

# USE OF ASSESSING ORGANIZATIONAL KNOWLEDGE (OKA) FOR ANALYSIS OF KNOWLEDGE MANAGEMENT IN A PUBLIC ORGANIZATION

Data de submissão: 28/05/2014

Aceite: 02/08/2016

Oscar Pedro Neves Júnior<sup>1</sup>

Sidnei Vieira Marinho<sup>2</sup>

## ABSTRACT

Knowledge Management is increasingly becoming important to enable organizations to sustain competitive advantages and increase the efficiency of their processes. As part of this process, it is increasingly necessary to identify an organization's level of Knowledge Management (KM). To achieve this, public sector organizations must undertake exercises to diagnose their KM practices, as a means of evaluating and improving the quality of their information. This paper deals with the issue of KM in Public Administration, specifically in a Civil Defense Secretariat, with the specific objective of quantifying KM practices using the OKA Method. This method has been developed to identify the KM status of an organization by administering a questionnaire containing 199 questions to collect data on metrics developed to measure each of the dimensions of knowledge management. The results show that this organization needs to promote implementation and dissemination of KM practices, encouraging information flows, facilitating communication, targeting alignment of strategies, and defining common objectives with all employees.

**Keywords:** Knowledge Management, OKA Method, Civil Defense.

---

1 Has a degree in Science of Computer from Universidade do Sul de Santa Catarina, MS in Administration from Universidade do Vale do Itajaí, UNIVALI. Capivari de Baixo-SC – Brasil. E-mail: oscarjnr@gmail.com

2 Has a degree in Mechanical Production Engineering from Universidade Federal de Santa Catarina, UFSC, MS in Production Engineering from UFSC and a PhD degree from UFSC. São José, SC – Brasil. E-mail: sidnei@univali.br

# 1 INTRODUCTION

In a scenario of technological advances, particularly in the areas of information and communication, policies to improve the quality of services for dealing with emergencies, especially those focused on the safety of society, have become extremely important to ensuring the quality of human life. The current model of economic growth, the risks and impacts of climate changes, and the overarching need to focus on a sustainable economy bring with them challenges for creation of values within organizations (PINSKY & KRUGLIANSKAS, 2013).

Davenport and Dörflinger (2001) state that value creation begins with successful Knowledge Management, for which organizations must assemble the functions and qualifications needed to perform the tasks of learning, distributing, and applying knowledge, assembling different types of organizational structures, supports, and projects; the effective technologies that enable value creation and guide future directions. Knowledge Management (KM) is not a single discipline, it is an integrated field based on a number of disciplines that make it possible to seek initiatives in the various different domains and levels of the organizational hierarchy (ANSUATTIGUI & PITHON, 2011).

Knowledge Management enables public sector organizations to measure their efficiency with greater confidence, to take the correct decisions with relation to the best strategy to adopt towards their customers and services, to administrate data and information, and to manage their knowledge (SANTOS, 2012).

One of the conclusions that Batista et al. (2005) reached in their research into Knowledge Management in Public Administration was that prioritizing KM is the major challenge for the majority of Direct Administration public sector organizations. In addition to issues related to administration and planning, such organizations also have to deal with another major challenge, which is to integrate Knowledge Management into their activities for managing working routines.

In this regard, public sector organizations have gone through countless transformations, demanding a better cognitive understanding between man and technology to interact in this scenario of constant change and developing the competencies to understand, plan for, and intervene in the natural and human disasters with which the Santa Catarina Civil Defense deals. One of the major difficulties for Civil Defense managers is use of information to develop strategies for deployment of their resources. This difficulty is primarily the result of the large number of different organizations and workers involved at the three different levels of administration (municipal, state, and federal), the volume of information held by each, and the absence of KM practices (CALHEIROS, CASTRO, & DANTAS, 2009).

Therefore, implementation of Knowledge Management practices within the State Department for Civil Defense should enable management to improve the quality of their decision-making, using information from the entities involved in each Municipal Civil Defense organization in the state of Santa Catarina. Rossetti and Morales (2012) have stated that management should focus on the context of organizational strategy, aiming to improve organizational performance through an integrated Knowledge Management vision, both in planning of functional and command structures, and with regard to processes, seeking alignment between KM practices and other areas concerned with adding value.

Notwithstanding, a diagnosis of the critical factors in the organization's processes, will only have an impact on adoption of practices and activities related to KM if it is the objective of careful planning and execution by means of a diagnosis of organizational knowledge, as a fundamental practice and one that must, obligatorily, be the first stage of Knowledge Management planning (PEREZ-SOLTEIRO et al., 2009).

However, the challenge lies in developing people with the profile needed for this new type of organization. It is of fundamental importance to rethink the roles of public managers and workers in these organizations; to create new management systems, making learning part of the organization's daily activities. Therefore, a Knowledge Management program in an organization will only achieve success if the organization conducts a diagnosis to give it a comprehensive overview of these management practices (FRESNEDA, et al., 2008).

It is from this perspective that the research question guiding this study emerges: **How are Knowledge Management practices conducted in the Santa Catarina Civil Defense Secretariat?** The central objective of this article is therefore to use an assessment tool to analyze Knowledge Management in a public organization - the Santa Catarina Civil Defense Secretariat - in order to inform its managers of the status of Knowledge Management practices and, in possession of the results, facilitate development of a Knowledge Management plan.

## 2 THEORETICAL FRAMEWORK

According to Grotto (2001), one of the great challenges in Knowledge Management studies is ensuring that the knowledge that is not found in manuals, reports, or studies is shared. Since this is knowledge that is difficult to capture, formalize, and communicate, monitoring it and ensuring that it is shared can demand mobilization and adaptation of the entire organization.

Interaction between people, technologies, and processes provides the support needed for an organization to execute new and complex tasks. It is the managers' responsibility to coordinate different levels of knowledge between team members, through sharing of information, considering that it is through people that information can be interpreted and transformed into knowledge (BHATT, 2001).

Knowledge Management is a management principal that offers the possibility of amplifying information, knowledge, experience, and intuition in organizations with the objective of creating value. Its importance derives from its ability to build on knowledge as the foundation for organizational sustainability (FONSECA, et al., 2010).

Schreiber (2002) defines knowledge as the collection of data and information that people use for their actions, performing tasks and creating more information. Knowledge is the complete conjunction of information, data, and relations that lead people to take decisions, to perform tasks, and to create new information or knowledge (FIALHO, 2006).

According to Silveira (2011), the objective of Knowledge Management is to create, identify, integrate, capture, share, and measure the experience and knowledge that exist within the organization, through utilization of specific methodologies and technologies. One way of dealing with the successive changes that affect the environment is to originate, obtain, and apply knowledge continuously.

Knowledge Management therefore enables improvement of products, processes, quality, organizational arrangements, skills, beliefs, values, learning, attitudes, and behaviors, and facilitates the search for new sustainable competitive advantages. The objective is to obtain a perspective for achieving superior results (NONAKA & TAKEUCHI, 1997).

Knowledge Management guides the organization in its processes and generates creative capacity for implementing practices for achieving objectives for competitive differentiation. Through Knowledge Management, it is possible to identify internal deficiencies and conduct planning oriented towards remedial actions (CRUZ, 2002, FIALHO et al., 2006, GROTTTO, 2001).

According to Boff's (2000) conceptualization, Knowledge Management is sometimes excessively wide and demonstrates the notion of integration within a continuous process of generation and use of knowledge, which can be better understood within a permanent cycle of many actions. This conjunction of actions creates within the organization a knowledge environment that becomes part of the organization itself. This environment that fosters knowledge creation, represents the process of wealth creation (BUKOWITZ & WILLIAMS, 2002).

Through the several different concepts studied (NONAKA & TAKEUCHI, 1997; BOFF, 2000; BHATT, 2001; FONSECA et al.; SCHREIBER 2002; SILVEIRA, 2011), Knowledge Management is understood as a process, the purpose of which is to create wealth and strategic value in search of competitive advantage for the organization, involving technologies, organizational learning, creativity, the fundamental competencies for construction of knowledge, corporate education, and new methodologies and tools, among other aspects.

## **2.1 Knowledge Management Practices and Strategies**

Knowledge utilization refers to an organization's capacity to exploit its knowledge and by doing so to generate more applications and better results. The utilization of knowledge thereby occurs during the process by which individuals integrate it into their daily practices in the organization.

Leocádio (2011) has stated that the characteristics of the processes of creation, dissemination, and utilization of knowledge can be used to define the Knowledge Management approach adopted, and provide a starting point for identifying and analyzing knowledge practices.

As such, in common with the process of innovation, Knowledge Management is a continuous investigation along a development path and its pillars are the principles of Knowledge Management practices among people in the many different departments of an organization (PARK & KIM, 2005).

However, according to Coombs and Hull (1998), in order to ensure interaction between people, it is necessary to understand an organizational routine as any activity that has some of the characteristics of such. For example, organizational routines are conducted regularly; they are based on formal or informal working patterns; they may or may not have technological support; they enable creation, dissemination, and utilization of knowledge; and, they facilitate fulfillment of the organization's objectives.

Therefore, these formal or informal organizational routines identify how organizations achieve interaction between people, processes, and technologies in Knowledge Management.

In turn, strategic knowledge related to the processes and infrastructure of the organization is employed to acquire, create, and share knowledge for strategy formulation and strategic decision-making, connecting Strategic Knowledge to enact organizational strategy. The organization's knowledge strategy describes the overall approach that the organization intends to take to align its knowledge resources with the intellectual capabilities needed for its strategy, thus reducing the knowledge gap between what the organization needs to know to execute its strategy and what it actually does know (ZACK, 1999, SCHULTZ, 2011).

Bierly and Daly (2002) provide a similar definition, in which the selection of choices made in an organization's knowledge creation encompass its Knowledge Management, and offer the same guidance for creating competitive advantage. Both definitions take into account the convenience of explicit knowledge management with a clear strategic objective. Knowledge Management is almost always adopted unconsciously during the course of the organization's existence (GARAVELLI, GORGOLIONE & SCOZZI, 2004).

Bierly and Chakrabarti (1996) have labeled firms according to the ways that they manage knowledge. They concluded that more aggressive knowledge strategies are characteristic of more innovative companies and are linked with high performance in business. Along the same lines, Zack (1999) proposed two orientations: conservative vs. aggressive, in which conservative organizations are those with a strategic focus on exploiting internal knowledge, whereas aggressive organizations tightly integrate knowledge exploration and utilization without taking account of organizational limits.

Zack's (2009) guidelines are centered on Knowledge Management strategies and his research is widely cited in the field of Knowledge Management. A second area of focus is March's (1991) classification of exploration vs. exploitation or Choi and Lee's (2003) human-oriented vs. system-oriented dichotomy and is related to the distinction between tacit and explicit knowledge (DAVENPORT & VÖLPEL, 2001).

Working with strategy, one discovers the capacity of organizational power, understood as the resources available in the organization, those that it has in reserve and those that it can mobilize to achieve its objectives.

The next subsection presents the OKA method for assessment of knowledge management, which offers dimensions and metrics that will be used to evaluate the Knowledge Management practices of the Santa Catarina State Civil Defense Secretariat.

## **2.2 Methodology for Diagnosis of Knowledge Management**

The World Bank, through the World Bank Institute, developed the Organizational Knowledge Assessment (OKA) methodology as a means for diagnosing of the status of KM in organizations. This tool enables data to be collected on the several different aspects of KM in an organization and facilitated analysis of this data using spider diagrams.

According to Fresneda and Gonçalves (2007), there are three possible strategies for formulating a Knowledge Management Plan from the information collected and, more specifically, from an initial analysis of the final diagram. These are: a) Analyze the organization's weak points, represented by the OKA method dimensions that have been scored lowest, illustrated on the diagram as points closest to the center, and make an action plan on the basis of this analysis; b) Analyze the organization's strong points, represented by the OKA method dimensions that have been scored highest, illustrated on the diagram as extreme points farthest from the center, and make an action plan on the basis of this analysis; and c) Analyze the organization's weak and strong points, as in items (a) and (b) and, on the basis of this analysis, make an action plan that is a combination of the two previous strategies. Irrespective of which of these strategies the organization chooses, account should always be taken of the analysis of alignment between the organization's objectives and the dimensions of knowledge necessary to implementation of a KM plan (FRESNEDA & GONÇALVES, 2007).

It should be pointed out that this method is not related to the classical models, such as Nonaka and Takeuchi's (1995) knowledge creation model, but is a method for assessment of Knowledge Management in an organization, irrespective of whether there are formal or informal Knowledge Management practices or which Knowledge Management model is applied.

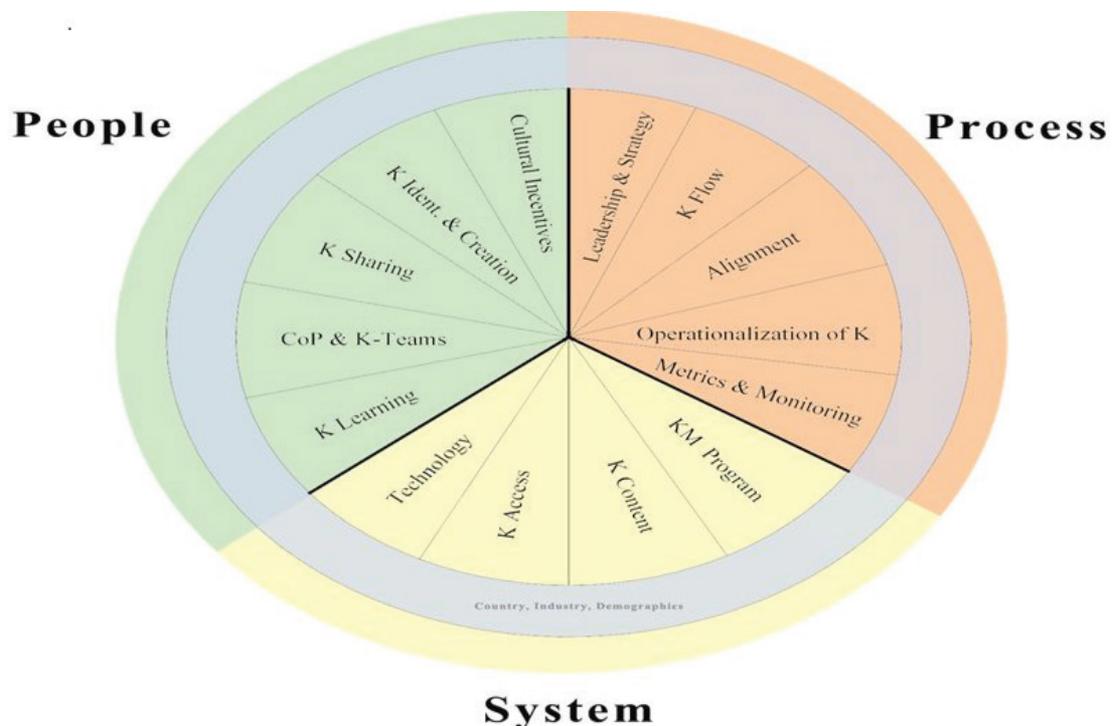
Fresneda and Gonçalves (2007) point out that the majority of organizations under Public Administration do not have a KM plan and need an instrument to develop such a plan. They consider that the Organizational Knowledge Assessment instrument is an appropriate tool for conducting a diagnosis in such organizations and that, working from an analysis of the data collected by applying the OKA method, it is possible to define the strategies and actions to best improve or create an organizational KM Plan.

Wiig (2000) confirms this idea, mentioning that the diagram generated by the OKA method demonstrates the current KM status in the organization and states the diagnosis can be used for countless purposes, such as: KM situation, definition of strategies, prioritization of projects, and identification of needs and opportunities specific to the context of KM.

According to Fonseca (2006), an organization should make efforts to quantify its capacity to identify information, knowledge, experience, and intuition by means of People, Processes, and Systems, in order to achieve its objectives and create value.

The OKA method was developed by the World Bank for assessing whether organizations are adequately employing their intellectual assets (information, experience, knowledge, and skills) to add value to products and services (BRASIL, 2004).

The OKA method is therefore presented as an instrument for quantifying where Knowledge Management impacts occur and which is essentially dependent on three elements that comprise an organization: People, Processes, and Systems (Figure 1).



Source: Fonseca, 2006

Figure 1 illustrates the three basic elements, People, Processes, and Systems, of the OKA method, made up of 14 dimensions of knowledge, which in turn are distributed across 199 questions, scored to attribute a value to each dimension. The dimensions are Cultural Incentives; Knowledge Identification and Creation; Knowledge Sharing; Communities of Practice and Knowledge Teams; Knowledge and Learning; Leadership and Strategy; Knowledge Flow; Operationalization of Knowledge; Alignment; Metrics and Monitoring; KM Technology Infrastructure; Knowledge Access Infrastructure; Content Management; and KM Environment Infrastructure. It is this series of dimensions of knowledge that constitutes the method's key element, and the dimensions are characterized in turn by well-defined metrics that were chosen on the basis of the results of research and studies in the area of Knowledge Management (FONSECA, 2006).

Fresneda and Gonçalves (2007) consider that it is possible to define KM strategies for an organization based on an initial diagnosis conducted using the OKA method and analysis of the data thus collected. The principal contribution of the OKA method is to quantify the organization’s capacity to foster use of information, knowledge, experience, and intuition through people, processes, and systems to achieve objectives and create value (BATISTA, 2008).

The next chapter presents the phases of application of the Knowledge Assessment Methodology (OKA).

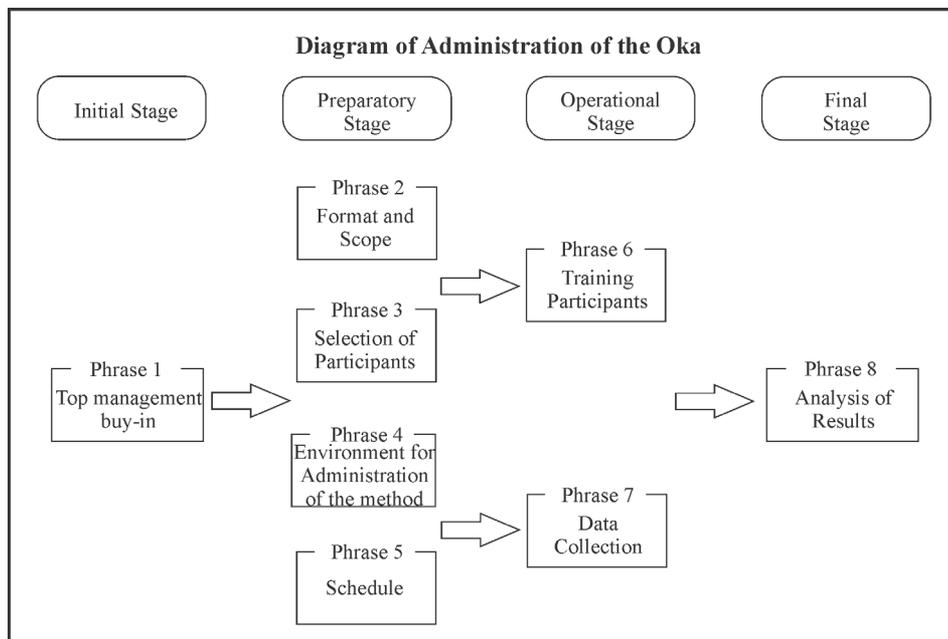
### 3 RESEARCH METHODOLOGY

Exploratory and bibliographic research were conducted as part of this study. The data collection instrument employed was the Organizational Knowledge Assessment (OKA) questionnaire.

Once data collection is complete, the response sets collected using the OKA tool are subjected to a scoring methodology that attributes a numerical value to each of the fourteen dimensions of knowledge assessed. These values are used to generate a spider diagram (Figure 3), which can be analyzed to reveal the virtues and weaknesses of the knowledge resources of the organization assessed and the information contained in this plot serve as a foundation for planning actions related to KM (FRESNEDA et al., 2008).

To facilitate comprehension and administration of the OKA method, it was divided into: initial stage, preparatory stage, operational stage, and final stage (Figure 2).

Figure 2: Phases of administration of the OKA Method



Source: Adapted from Fonseca (2006)

It is important to point out that in the process of administering the OKA method questionnaire, respondents will be selected by organizational departments, enabling several different members of staff to take part. Santa Catarina Civil Defense has well-defined departments, facilitating administration of the method and guaranteeing the quality of the managers’ responses.

## 4 ANALYSIS AND RESULTS

The Santa Catarina Civil Defense Organization was created by law 4.841, on May 18, 1973, affiliated to the Office of the Chief of Staff and reporting directly to the State Governor, who at the time was Governor Colombo Machado Salles. Striving to ensure its citizens' fundamental and constitutional right to safety, the State of Santa Catarina delegates planning of activities to provide permanent defense from emergency situations to the Civil Defense Organization (SECRETARIA DE DEFESA CIVIL, 2015).

The State Secretariat for Civil Defense was created by Supplementary Law 534, on April 20, 2011. Formerly the State Department for Civil Defense, affiliated to the Executive Secretariat for Justice and Citizenship and the State Secretariat for Public Safety and Citizen's Defense, it became a State Secretariat in its own right in May 2011. The structure of the State Secretariat for Civil Defense included two Directorates, one for Prevention and the other for Response, in order to improve implementation of Civil Defense activities and meet the population's needs. On September 27, 2011, Decree 553 created the State Commission for Prevention, Preparation and Rapid Response to Environmental Emergencies Involving Dangerous Products, responsible for implementing and promoting activities for the prevention, preparation and rapid response to environmental emergencies involving dangerous products (SECRETARIA DE DEFESA CIVIL, 2015).

The Santa Catarina Civil Defense Organization works to raise awareness of and increase commitment to actions to reduce the risk of disasters and State Decree 728, of December 13, 2011, created 36 Regional Supervision Bodies for Civil Defense, which will work with the State Secretariat for Regional Development headquarters. However, at the time of writing, only 13 regional supervision bodies were active in the State.

Notwithstanding, the primary function of this decentralization is reduction of the impact of disasters through four distinct types of action: actions for prevention, actions in preparation for emergencies, actions for response to disasters and, finally, actions for recovery from adverse events affecting the State of Santa Catarina. There are also activities to encourage society to pro-actively work to reduce the risk of disasters in conjunction with local government entities and organs.

In view of this, our unit of analysis was the State Secretariat for Civil Defense (SIEDEC), where we administered the 199-item OKA method questionnaire to directors and managers at the Secretariat; a total of 6 members of staff. The results were tabulated as follows: where four to six of the respondents chose the same answer to a question, this was taken as a consensus response and used for analysis. Other questions, for which there was no absolute majority response, were discussed by all six respondents together to arrive at a consensus answer. The resulting responses were then input to the OKA method data collection software.

### 4.1 Diagnosis using the OKA Method

The Organizational Knowledge Management Methodology developed by the World Bank Institute (2014) was selected as the method of choice on the basis of a presentation by Fonseca (2006). The OKA method has proven of great utility as an instrument for diagnosis and for supporting development of a Knowledge Management plan. Additionally, in an indirect manner it also serves as a didactic tool for educating staff members about KM, informing them what KM is and what its importance and benefits are for public sector organizations. The OKA method helps to assess the stage of development of knowledge management in public sector organiza-

tions. As explained by the speaker, the basic structure of the method comprises three elements: people, processes, and systems. These elements are composed of knowledge dimensions, and each dimension of knowledge comprises a set of metrics which, in turn, are linked to questions in a questionnaire (FONSECA, 2006).

According to Fonseca (2006), the OKA method uses the following factors as metrics: the degree to which organizational policies reward knowledge activities; the degree to which the organization is tolerant of innovation-related risk and behavior; the degree to which the organization supports learning activities by employees; the receptiveness of the organization to employee-driven change; the degree of employee participation in improving the organization’s performance; and the degree to which the organization is receptive to external ideas.

The OKA Method results are used to generate a table and a spider diagram. The table was used in the analysis of the elements and their dimensions and the radial chart was used to draw conclusions about the quantitative analysis. The table generated by the OKA tool has 14 rows and two columns. The rows list each of the 14 dimensions of knowledge in the left column and their scores according to the OKA in the right column, showing the differences between each unit surveyed in relation to the degree of KM practice in each dimension. Fonseca’s criteria (2006) were used to transform results into indicators in order to facilitate interpretation and comparison of the table and the spider diagram generated by the OKA (Chart 1).

Chart 1 - Indicators for Metrics

Indices	Grade	Result
0 – 10	Low	Weak point
11 – 20	Medium	Neutral point
21 - 30	High	Strong point
Over 31	Very high	

Source: Fonseca (2006, p.125)

It is important to point out that the dimensions are not necessarily restricted to just one of the three elements (people, processes, and technology), but may impact on two or even all three of them. Fresneda et al. (2008) give the example of knowledge sharing, which is attributed to people, but undoubtedly contributes to technologies and policies (processes). Technology and knowledge sharing policies, in this case, may be included in specific metrics, such as IT Infrastructure and KM Quality Policies.

The interpretation of the results for the State Secretariat for Civil Defense, its dimensions according to the OKA method, and the possible causes are described below.

Table 1 – Result of application of the OKA methodology

SANTA CATARINA STATE SECRETARIAT FOR CIVIL DEFENSE	
Dimensions	Value
Cultural Incentives	19.4
Knowledge Identification and Creation	19.4
Knowledge Sharing	12.6
Communities of Practice and Knowledge Teams	18.3
Knowledge and Learning	42.3
Leadership and Strategy	31.1
Knowledge Flow	11.6
Operationalization of Knowledge	23.8
Alignment	20.3
Metrics and Monitoring	7.1
Knowledge Management Technology Infrastructure	11.0
Knowledge Access Infrastructure	30.0
Content Management	26.8
KM Environment Infrastructure	11.4

Source: The authors.

According to Fonseca (2006), for the purposes of analysis, strong points are those with scores greater than 20 and weak dimensions are those scoring less than 10 (Chart 1). The following overall results were observed for the Civil Defense Secretariat:

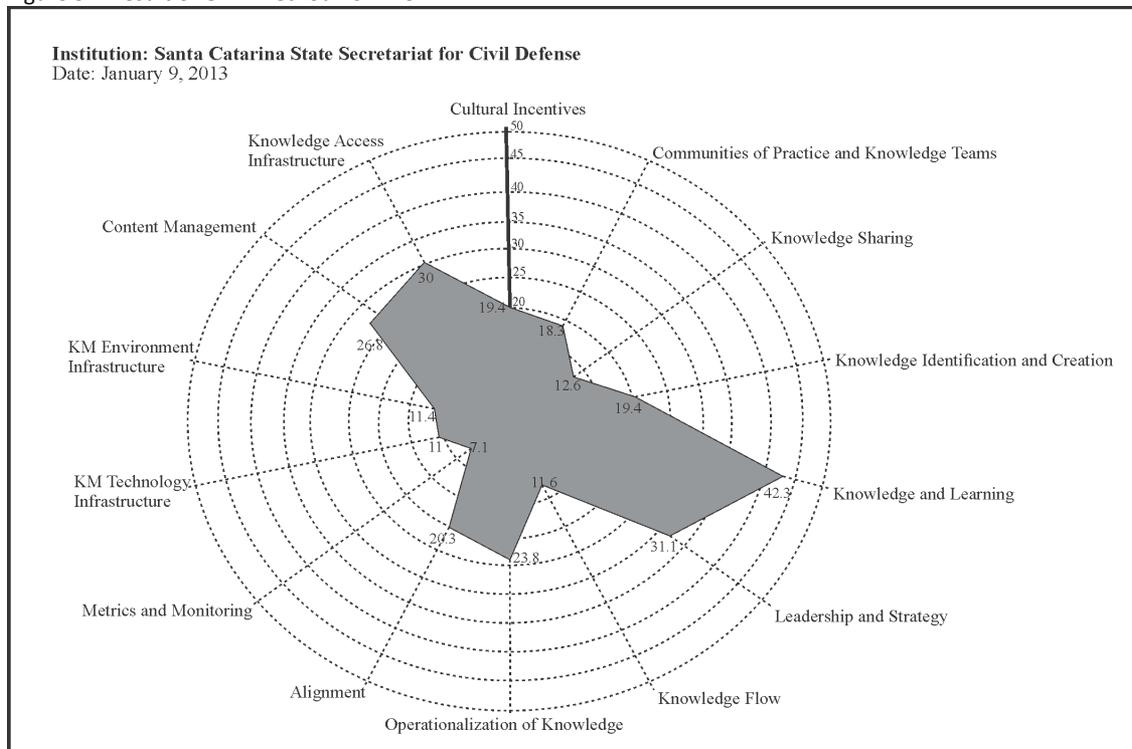
**Strong points:** Alignment (20.3); Operationalization of Knowledge (23.8); Content Management (26.8); Knowledge Access Infrastructure (30.0); Leadership and Strategy (31.1); and Knowledge and Learning (42.3).

**Neutral points:** KM Technology Infrastructure (11.0); KM Environment Infrastructure (11.4); Knowledge Flow (11.6); Knowledge Sharing (12.6); Communities of Practice (18.3); Cultural Incentives (19.4); and Knowledge Identification and Creation (19.4).

**Weak points:** Metrics and Monitoring (7.1).

Analysis of the strong and weak points, working from the final spider diagram (Figure 3) provides detail on the information collected using the OKA methodology, starting from the metrics related to the dimensions and moving on to analyze the responses to the questions that make up these metrics. The Knowledge Management diagnosis obtained by applying these methods is consolidated into a wide-ranging body of information that will make it possible to develop a Knowledge Management Plan aligned with the strategy and objectives of the public sector organization in question.

Figure 3 - Result of OKA Method - SEDEC



Source: The authors.

#### 4.1.1 Element: People

Cultural Incentives (19.4), one of the dimensions analyzed in this element, refers to the implicit and explicit cultural attitudes, beliefs, and incentives that exist within the organization to shape, create, and support the use of intellectual assets to reach its goals (FONSECA, 2006). The result observed was neutral, which was influenced by the training policy. Training policy is individualized and is directly related to the project to which the researcher is allocated. The culture in public sector organizations needs to move towards a culture of sharing. To achieve this, they need strong management leadership, providing tools for Knowledge Management and encouraging use of the system and knowledge sharing, since people must be adequately motivated to contribute their knowledge.

The score for Knowledge Identification and Creation was the same as the previous dimension (19.4), showing that the organization and its controllers do have the capacity to identify and create knowledge and other intellectual assets (PARK, KIM, 2005). This space, does not necessarily have to be physical, because interactions between people can occur by e-mail or other virtual methods, with the objective of encouraging information sharing, knowledge creation, and teamwork.

However, the score for Knowledge Sharing (12.6) shows that the organization and its controllers have a poor capacity for sharing the intellectual assets that enable the organization to achieve its objectives (FONSECA, 2006). This score is the result of the extremely functional and hierarchical structure and the low importance given to construction of social networks for knowledge sharing.

Communities of Practice and Knowledge Teams (18.3) emphasize the existence, nature, and utilization of groups of people within the organization who can effectively leverage the solutions to problems (ROSSETTI & MORALLES, 2012). Indices were regular, because of the lack of incentives for creation of knowledge teams and communities of practice and promotion of creation of collaborative environments.

Contrasting with these was the dimension Knowledge and Learning (42.3), which reflects the existence and capacity of the organization to build human capital through training and other structured or formally-driven knowledge-building activities (FONSECA, 2006). The high score reflects the extent to which the Civil Defense Secretariat is concerned with providing its staff with the training and educational conditions necessary to give them the potential to achieve the organization's objectives. In this dimension, the government is investing heavily to improve the qualifications and training of State Secretariat for Civil Defense staff, with programs in cooperation with other States and in partnership with Federal authorities, aiming to learn from experience acquired in adverse situations.

According to Garvin (2003), learning organizations should be capable of creating, acquiring, and transferring knowledge and of modifying behavior to reflect new knowledge. Thus, since the Santa Catarina Civil Defense Secretariat is an organization for coordination and development, it puts a very high priority on training its staff, as demonstrated in the dimension Knowledge and Learning, which verifies the existence and capacity of the organization to build human capital through formal training or development for knowledge-building.

Notwithstanding, the score of 12.6 shown in Figure 3 for the Knowledge Sharing dimension indicates a need to create programs and stimuli to share intellectual assets with stakeholders, primarily those in other sectors, and a need for dialogue with other areas in the Civil Defense Secretariat. These practices would bring staff together and improve the quality of service provision.

Analyzing all of the dimensions in the People element, it can be observed that all results are classified as medium to high, with a mean score for of 22.4 dimensions in the People element. Thus, according to the OKA method, it can be stated that the organization diagnosed has a strong level of identification, sharing, and learning in relation to Knowledge Management (FONSECA, 2006).

#### **4.1.2 Element: Processes**

Leadership and Strategy (31.1) is one of the dimensions in the Process element, and the high score was interpreted as showing that adoption and execution of Knowledge Management is taken as a management principle by the leadership, with the result that the organization considers KM to be a corporate value, becoming flexible and able to change its own structure and maintain a good relationship between the organization's top and middle management (FONSECA, 2006). To this extent, it can be observed that the Leadership and Strategy dimension expresses the image of the State Secretariat for Civil Defense. The evidence for this finding derives from the fact that the Secretariat has an extremely hierarchical structure and the majority of its staff come from military organizations, such as the Military Police and the Military Fire Brigade, where they perform operational and management roles.

The Knowledge Flow dimension (11.6) is concerned with the entire body of information, data, and relationships that lead people to take decisions, perform tasks, and create new information or knowledge (FIALHO, 2006). Although the score is classed as regular, this is undoubtedly one of the greatest challenges for Civil Defense in the state of Santa Catarina; the organization's capability to enable knowledge and other intellectual assets to flow (including capture, storage,

and dissemination) as a means for delivery to and from the municipal districts for use in prevention of and response to disasters. This integration of corporate strengths will occur if there is articulation of Knowledge Management practices in the categories of people, processes, and systems, enabling people to help to operationalize processes through use of technology, while processes define the functions and needs and elicit the necessary knowledge from people (EDWARDS, 2009).

The Operationalization of Knowledge (23.8) dimension analyzes the organization's capacity to integrate and apply knowledge into its business and operational processes, such as the degree to which the organization's business processes are defined and accessible to its employees (FONSECA, 2006). The values observed indicate that information is available within each project division, but knowledge sharing is not practiced in the organization as a whole.

Put another way, the organization's capacity to integrate and apply knowledge into its business and operational processes was scored high; the Operationalization of Knowledge (23.8) dimension reveals that there is application of knowledge in business and operational processes of the organization, but there is no integration of these processes and knowledge throughout the organization.

Alignment (20.3) measures the degree to which the goals of the KM Program and its outcomes attempt to fulfill or realize the objectives and goals of the organization (FONSECA, 2006). Here the score was high. This occurred even though the Secretariat does not have formal process for Knowledge Management, although because of its specific activities, different actions may be planned and executed in coordination, isolation, or synergy.

The dimension Metrics and Monitoring (7.1) shows that the organization's capacity to manage intellectual assets and monitor and identify best practices, external information, and learning (FONSECA, 2006) is a major counterproductive factor and one that demands greater attention from the Secretariat. The nature and composition of the State Secretariat for Civil Defense means that there are no established indicators for measuring the results of investments in knowledge.

Analyzing the dimensions of the Process element in conjunction, it can be observed that the target organization operationalizes knowledge relatively well, but that the other dimensions in this element, which represent a considerable part of Knowledge Management, had low values, such as, for example, capture, storage, and dissemination of knowledge.

#### **4.1.3 Element: Systems**

In the System element, the KM Technology (11.4) dimension analyzes the existence and capacity of technological infrastructure that enables KM and sharing of best practices. This dimension includes the software, applications, or communication environments, and the telephone and technological infrastructure (FONSECA, 2006). Use of videoconference facilities and the Internet network are assessed. Videoconferencing is employed depending on circumstances in this organization, but it does not have a high-speed data network. Currently, facilities belonging to the Federal University of Santa Catarina are used.

With regard to organizational infrastructure, Davenport and Prusak (2003) emphasize the importance of having a set of functions, organizational structures, and capabilities that benefit each project. To achieve this, the State Government of Santa Catarina has been installing high-speed internet at the Secretariat and Regional centers, increasing bandwidth, thereby improving administrative processes and facilitating training using Distance Learning techniques.

The data collected by the OKA method confirm that a deficiency exists in KM Technology Infrastructure, with a score of 11 points, indicating a neutral point in the Systems element and revealing a need to review the entire IT setup. Another index that scored very low was KM Environment Infrastructure, with 11.4 points, and although both are classified as medium, they are indicative of vulnerability and deficiency and are very close to the cutoff for definition as weak points. Flexibility of IT structure in public sector organizations is positively associated with improved generation and dissemination of information which, in turn, influence the organization's capacity to respond to new demands and challenges (BHATT, EMDAD, ROBERTS, & GROVER, 2010).

Nevertheless, it is important to note the high score for the Systems dimension Knowledge Access Infrastructure (30), which analyzes the capability and infrastructure that enables controllers to access and interact with the organization's intellectual assets (SILVA & MUSSI, 2014). One way of understanding this good performance indicated by the OKA method is to relate it to the fact that the Secretariat has a software environment that is adequate for its organizational requirements, including institutional search software and applications for day-to-day administrative use. Nevertheless, it was also found that the Civil Defense has few administrative processes to manage records or files to construct an organizational memory. Notably, there were no incentives for knowledge sharing between employees, only a few informal practices, which go unnoticed by the employees. This is confirmed in the Content Management dimension, which was scored at 26.8, and in which significant values showed that content is created within the organization, notably with intellectual assets, but it is explored and shared little and very often many employees do not know that these assets exist and there is little concern with the means of recording knowledge or information.

The Content Management dimension (26.8) covers the types of content and the information management tools that the organization produces or administers to conduct knowledge management (FONSECA, 2006). This dimension had a very high score in relation to the other dimensions, but since the target organization does not have a formal KM program, it does not have the adequate technological infrastructure for Knowledge Management.

The KM Environment Infrastructure (11.4) dimension analyzes the nature, design, and capacity of the KM Environment Infrastructure, involving people, units, and groups in the organization (FONSECA, 2006). The overall score was 11.4, which translates to an intermediate result. While the organization does have some functional mechanisms for management of knowledge, such as a recently implemented electronic document management system, some internal information is available via the network, and there is a program for accessing standards for drawing up technical specifications for projects, it can nevertheless be concluded that the organization does not have a formal knowledge management program.

## 5 FINAL COMMENTS

Knowledge Management in an organization should be the fruit of strategic management, taking into account all of its aspects, to achieve the best result possible and to obtain all of the benefits that it can provide. Knowledge Management initiatives have the potential to aid organizations in identifying, acquiring, developing, sharing, and utilizing the knowledge and expertise of their employees and the knowledge created within and beyond the organization.

Thus, Knowledge Management is also very important in the public sector, where the objective is to improve the way the public machinery functions and increase the efficiency of the services provided to the public. It is necessary to define knowledge policies to help public sector

organizations to implement their strategies if knowledge is to be made a basic resource in the search for effectiveness in public sector activities in Brazil.

This article contributes to an improved understanding of Knowledge Management practices in public organizations by attempting to identify the Knowledge Management practices of the State Secretariat for Civil Defense. A stand-out point in these results is the positive factor of the Knowledge and Learning dimension, in which it was found that the organization has the capacity to construct Human Capital using a diverse range of training and education programs, primarily since it entered into partnership with the federal University of Santa Catarina's University Center for Disaster Studies and Research, where work has been carried out to develop programs for mapping areas of risk and for training staff all over the State of Santa Catarina, in all of its municipal districts.

Another positive point worth highlighting is the Leadership and Strategy dimension, since the organization's structure is highly hierarchical, the majority of its staff are from military organizations such as the Military Police and the Military Fire Brigade, which are institutions that take hierarchy and discipline as basic principles. Nevertheless, it was observed that certain strategic roles are filled on the basis of military rank. To a certain extent, this could lead to age being preferred over values of competency, creating disincentives for other members of staff who do not fit this context of originating from military organizations.

Another finding that merits mention is in the People element, in which there is a cultural challenge that needs to be worked through communities of practice, and strong leadership is needed, with support from the appropriate tools, so that managers can lead the program, encouraging and guiding their staff to contribute, sharing knowledge throughout the State Secretariat for Civil Defense.

In the case studied, it was found that the organizational culture and a lack of deeper knowledge in relation to KM techniques are the factors that have the greatest impacts on formalization of Knowledge Management practices.

Obstacles that need to be overcome in order to enable implementation of a KM program in the Santa Catarina Civil Defense include: Top management recognition of the importance of KM in the area of Civil Defense; the need to improve the Information Technology and Communications infrastructure, and for Systems specifically for management throughout the Secretariat; the lack a program to train employees in KM; a lack of understanding of Knowledge Management among top and middle managers; failures in communication tools; individualistic attitudes detrimental to the group; and a lack of incentives for knowledge sharing.

Thus, by means of this study of the Santa Catarina State Civil Defense Secretariat, it proved possible to make a diagnosis of its Knowledge Management practices and, on the basis of the data collected, to design a Knowledge Management Program. However, it is important to point out that many practices are already being conducted in different sectors and the major challenge is to move from informality to a daily process of knowledge sharing, as a means of integrating and implementing KM throughout the Secretariat and its 36 Regional Civil Defense Supervision Bodies, providing better responses to disasters and contributing to reestablishment of social normality in their aftermath.

Despite the importance of the results observed here, application of the OKA methodology should be suggested and considered for future investigations, since even though all of the sectors and their managers were included, the method could be administered to the remainder of the workforce, enabling comparison of results across the different functional levels of the Civil Defense Secretariat. Thus, it can be reiterated that the principal contribution of this study

is demonstrating how KM practices are conducted which, amidst a conjunction of interactions, albeit informal, illustrates organizational deficiencies and values and is indispensable to the process of construction of KM.

From an academic perspective, it is left as a challenge for future studies to continue this project, working from the results observed to implement a Knowledge Management Program and adopt mechanisms for measuring KM performance in Santa Catarina Civil Defense, extending studies to all regions of the State.

## REFERENCES

- ANSUATTIGUI, R.V; PITHON, A.J.C. Aplicação do Método OKA em Redes Colaborativas de Autoria. In: **XXXI ENCONTRO NACIONAL DE ENGENHARIA DE PRODUÇÃO (ENEGEP)**, p. 1-12, Belo Horizonte, 2011.
- BATISTA, F. F; QUANDT, C. O; PACHECO, F. F; TERRA, J. C. C. **Gestão do Conhecimento na Administração Pública**. Texto para discussão n. 1095. Brasília: IPEA, 2005.
- BHATT, G. D. Knowledge Management in organizations: examining the interaction between, technologies, techniques, and people. *Journal of Knowledge Management*, v. 5, n. 1, p. 68-75, 2001.
- BHATT, G. D; EMDAD, A; ROBERTS. N. & GROVER, V. Building and lever-aging information in dynamic environments. *Information & Management*, 47(7-8), p. 341-349, 2010.
- BIERLY, P, CHAKRABARTI, A. Generic knowledge strategies in the US pharmaceutical industry. *Strategic Management Journal*, p. 123–135, 1996.
- BIERLY, P. & DALY, P. Aligning human resource management practices and knowledge strategies: Atheoretical framework. In: C.W. Choo & N. Bontis (Eds.), The strategic management of intellectual capital and organizational knowledge. *Oxford University Press*, 2002.
- BOFF, L. H. Conhecimento: Fonte de riqueza pessoas e organizações. *Fascículo profissionalização*, v. 22, 2000.
- BRASIL. **Comitê Executivo do Governo Eletrônico**. Oficinas de planejamento estratégico: relatório consolidado. Brasília, 2004.
- BUKOWITZ, W. R; WILLIAMS, Ruth L. **Manual de Gestão do Conhecimento**: ferramentas e técnicas que criam valor para a empresa. São Paulo: Bookman, 2002.
- CALHEIROS, L. B; CASTRO, A. L. C. e DANTAS, M. C. **A Implantação e Operacionalização de Comdec**. Ministério da Integração Nacional, Secretaria Nacional de Defesa Civil. Brasília, 2009.
- CHOI, B; LEE, H. An empirical investigation of KM styles and their effect on corporate performance. *Information & Management*, 40(5), p. 403–417, 2003.
- COOMBS, R; HULL, R. Knowledge management practices and path in innovation. *Research Policy*, p. 27, 1998.

CRUZ, T. **Gerência do conhecimento**. São Paulo: Cobra, 2002.

DAVENPORT, T. H; PRUSAK, L. **Conhecimento empresarial**: como as organizações gerenciam o seu capital intelectual. Rio de Janeiro: *Elsevier*, 2003.

DAVENPORT, T. H, VÖLPEL, S. The rise of knowledge towards attention management. *Journal of Knowledge Management*, 5(3), 212–221, 2001.

EDWARDS, J. S. Business processes and Knowledge management. In M. Khosrow-Pour, *Encyclopedia of Information Science and Technology*, 2 ed. v. 1, Hershey, PA: Igi Global, 2009.

FIALHO, F. A. P; MACEDO, M; SANTOS, N; MATIDIERI, T. C. **Gestão do Conhecimento e aprendizagem**: as estratégias competitivas da sociedade pós-industrial. Florianópolis: *Visual Books*, 2006.

FONSECA, A. F. Organizational Knowledge Assessment Methodology. Washington, DC: *World Bank Institute*, 2006.

FONSECA, A. F; TORRES, M. F. P; GARCIA, J. C. R. Definição de Referências e Adequação do Uso do Método OKA na Medição dos Elementos Necessários para Gestão do Conhecimento em Organizações de Pequeno e Médio Porte. **II Simposio Iberoamericano em Generación, Comunicación y Gerencia del Conocimiento**: GCGC 2010.

FRESNEDA, P. S. V; GONÇALVES, S. M. G. **A experiência brasileira na formulação de uma proposta de política de Gestão do Conhecimento para a Administração Pública Federal**. Brasília. Câmara dos Deputados, Coordenação de Publicações, 2007.

FRESNEDA, P. S. V; GONÇALVES, S. M. G; PAPA, M; FONSECA A. F. Diagnóstico da Gestão do Conhecimento nas Organizações Públicas Utilizando o Método Organizational Knowledge Assessment (Oka). In: **II Congresso Consad de Gestão Pública – Painel 20: Gestão do Conhecimento e inovação para a melhoria da gestão pública**, 2008.

GARAVELLI, C; GORGOGNONE, M; SCOZZI, B. Knowledge management strategy and organization: A perspective of analysis. *Knowledge and Process Management*, p. 273–282, 2004.

GARVIN, D. A. Building a learning organization. *Harvard Business Review*, 71(4), jul-aug. 2003.

GROTTO, D. **Um olhar sobre a Gestão do Conhecimento**. Revista de Ciências da Administração. Florianópolis, ano 3, n. 6, p. 31-37, 2001.

LEOCÁDIO, L. C. S. **Mecanismos de Coordenação e práticas da Gestão do Conhecimento na Rede de Valor Terceirizada**: Estudo no Setor Elétrico, 2011. 169 p. Tese Departamento de Engenharia e Gestão do Conhecimento, UFSC, Florianópolis, 2011.

MARCH, J. G. **Exploration and exploitation in organizational learning**. *Organization Science*, 2(1), 71–87, 1991.

MARCONI, M. A; LAKATOS, E. M. **Fundamentos de metodologia científica**. 6ª ed. São Paulo: Atlas 2005.

NONAKA, I; TAKEUCHI, H. **The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation** (Hardcover). New York: *Oxford University Press*, 1995.

\_\_\_\_\_. **Criação de conhecimento na empresa**: como as empresas japonesas geram a dinâmica

da inovação. Rio de Janeiro: Campus, 1997.

PARK, Y; KIM, S. Linkage between knowledge and R&D management. *Journal of Knowledge Management*, v. 9, n. 4, 2005.

PEREZ-SOLTERO, A, VALENZUELA, M.B. SANCHEZ-SCHMITZ, F.M.R, PALMA-MENDEZ, J.T. & VANTI, A.A, Knowledge Audit Methodology with Emphasis on Core Processes. **European and Mediterranean Conference on Information System (EMCIS)**, Costa Blanca, Alicante, Spain, 6-7 July, 2009.

PINSKY, V. C.; KRUGLIANSKAS, I. Gestão estratégica da sustentabilidade e inovação. Rev. Adm. UFSM, Santa Maria, v. 6, número 3, p. 465-480, set. 2013.

ROSSETTI, A, & MORALES, A. B. Sistemas de computação do usuário final: apoio direto à computação para produtividade do usuário final e colaboração de grupos de críticas para a alta gerência. Sistemas especialistas: conselho especializado baseado em conhecimento para os usuários. *Knowledge Management*, p. 1-10, 2012.

SANTOS, I. C; AMATO NETO, J. **Gestão do Conhecimento em Indústria de Alta Tecnologia**. v. 18, n. 3, p. 1-13, 2012.

SCHREIBER, G. et al.. Knowledge engineering and management: the commonKADS methodology. *MIT Press*, 2002.

SCHULTZ, M. & Jobe, L. A, Codification and tacitness of knowledge management strategies: An empirical exploration, *Journal of High Technology Management Research* 12(1), p. 139–166, 2011.

SECRETARIA DE DEFESA CIVIL. **A Estrutura da Secretaria de Defesa Civil em SC**. Disponível em: <http://www.defesacivil.sc.gov.br/>. Acesso em: 27 jun 2015.

SILVA, I; MUSSI, C. Tecnologia da Informação, Criação e Compartilhamento do Conhecimento: Um Estudo do Sistema Integrado de Segurança Pública em Santa Catarina. Rev. Adm. UFSM, Santa Maria, v. 7, número 1, p. 81–100, mar. 2014.

SILVEIRA, R. R. **Diretrizes para mitigar as Barreiras à Implementação da Gestão do Conhecimento em organizações**. 2011, p. 221, Tese Engenharia e Gestão do Conhecimento, UFSC, Florianópolis, 2011.

WIIG, K. M. Introducing Knowledge management into the enterprise. In: LIEBOWITZ, Jaz. *Knowledge management handbook*. USA, CRC press LLC, 2000.

WORLD BANK INSTITUTE. **About the World Bank Institute**. Disponível em: <http://go.worldbank.org/53LOBQ2OK0>. Acesso em: 20 abril 2014.

ZACK, M. H. Developing a knowledge strategy. *California Management Review*, v. 41, n. 3, p. 125, 1999.