# A view of knowledge management in the design department of a brazilian SME Company

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**Abstract:** The success of the Design department of SEBRAE/RN or any organization depends on the ability to manage the knowledge of its team members. However, an organization's Knowledge Management (KM) is usually done informally, for in-house knowledge is neither shared nor used properly or correctly. Therefore, a view of the KM was drawn up, i.e., a KM diagnosis was made of the Design department of SEBRAE/RN based on a questionnaire aimed at discovering the existing KM and information management practices in this department. Based on a theoretical model, the purpose of the diagnosis was to identify what actions require increased attention, i.e., greater dedication to the practice of KM in the organization. The analysis identified the state of the art of the Design department that should provide support during the application of the KM methodology and tools. The practice of KM by SEBRAE/RN's Design department is now expected to rise to a higher level, contributing to improve the organization's products and services.

**Keywords:** knowledge management, design, SEBRAE/RN

## 1. Introduction

Small and Medium-sized Enterprises (SMEs) play an important role in the development of Brazil. Most part of the formal jobs in Brazil as well as of the economy power of a country comes from the SMEs. Within this context, there are those that produce goods and traditional services with intensive use of labour and those that use new technologies employing high-qualified workers (knowledge workers). These last ones dedicate to the activities that demand more intellectual capital and, as consequence, are becoming the main competitive advantage of the company.

SEBRAE/RN (Brazilian Service of Support to the Small and Medium-sized Companies of the RN) is an autonomous organization destined to induce and to support the development of the SMEs (SEBRAE/RN, 2004). Its main role is to help companies to become more competitive at the marketplace by giving them access to the necessary information, correct managerial instruments and technological qualification. In other words, its mission is to promote the competitiveness and the sustainable development of these SMEs.

Based on that, SEBRAE/RN possess a department dedicated to the design management in which support initiative to the development of new products by providing to SMEs services such as: incentive programs (example: Via Design Program), lectures, courses, workshops, seminars etc.

The design adds value and creates identity to the products and services, being the creative and distinguishing element decisive for the competitiveness for companies at internal and external markets (PUGH, 1991). Adding value to a product through the insertion of the design or creating a new product is an innovative activity. Therefore, the Design department needs an efficient management of the involved knowledge to be able to help the companies to react quicker to the new needs of the markets. This will enable them to introduce new products at the market by creating a culture in which the companies start to perceive knowledge as the biggest factor from better production and competitiveness.

The KM supplies tools and methodologies to be worked and practiced with intention to help the SMEs to have a sustainable development (TERRA & KRUGLIANSKAS, 2003). The Design department at SEBRAE/RN observed this fact and initiated the process of KM implementation through a diagnosis regarding the use of a questionnaire applied to the employees of the Design department at SEBRAE/RN. This aspect will be discussed in more details at the methodology section.

## 2. Importance of the SMEs in Brazil

The IBGE – Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics) takes for base the employees of the company considering small company those that have between 1 and 99 employees. A medium company has between 100 and 499 employees, while that a large company is the one that employs 500 or more people (IBGE apud SEBRAE/RN, 2003).

SEBRAE also uses the number of employees as parameter to classify the size of the company.

SMEs represent over 90% of enterprises in most countries, worldwide. They are the driving force behind a large number of innovations and contribute to the growth of the national economy through employment creation, investments and exports.

In Brazil, the related numbers the SMEs show its importance in the generation of jobs and income. To follow, some data are presented to demonstrate the on importance of the SMEs to the country (SEBRAE/RN, 2003):

- Informal and formal SMEs are responsible for 60 million jobs; and
- SMEs represent 29% of the Brazilian GDP, being 23% of them formal companies (3.6 million) and 6% of them informal companies (1 million).

A report of GLOBAL ENTREPRENEURSHIP MONITOR (2002) emphasized an important aspect, in Brazilian economy. Although

Brazil is in seventh place in terms of an enterprising country, it is the fourth in unfavorable conditions for their development.

## 3. Research methodology

The methodology used in this paper was an empiricist-analytical research. This research makes observations of the reality to elaborate an organizational diagnosis of the Design department at SEBRAE/RN (research-diagnosis).

The research-diagnosis is a special type of inquiry that considers the exploring of the environment by raising questions and defining problems. Any organizational change should be preceded by a diagnosis phase (MARTINS & LINTZ, 2000).

In the phase of data collection, a pre-defined questionnaire was used (WILLIAMS & BUKOWITZ, 1999). This questionnaire is divided into seven sections. At the end of each section, the results (punctuation) are written down. Finally, the results are compiled in a spreadsheet of KM diagnosis in order to have the complete diagnosis of the study.

This questionnaire represents a quantitative analysis because it uses statistical parameters to analyze and quantify them. In addition, it works as a qualitative analysis because it gets an analytical result which is related to the presented results, describing how the employees perceive the KM within the organization (behaviors of variable and situations).

At the analysis of results phase it was presented the KM diagnosis of the Design department followed of commentaries regarding some relevant aspects of the research. Moreover, this diagnosis was compared with a survey made at SEBRAE/RN and compared it with the view of the Design department.

Finally, follow-up visits were carried out at the Design department in other to validate the hypotheses with relation to the results of the applied questionnaire.

## 4. Knowledge management

The knowledge is inherent to people, in other words, it is inside of the people's heads (tacit knowledge).

Much of what the KM does is to convert tacit knowledge into explicit knowledge (formal knowledge, registered knowledge, knowledge that can be used) and vice-versa (to convert explicit knowledge to tacit knowledge). This process starts with the use of a methodology that consists of creating, maintaining, disseminating and utilizing knowledge. In other words, the share of knowledge within company through information technology tools (Intranet, communities, websites etc.) facilitates the access to the involved knowledge (NONAKA & TAKEUCHI, 1995). These four steps and the step "delete" being executed correctly, they do with that the organization practices the KM.

The research accomplished in the Design department through the questionnaire proposed by WILLIAMS & BUKOWITZ (1999) takes in consideration the four described steps added of the step "delete". This fifth step has as objective to eliminate useless knowledge because some knowledge is more useful if it will not be into the knowledge base. Each step represents an action that becomes the model dynamic and of easy understanding. It sees the relation between each step and its respective action(s).

- Create – learn and contribute: the actions "learn" and "contribute" are relatively new for the organizations (WILLIAMS & BUKOWITZ, 1999). This does not suggest that, in the past, nobody learned or cooperated (contribute) to organizational knowledge base. However, the formal recognition of the step "create" as a way to create competitive advantage is new. Therefore, to convince people to cooperate (contribute) will give return for the organization and for themselves as it is the beginning for the cycle of creation of an organizational memory;

- Maintain – evaluate and sustain: the actions "evaluate" and "sustain" assures that the organizational knowledge base (useful knowledge) is viable and competitive. Attributing to the "knowledge manager" the accountability of maintenance of this knowledge base and, also, that it defines the necessary knowledge for organization mission. The "knowledge manager" is responsible to develop a measure that demonstrates if the organization is increasing its knowledge base and profiting from its investment in intellectual capital as well (WILLIAMS & BUKOWITZ, 1999). The knowledge base can be created through communities, intranets, websites etc. To enable and to motivate the employees to utilize these tools are a challenge that the organizations have that to breast;

- Disseminate – sharing (useful knowledge sharing): the action "sharing" is when the people (employees) of the Design department begin the practice externalization and internalization besides combination and socialization (knowledge conversions);

- Utilize – acquire e use: the actions "acquire" e "use" are the most familiar to organizations (WILLIAMS & BUKOWITZ, 1999). The people always look for information and knowledge and later utilize them to solve problems, to take decisions or to add value to the product or service through the knowledge regarding design. Thus, new information technologies allowed that a great amount of information and knowledge can flow within organizations; and

- Delete – elimination (needless knowledge): the action "eliminate" excludes any useless knowledge from the knowledge base because some knowledge can be more valuable if it is posed outside of the knowledge base of the organization.

The model was developed based on the steps described previously (Figure 1). This model tries to represent the dynamics of the steps carried through a process of knowledge sharing as support to the development of products at SEBRAE/RN. Even though it is represented in Figure 1, the model displays how these steps interact between themselves to one better improvement of the KM of the Design department at SEBRAE/RN.

At the first moment, the sequence of procedures follows a counter-clockwise direction, starting from the actions "learn" and "contribute" (step: creation of the knowledge). Therefore, no further action "acquire" and "use" (step: utilize of the knowledge) is taken if it does not possess useful knowledge in the knowledge base of the Design department. After the "storage" of knowledge in the knowledge base, not necessarily the steps must follow a determinate order.

## 5. Characterizing the design department at SEBRAE/RN

Design is an effective way of adding of value to products and services being distinguished as one of the main factors for the success of a company (SEBRAE/RN, 2004). Depending on the case, design is present in all processes of product development. The design influences since the conception of a new product in its planning phase, going to its production phase, marketing and very intensely in its commercialization phase (PAHL & BEITZ, 1984).

The SEBRAE/RN through the *Via Design* program (SEBRAE, 2004) offers the opportunity for SMEs to receive on the benefits of design. Therefore, the company has achieved competitive advantages through of the biggest identification of its products and services.
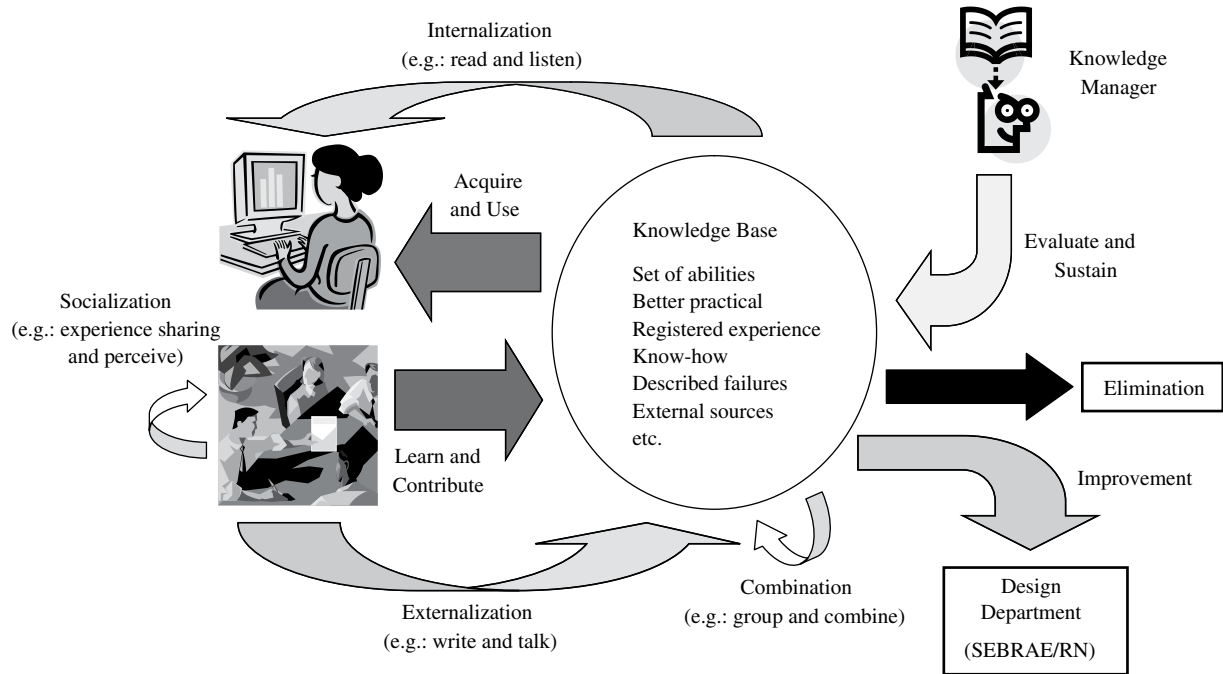
**Figure 1.** Knowledge management model and its steps: creation, maintenance, dissemination, utilization and elimination (adapted from COSTA & GOUVINHAS, 2003)

The *Via Design* program and other partners had stimulated the formation of a *Potiguar Design Net* that has the mission to increase the competitiveness of SMEs by using design as an element of adding value for products and services.

*Potiguar Design Net* co-ordinates two Innovation Nucleus in Design: one related to handcrafted products and other in the fashion department.

These two Nucleus aim to attend the needs of SMEs at Rio Grande do Norte State. It acts in a continuous way to assist them to develop competitive products and to disseminate new techniques and technologies, showing that the design process should be adopted as one of the normal procedures inside of its activities.

The *Potiguar Design Net* (SEBRAE/RN, 2004) has some objectives such as:
  • Incorporation of the design culture in SMEs as a competitive advantage;
  • Creation of the "*Design Potiguar*" as identification and differentiation mechanism of the products developed in this region;
  • Strengthening of competitive strategies in other areas related to design (marketing, KM and corporate management);
  • Increase of the productivity, reduction of production costs, improvement of the quality of products and services;
  • Awareness of the SMEs regarding the needs of continuous search for competitiveness; and
  • Opening of new markets due the adoption of practices from the Design department.

The Design department at SEBRAE/RN has three employees developing all the programs and projects directed to SMEs (SEBRAE, 2004).

## 6. Results review

In the questionnaire each section is composed by 20 questions. For each question, the answers obtained has the following grade:

  • S – strong: the affirmation is surely perceived in my organization;
  • M – moderate: the affirmation is moderately perceived in my organization; and
  • W – weak: the affirmation is weakly perceived in my organization.

Answers type "S" has weight 3, type "M" has weight 2 and type "W" has weight 1. To the end of each section, the answers of each type are summed and after it is multiply by its respective weight. The maximum punctuation for each section is 60 points. Thus, multiply the total sum by its weight and divided by the maximum number of questions: [(punctuation obtained x weight)/60] x 100, generates the percentage equivalent to the state of the art of the KM inside of the Design department whose scope is from 33.33% to 100%. For example, if all the answers of a section are "W" it gets 20 points which is the minimum. Therefore, the minimum percentage is: [(20/60) x 100] = 33.33%.

Making the correlation between the research results and its respective punctuation, the following results are observed (Table 1).

The questionnaire helped to identify the section or sections that needs larger investment from the responsible team for implementing the KM. In other words, the section or sections that face greater resistance from the employees of the company and it needs direct action from the responsible team to motivate the knowledge sharing within the organization.

Making the relation between the questionnaire sections and the proposed methodology some steps describing the KM can be (Table 2):
  • Create: an average between the punctuation of the actions "learn" and "contribute";
  • Maintain: an average between the punctuation of the actions "evaluate" and "sustain";
  • Utilize: an average between the punctuation of the actions "acquire" and "use"; and
  • Delete: the same punctuation of the action "eliminate".

**Table 1.** Punctuation of the employees to each section (COSTA & GOUVINHAS, 2005) .

| Action | Employee 1 | Employee 2 | Employee 3 |
|---|---|---|---|
| Section 1: Acquire | 42/60 = 70.00% | 37/60 = 61.66% | 43/60 = 71.66% |
| Section 2: Use | 51/60 = 85.00% | 47/60 = 78.30% | 40/60 = 66.66% |
| Section 3: Learn | 55/60 = 91.66% | 51/60 = 81.00% | 36/60 = 60.00% |
| Section 4: Contribute | 38/60 = 63.33% | 41/60 = 68.30% | 39/60 = 65.00% |
| Section 5: Evaluate | 30/60 = 50.00% | 28/60 = 46.60% | 25/60 = 41.66% |
| Section 6: Sustain | 50/60 = 83.33% | 43/60 = 71.66% | 38/60 = 63.33% |
| Section 7: Eliminate | 45/60 = 75.00% | 44/60 = 73.33% | 38/60 = 63.33% |
| **Average** | **311/420 = 74.04%** | **291/420 = 69.28%** | **259/420 = 61.66%** |

**Table 2.** Stages of knowledge management implementation with the respective punctuation to each employee (COSTA & GOUVINHAS, 2005).

| Step | Employee 1 | Employee 2 | Employee 3 | Average |
|---|---|---|---|---|
| Create | 77.50% | 76.66% | 62.50% | 72.22% |
| Maintain | 66.66% | 59.16% | 52.50% | 59.44% |
| Utilize | 77.50% | 70.00% | 69.16% | 72.22% |
| Delete | 75.00% | 73.33% | 63.33% | 70.55% |

Therefore, for the processes: create, maintain, utilize and delete; it was observed the following percentages of accordance with the relation presented in the section 4.

Analyzing the results of Table 2, it was observed that the stage that is weaker (needs a bigger attention) of the Design department is the "maintain" (actions: evaluate and sustain) of the involved knowledge. Therefore, the first step is to analyze how the department stores the information and knowledge and then, to understand why the step "maintain" obtained the lowest percentage with relation to the other steps (create, utilize and delete).

It is important to observe that the people have used knowledge in the organizations for a long period. However, the recognition that knowledge is a resource that it needs to be managed is relatively new (TEIXEIRA, 2000). This argument can justify the high percentage of the step "create".

With regard to the use of knowledge, it is natural that when it needs to gather information and knowledge to apply them, they must be always searched.

In the case of the step "delete", it is concluded that is a simple task. When the knowledge is useful it needs to be stored in some place previously selected to after analyzed, classified and formalized (register). However, when the knowledge is considered to be useless it has to be eliminated from the knowledge base.

In a more superficial analysis of the Design department, the first hypothesis regarding the results (low punctuation of the step "maintain") is the lack of tools capable to store all the knowledge created inside of the department which makes it difficult the search and recuperation of the registered knowledge as well as the lack of the knowledge manager. Second hypothesis, deficiency of a system to register explicit knowledge some place of the organization, a gap due the inexistence of a responsible person for doing that: a knowledge manager.

The KM tools supported by the information technology facilitate mainly at the "storage" stage as well as recuperation of information and knowledge. To utilize knowledge is a natural process of the human being, but to create it (formally) and to maintain it depends on the organizational culture. Company knowledge has always been in the workers mind, but to register this tacit knowledge (converting tacit knowledge to explicit knowledge) and to sustain in a place (knowledge base) where all the team members can find it and learn about it, it has become the big challenge for the team during the execution of projects.

The lack of tools appropriate to maintain the information and knowledge created in the Design department and the absence of knowledge manager within the organization have been considered as the weak points of the KM at SEBRAE/RN.

## 7. Conclusion

This work is part of a process of KM implementation in the Design department at SEBRAE/RN. The diagnosis in Design department is requisite to implementation successful of KM. Besides, the diagnosis results may facilitate in the KM implementation within the Design department.

Moreover, some factors may be analyzed to know if some KM aspects had improved. These factors are the following: the existence of a knowledge base in the Design department (organizational memory); the easiness of access to the information and knowledge; the exchange of experiences between all members of the Design department; the efficiency of the team even if one of the member leave the group; the learning process in the collecting and correcting errors and rationalization of tasks as consequence of standard procedures and norms.

In addition, the diagnosis was important to:
- To know how the Design department works;
- To understand the cultural aspect within the organization in order to implement a KM;
- To identify a staff profile: resistant, neutral or innovative;
- To join professional who know the importance of the KM in order to break the resistance from the others; and
- To have a leader that can stimulate, orientate and facilitate the team work in the adoption and implementation of KM;

During the KM implementation, it is advisable:
- To keep the team always aware of the benefits of the KM implemented into the organization;
- To promote meetings in order to evaluate and measure the results obtained from the KM;
- To develop the spirit of partnership and team working;
- To facilitate the synergy among areas and departments;
- To elevate the motivation and keep it with transparency and constant communication; and
- To consider the staff member as a "collaborative person for the knowledge sharing".

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Therefore, it has been observed that the KM is not a simple task. On the contrary, it needs dedication and effort from all members, mainly from those responsible for its implementation. However, having a systematic management model can help to facilitate this process and can give excellent resulted to the Design department at SEBRAE/RN.

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