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Organizational Knowledge Management: a Qualitative Analysis in a Brazilian Reference Research Center

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Abstract

This paper presents how knowledge management is currently employed at a clinical research center in Porto Alegre city, southern Brazil. Clinical research has been incorporated to Brazilian health organizations over the past few years. The results have enhanced these institutions´ performances since it is through clinical research that new drugs and new protocols are incorporated and can improve the health care provided for the population. The management of the knowledge thus generated must be part of the strategy of organizations, so that they can profit both from the direct and indirect results of scientific findings, which could generate a competitive advantage. The research presented here has used a qualitative descriptive approach in order to analyze how the management of knowledge generated in research processes occurs inside a clinical research center and how it is disseminated through various sectors, departments and areas. The theoretical framework was based on the SECI model. And the research developed a single case study to identify the mechanisms used to create, convert and discard knowledge through semi-structured interviews. Data gathered through interviews were analyzed using content analysis techniques and were later triangulated with the analysis of documents and participant observation. The results suggested potential to improve competitive advantage based on improving the management of knowledge.

Keywords: healthcare management; knowledge management; clinical research; clinical research center.

1 Introduction

The distinction between information and knowledge is important, given that information is a contextual data (Davenport, Prusak, 1998; Evans, Wurster, 2000), while knowledge requires the human element to process, to adequate and to adapt the available information to the presented context (Nonaka, Takeuchi 1997; Nonaka, Takeuchi, 2008). Knowledge management includes the processes and resources needed for the acquisition, use and reuse, transfer, adaptation and disposal of information as it changes the context in which the organization operates (Davenport, Prusak, 1998).

In the context of this work we understand that, from an organizational point of view, the acquisition of knowledge may occur through new knowledge that individuals acquire in research or work experiences (Turner, Makhija, 2006) or outside this context. Also, new knowledge can be acquired intentionally and systematically, or as a secondary outcome of organizational activities. But even if external sources can be part of the acquisition of knowledge, the flow of organizational knowledge occurs through the individuals that are part of the organization.

To maximize the effectiveness of knowledge, one organization needs to make knowledge management in a systematic, explicit, deliberate and creative way, expanding the knowledge assets (Jafari et al., 2008). For Davenport and Prusak (1998), in practice, knowledge management includes identifying and mapping intellectual assets linked to the organization. Generating new knowledge can provide competitive advantage and make accessible a large amount of corporate information, thru identifying and sharing

best practices. Thus, to manage its knowledge, the organization seeks to acquire internal and external knowledge considered relevant, enabling new ways to develop and create knowledge. By sharing all this knowledge and expertise throughout the organization and making it usable, knowledge management increases organizational value and helps to achieve goals.

This context is valid for health organizations. It is also of particular interest to these organizations the conduction of clinical research, i.e. research involving human subjects, typically associated with health matters. The incorporation of clinical research in health organizations is seen as a subject that brings improvement of functional performance and delivers value to society: through clinical research new drugs, new protocols and new solutions are created, aiming at innovating and improving healthcare for the population. Analyzing the health sector, knowledge management can occur in long term, because it means aligning people, processes, data and technologies to optimize information, collaboration, expertise and experience with the ability to positively impact the performance of the organization (Guptill, 2005).

The context in which are inserted hospitals, clinical research centers and other centers of assistance and human health, are related to the provision of high complexity services. And these shall be based on organizational knowledge as a strategic value because it is this knowledge that is encapsulated in technology diagnosis and treatments, and, especially, can be found in people who provide health care. In this sense, health based organizations can be classified as knowledge-based organizations (Gonçalo, Borges, 2010).

Considering the issue of knowledge management in hospitals, specifically in clinical research centers, the development of knowledge as outlined above requires processes of information dissemination and incorporation of knowledge acquired during the conduct of research projects and the consideration of how this knowledge is transferred for the sectors concerned with processes and practices associated with the clinical research within the organization. More specifically, it needs to consider the human element (the researchers, the patients, the nurses etc.) since, even using strict protocols, the knowledge is primarily encapsulated in these actors of the healthcare system.

Considering the premise that knowledge is established in individuals and that it needs to be managed by the organization to become organizational, among the knowledge management models already published in the literature, we choose as reference the SECI Model (Nonaka, Takeuchi, 1997; Nonaka, 2006; Nonaka, Takeuchi, 2008), since it considers the interactions among individuals and with the organization. This choice is justified by the fact that individuals conduct clinical research, and they are involved in research projects, so the generation and transfer of knowledge is focused on the potential that each individual has to disseminate the knowledge gained to the organization.

In this context, the main objective of this research is to analyze, based on the SECI model, how knowledge management happens on a Clinical Research Center, and how the generated knowledge is shared with other parts of the organization.

The research was conducted at the Mãe de Deus Hospital Group (HMD), which is a private non-profitable hospital group located in the Rio Grande do Sul state, southern Brazil. Among its principles and values HMD helds education and research to foster knowledge improvement and innovation. In this sense, the development of clinical research at the institution became a strategic aspect. Currently in HMD, clinical research is developed through the Medical Institutes, which are assembled in the allied medical specialties, with performance-based care, teaching and research. In particular, the Mãe de Deus Cancer Institute (ICMD) was the first medical center established in the institution, bringing together specialties involved in the care of cancer patients. The Center for Research in Clinical Oncology is part of this structure and makes the conduct of research projects in oncology and hematology and understands that the interaction with other areas of the hospital is fundamental and critical to manage information and knowledge. In this context, the actors involved in the process of clinical research include representatives of the Research Center, of the sponsor of the study, of the Ethics Committee (CEP), of the National Research Ethics (CONEP) Governmental Agencies, and of sectors of the organization directly related to clinical research (laboratory, radiology, nursing, pharmacy, legal etc.).

The understanding of how knowledge is managed in this Clinical Research Center and how it spreads among the sectors of the organization involved in clinical research aims to contribute to the discussion established in the literature on the subject, in order to highlight evidence to support the creation of knowledge management models suitable for such environments. Moreover, the evaluation of knowledge management includes important aspects to support research, also the performance measurement and efficiency can provide references to management processes (Colauto; Beuren, 2003).

2 Theoretical Background

Only a brief theoretical background is presented in this section due to paper size limitations. The reader interested on this subject is encouraged to look in depth at the references presented for further enlightenment.

2.1 Organizational Knowledge

The concept of organizational knowledge stands as a challenge (SINGALA, 2007) because the literature focuses on two fundamentally different definitions of knowledge. Rationalism holds that knowledge is a true justified belief, while Empiricism argues that knowledge is created on an ongoing basis from the experience (Nonaka, Takeuchi, 1997).

In the interpretation of Nonaka and Takeuchi (1997), based on Rationalism, knowledge is considered a dynamic human process of justifying personal belief about the truth. Thus, knowledge can be understood as a set of beliefs, schemas and mental models on which decisions are generated (Azevedo et al., 2010). On the other hand, learning involves developing the ability to articulate conceptual knowledge and understanding of an experience, or can be the process by which knowledge is generated. In this paper, it is considered that knowledge and learning are related concepts that generate resources for companies seeking differentiation and competitive advantage. According to Azevedo et al. (2010), to the link between learning and knowledge be positive it is necessary that adequate environment and processes are available. Learning needs to be part of the organizational structures, providing the development of autonomy, and also the technical and political conditions for individuals to learn.

The creation of knowledge in the Japanese approach is linked to the use of insights, attitudes and tacit and subjective hunches of people (Shinyashiki, Trevisan, Mendes, 2003), which are converted "into something subjected to tests" allowing its use in organizations (Nonaka, 2000). The literature addresses this issue by identifying and attempting to remove barriers to learning, thus contributing to the organization and management of the learning process (Zangiski, Lima, Costa, 2009).

To Sigala and Chalkiti (2007), tacit knowledge resources become valuable strategic assets to organizations, because they are not easily copied and replaced. In this sense, some authors emphasize this importance trying to explain how knowledge is a valuable, inimitable and irreplaceable resource, and a source for achieving sustainable competitive advantages (Davenport, Prusak, 1998; Hall, Sapsed, 2005; Alwis, Hartmann, 2008; Wu, Lin, 2009). To Colauto and Beuren (2003), knowledge management advocates the successive passages of tacit knowledge to explicit and vice versa, as it seeks to transform individual knowledge resources available to others, through the conversion of tacit knowledge in words or numbers likely to be understood. This view is supported by Azevedo et al. (2010), who add that these successive conversions continue until the individual becomes aware of the resources available to others, through the process of "social conversion", and that this knowledge can expand or shrink, in both quality and quantity over time.

For Nonaka and Takeuchi (1997), both explicit-and-tacit knowledge, and organizational-and-individual knowledge are not separate entities. Instead, they are complementary, interacting with one another as the individuals perform creative exchanges. In this sense, tacit knowledge is not written somewhere, it is highly personal and hard to formalize, making it difficult to transmit and share with others. It occurs through actions and experiences of individuals with acquired skills, perceptions, insights, conclusions and

predictions. According to Nonaka and Krogh (2009), tacit knowledge is the cornerstone in the theory of organizational knowledge creation. Explicit knowledge, on the other hand, is one that can be expressed in words, numbers or sounds, easily communicated and shared in the form of data, scientific formulas and is available to all people (Nonaka, Takeuchi, 1997; Kikoski, Kikoski, 2004).

2.2 Knowledge Management

For Davenport and Prusak (1998), knowledge management should be applied in order to provide the right knowledge to the right people at the right time, helping people transform information into action, and to enhance organizational performance.

To Chang and Lee (2008), knowledge management has the following objectives:

- Improve methodologies for managing innovation, seeking greater efficiency in operations;
- Use creativity to create innovative products to better fit the market;
- Be aware that knowledge can reduce costs in the organization;
- Improve the ability to solve problems of the organization through the sharing of knowledge;
- Improve competitiveness by increasing the efficiency of the organization.

In the context of health services, Guptill (2005) emphasizes that knowledge management means aligning people, processes, data and technologies to optimize information, collaboration, expertise and experience with the ability to positively impact organizational performance. Assuming that healthcare needs individual and collective skills for successful service delivery, we understand that the model proposed by Nonaka and Takeuchi (1997) can support the analysis of knowledge management in this segment. So, we assume that knowledge is created only by individuals and use the SECI model to represent knowledge creation through the conversion between tacit and explicit knowledge. Moreover, we incorporate another element proposed by the same authors: the Ba, ie the shared context for knowledge creation. In the SECI model, the four processes of knowledge conversion – Socialization, Externalization, Combination and Internalization – are the "engine" of the process, working in the form of a four phase spiral of knowledge creation. To promote the spiral of knowledge, Nonaka and Takeuchi (1997) presented five conditions at the organizational level: intention, autonomy, fluctuation and creative chaos, redundancy and variety of requirements, so that the organization can provide the appropriate context to facilitate interaction between groups, creating and accumulating knowledge at the individual level.

2.3 Clinical Research

Clinical research can be defined as a systematic study that follows scientific methods applicable to humans (Accetturi et al., 2002). Clinical research, as a protocol, is usually inserted in an academic hospital, where a Research Center uses the hospital structure to: meet the "research subject"; perform procedures; and approve research projects. This requires that the provided structure meets the requirements of national govern and international standards of research, ensuring quality, safety and ethics in the conduction of clinical and research proceedings. With the development of a research project, innovations are developed and studied, and the hospital can benefit from this activity getting expertise in "something that is still in development". Thus, knowledge of individuals involved with clinical research becomes a key resource in implementing the activities, but also the knowledge of those involved in the regulatory process is key for the approval of a research project.

However, not always the results of clinical research are seen as tools of innovation and knowledge creation because there is an understanding that this type of innovation adds value only to patients. Nevertheless, knowledge management related to clinical research is considerably complex and requires a huge effort related to the preservation of explicit knowledge. But the knowledge of those patients, their relatives and the staff involved in the care process is largely tacit, silent and not formalized (Fayard, 2003). The creation of conditions for externalization of this knowledge passes thru the establishment of an adequate Ba. For Sarvary (1999), the principles of knowledge management in clinical research are supported by a triad of people, technology and processes.

3 Methodological Approach

This study was conducted using a descriptive qualitative approach. For to do so, we divided the research in five main steps, as follows: 1) Construction of theoretical background, grouped under five topics: (i) organizational knowledge; (ii) knowledge management; (iii) models for knowledge management; (iv) management of Clinical Research Centers; and (v) knowledge management in health services; 2) Field data collection, including documents retrieval, participant observation and verbal data collection; 3) Analysis of data, divided into content analysis of interviews and data triangulation; 4) Analysis and discussion, based on the elements of the previous steps, a summary of the findings was established in order to represent the knowledge management in clinical research; 5) Reporting and evaluation of the accomplishment of the objectives.

4 Analysis and discussion

The content analysis of the interviews identified the elements presented in the theoretical background, as well as produced evidence about the context of the hospital and the culture of the organization. As general evidence from the research findings, based on interviews, documents and observations made, we could propose that, despite the structured organization and strict protocols attended, knowledge management in the context of the Clinical Research Center is not formalized as a subject of management. There are isolated initiatives to transfer knowledge, but without a formal structure, in charge of design and monitor a process of knowledge management. There is no formal planning, defined processes, indicators or evaluation in relation to knowledge management initiatives in the organization. Clinical research is an activity of great and growing interest within the organization, and seen by top managers as well as other representatives of different levels, as a form of innovation and competitive advantage, but this is not aligned and systematically structured to benefit the organization's processes.

The concept of knowledge management used in this study proved to be appropriate in the context investigated as are the individuals who provide assistance to the population and are responsible for these processes, technology and interaction in the hospital environment by providing mechanisms to transfer organizational knowledge. According to Nonaka and Takeuchi (1997), and Nonaka (2008) knowledge is created only by individuals, and is supported by the deliberate and systematic coordination of people, structure, organizational processes and technology, with the aim of adding value through reuse of knowledge and innovation. It is a continuous network, with persistent and purposeful interactions among agents, that seeks to manage (manipulate, manage, govern, control, coordinate, plan, organize) knowledge.

Also from the analysis it was possible to establish a conceptual map of knowledge management in clinical research regarding the case studied, identifying where the organization is developed and which points need to be explored and qualified (Figure).

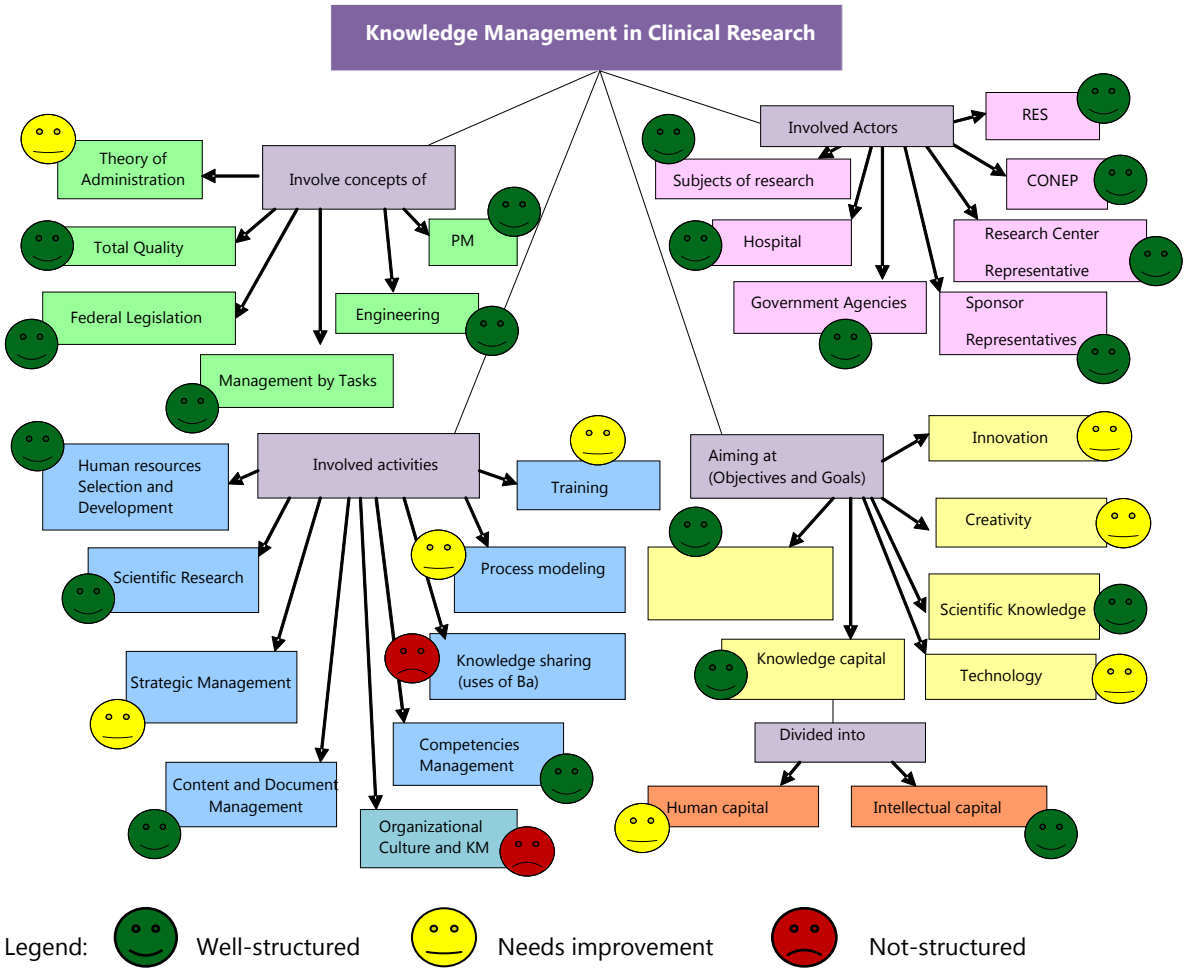

Figure 1 – Conceptual map of the knowledge management in clinical research at HMD. Source: the authors (2011).

The findings allowed to establish a discussion with the organization, in the light of the theoretical background, and to present a qualitative evaluation of knowledge management in clinical research, indicating well-structured elements and others that require attention in order to enhance the structure and leverage the results.

The yellow dots in Figure represent processes that require further development and improvement to effectively contribute to the knowledge management in clinical research. Also, the items signaled in red need to be structured and consolidated to better support knowledge management in the organization.

Nevertheless, regarding the actors involved, the knowledge management in clinical research is well structured and organized. All actors have a well-designed role, and different responsibilities are defined and commonly known. Notwithstanding, the field results show that the organization can benefit more from the knowledge and learning generated by all actors.

In terms of objectives, the organization can benefit more from the efforts of the clinical research by providing tools where the actors can use the knowledge generated and thus fostering competitive advantage, while increasing satisfaction and motivation to employees / actors, specially focusing on innovation, creativity, technology and human capital.

Regarding to conceptual support, we found an adequate level of maturity in the organization. But training activities could be organized and structured in order to create, transfer and encode the knowledge of clinical research into organizational knowledge. Clinical research may qualify processes and practices of the hospital as a whole, and, on the other hand, it can benefit from the available knowledge in other areas, by using more concepts from management theory, strategic management and process modeling.

The two aspects identified that we considered as needing more attention are related to organizational culture and the sharing of knowledge. The findings from field indicate that the organization could have strong benefits in structuring more Bas for fostering the spiral of knowledge, especially when considering the interface between the clinical research team and the teams of other departments or centers. In the same sense, a program for acknowledge the benefits of the clinical research on daily practices of the organization could improve the results in terms of competitive advantage, by letting this knowledge to flow thru the organization.

5 Conclusion

The field results corroborate the propositions of the literature on the wide range of possibilities for creating and transferring knowledge that clinical research can provide, as well as the importance of intraorganizational relationships in the development of knowledge management in these environments. From these analyzes it was possible to present a descriptive sketch of how the knowledge management is established in the clinical research center studied.

We can infer that knowledge management is important in this segment as a vector for classifying and structuring processes within the organization. Nevertheless, this factor of potential competitive advantage needs to be formalized and structured in some level to help the organization. The SECI model can support the structuring process, since this seems to be a suitable way for considering the contextual aspects of clinical research and hospital environments.

Field data also allowed us to conclude that, in the context analyzed, the activity of clinical research is a strategic aspect for the organization, being identified as a way of attracting customers and high level medical professionals, besides keeping the organization updated and allowing constantly learning. The study also showed that clinical research produces advantages to the organization, producing qualified and distinguished practices and improving medical records when the information from clinical research spreads thru other levels and departments of the organization.

The study also shows that in the context under analysis, individuals are fundamental and indispensable for the generation, codification and transfer of new knowledge. Each individual has potential for dissemination of knowledge as s/he interacts with parts of the organization. The sharing of knowledge, making it usable, increases organizational value and helps in achieving goals. In this sense, we identified the interest of all the respondents involved with clinical research to maximize the transfer of "clinical research culture" to the organization, which is an important aspect to be followed in the context analyzed. However, it is necessary to establish strategies and mechanisms to operationalize knowledge management. We identified the need for institutional tools and processes that can help teams in the transfer of knowledge, thus improving communication and integration among those involved in clinical research. The establishment of indicators and mechanisms to control the activity of clinical research was also highlighted as an important factor for knowledge management.

Regarding the transfer of knowledge generated in clinical research to the organization's processes, we suggest developing a pilot project for the entire organization to internalize the quality and control processes arising from clinical research, so that they become routine for the entire organization with no difference in care between the general patient and the patient in clinical research. This concept would add quality in processes and knowledge to the organization as well as a market differentiation to the extent that this process is not identified as routine in health services. Finally, it is still possible to discern a wide field of research on knowledge management in hospital settings, particularly in clinical research.

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