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**IMPLEMENTATION OF A KNOWLEDGE MANAGEMENT PROGRAM AND ITS  
IMPACT ON THE MANAGEMENT SYSTEM: CASE STUDY AT AN INDUSTRIAL  
COMPANY**

**Carla Gonçalves Machado – FEB/UNESP, [cmachado@lwart.com.br](mailto:cmachado@lwart.com.br), +55(14) 3103-6122**  
**João Pedro Albino – FC/UNESP, [jpalbino@fc.unesp.br](mailto:jpalbino@fc.unesp.br), +55(14) 3103-6079**  
**Marco A. Torres - UNESP, [marco.torres@unianhanguera.edu.br](mailto:marco.torres@unianhanguera.edu.br), +55(14) 3103-6122**  
**Paulo Sergio Orti – FEB/UNESP, [pauloorti@pauloorti.com.br](mailto:pauloorti@pauloorti.com.br), +55(14) 3103-6122**  
**Vagner Cavenaghi - FEB/UNESP, [vagnerc@feb.unesp.br](mailto:vagnerc@feb.unesp.br), +55(14) 3103-6122**

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**ABSTRACT**

The business and management environment is influenced by political, organizational, institutional, technological, economic and social phenomena of a global scope. Thus, capturing, registering, organizing and disseminating information and knowledge plays a strategic role in organizations. The objective of this paper is to present a case study of an organization that is developing a Knowledge Management project, analyzing its initiative in order to classify the stage at which the company's knowledge management cycle is at and to relate this cycle to other management instruments it has. The following instruments were used to raise and collect data: individual interviews and bibliographic study. This paper represents an important contribution to the study of knowledge management, demonstrating new technologies that can leverage organizational change and trigger a new understanding of Knowledge Management.

**Keywords:** *Knowledge Management; Knowledge Management Cycle; Management Tool.*

## **1. Introduction**

The business and management environment is influenced by political, organizational, institutional, technological, economic and social phenomena of a global scope. Thus, capturing, registering, organizing and disseminating information and knowledge plays a strategic role in organizations.

The speed and frequency of connectivity, communication and exchange of information has been an intense and usual practice in the diverse forms of relationship between players from different market segments and economic sectors.

The growing volume of information disseminated by the respective media helps the company to improve management of such information so it can contribute towards knowledge management at organizations. In this sense, information technology, with its flexibility and adaptability, contributed towards leveraging and accelerating knowledge transfer speed.

The search for innovation and the need to be increasingly more competitive in face of globalization have led organizations to the adoption of new management and information technologies capable of generating sustainable competitive differentials for their operations and the feasibility of their strategies.

These Knowledge Management practices are not always integrated with other business practices, being implemented by demands without compatible cultural changes or periodically reviewed and incremented by new strategic realignments.

This paper aims at providing more in-depth discussion of the integration of Knowledge Management with the organization's business processes using a case study that analyzes the feasibility of a Knowledge Management (KM) implementation project supported by Information Technology tools.

## **2 Research Methods Used**

The case study method was used in this paper since the objective is to provide more in-depth knowledge through one or few objects in a manner that permits broad-based and detailed knowledge (GIL, 2008), and because it is a comprehensive research strategy exploring real life situations whose limits are not clearly defined (YIN, 2005).

Unstructured individual interviews with the managers responsible for the company's information management were used to collect data, which directed the topic of the case study, as suggested by Yin (2005). A bibliographic consultation of the main works on KM, as well as national and international articles and journals, was part of the research.

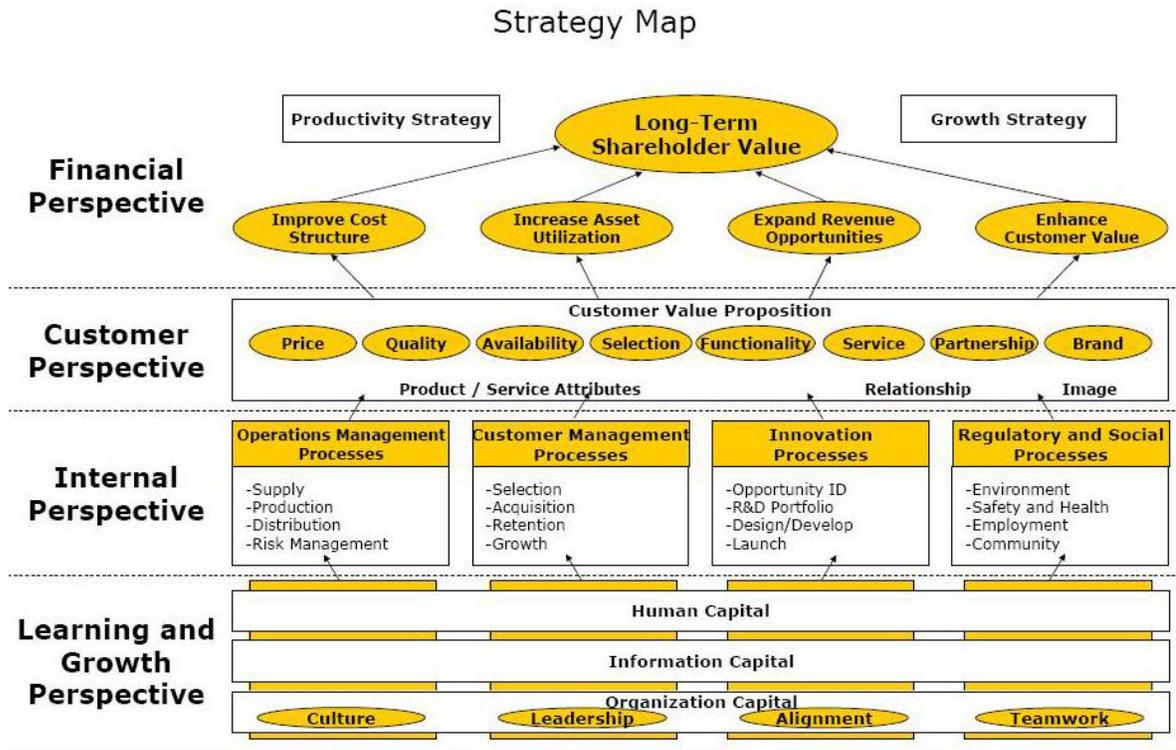
Application of the interview at the organization in question was due to its importance in the sectors of operation and its interest in having its processes studied.

## **3 Management Cycles and Organizational Change**

According to Bertero (1994), many theories seek to assess the issue of organizational analysis and its evolution process, with the objective of carrying out the purpose for which it was created thus obtaining the best results. This is derived from its specific competencies and its competitive advantages, which need to be captured, recorded, developed, disseminated and expanded so the entire organization can enjoy its benefits and increase competitiveness.

These advantages must be measured strategically. The *Balanced Scorecard (BSC)* (KAPLAN and NORTON, 1992) was chosen for this analysis. The BSC is an instrument that permits this measurement by analyzing performance in four dimensions as per the model proposed and shown in **Figure 1**.

The appropriately measured and administered dimensions allow the organization to remain alive and with advantages in relation to the market. The knowledge acquired throughout the organization's history and in all its processes and production sectors stands out in this process.

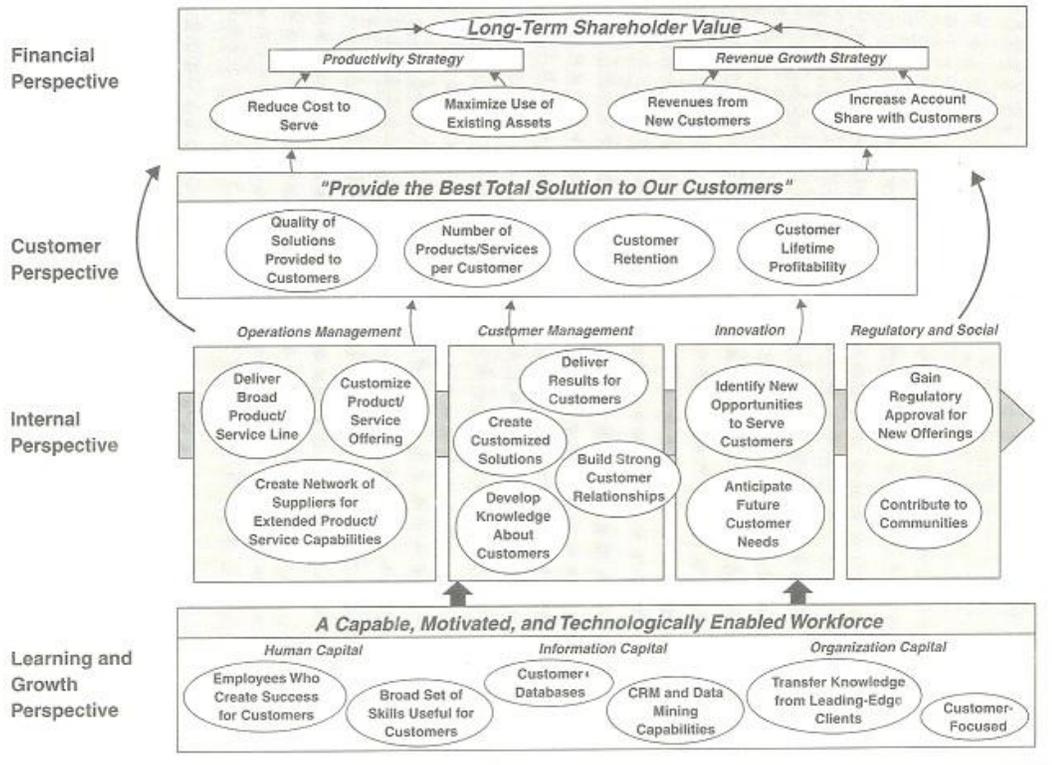


**Figure 1. Model of the Strategic Map: Complete solutions for the clients.**

Source: Kaplan and Norton (2002, p. 339).

Kaplan & Norton (2002) underscore the importance of the human factor in the process of converting strategic guidelines into organization readiness. Various technological and administrative tools are used for such in order to transfer the organization's vision and mission to every level of the organization, seeking alignment, response readiness and organizational change as shown in **Figure 2**.

This strategic analysis process needs to be reviewed periodically because unforeseen variables, adjustments, resources to be optimized or expanded and new knowledge can arise that are incorporated to the organization.

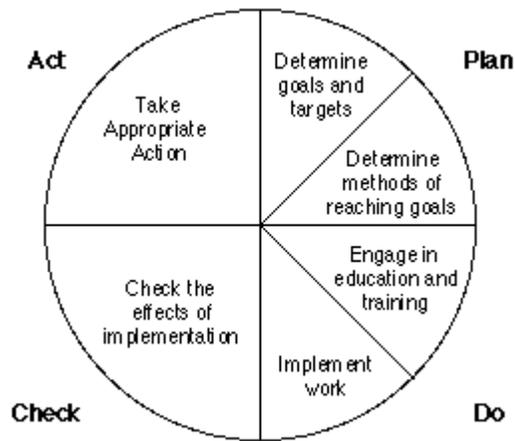


**Figure 2. Organizational Change.**  
 Source: Kaplan and Norton (2002, p. 284)

The need for a structured knowledge reference for the organization arises for several reasons, such as: succession of founders, expansion of product lines, corporate governance, competitive challenges, and difficulty in finding qualified collaborators in the market, among others.

Practices that are initiated do not always have a complete strategic vision. They often emerge as isolated practices that expand with the constant evolution of organization knowledge.

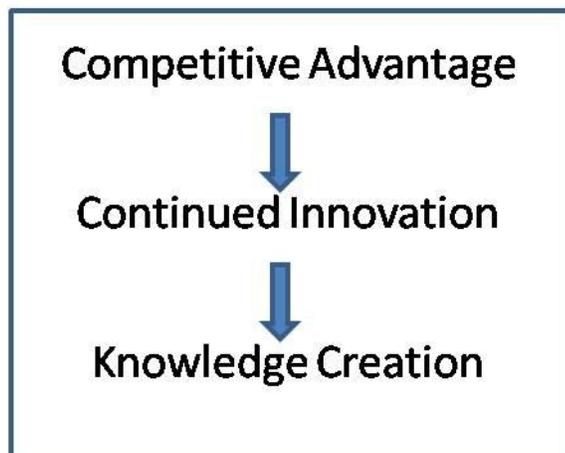
The PDCA cycle (Plan, Do, Control and Action) presented by Campos (2004) helps maintain the permanent revision focus on these practices, and when accompanied by BSC measurement instruments, it maintains the continuous evaluation and development of the management process as shown in **Figure 3**.



**Figure 3. PDCA Cycle.**  
Source: Campos, 2004

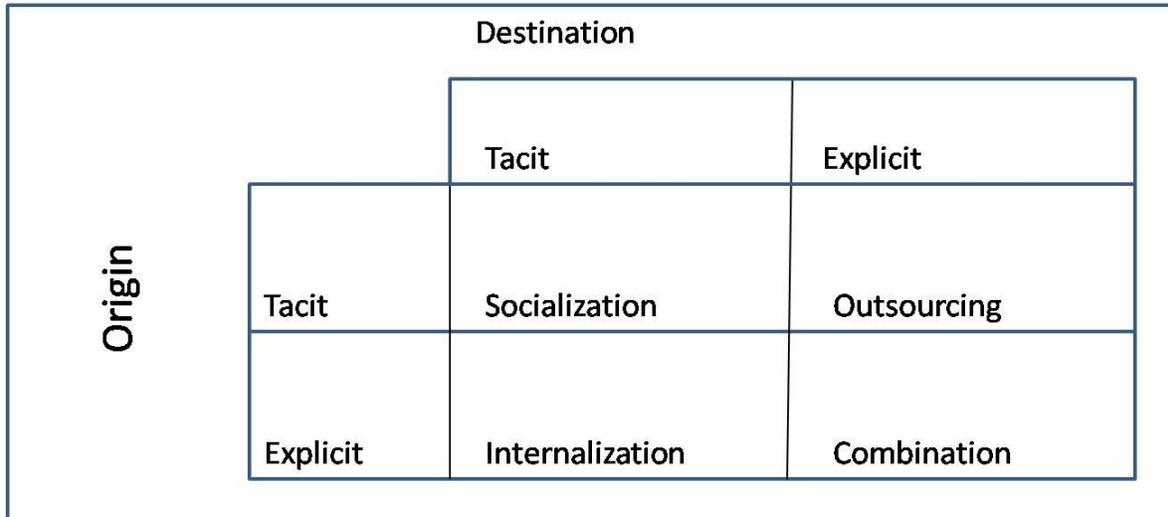
In the alignment flow and in establishing readiness it is common to need a new guideline or improvement of the previous one. That is the learning and knowledge flow that begins to be established in the organization. The actions need to be integrated with each other in order to obtain the best management of all resources and operation of the entire organization.

In this context, an organization’s greatest challenge is to transform knowledge from tacit (internal to people – informal) to explicit – formalized throughout the organization as per the model by Nonaka and Takeuchi (1997), shown in **Figure 4**.



**Figure 4. Process for Creating Knowledge and Competitive Advantages.**  
Source: Nonaka and Takeuchi (1997)

The more spontaneous this process is the better team competencies and skills will be used, as shown in **Figure 5** in the Nonaka and Takeuchi (1995) model.

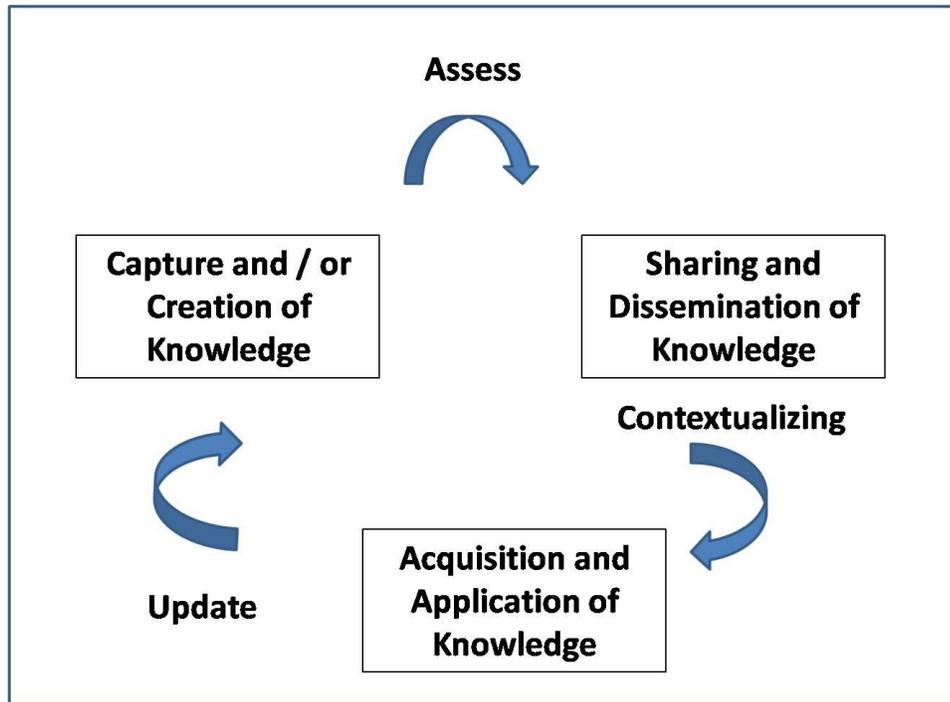


**Figure 5. Knowledge Spiral Cycle.**  
Source: Nonaka; Takeuchi (1997)

The Knowledge Management process occurs in cycles, involving stages that range from the search for tacit knowledge to the application of explicit knowledge by other people. These cycles and some examples based on Dalkir (2005) are shown below:

- **Capture:** Brainstorming, discussion and enrichment of ideas;
- **Codification:** Organization and representation, Knowledge Map, Decision Making and Product Planning;
- **Creation:** Professional Development, Reward Policy and Knowledge Quality and Quantity;
- **Sharing:** Software, Access and Contribution, Broadening and Improvement of Knowledge;
- **Acquisition:** Interview, Scaling of Ideas and Structuring of Knowledge;
- **Application:** Product Project, Reduces the Possibility of Errors and Less Time.

This process is experienced in organizations in a formal or informal manner, integrated or in isolated and partial actions. That is why it is so important to have a permanent review of the strategies defined by the company, aiming for a more integrated and complete process. Dalkir (2005) summarized the Integrated Knowledge Management (KM) Cycle, as seen in **Figure 6**:



**Figure 6. Integrated Knowledge Management Cycle.**  
Source: Dalkir (2005, p. 110)

The conversion of tacit knowledge to explicit knowledge and the integration of the KM process enable the organization to codify and administer existing knowledge and to create good conditions for new knowledge to emerge. It is a process of variations among codifications, abstractions and diffusion of this knowledge throughout the organization, as per Boisot's model, presented by Choo (1998).

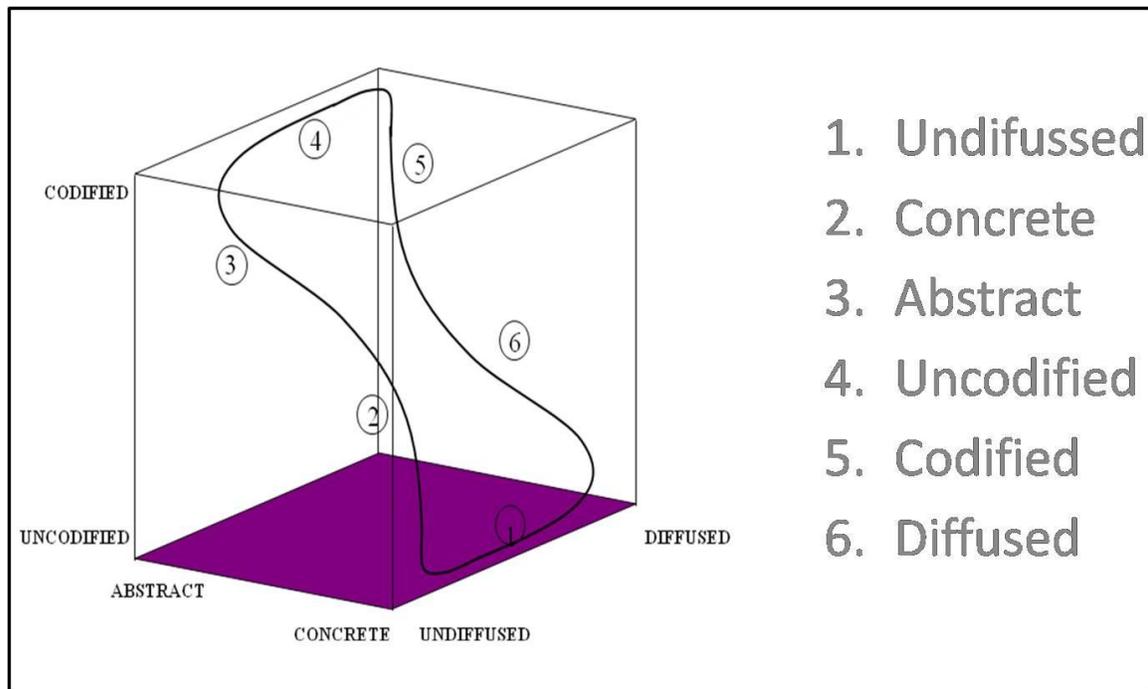
Boisot's KM model is based on the key concept of an "information good", which is different from a physical resource. According to Choo (1998), Boisot's model distinguishes the

information from data, emphasizing that information is what the observer will extract from the data as a result of prior expectations or knowledge.

Boisot's I-space model, as seen in Figure 7, can be visualized as a three-dimensional cube with the following dimensions:

1. codified – uncoded;
2. abstract – concrete; and,
3. diffused – undiffused.

Sweeping, codification, abstraction, diffusion, absorption and impact activities contribute towards learning. When they occur in the sequence – and in a way they should do that – together they comprise the six phases of a Social Learning Cycle (SLC).



**Figure 7 Boisot's I-Space Model.**  
Source: Choo, 1998, p.110

KM needs to go through an ample process to be as effective as possible. Organizations are not always able to fully carry it out, but it generally occurs in an “intuitive” manner to meet the company’s specific needs.

After the cycle stages are concluded, it is necessary to review planning, redo the PDCA cycle and reset goals and guidelines for the organization. A new alignment and readiness must be sought for the entire organization.

It is important to not have any disengagement between the organization’s practice and top management to avoid any steps backward or going off course, unnecessary expenses or breaking of ties of trust with managers during the process.

#### **4 Applications of Information Technology Resources in Knowledge Management**

Information Technology (IT) tools can contribute more towards the externalization, internalization and combination of explicit knowledge when they are derived from situations in which the recommendations and concerns, such as an emphasis on synthesis, impersonal writing, approval criteria and access to lessons learned and socialization of knowledge for the organization’s different areas are taken in consideration, by Birchall and Smith (1998).

IT does not solve all the problems involved in work with explicit knowledge; however its application, use and potentialities contribute towards a significant part of the solution to these problems, interacting as an individual and organizational learning facilitator.

According to Medermott (1999), IT resources facilitate: externalization – which helps recording knowledge; internalization – which speeds up access to explicit knowledge; and the socialization of knowledge – which makes it easier for people to be found and establish communication.

The use of IT facilitates network work, keeping knowledge decentralized with those locations in which it is generated and/or used (DAVENPORT and KLAHR 1998), improving user interactivity with knowledge records, such as lessons learned (DAVENPORT and PRUSAK,

1998). Company intranets permit managing organization knowledge and facilitate access to the different accumulated explicit knowledge. Its use can be personalized in accordance with each person's preferences and needs (MAURER, 1998).

Intranet resources also permit users to make comments or create virtual discussion groups (groupware forum). However, an important part of the solution for these systems to work goes through establishing the key processes (core business) and the main roles and workflows in these processes (ELLIOTT, 1999).

Seeking a more in-depth discussion about KM's integration with the organization's business processes, a case study was carried out at an industrial conglomerate based on a KM implementation project supported by information technology tools.

## **5 Description of the Organization and its Information Technology Structure**

The studied organization is a private industrial conglomerate founded in 1975. Its headquarters is in the city of Lençóis Paulista, state of São Paulo. It has nearly 2500 employees, 16 affiliates distributed throughout the country, 1 distribution center in Tamboré, São Paulo and 2 industrial units.

In relation to its information and communication technology infrastructure, KM is conducted by four corporate areas:

- **Management of documents and processes:** Management Processes and Systems Department;
- **Technological Support:** Information Technology Department;
- **Institutional and corporate content management:** Corporate Marketing;
- **Internal communication management:** Endomarketing.

The company's organizational scenario is in a transition phase to a corporate governance system. This family-owned company is experiencing a new moment with the founders leaving executive

functions and executives who do not belong to the controlling family assuming management positions. The managerial staff is also being restructured with the arrival of managers from other centers and moving of the founders to the Board of Directors.

Since 2008, the company has been developing a large project that involves internal and external brand repositioning and preparation for ISO 9001, ISO 14001 and OHSAS 18001 certification.

The implementation process for Corporate Governance was the starting point for information management processes, though still without a systemic focus. The first point was to capture information for the historical recovery and location of undocumented concepts and processes with the objective of creating a Research and Documentation Center – RDC.

A specialized consulting firm was contracted to conduct the first historical and documental inventory, which consisted of locating people and key processes at the conglomerate's companies with the objective of creating a knowledge repository, a database that will store all the organization's historical documents (physical and digital). Paper documents, CDs, DVDs, photos and VHS tapes comprised the file. It also established document management with rules and policies regarding the safeguarding, access and availability of information.

After finalizing the process, a professional was contracted to organize documentation. The selection initially focused on biblioteconomy; however, the first experience did not achieve expected results and a new selection process was opened.

The company currently finds itself in another information management phase with the implementation of a Total Quality System (TQS) to manage procedures, job instructions and records and handling non-conformities.

Another important issue in the KM implementation phase was the launching of a new intranet system and the company's decision to invest in Microsoft Enterprise Agreement (EA), a system

that makes it easier to control licenses and guarantee better management of the technological park. The package includes these systems:

- Office 2007 automation set;
- Windows Vista Business operating system;
- SharePoint Portal Server platform;
- SQL Server 2005 database;
- Microsoft Active Directory;
- System Center Configuration Manager;
- Exchange Server 2007 message manager;
- Office Communications Server 2007 document integration package;
- Windows Terminal Services.

This new technological infrastructure, based on the Windows platform and Microsoft tools, provided an updated technological park, a 30% reduction in Total Cost Ownership (TCO), the centralization of information and increases in productivity, according to information provided by the company.

The company currently uses tools that are not integrated, including:

- Outlook – e-mail;
- OCS - Office Communication Service;
- Live meeting;
- Intranet - base Sharepoint;
- Research and Documentation Center;
- Site;
- Total Quality Control – TQC;
- ERP – JDEdwards;

- Digital Telephone Central – VOIP System;
- Databases – Oracle; SQL Server

The capacity to manage documents is an indispensable tool for Knowledge Management. The organization's objective is to implement an EDM (Electronic Document Management) integration program in the near future. This technology makes it possible to generate, control, store, share and recover existing information in documents. EDM systems permit accessing documents in a fast and safe manner using a browser in the corporate intranet.

The project is in its final stages and it is being developed in a personalized manner for company needs. The project's main objective is to create an organizational structure where all the information, today allocated to diverse networks, is migrated to a single platform, the SharePoint. A new professional was hired for this new reality who will carry out the role of information architect. Knowledge in biblioteconomy and a specialization in information science were the criteria used in this new selection process.

## **5.1 Analysis**

As can be seen in the review of studied literature, actions in various areas of the organization and more specifically in KM are carried out by demand and without a broad vision of all the variations of the steps adopted in the organization's areas.

The studied company demonstrates this profile having begun the KM process by a demand tied to raising the company's history and its main processes as a result of a change in Corporate Governance and the subsequent expansion of these actions. KM is seen to be made feasible by actions implemented over the past three years. These actions are taking the company to a stage of evolution that opens new possibilities for an expansion of KM's vision.

The utility and need for a permanent revision process for implementing a practice so susceptible to organizational, cultural and technological changes like KM becomes evident. The use of

replanning tools like PDCA and BSC can provide realignment and a new readiness for the entire organization, as per Kaplan & Norton (2002).

In terms of cultural change, the Intranet can be seen as helping the company create an appropriate environment for sharing and participation. The implementation team sees the KM process as a whole as being possible to be implemented; however, top management still has the total dimension of the possibilities represented by the new tools.

The tools are still being using in isolation for the most part, but the Internet base is providing integration in a gradual process for day-to-day use, forming the basis for KM implementation.

The company's technological personnel infrastructure is prepared for KM development. At present, there is still no clear strategic direction for this subject. Top management is still partially involved and has a fragmented vision of the process.

According to Boisot's model, shown in Figure 7, it is possible diagnose that the studied company's Knowledge Management Cycle is between the knowledge sweeping and codification stages.

## **6 Final Considerations**

The figure of the information architect or knowledge manager has yet to be officially established. A pilot project for documentation inventory is still in its implementation phase, but availability is still not projected and the teams involved study new strategies for capturing and evaluating knowledge use.

Realignment is important in order to enable a new readiness at the company, thus avoiding a waste of energy on projects not aligned with top management, and thus frustration of the implementation team and discouragement of the company and those involved in the process. The KM process must be taken care of in all its phases and well-defined at every level in order to

maintain a continuous flow of converting tacit knowledge into explicit knowledge and to keep competitiveness high in relation to the market.

As final considerations, the paper underscores that new technologies can leverage organizational changes and trigger a new understanding of Knowledge Management. However, knowledge renews itself and continues to occur in an organization whether there is a formal program or not. But, with a formalized system, the process becomes faster and more effective.

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