three other characteristics of the knowledge creation related to tacit knowledge transformation into explicit.

First, in the knowledge creation, great confidence should be deposited in figurative language and symbolism. In other words, the company uses figurative language to express their intuition and insights. Secondly, Honda City story reveals now the new knowledge always starts with an individual and now the personal knowledge of an individual is transformed into valuable organizational knowledge to the company as a whole. Among other examples of this type of transformations can be the insight of a brilliant researcher generating a new patent, or the experience of long years of an employee in a store, resulting in an original innovation process.

Although Nonaka and Takeuchi (1997) used the expression of organizational knowledge creation, let us remember that the organization cannot create knowledge by itself without the individual initiative and the interaction that occurs within the group and with the team. Through the group interaction that knowledge can be amplified in the group level, through discussions, experiences sharing and observation; as it occurs in the brainstorm. The team provides a common context in which individuals interact with each other through dialogue and debate, and it may involve substantial conflicts and divergences. Thus, this type of dynamic interaction makes personal knowledge transformation easier in the organizational level.

Finally, Nonaka and Takeuchi (1997) mentioned the ambiguity and redundancy. They use the example of Honda; since the confusion, ambiguity created within Honda product development team may be useful, sometimes, not only as a source of new sense of direction, but also as a new source of meanings and a different way of thinking. In this sense, the new knowledge was born from the chaos. And redundancy also stimulates the frequent dialogue and communication, leading the team to analyze a project in various perspectives and guidance of a team leader.

The Organizational Knowledge Spiral

Nonaka and Takeuchi (1997) pointed out that the basic conceptual structure on the knowledge creation process management forms has two dimensions: the ontological and the epistemological.

The First Dimension: The Ontological

In this dimension, “Knowledge can only be created by individuals. An organization, by itself, cannot create knowledge. Its scope is to support creative individuals and provide them with the creation conditions for this” (Nonaka & Takeuchi, 1997, p. 75). The organizational knowledge existence is possible from interactions that allow its creation individually and the dissemination to the organization as a whole (see Figure 1).

The Second Dimension: The Epistemological

In this dimension, there are two types of knowledge: the tacit and explicit knowledge. Tacit knowledge is personal, specific to the context and difficult to be formulated and communicated. And explicit or “coded” knowledge refers to knowledge transferable in formal and systematic language.

Figure 1. Knowledge spiral.

According to Nonaka and Takeuchi (1997), "The spiral arises when the interaction between tacit knowledge and explicit knowledge dynamically rises from a lower ontological level up to higher levels" (p. 62). Tacit knowledge and explicit knowledge are not entirely separate entities, but mutually complementary. They interact with each other and make changes in the creative activities of human beings. This dynamic model of knowledge creation is anchored in the critical assumption that human knowledge is created and expanded by the social interaction between tacit knowledge and explicit knowledge. We call this interaction "knowledge conversion" and this conversion occurs in four steps of phases.

The first step would be the socialization, this moment in which tacit knowledge remains tacit. Nonaka and Takeuchi pointed out that "An individual can acquire tacit knowledge directly from others, without using the language" (1997, p. 69). The apprentices work with their masters and learn their art not through language, but rather by the observation, imitation and practice. In the first phase, there is no use of verbalization.

The second phase would be the externalization, this phase in which the tacit knowledge becomes explicit. For Nonaka and Takeuchi "The externalization is an articulation process of tacit knowledge in explicit concepts" (1997, p. 71). It is a perfect knowledge creation process, to the extent that tacit knowledge becomes explicit, expressed in the form of analogies, concepts, hypotheses, or models.

The third phase would be the combination, a moment which explicit knowledge remains explicit. They point out that "The combination is a concepts systematization process into a knowledge system" (Nonaka & Takeuchi, 1997, p. 73). The individuals exchange and combine knowledge through documents, meetings, phone calls or computer communication networks. The reconfiguration of existing information through classification, addition, combination and categorization of explicit knowledge (as in computer databases) can lead to new knowledge. The knowledge creation carried out by education and formal training in schools usually assumes this form.

The fourth and last phase is the internalization. In this phase occurs the explicit knowledge incorporation process into tacit and it is closely related to the learning by doing. On internalization (of explicit knowledge

into tacit knowledge) occurs the knowledge incorporation in the company operational activities to achieve a practical result. All knowledge assets obtained in the previous socialization, externalization, and combination processes become valuable when they are internalized in the basis of the individual tacit knowledge. In this way, learning by doing is essential for the internalization process.

Conclusion

On the basis of the contributions of Nonaka and Takeuchi (1997) to knowledge management, this article focuses that an organization by itself cannot create knowledge without the initiative of the individual and the interaction that occurs within the group. Therefore, the teamwork is critical for companies that aim at success.

Teamwork and the knowledge dissemination by the organization (carried out by mid-level managers) are essential for organizations that aim at success and competitive advantages.

Through the groups, knowledge can be amplified or crystallized through discussions, experience sharing and observation. The team provides a common context in which individuals can interact with each other. The team members create new perspectives through dialogue and debate, involving substantial conflicts and divergences. Thus, this type of dynamic interaction makes personal knowledge transformation easier in the organizational level.

In addition, the interaction between tacit and explicit knowledge can be expanded to higher ontological levels, if this organization values the practical experience of each employee. For explaining this interaction, we use the knowledge spiral which can be summarized as follows. Initially, the socialization develops a field of interaction that enables the individuals' experiences sharing. From the externalization the dialogue or collective reflection is generated, using the metaphors or analogies, which generates the concept. The combination mode allows the newly created knowledge placement with that already existing, which results in a new process, system or way to do. Internalization occurs from the "learning by doing" (Nonaka & Takeuchi, 1995, p. 78). And for the occidental companies becoming knowledge creators, the first step would be treat each employee as a team member, not discriminating and valuing each hint or idea indicated by each employee.

References

- Angeloni, M. T. (2003). *Organizações do conhecimento: Infra-estrutura, pessoas e tecnologias (Knowledge organizations: Infrastructure, people and technologies)*. São Paulo: Saraiva.
- Fleury, M. T. L., & Oliveira JR, M. M. (2002). *As pessoas na organização (People in the organization)*. São Paulo: Gente.
- Nonaka, I., & Takeuchi, H. (1997). *Criação de Conhecimento na Empresa: Tradução de ana beatriz rodrigues e priscilla martins celeste (19 º edição) (Knowledge creation in the company: Translation of Ana Beatrix Rodriguez and Priscilla martins Celeste (19th ed.)*. Rio de Janeiro: Elsevier.
- Oliveira, M., Goldoni, V., & Constantino, F. Gestão do Conhecimento: pesquisas realizadas e novas oportunidades (Knowledge management: Researches and new opportunities). XXVI ENEGEP-Fortaleza, CE, Brasil. Retrieved from http://www.abepro.org.br/biblioteca/ENEGEP2006_TR530353_7176.pdf.
- Probst, G., Raub, S., & Romhardt, K. (2002). *Gestão do conhecimento: os elementos construtivos do sucesso (Knowledge Management: The constructive elements of success)*. Porto Alegre: Bookman.