# Knowledge Management Implementation: a Process Design Proposition at Brazil's ONS (National Operator of the Interconnected Power System)

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**Abstract:** The implementation of Knowledge Management (KM) processes has been long overlooked in the KM literature. This paper describes and analyzes the implementation of a KM process within the Brazilian organizational context based on a theoretical framework entitled "The SET KM Model". Both propositions – a process design for KM Implementation and "The SET KM Model"- came out as results of different sets of studies and researches conducted by two of the authors within the past decade. The methodology, qualitative in nature, is based on the study of multiple cases with incorporated units of analysis and three criteria were observed for the judgment of the quality of the research project: validity of the construct, external validity and reliability. Multiple sources of evidence were used – semi-structured interviews, extensive documental research, direct observation and participant observation – and data analysis consisted of three flows of activities: data reduction, data displays and conclusion drawing/verification. Among others, the case study conducted at ONS is highlighted in order to discuss a successful implementation experience in its early stages. The results confirmed the frameworks proposed and the conclusions suggest that (i) within KM, what is managed it's not knowledge itself, but solely the context where knowledge emerges and is socially constructed (ba) and (ii) KM implementation processes should be developed around strategic organizational issues and involve key knowledge activists in the organizations, mainly middle-managers composing a governance committee supported by top administration.

**Keywords:** Knowledge Management; Knowledge Management implementation; KM in interconnected power systems; the SET KM model; ba

## 1. Introduction

Knowledge Management is a controversial, complex and multifaceted subject. In spite of the fact that the term is not yet stable, there's been a growing interest worldwide within the past two decades - from academics to practitioners - in the management of knowledge and its related topics, such as "organizational epistemology" (TSOUKAS, 2005), "knowledge creation processes" (CHOO, 1998), "knowledge-based theory of the firm" (GRANT, 1996; NONAKA, VON KROGH and VOELPEL, 2006), "the concept of ba" (NONAKA and KONNO, 1998) and "enabling conditions" (VON KROGH, ICHIJO, NONAKA, 2000; VON KROGH, 1998)", "knowledge tools" (BONTIS et al., 1999), "knowledge types" (BLACKLER, 1995), "knowledge assets" (BOISOT, 1998) and "knowledge taxonomies" (ALAVI and LEIDNER, 2001),among others

KM initiatives have been adopted worldwide with distinct conceptions, objectives, practices, emphases and metrics (ALVARENGA NETO 2005). There has been successful initiatives reported on qualitative studies (ALVARENGA NETO, 2005, 2008), elegant quantitative studies on specific aspects (CHOU and WANG, 2003), in-depth case studies (PELTOKORPI et al, 2007) and deviate studies that combine myopia, territory defense and solely IT as the core concept (SOUZA and ALVARENGA NETO, 2003).

In our researches within the last ten years, concerning the management of knowledge in world-class organizations, we have come out and discussed similar topics and approaches, but above all, we have stressed out two main concerns: (i) a long standing misinterpretation that considers knowledge management and information management (IM) as synonyms. We shall call this "information reductionism", as the "map is not the territory" (TSOUKAS, 2005; WEICK, 1979). IM is just one of the components of KM, as KM also incorporates other concerns such as to the creation, sharing and


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enabling condition for organizational knowledge (Alvarenga Neto, 2008); (ii) a long overlooked topic in the KM literature: KM implementation processes (Alvarenga Neto, 2005).

As we have already addressed the first concern in different publications within the past decade, we have decided to move on and examine/discuss the implementation of KM processes. To justify our decision, we argue that the literature concerning this specific topic is scarce or mainly publicized with commercial interests (consulting and IT firms) and, uttermost, there is a knowing-doing gap concerning a process that is highly embedded and firm-specific. Therefore, our goal in this paper is to describe and analyze the implementation of a KM process within the Brazilian organizational context based on a theoretical framework entitled "The SET KM Model". Both propositions – a process design for KM Implementation and "The SET KM Model"- came out as results of different sets of studies and researches conducted by two of the authors within the past decade. A case study applying our propositions has been successfully conducted - and will be highlighted, although still in early stages – at ONS, a Brazilian organization responsible for operating the national interconnected power system.

The psychologist George Miller in his famous article "*The Magic Number Seven Plus or Minus Two: Some Limits in Our Capacity for Processing Information*" suggested the inclination human beings have to classify things into seven due to the fact that this magic number reflects the chunks of information we are able to store in our short-term memories. We too, somehow, serendipitously, ended up in this paper with such a "*pernicious Pythagorean coincidence*" (Mintzberg, 1989), as it is structured around Miller's magical number: (i) this introduction, (ii) our proposition of a theoretical framework for KM (The SET - **S**trategy-**E**nvironment-**T**oolbox - KM Model", (iii) a process design proposition for the implementation of KM, (iv) an implementation case study at Brazil's ONS, (v) conclusions and (vi) references.

The proposition and results shall be presented in the lines below.

## 2. A theoretical framework for KM: the "SET KM Model" as a dynamic model to unify the trinity of strategy (knowledge vision) - environment (enabling context) - toolbox (action)

Alvarenga Neto (2005, 2008), Souza and Alvarenga Neto (2003) and Alvarenga Neto, Souza, Barbosa and Neves (2008) proposed a KM integrative conceptual mapping proposition as a result of their researches of multiple case studies in world class organization within the past decade. The multiple case studies involved KM initiatives of 23 international firms, such as 3M, Dow Chemical, Xerox, PricewaterhouseCoopers, Siemens, CTC (Sugarcane Technology Center), Ernst & Young, British Telecom, Microsoft, Novartis and Chevron, among others. This so called "KM Integrative Conceptual Mapping Proposition" was further developed by one of the authors within his work at Fundação Dom Cabral – a Brazilian business school - into a comprehensive KM model used as theoretical framework for executive education and consulting services in many different best-in-class organizations within the Brazilian organizational context such as Embrapa, Anglo America, Mittal Steel, Astra Zeneca, the Linde Group, NEC, Petrobras, Prosegur, Santander- ABN Amro Bank and local state governments, among others. Henceforth, this model is entitled 'the SET KM Model", a dynamic model to drive the KM strategy into action by unifying the trinity (i)**S**trategy (knowledge vision, knowledge as a potential to act and knowledge as a commitment to act), (ii)**E**nvironment (the enabling context for knowledge creation, hereafter "ba") and (iii) **T**oolbox (the IT tools and managerial practices used to drive the organizational knowledge strategy into action).

As mentioned above, the SET KM Model is grounded on three basic conceptions, as for now explained in details, that is to say: (i) Strategy – a strategic conception of organizational information and knowledge, as proposed by Choo (1998) in his "Knowing Organization Model"; (ii) Environment - the creation of an enabling context or "ba" - the "shared contexts in motion" where organizational knowledge is created, shared and utilized - plus the enabling conditions that should be provided by the organizations to energize and support its different ba types (care, trust, commitment, lenience in judgment, tolerance to 'honest mistakes', openness to multiple and conflicting mind-sets, etc.) as suggested by Nonaka and Konno (1998), Von Krogh, Ichijo & Nonaka (2001) and Alvarenga Neto (2005, 2008); (iii) Toolbox - the provision of IT tools and managerial practices/processes to drive the strategy into action: intranets, portals, information systems, processes for information management, "yellow pages", best practices repositories, places for face-to-face interaction, front line contact with customers and other external environment's actors, informal circles, storytelling, communities of practice, OJT and other practices of organizational learning, among others.

 

These conceptions will be thoroughly discussed below:

**i) The SET KM Model Part I: a strategic conception for information and knowledge use in organizations**

Choo (1998) asserts that the "knowing organizations" are those which use information strategically in the context of three arenas, namely, (a) sense making, (b) knowledge creation and (c) decision making. These three highly interconnected processes play a strategic role as to the unfoldment of the organization's knowledge vision, it's potential to knowledge creation and its commitment into taking knowledge creation to the utmost consequences. Concerning (a) Sense making, its long term goal is the warranty that organizations will adapt and continue to prosper in a dynamic and complex environment through activities of prospecting and interpretation of relevant information enabling it to understand changes, trends and scenarios about clients, suppliers, competitors and other external environment actors. Organizations face issues such as the reduction of uncertainty and the management of ambiguity.

(b) Knowledge creation is a process that allows an organization to create or acquire, organize and process information in order to generate new knowledge through organizational learning. The new knowledge generated, in its turn, allows the organization to develop new abilities and capabilities, create new products and new services, improve the existing ones and redesign its organizational processes. This process reveals the organization "potential to act".

The third component of Choo's (1998) model involves (c) decision-making. The organization must choose the best option among those that are plausible and presented and pursue it based on the organization's strategy. Decision making process in organizations is constrained by the bounded rationality principle, as advocated by March & Simon (1975). Many inferences can be made upon the decision making theory, Choo (1998) lists a few of them: (i) the decision making process is driven by the search for alternatives that are satisfactory or good enough, rather than seeking for the optimal solution; (ii) the choice of one single alternative implies in giving up the remaining ones and concomitantly in the emergence of trade-offs or costs of opportunity; (iii) a completely rational decision would require information beyond the capability of the organization to collect, and information processing beyond the human capacity to execute. The decision-making process results in the organization commitment for action.

It's imperative to take Choo's (1998) strategic conception of the Knowing Organization model and place it in the context of organizational levels/structure as a way to incorporate it into organizational KM (or KM Models, such as the "SET KM Model" presented here) as shown in FIGURE 1 at the end of this section.

Knowing what to do is not enough (PFEFFER and SUTTON, 2000) as the firm must turn its knowledge into action. As one can note in FIGURE 1, the tactical level "stands/sits" in between the strategic and operational levels. Our argument here is that in between the strategic intentions and visions of top-management, and the chaotic reality of operational level workers, the role of leadership in the tactical level is to create an environment that not only enables, but mainly energizes the creation and sharing of organizational knowledge. Hereafter, the environmental conditions may be translated into the Japanese concept of ba (NONAKA & KONNO, 1998; NONAKA, VON KROGH and VOELPEL, 2006). Therefore, ba is the bridge that links strategy to action and this re-defines the role of leadership of middle-managers in the means of knowledge enablers or knowledge activists. This conception will be discussed as part II of "the SET KM Model"

**ii) The SET KM Model Part II: "Environment"- the creation of ba or/and an enabling context for organizational knowledge creation and sharing**

The concept of ba was first introduced in the management literature by Nonaka and Konno (1998) and further developed and enhanced until Nonaka, von Krogh and Voelpel's (2006) inclusion of the concept into a comprehensive, yet contested (TSOUKAS, 2005; SNOWDEN, 2003), knowledge-based theory of the firm. We argue that knowledge without a context is meaningless. Knowledge needs a context to be created and this context is ba. According to Nonaka et al. (2006): ba is defined as a shared context in motion in which knowledge is created, shared and utilized; it can be physical

(office space, dispersed business unit), and/or virtual (e-mail, videoconference) and/or mental (shared ideals and ideas); it can emerge in individuals, working groups, project teams, informal circles and front-line contact with customers; there are four types of ba (originating, interacting or dialoguing, cyber or systemizing, exercising) each of which corresponding to each one of Nonaka and Takeuchi's (1995) SECI model of knowledge creation.

To the concept of ba, knowledge activists should add the enabling conditions (e.g., care, trust, commitment, lenience in judgment, tolerance to 'honest mistakes', manage conversations, among others) that must be provided by the organization to energize and support its different types of ba. It's a *sine qua non* condition to highlight the fact that "ba" and enabling conditions" are not synonyms, but rather complementary concepts. The different types of ba need different types/combinations of enabling conditions. The creation of organizational knowledge is, in fact, the augmentation of knowledge created by individuals, once fulfilled the contextual conditions that should be supplied or enabled by the organization. This is what Von Krogh, Ichijo & Nonaka (2001) call the enabling conditions for knowledge creation and sharing. Alvarenga Neto's (2005, 2008) definition of "enabling context" mirrors von Krogh's et al. (2001) and Nonaka's et al. (2006) conceptions: *the propitious conditions created by the organization in order to favour, stimulate and reward sharing, learning, upcoming of new ideas and innovation, tolerance to "honest mistakes" and collaborative problem solving*. It's Alvarenga Neto's (2008) argument that "ba" and "enabling conditions" are needed in the tactical level – and achieved through middle-managers' leadership - in order to bridge the existing gap between strategy and action. In this context, the understanding of the word "management" when associated with the word "knowledge" should not mean control, but promotion of activities of knowledge creation and sharing in the organizational space. Hence, KM assumes a new hermeneutic perspective – from knowledge as a resource to knowledge as a capability, from knowledge management to a management towards the context where knowledge emerges and is socially constructed. Nonaka & Takeuchi (1995) and Von Krogh, Ichijo & Nonaka (2001) also list other elements that shape the enabling context, namely: creative chaos, redundancy, layout, organizational culture and human behavior, leadership, intention or vision of future and empowerment, not to mention organizational structure and layout, among others.

**iii) The SET KM Model Part III: "Toolbox"- the provision of IT tools and managerial practices/processes to drive the organizational knowledge strategy into action**

Last but not least, the "toolbox" metaphor assumes that knowledge workers need managerial practices/processes and IT tools to leverage the knowledge that exists solely in one's cognition and "in the magic space" between creative heads in synergy of purposes and action. We advocate that out of people's heads and out of a context (ba), knowledge is not only meaningless, but also equaled to information. KM encompasses in its aegis many themes, managerial approaches/processes/practices and IT tools that concern the use of information and knowledge in the daily activities of the knowing organization. Alvarenga Neto (2005, 2008) highlights a few of these processes and tools encompassed under KM initiative/processes in the firms considered in his studies, which he named the "KM Umbrella Metaphor": 'strategic information management', 'IT', 'intellectual capital', 'organizational learning', 'competitive intelligence', 'communities of practice', among others. These knowledge tools in a knowledge toolbox are orchestrated – solo and collectively – in the daily and creative routines of firms committed to the management of knowledge. The use and emphasis will vary depending on directions provided by the strategic level and coordinated/enabled by middle-managers in the tactical level. For example, if a organization focuses its strategy in the sense making arena - in order to collect and interpret information concerning the different actors of the external environment - it can rely – at the operational level – in specific tools for achieving action coordination, such as competitive intelligence or market research. The same thing applies when the firm focuses on the strategic arena of knowledge creation – communities of practice and spaces/approaches to organizational learning practices are tools that drive the strategic concept "knowledge creation" into action. It's exactly the interrelation and permeability between those many themes that enable and delimitate the upbringing of a possible theoretical framework which can be entitled "the SET KM Model".

Figure 1 illustrates the "SET KM Model" as a multifaceted organizational process that involves (i) a strategy, (b) the creation of an organizational environment or space for knowledge - known as the "enabling context" or the Japanese concept of "ba" - which in its turn is quintessential to bridge the gap between organizational strategy and organizational action and (iii) an operational/action toolbox

 

consisting of IT tools and managerial practices to effectively put the strategy into action. Hereafter, we'll substitute the tactical level for "environment" and the operational level for "toolbox":

Figure 2 updates Alvarenga Neto's (2005, 2008) original integrative conceptual map. This ontology is an evolution of the studies of the authors (SOUZA & ALVARENGA NETO, 2003; ALVARENGA NETO, 2005, 2008) and was used both as a theoretical framework and a guide for field research and data collection, and shows the levels of strategy, environment ("ba", or the enabling context), along with the IT tools and managerial practices/processes found in the firm's knowledge toolbox:

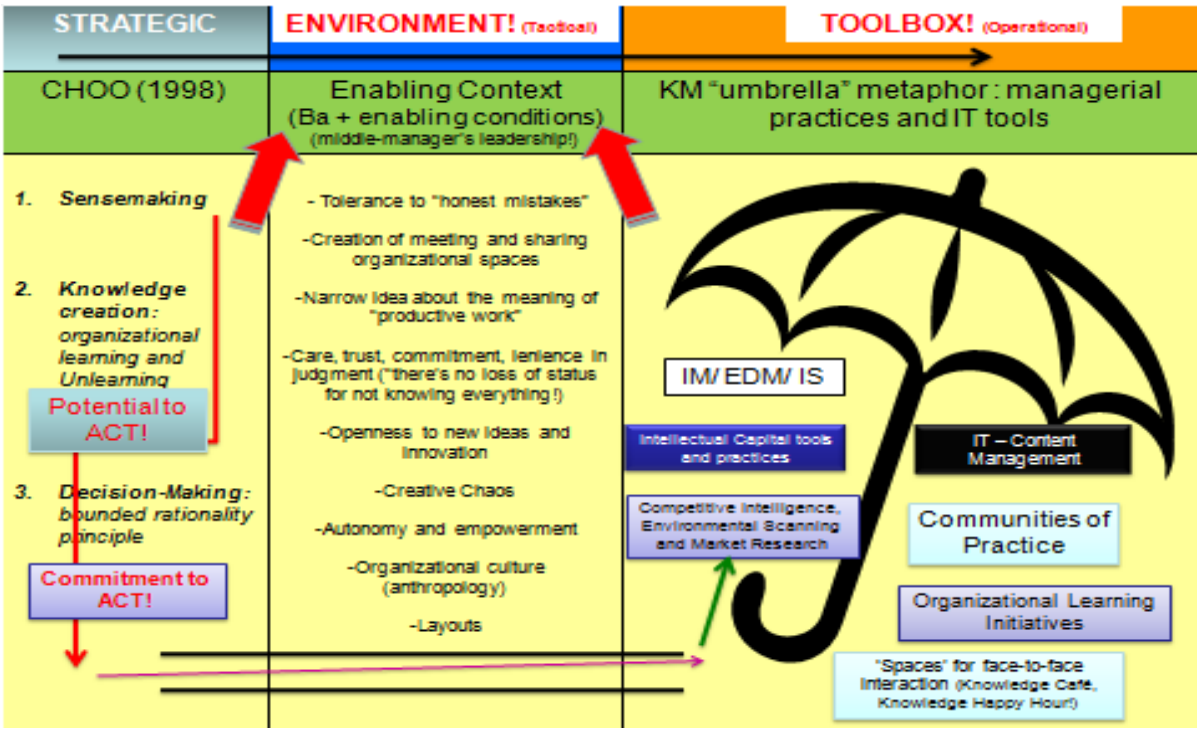


**Figure 1**: THE SET KM model – source: Alvarenga Neto, 2008

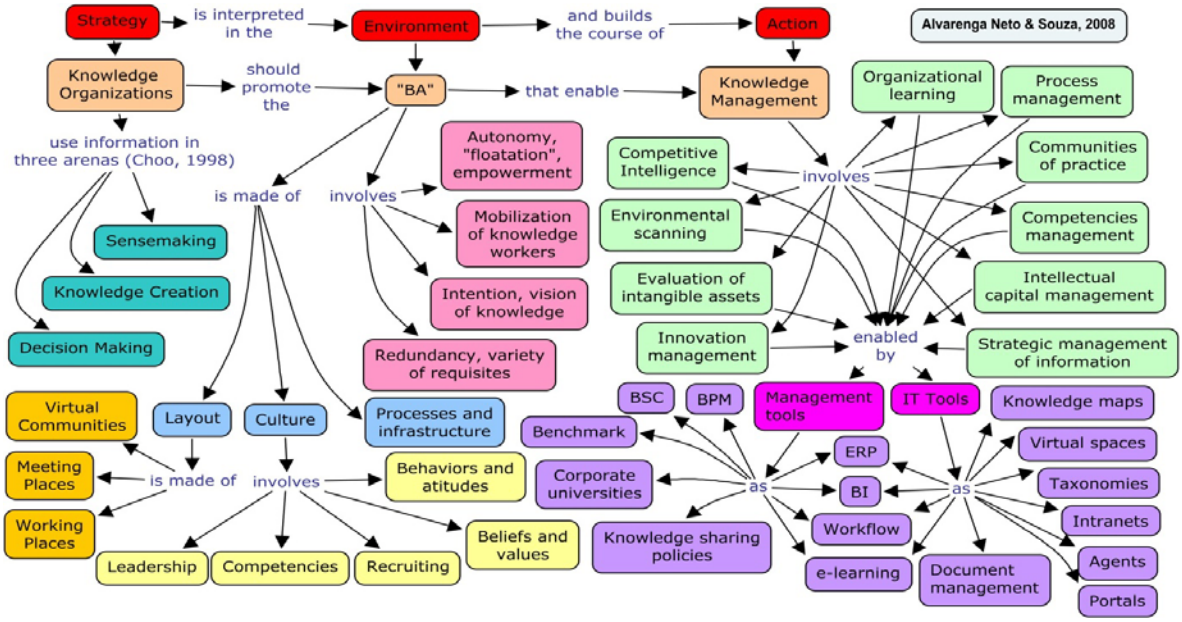


**Figure 2** KM: Alvarenga Neto and Souza's update to Alvarenga Neto's original KM integrative conceptual map (Alvarenga Neto & Souza, 2008)

The "SET KM Model" was used as the basis for the development of a process design proposition useful in the implementation of a KM process. We'll advance in this discussion in the next section.

## 3. KM implementation: a process design proposition

Our proposition of a process design for the implementation of KM initiatives derives from the "SET KM Model" proposition. It is made of 7 generic parts (Figure 3) that can be interchangeable, added, excluded, combined, re-defined and "served as you like", considering the specificities of each individual organization. We have no assumptions – as we do not take it for granted - of it as being a hermetic or highly prescriptive process. It's just a starting point than can be used to aid managers involved with KM implementation.

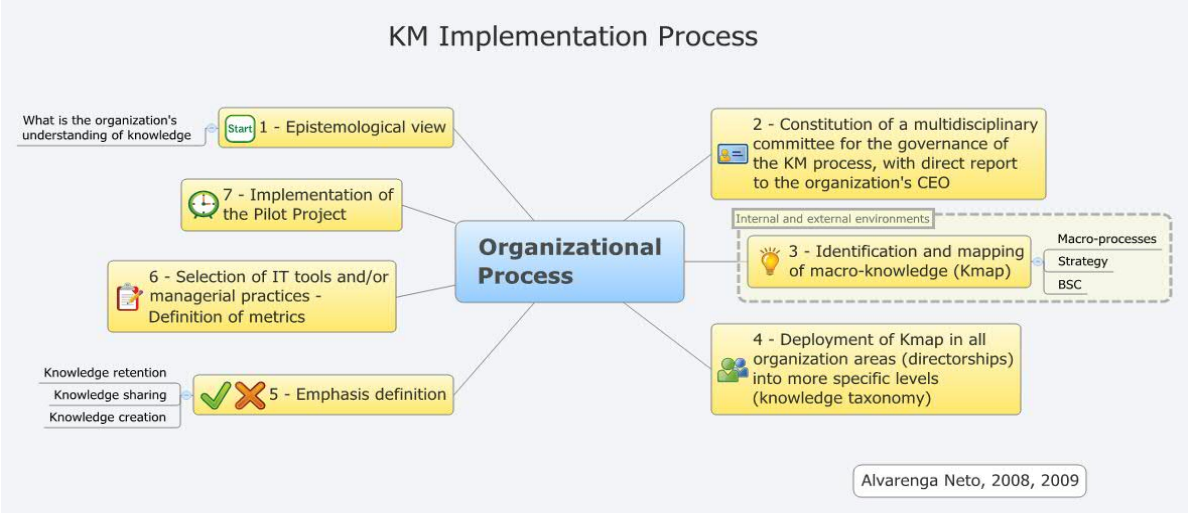


**Figure 3:** A process design for the implementation of KM. source: Alvarenga Neto, 2008.

We'll briefly explain each of the seven basic parts and, in the next section, describe and analyze its application on a single case study at Brazil's ONS:

- Epistemological view: the organization needs to define its own understanding of knowledge and information and how these two concepts differ (or not!). This is useful in building a common vocabulary in the organization. E.g.: at Siemens Brazil, explicit knowledge is equal to information, while tacit knowledge resides only in people's head (Alvarenga Neto, 2005). This stresses our opinion that organizational epistemology matters and needs further discussion and research;
- Constitution of a multidisciplinary committee for the governance of the KM process with direct report to the organization's CEO: top-management support is a cardinal condition for successful KM. By fully supporting KM and the multidisciplinary KM committee, top-administration is openly communicating that KM is welcome and that it will receive full nurture and support to perform. A multidisciplinary committee for the governance of the KM process shall encompass members from different parts of the organizations, with different backgrounds and readiness to act as knowledge brokers and knowledge activists. It's recommended to involve middle-managers from strategic organizational areas and held them responsible for conducting the KM process. The idea behind the committee is to involve and entrust the organization as a whole, communicating that it's everyone's responsibility to make KM a successful process in the organization. This committee shall meet on a regular basis and all decisions involving the firm's KM process should be discussed and approved within this instance. Top-administration shall receive regular reports on the upbringing of the process. It's important to notice the link between this part and the "SET KM Model" environment part;
- Identification and mapping of organizational macro-knowledge (the Knowledge Map); our point here is to identify and map the organization's macro-knowledge. We define macro-knowledge as the wide categories of knowledge that are intrinsic to the organizations' successful operation and survival in dynamic and complex environments. One can note here the link to the "SET KM Model's" strategy part. Wide macro-knowledge categories are generally derived from the organization's strategy or strategic planning, BSC, macro-processes map and others. If an organization's business is within the electrical or power systems, one can assume that one of its macro knowledge derived from its strategy would be "the energetic matrix" or "new technologies for generation or transmission";
- Deployment of the Knowledge Map (K-Map) in all of the organization's directorships into more specific levels: the macro-knowledge categories generated in the latter step are very

 

comprehensive, thus they need to be refined and deployed until specific levels of knowledge are reached and these are suitable for incorporation in the organization's actions and planning. Knowledge taxonomies are created in order to develop and deploy macro-knowledge into more specific levels, e.g. the macro-knowledge "new technologies for generation or transmission" can be deployed to a second more specific level of "transmission technologies". If this second level is still too broad, the knowledge can be deployed again into a third level until its specific enough to be object of organizational action;

- Emphasis definition: once the organization has defined its deployed knowledge taxonomy and the KM Committee has chosen the ones to be privileged, the organization will now, within the KM Committee, define the emphasis it wants on that specific knowledge type: **retention, sharing or creation**. One single emphasis or any combinations of them can be chosen. Once again, the KM committee decides and submits its decision to top-management. e.g.: if the specific knowledge "models of optimization using XYZ model" is chosen, an emphasis – retention, sharing, creation – should be delineated;
- Selection of IT tools, managerial practices/processes and definition of metrics: once the emphasis is chosen - e.g., emphases on sharing and creation - the organization can choose (a) to share that knowledge within on-the-job training, intranet or information systems, and/or (b) to create new knowledge based on that specific knowledge within a task-force or a project team. It's our understanding that the organization is what it measures. When KM is concerned, metrics should be both quantitative and qualitative. Metrics are still not well clearly defined to measure KM initiatives, but they vary on a continuum that goes from the BSC, number of hits in intranets or communities of practice to "informal" conversations with organizational members. There's a strong link between this part and the part entitled "Toolbox" in the "SET KM Model";
- Implementation of a Pilot Project: the idea here is to start the implementation with small progressive bites. A pilot project should be put to proof in a critical place of the organization or in an area that it's most likely to succeed. Feedback is now achieved and the whole never-ending process starts again.

The application of this process design for KM implementation at Brazil's ONS will be now described and analyzed.

## 4. One case study highlighted: Brazil's ONS experience with KM implementation

The methodology, qualitative in nature, is based on the study of multiple cases with incorporated units of analysis and three criteria were observed for the judgment of the quality of the research project: validity of the construct, external validity and reliability. Multiple sources of evidence were used – semi-structured interviews, extensive documental research, direct observation and participant observation - and data analysis consisted of three flows of activities: data reduction, data displays and conclusion drawing/verification. Among others firms cited in the lines above from the authors' previous researches, the case study conducted at ONS is highlighted in order to discuss a successful implementation experience in its early stages.

The National Operator of the Electric System – ONS is a not for profit private company constituted on August 26th, 1998, which is regulated and audited by the National Electric Energy Agency – ANEEL. ONS is responsible for the coordination and control of the operation of generation and transmission facilities of its associate members, which form the Brazilian National Interconnected Power System (SIN). The National Operator manages a network formed by its associate members in different categories – production, transport, distribution of energy and free consumers – and works to guarantee the continuous, safe and economical supply of electric energy, through the SIN, to millions of Brazilians all over the national territory.

ONS's mission is

> *"to operate the National Interconnected Power System in a transparent, equanimous and neutral manner, to guarantee a safe, economic and continuous electric energy supply to the country." (*www.ons.org.br*)*

Federal laws have designated ONS with the following responsibilities:

- Planning and programming of the electric operation and the centralized dispatch of energy generation in the country.

- Supervision and control of operations of the national power systems and the international interconnections with neighboring countries.
- Contracting and administration of transmission services, providing access to the Main Transmission Network and all ancillary services.
- Supervision and coordination of the ONS Operation Centers of the electric power systems in Brazil.
- Elaboration of transmission network expansion and reinforcement proposals.
- Definition of transmission network operation rules and procedures.

In Brazil, the electric energy production, transportation and distribution systems are in the hands of multiple owners that are interconnected from the western area of the state of Pará, in the north, to the Brazil's southernmost state, Rio Grande do Sul, forming what is known as the National Interconnected Power System. The SIN is made up by the assets of more than a hundred generation, transmission and distribution agents, as well as free consumers, who supply almost all energy produced in the country. Only 4.6% (2006) of this energy come from small isolated systems and producers outside the SIN, mainly located in the Amazon region.

When operating the SIN, ONS bases its actions on technical procedures and solutions that produce the best results for the country's population and at the same time, takes into consideration the different interests of its associates, ensuring every sector agent a fair and just treatment.

It's important to point out that KM has always been an important strategic issue for ONS. The documental research came up with some sort of an internal developed knowledge typology, named "ONS Knowledge Typology". ONS' Knowledge Typology defines 4 different types of knowledge within ONS' knowledge domain (Figure 4):

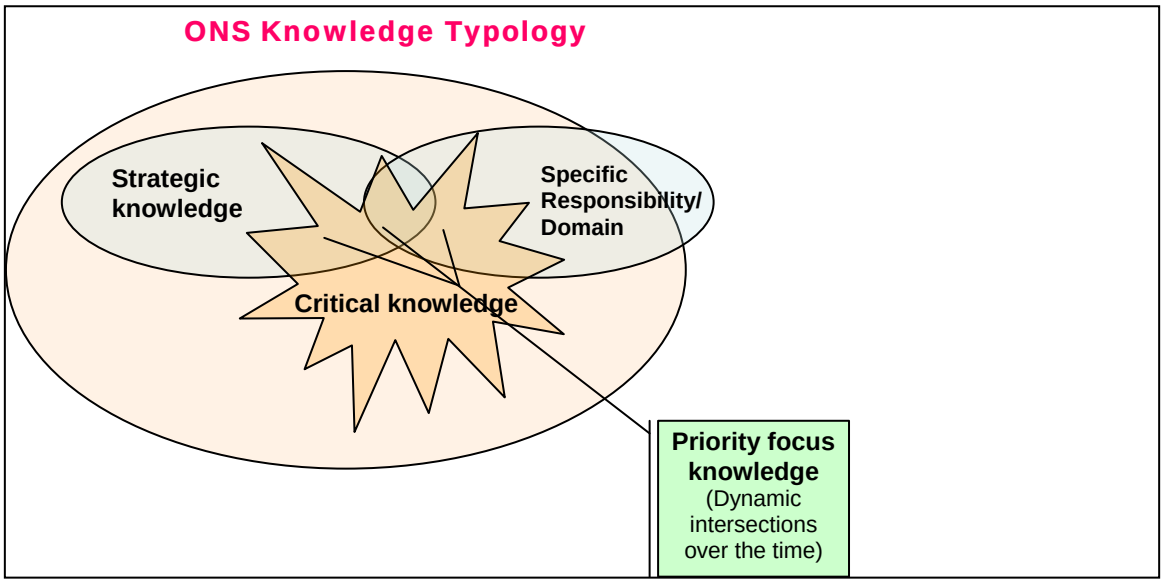


**Figure 4:** ONS' knowledge types/domain. source documental research and Queiroz 2007

- Strategic Knowledge: related to the strategic goals of ONS. In a broader sense, it corresponds to resources that allow for innovation, that is to say, to create new products, processes and readily reply to environmental changes. It also includes new knowledge that ONS might need in the future to achieve its organizational mission;
- Knowledge of Specific Responsibility/Domain: this type of knowledge is specific to ONS's *raison d'être* and are singular types of knowledge existing only within the nature of the firm;
- Critical Knowledge: this type of knowledge refers to existing organizational knowledge types that are in a critical condition according to the following three criteria (a) knowledge not available within the firm; (b) knowledge that will soon fade, either because it's concentrated in a few singular minds, or because people with that specific knowledge are about to retire, or else because the knowledge is concentrated within partner firms; (c) knowledge associated to productivity gaps. The lack of these knowledge means actual risks to ONS' Mission achievement;

 

- Knowledge of Priority Focus: this specific type of knowledge lies on the intersections of the three previous ones in either (i) a combination of all three knowledge types all together (strategic-specific responsibility/domain-critical) or (ii) a combination of any two knowledge types being one of them strategic.

The KM implementation process at ONS is described in the lines below within each of the seven parts of our proposal:

- Epistemological view: ONS assumes that knowledge resides in one's cognition and in between creative minds;
- Constitution of a multidisciplinary committee for the governance of the KM process with direct report to the organization's CEO: top-management support was granted. A KM Committee was established with members appointed by all of ONS' directors, giving the committee a sense of organizational representativeness. ONS's KM Governance Committee meets on a regular basis;
- Identification and mapping of organizational macro-knowledge (the Knowledge Map): after discussions based upon ONS' strategic planning and macro-processes map, four macro-knowledge were selected by the KM Committee and later approved by top-management: 1) electro energetic security/safety; 2) energetic matrix and new technologies for generation and transmission, 3) management of the relationship network; 4) corporative management;
- Deployment of the Knowledge Map (K-Map) within each and all the organization's directorships into more specific levels: deployment matrices were developed using Microsoft's Excel within each specific directorship with the purpose of deploying the K-MAP into knowledge of more specific levels. After the deployment task, each directorship should also classify its results (the more specific knowledge levels) using "typology matrices" based on ONS' knowledge typology in order to find and justify its "priority focus knowledge" types. In this sense, the fact that ONS' KM Committee was formed by representatives of all the directorships made it easier for each committee member – appointed by its director as a committee component – to set the deployment task as a priority within his/her own directorship. Each directorship felt the urge to guarantee that its views and opinions were represented at ONS' KM Committee as they would be affected by the decisions made within the KM Committee. After discussions and conclusions, KM committee members within each directorship were held responsible for presenting its results at the KM Committee's next meeting. After all the results were presented, it was the KM Committee's task to gather and analyse the overall results that would constitute "ONS' Knowledge Map of Priority Foci". After the deployed K-map was assembled, the choice and decision of two or three knowledge of priority focus for immediate organizational action was also the KM's Committee responsibility and this decision would be further submitted to top-administration's approval.

Figure 5 illustrates the deployment and typology matrices used in this part of the process.

| Deployment/Typology Matrix – Third level knowledge classification | | | | Sheet 1 of 4 | | |
|---|---|---|---|---|---|---|
| Taxonomy GC / ONS | | DAC - Corporate Affairs Directorship | | | | |
| Group: | | | | | | |
| Macro-knowledge (First level) | Second Level Knowledge | Third Level Knowledge | ONS Specific Knowledge | Critical Knowledge | Strategic Knowledge | Priority Focus Knowledge |
| Electro Energetic Safety | | | | | | |
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| Energy Production Matrix / New Technologies for Generation and Transmission | | | | | | |
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**Figure 5:** Deployment and typological matrices used for KM Implementation at ONS. source: developed by the authors

Figure 6 illustrates the use and deployment of the matrix displayed on FIGURE 5 within one specific directorship (Operation's Directorship):

| Deployment Matrix | | |
|---|---|---|
| Macro-Knowledge (First Level) | Second Level Knowledge | Third Level Knowledge |
| Electro-energetic Safety | G & T Planning, Coordination and Control | Organon (Software Tool) |
| | Systemic Protection and Control | Outage Analysis |
| | | Intrinsic Safety Analysis |

**Figure 6:** Matrix used at ONS' operations directorship. source: documental research.

The Operations Directorship justified its choice of the third level knowledge "Organon" because this tool was internally developed at ONS and the knowledge about it, at present, is fully concentrated in one single professional. For this motive, there are difficulties in both new development and maintenance development due to low productivity. It's actually knowledge with high potential risk of imminent loss and for this specific directorship this is a "priority knowledge focus" type. This specific directorship's decision would then have to be submitted to ONS' KM Governance Committee.

The final product of this stage is ONS's Knowledge Map shown in FIGURE 7. Note that an organization's knowledge map should be revised in a continuous basis, as knowledge management is a dynamic process.

- Emphasis definition: two priority knowledge types – among the seven more specific levels highlighted on Figure 7 - were chosen by the KM Committee and they'll serve as the starting point for ONS' KM initiatives. The decided emphases for these two rely in all of the three originally proposed emphases in the implementation process: creation, retention and sharing.

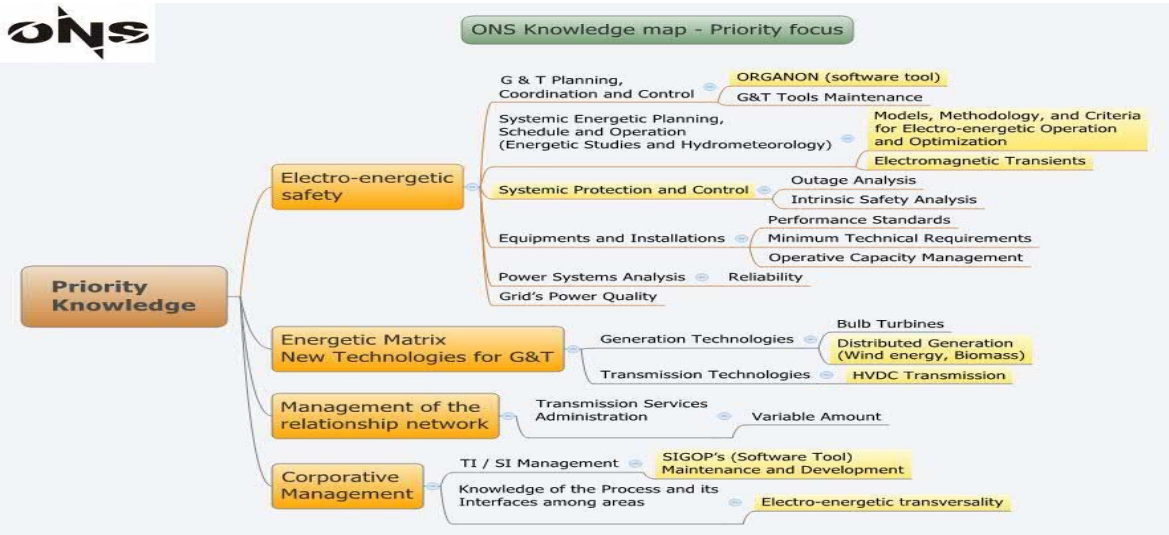


**Figure 7:** ONS' knowledge map and priority knowledge types. source: documental research, 2008.

The other remaining two phases were not yet accomplished by ONS's KM initiative. It's important to highlight that ONS is still working in its implementation process and that it faces a process of organizational change.

## 5. Conclusions

This paper's main goals were the proposition of a theoretical framework for KM – "the SET KM Model" - and the proposition of a KM process design for the implementation of KM. This latter was successfully put to proof in a single case study at Brazil's ONS.

Our conclusions, coherently with our researches and studies within the past decade, suggest that knowledge as such cannot be managed; it is just promoted or stimulated through the creation of a favourable organizational context. There is strong qualitative evidence of a major shift in the context

 

of the organizations contemplated in this study: from “knowledge management” to the “management of ‘ba’ and the enabling conditions” that favours innovation, sharing, learning, collaborative problem solution, tolerance to honest mistakes, among others.

Although ONS has been successful with its KM implementation process, it hasn’t completed the implementation process’ full cycle. Even when it does, ONS faces a long walk until KM, as an organizational process, reaches a stage of maturity. It’s recommended to test this model in different organizations of different types/sizes and belonging to different sectors of the economy.

The SET KM Model needs to be further enhanced through extensive testing in other organizations. The authors are currently adapting it and will present it in the future as a general KM development strategy.

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