BJIS Brazilian Journal of Information Science

MODELS OF KNOWLEDGE MANAGEMENT IN MICRO AND SMALL ENTERPRISES

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ABSTRACT

The paper analyzes models of knowledge management (KM), based on the profile of the micro and small enterprises (MSE) in the state of Sergipe, Brazil, specifically the models proposed by C. R. Silva Jr. (2006); E. E. Thiel (2002); M. C. Rumizen (2002) and G. Von Krogh and K. Ichijo and T. Nonaka (2000). The characteristics of the MSE in the Brazilian economy emphasize their place of prominence as responsible for 28% of gross revenues from the formal sector and 20% of Gross Domestic Product. However, the lack of researches which emphasize the reality of the MSE may be one reason which interferes in their more significant role in the Brazilian economy. The *corpus* consists of 60 (sixty) employees from 10 (ten) MSE installed in the Technological Park of Sergipe, incorporating managers, key professionals and members of the operating body. Through the techniques of interview, questionnaire and direct observation, it identifies the attributes of technology in the MSE, as well as the characteristics of the adopted processes and the ones considered ideal for employees. The most important results reveal the inadequacy of the analyzed models, because they are always elaborated by considering the reality of medium and big enterprises. It concludes, finally, that none of analyzed models are fully adequate to the reality of the MSE, and even the model of Von Kroch, Ichijo and Nonaka approaching closely to the profile of these companies, still requires modifications to its implementation. It is recommended, therefore, the creation of a model through further analysis of the activities from other adoption models to establish a new model suitable to the limitations of MSE.

Keywords: Knowledge Management; KM; Micro and Small Enterprises; MSE; Models of Knowledge Management; Models of KM.

1 INTRODUCTION

The terms – data, information and knowledge – have own but independent concepts. While data lacks significance, information refers to data inserted in a given

context, in order to allow the individual to attribute meanings to it, similar or not, considering that the interpretation will vary from person to person, depending on their cyclical reality. The information is, therefore, raw material of knowledge. The latter, in its turn, comprises a multiplicity of conceptions depending on the theoretical line. Broadly speaking, knowledge concerns the capacity of acquiring information, which then incorporates the human being's cognitive repertoire. For Takeuchi and Nonaka (2008), knowledge is essentially tacit and personal, since it is linked to each one's subjectivity. It seems obvious that it is intangible, i.e., it is neither transferable nor tangible. It is in the intellect of people. This justifies certain positions, such as Polanyi's (2009), for whom not even the holder is able to convey everything they know, as they have more knowledge than they can express.

At the time the academic and scientific community produces information and knowledge continuously within organizations both Information Management (IM) and Knowledge Management (KM) are valued. Briefly, since it does not constitute the core of the paper, we add that IM is about the management of information circulating within organizations so that its potential is maximized in order to help systematically in the decision making process. The KM, in turn, plays a decisive role in the success (or not) of the business world, including micro and small enterprises (MSE).

Actually, we admit that the KM is, *per se*, a complex and controversial topic, given that it puts together two words apparently incompatible: knowledge and management. Management means to manage, measure and control, particularly processes. How is it possible to control or measure something acknowledged as intangible? The answer is simple: almost impossible. In this regard, Von Krogh and Ichijo and Nonaka (2000) are vehement and reassure that it is an illusion to think about managing knowledge. It is up to the KM to empower people to take at least five essential steps: (1) instill the vision of knowledge; (2) manage conversations, (3) mobilize activists of knowledge; (4) provide the appropriate context; (5) globalize local knowledge. Therefore, it is essential to implement management procedures, which are designed, planned, executed and evaluated. These are actions that characterize the administration and management. This argument justifies the use of the word management in this context and it allows us to present the KM as the study

BJIS, Marília (SP), v.7, Special Number, p.166-188, 1º.Sem. 2013. Available in: <http://www2.marilia.Unesp.br/revistas/index.php/bjis/index>.
ISSN: 1981-1640

of methods that help in the creation, dissemination and use of knowledge to fully achieve organizational goals and objectives.

On the other hand, it is essential to stimulate the creativity and curiosity of collaborators/employees, making them seek, create and share knowledge, and at the same time, as Figueiredo (2006) points out, recognize their limits, asking for help whenever necessary. Having such values in mind, employees tend to share knowledge in order to perpetuate them, expressing themselves textually or graphically, aiming at making them available to the organization as a whole, in the form of information. That is explicit knowledge.

However, most existing texts on the subject only favors big organizations. The approach is far from the reality of the MSE, which leads us to think of KM as exclusive to big public or private corporations. This is a surprising fact because in Brazil micro and small enterprises account for 98% of formal enterprises, 67% of occupations, 28% of gross revenue in the formal sector and 20% of Gross Domestic Product. Among them, 56% are part of commerce, 30% of services and 14% of the industry (BEDÊ, 2006). Moreover, in terminological terms, according to the Brazilian Service of Support for Micro and Small Enterprises [*Serviço Brasileiro de Apoio às Micro e Pequenas Empresas* (SEBRAE)] (2012), micro and small enterprises are those whose staff has up to 49 employees in commerce and services and up to 99 employees in industry. As a result of the magnitude of the performance of MSE, it is clear that information and knowledge keep their prominent role in order to ensure dynamism, speed and ability to adapt to the contemporary society, ruled by quick changes.

2 OBJECTIVES AND JUSTIFICATION

According to what has been said so far, our general objective is to analyze models of KM in micro and small enterprises in the State of Sergipe (Brazil), in the area of technology, from the following operational objectives: (1) identify, in enterprises, the average number of employees as well as their turnover, through the admittance of new employees, and the experience that each one observes in the

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ISSN: 1981-1640

other; (2) detect how collaborators of MSE understand the technical and administrative processes and which features they have greater expectations on; (3) analyze the need to meet the standards and processes imposed by customers and suppliers; (4) evaluate the models, assessing their suitability to the MSE reality.

Certainly, these goals are justified by a number of factors. For example, the growing expansion of the information flow present in contemporary business organizations and relevance of KM in the universe of Brazilian MSE, as envisioned in the previous section, in general terms, which is already highlighted by the present study. This can also emphasize the importance of micro and small enterprises in the national economy. By adopting the KM and its functions, the MSE reflect much higher survival and growth rates. Any organization, when adopting the KM through tested and consolidated models, faces fewer difficulties in its process, because it defines a practical guide of what should be done, as reassured by Valentim (2008). That is, it is easier for companies to make decisions and they tend to be more cooperative and agile in order to adapt quickly to new opportunities and changes in the market, according to Von Krogh (2003), because, as noted by Mota (2011), micro and small businesses often show characteristics that are not very promising, such as high employee turnover; daily renewed problems; constantly built knowledge, and managers' negligence towards stored information and the new knowledge generated.

In turn, the cutout facing the State of Sergipe, and more specifically, the companies inserted in the Sergipe Technology Center, was caused by the presence of renowned public agencies in the State, especially *Petróleo Brasileiro S/A* (Petrobras) and Technological Park of Sergipe [*Parque Tecnológico de Sergipe* (SergipeTec)]. This detail, in turn, induces the study within the limitation of technology companies, pointing out that, in Brazil, "[…] out of the total number of software companies, 77.4% of them are MSE [...], which represents a significant presence of small businesses in the sector" (KRAFTA, 2008, p.12).

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ISSN: 1981-1640

3 KNOWLEDGE MANAGEMENT

The Master's thesis entitled *Models of knowledge management and micro and small enterprises* (MOTA, 2011) underlies the present paper and extends its theoretical framework beyond the Information Science (IS) and its current paradigms. It achieves not only relevant aspects to IM but also, above all, strong and detailed features of models for the adoption of KM.

However, here, we have chosen to be more concise. So, it is important to remember that the main input of any corporation focuses on natural resources as raw materials for the manufacture of its products. However, it takes us back to the initial idea that contemporary society is ruled by another resource: information. The distinction lies on the fact that raw materials are finite in contrast to the infinity of the information flow, as Wurman (2005) believes. While the IM works with information, documents and records and takes charge of tangible information flows, the KM works with knowledge, taking charge of the teaching-learning processes that occur when consuming or creating tangible information. In other words, the KM takes care of mapping the potential knowledge of each employee, and studies the means of its explicitness in the form of information, query able, even subsequent to the individual's departure of the company, if that is the case.

Under this view, the current concept of KM is relatively new, although the same does not apply to its origin. According to Barbosa (2008), back to 1940, there are concepts and implications accountable for what we call today as KM. The strongest evidence refers to the work of Frederick Hayek. In 1945, the article *The use of knowledge in society* argues that the fact that knowledge is not found in an explicit and clear form represents the root of the economic problem faced by the society of that time.

Anyway, the main impact with the emergence of KM occurs in the field of administration because its focus is on business and computer science. But there is some sort of pulverization. For example, at the National Meeting of Research and Graduate Studies in Information Science [*Encontro Nacional de Pesquisa e Pós-Graduação em Ciência da Informação* (ENANCIB)], the most important Brazilian

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ISSN: 1981-1640

event in IS, researches related to KM are reported each year, covering different facets. And what is interesting is that, among the nine working groups of the National Association for Research and Graduate Studies in Information Science [*Associação Nacional de Pesquisa e Pós-Graduação em Ciência da Informação* (ANCIB)], promoter of the Meetings, you can identify papers on KM in several Groups. Some of them are: Group 2 Organization and Knowledge Representation; Group 3 Mediation, Circulation and Use of Information; Group 4 Information and Knowledge Management in Organizations; Group 6 Information, Education and Labor; Group 8 Information and Technology.

This data is apparently irrelevant, but very important. After all, it certifies the deficient maturity of the field, despite several attempts, like Miranda's (2004), which outlines, didactically, the distinction between IM and KM. In this author's view, the strongest features of KM are: (1) focuses on the capture of tacit information and its transformation into explicit; (2) obtains information from a source and promotes their reuse in new situations; (3) emphasizes storage, control and distributed access of information – the focus is on the end user; (4) prioritizes collaboration and sharing; (5) provides the definition by the end user of the interrelationship between information and demands; (6) employs technological resources in the apprehension of new knowledge; (7) adds value to growth, innovation and leverage; (8) searches productivity through innovation; (9) meets radical and discontinuous changes; (10) uses pre-cognition and adaptation to reach business objectives.

It is essential to add that the slow maturation of KM happens, in part, because it is a multidisciplinary field. As it was said before, it may be the subject of study of professionals not only in the areas of administration and IS, but also computer science and economics, except that it incorporates concepts from different branches of knowledge, such as education, communication, informatics, psychology, sociology, and management. In the field of education, KM makes use of teaching and learning theories used for sharing organizational knowledge. In communication, KM makes use of the studies on dissemination methods and on the disclosing of information. In computer science, it takes advantage of the storage techniques and retrieval of information, extremely useful for IM, support of KM. In psychology, it uses the

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ISSN: 1981-1640

outlines of human behavior, in order to identify the best ways to act towards/and for individuals and, through the help of sociology, how to work with groups of individuals and communities.

In one aspect of the KM facing administration, it is possible to explore the behavior of collaborators, mainly characterized by the organizational culture, as fundamental to the use of KM. However, it is clear that these processes of adoption of KM, despite being sophisticated, well-designed and tested do not work in an organization without organizational culture prone to acquire and share information, clarify and create new knowledge. The dependence between organizational culture and success of the KM process is so widespread, both in academy and in organizations, that some models ignore the diagnostic phase of the culture prior to insertion of KM, and run directly to the adoption process itself. That's why the fifth section of this paper presents the KM models, complementing the theoretical framework.

4 METHODOLOGICAL PROCEDURES

As previously seen, this study on knowledge management particularizes the MSE of technology in Sergipe, in particular those that are installed in technology-based incubators and are in the already mentioned SergipeTec, due to facilitated access and contact and also because of the support, the training and systematic monitoring of these organizations provided by the agencies in which they are allocated.

Given the nature of the object under study, in spite of the disagreements regarding the categorization of scientific researches, we chose to carry out an investigation of a qualitative and quantitative nature, which favors measurement together with the analysis and interpretation of data with a comparative approach, ideal for assessing adequacy of KM models to the defined categories and the reality of MSE.

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4.1 Population and Samples

We reiterate that the *corpus* covers the 25 (twenty-five) MSE installed at SergipeTec. Among them, 18 (eighteen) are categorized as micro and seven others as small businesses (Table 1). Given the impossibility of analyzing the 18 (eighteen) MSE, we resort to sampling, for its advantages: lower cost, higher chance of reliability towards the prospect of greater control; and more efficient operation (handling facility). We follow the simple random probability sampling (MARCONI; LAKATOS, 2006), which allows, through raffle, via a random number table, the inclusion of any member of the public to the *corpus*, so that we worked with 10 (ten) corporations.

Table 1: Population, models of knowledge management in micro and small enterprises.

Empresas	Numbers of Enterprises*			
	Total	Micro	Pequena	MPE (%)
Technological Park of Sergipe (SergipeTec)	25	18	7	92.6
Business Incubator Center of Sergipe (CISE)	15	15	–	100
Business Technology-Based Incubator or I-Tec	3	3	–	100
Total	25	18	7	92.6

Note (*): The values of CISE and I-Tec are included in the totals of SegipeTec.

Source: Mota – 2011 - p.98.

We clarify that, along with 38 (thirty-eight) other companies, SergipeTec houses 2 (two) technology-based incubators, named Business Incubator Center of Sergipe [*Centro Incubador de Empresas de Sergipe* (CISE)]; and Business Technology-Based Incubator [*Incubadora de Empresas de Base Tecnológica* (I-Tec)]. Moreover, contrary to what it may seem at first glance, SergipeTec is not a governmental organization. It consists of a private association, yet a nonprofit organization, recognized as a social state:

> [...] SergipeTec acts in fostering the creation of technology-based companies and building relationships networks involving agents of the

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> productive process, the generation of knowledge, education, research and innovation. It works in conjunction with the State Department of Economic Development, Science and Technology [...] as part of the innovation system of the State (SERGIPETEC, 2012).

'Having an eye' on the proposed objectives, we selected three functions that are common to the MSE on the agenda – managers, key-collaborators and representatives of the operating body – because they cover different sectors of the MSE. In the case of managers, since each project has at least one manager in charge of the processes, one per company. Similarly and for the same reason, a key collaborator for each corporation, explaining that the designation appoints employees with a prominent position facing the management and colleagues. They are leaders who influence the actions and reactions of the team. Eventually, in the case of the operating body, we did not resort to sample.

We theoretically decided to work with all employees in every sphere of micro and small enterprises, given the access to them is simpler, although there was a real possibility that not all of them would attend to the request to participate in the study, which resulted in a total of 40 (forty) respondents. In short: our sample adds up to 60 (sixty) individuals of 10 (ten) MSEs, 10 (ten) managers, 10 (ten) key-collaborators; 40 (forty) representatives of the operating body.

4.2 Data Collection

Following the guidelines of Marconi and Lakatos (2006) and the classic Selltiz (1987), before the intended objectives, the most viable path led us to the combination of techniques – interviews, questionnaires and on-site analysis/direct observation technique – depending on specific segments surveyed. Mota (2011) provides the data collection instruments, in full and with more details in his original thesis, including information on the pre-tests applied to the improvement of the original scripts.

For managers and key-collaborators, we have adopted the structured interview technique, since the face-to-face contact provides an opportunity to obtain greater insight. In terms of representatives of the operating body, we used a closed

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questionnaire. This is the feature that most reduces the resistance of any interviewee, for its speed and chance to shorter answers, despite the disadvantage of not supplying properly detailed and/or accurate information. Moreover, given the unsettling question – What is the profile of MSE and how are models of KM appropriate (or not) to micro and small businesses? – also based on the authors referenced herein, we employed the technique of direct observation. Here's a resource which encourages the perception of the unsaid, i.e., the 'between the lines' present in the daily routine of the corporations and dilutes the masking of any ambiguous responses of the interviewees.

Taking the previous objectives as reference, we have mentioned the variables which compose the categories of analysis: (1) average number of employees; (2) level of employee turnover, resulting from the confrontation between the total of newly admitted in the past six months and current number of employees; (3) experience that each one perceives in the other – as applicable to employees in general and the newly hired; (4) percentage of managers operating in the body; (5) adoption of procedures by the MSE; (6) size of the organization's clients, both in public and private spheres; (7) organizational culture prone to collaboration among peers.

5 THE TURN AND THE VOICE OF MICRO AND SMALL ENTERPRISES

Reviewing goals and categories of analysis, from the interview and questionnaire's resulting answers and from data collection of observation, worked out in detail by Mota (2011), it was possible to profile the 10 (ten) technology MSE (Sergipe) incorporated to the *corpus*: Table 1 summarizes the categories analyzed.

Regarding number one operational objective – identify, in the enterprises, the average number of employees and their turnover, in addition to the experience that each one perceives in the other – confirming the design of MSE by Bedê (2006) and Sebrae (2012), the MSE surveyed have their staff (operating body) reduced. In average, they are 12 (twelve) individuals, and the turnover is somewhat high, i.e. 3,55 newly hired over a period of 6 (six) months. Here's a dubious data: at the same

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ISSN: 1981-1640

time that it can be seen as negative – instability of staff – it holds a different interpretation, i.e., it marks expansion and, perhaps, satisfactory growth in companies.

Frame 1: Profile of micro and small enterprises, Sergipe, 2011.

Items Discussed	Behavior/Preference of the MSE
Operating body (average)	12 employees.
Hiring (average)	3.55 new hires in the total of six months.
Experience	Experts prevail, alongside inexperienced beginners.
Adoption of processes	62% adopt administrative and operational processes.
Participation of employees	Most of them (58%) opt for involvement of all employees.
Sharing knowledge	Consultation with colleagues and sharing of information daily.
Deadline for results	Preference (92%) for solid results, even in the long term.
Definition of steps	Significant majority (82%) elects well-defined steps.
Customers size	State sphere and midsize enterprises.

Source: Mota – 2011 – p.136.

Therefore, workers with experience have to live together with newly hired or less experienced employees, but it happens in a positive way, considering that 58% of respondents (Frame 1) are in favor of the global and collective participation among all who belong to the staff of the MSEs. Thus, the sharing of knowledge generated and newly produced happens routinely, according to the testimony of the members of the sample who claim that the prevailing culture in the organization is visibly prone to collaboration. And all of this happens even when none of the respondents notice newcomers as experts: “[...] In general, the ones who arrive only have an idea of the organization’s business, but none of them dominates the operational tools of MSE”, as one interviewee has said.

As to the second goal – analyze how employees perceive the technical and administrative processes and what they expect of such procedures – the research shows that most of the MSE (62%) adopts them. A seemingly promising result is followed by surprising information: sampling units, in general, including the three

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segments, do not appear very safe in relation to the ideal and idealized characteristics of the procedures. At most, respondents (92%) limit themselves to say they expect solid results from 'their' enterprises, even if these demand a longer term, as of one of them confirms: "[...] prioritize the results without worrying about the speed of the response to processes". Again, a high rate of 82% is in favor of well-defined steps by managers or by the collectivity of those who make the MSE (Frame 1).

At this point, it is interesting to revisit the thought of Peter Demo (2002). Although it refers to education, such reflections are applicable to management and the MSE in particular. In his vision, who knows how to think, does it not just to do it, but knows why and how it is done. This is the basic aspect of any management autonomy: knowing how to think does not match subordinate citizenship, the one that imposes on individuals the condition of 'pawns', mere objects, submissive and ignorant. It does not fit either with assisted citizenship, but with emancipated citizenship, the one that knows what it wants, why and how it wants it. Finally, the third goal – meet the standards and processes imposed by customers and suppliers – indicates that the majority of the customers belong to the state and / or midsize companies.

5.1 Models of Knowledge Management in Micro and Small Enterprises

The central goal that merges with the fourth goal – analyze the KM models and assess their adequacy to the reality of MSE, Sergipe – demands the presentation of each of the models studied, because, in a more or less intense form, it is more appropriate to micro and small enterprises. Didactically, we use the illustrations (figures) to synthesize the inferences. To avoid continuous repetitions, we adopted the following caption to all of them:

CAPTION	
Completely meets	✓
Partially meets	–
Does not meet	✗

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ISSN: 1981-1640

The choice of the 4 (four) models arises from the fact that it was originally intended to enterprises in the technology sector. Two of them are already evaluated by academic assessment boards which ensure certain credibility. The rest is in bibliographic sources. In this respect, we add that the large category – Humanities and Social Sciences (HSS) – incorporating management and IS, has in the book its most common channel of dissemination. The most concise style of articles, papers and communications does not supply the needs of this large area, which requires a much more dense level of interpretative elaboration of data than that which characterizes the dissemination of research in other fields. The HSS demand more preparation time (thinking and writing) and are more analytical, and, generally, do not respect the limit of 10 (ten) to 15 (fifteen) pages, common in magazines, without the risk of compromising the content.

The first of academic texts, by Silva Junior (2006), under the original format of the Master's thesis in computing, *A model for knowledge management in software companies*, is aimed at technology companies. The second, under the responsibility of Edeltraut E. Thiel (2002), also directs itself to the same type of organization, and is distinguished by fairly simple structure. The difference lies in the fact that Thiel on his dissertation *Proposal for a model of deployment of a knowledge management project* advocated in the field of production engineering, and emphasizes the organizational processes and their understanding.

In the second group – KM models extracted from books – the archetype suggested by Rumizen (2002) is explained in a book series entitled *The complete idiot's guide to knowledge management*, which together with *For Dummies*, is quite popular among technology professionals. Reading accessible and attractive layout imposes itself as a model likely to be well accepted in the world of micro and small enterprises, considering that, except for honorable exceptions, contrasts with the 'seriousness' of academic texts. Finally, the fourth model, by Von Krogh and Ichijo and Nonaka, from *Enabling knowledge creation*, 2000, is a bit different from the previous ones. The focus of the book and of the model is to show that knowledge

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cannot be managed literally. The main activity is reduced to enable and promote the generation of knowledge in the organization.

5.1.1 Model of knowledge management for software companies (MKM-SC)

Described in detail by Mota (2011), Silva Junior's model (2006) goes through four phases: planning, implementation, execution, and continuous assessment, preceded by the preparation stage. The main goal is to achieve maximum team participation. Despite prioritizing the demands of technology companies, especially when aimed at creating software, it is partially adapted to the reality of the MSE. Frame 2 illustrates the points more likely to acceptance, which requires going back to the caption in item 5.1. For example: the MKM-SC model fully supplies three items: customer size; involvement of employees, and defining the steps. Especially the last two topics are important for employment of the KM in micro and small enterprises and its fullness, in the case of participation, seems to arise from the preparation stage.

Going forward, we state that the model of knowledge management for software enterprises serves, in part, to four other items: adoption processes; expected return deadline, required experience and organizational culture open to collaboration. These topics are extremely relevant to the admission of the model in the MSE universe, in particular with regard to the required experience and organizational culture since, as we have seen, the high turnover leads to a less vulnerable network of relationships.

BJIS, Marília (SP), v.7, Special Number, p.166-188, 1º.Sem. 2013. Available in: <http://www2.marilia.Unesp.br/revistas/index.php/bjis/index>.
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Frame 2: Adequacy of the MKM-SC Model to the profile of micro and small enterprises, Sergipe, 2011.

MKM-SC Model – Silva Júnior (2006)	
Questionnaire Items	
Size of the operation body	✗
Turnover	✗
Adoption processes	–
Size of customers	✓
Deadline for results	–
Involvement of employees	✓
Definition of steps	✓
Experience	–
Culture	–

Source: Mota – 2011 – p.137.

As a result, the partial adaptation (Frame 2) of four important points of agreement compromises the MKM-SC model, because two alternatives – operating body size and turnover – are not covered by what Silva Junior proposed (2006), which represents a limiting factor for satisfactory performance of KM in MSE. Anyway, we categorize the model in question as partially suitable for micro and small enterprises by the real chance of accommodation / review of identified failures.

5.1.2 Model project of implementation of knowledge management project in companies, based on the modeling of business processes (PKM-MBP)

Like the previous one, Thiel's model (2002) shows the steps the organization should take to effectively adopt KM as a cyclical organizational procedure: the entries for each phase are the results of the previous one and, after the implantation, the respective entries of each stage come from the system feedbacks, and it is possible to return to any point of the process and do it again. It also includes four phases (MOTA, 2011), but as Frame 3 shows, in general, it is not favorable to the reality of MSE.

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Frame 3: Adequacy of the PKM-MBP Model to the profile of micro and small enterprises, Sergipe, 2011.

PKM-MBP – Thiel (2002)	
Questionnaire Items	
Size of the operating body	✗
Turnover	✗
Adoption processes	✗
Size of customers	✓
Deadline for results	–
Involvement of employees	✓
Definition of steps	✓
Experience	✗
Culture	–

Source: Mota – 2011 - p.138.

The model meets three components in full: size of customers; involvement of employees and defining steps and, in part, two others – culture and deadline for results. This level of adequacy has impacts similar to the MKM-SC model, but it leaves four elements open. Besides the number of employees and turnover, the model neglects the experience of enterprises in the adoption process, which requires the implementation of parallel actions. Moreover, the experience of the operational body is compromised due to the high turnover in MSE, as discussed before. These data show that the deployment of PKM-MBP in the enterprises in question requires significant modification of the original model, with the risk of having a new archetype, completely different from the original, which makes us consider this model inappropriate to the reality of micro and small enterprises.

5.1.3 Model *The complete Idiot's guide to knowledge management* (CIG-KM)

Rumizen's model (2002) fulfills what is proposed in the title: it serves as a complete guide for any layman in KM. It begins with fundamentals of KM and ends up with examples of adoption processes in organizations. Systematically, it seeks to emphasize the importance of communication and face-to-face knowledge sharing or

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ISSN: 1981-1640

mediated by computers and other tools. The simplicity of the CIG-KM model ultimately facilitates its accommodation to the MSE, as pointed out in Frame 4.

Frame 4: Adequacy of the CIG-KM Model to the profile of micro and small enterprises, Sergipe, 2011.

CIG-KM – Rumizen (2002)	
Questionnaire Items	
Size of the operating body	➖
Turnover	✗
Adoption processes	✓
Size of customers	✓
Deadline for results	✓
Involvement of employees	✓
Definition of steps	➖
Experience	✓
Culture	✓

Source: Mota – 2011 – p.140.

The Idiot's guide meets six out of nine items completely (Frame 4 and caption, item 5.1): adoption processes; customer size; deadline for expected results; required involvement of employees; required experience and organizational culture willing to share. Furthermore, it is partially attentive to the size of operating body and to the definition of steps. In the first case, even if that requires some functions, these are not critical and may be performed by the same person. Regarding the definition of the steps, it is appropriate to the reality of organizations, but it does not meet the employees' aspirations. The only point in which the model fails refers to the turnover issue. This is because it neither facilitates the adaptation of the newly admitted nor favors interaction with the older ones. However, simple modifications favors the use of the model to micro and small enterprises studied, considering that Rumizen (2002), when describing it, calls the attention to the importance of employees involvement in all stages – from creation, launch and deployment of knowledge bases to the assimilation of its benefits in daily business.

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5.1.4 Model enabling knowledge creation (EKC)

Von Krogh, Ichijo and Nonaka (2000) are the only creators of KM models detailed by Mota (2011) which do not employ the expression knowledge management because they do not believe it is possible to manage knowledge. They use the concept of enabling knowledge creation when presenting *Enabling knowledge creation*, which is a simple proposition, but complete and focused on management of conversations instead of recording and storing information. That is, the focus is always on the human being, his relationships and the collaboration they establish, in particular, thanks to conversations. It is a model focusing on creating an organizational context and an environment favoring cooperation, sharing, loyalty and creativity in the organization. Therefore, these authors claim that it is essential that the people who make the company, consolidate feelings of trust, empathy, understanding, tolerance, courage and willingness to help.

As envisioned, the EKC model, as well as the precedent, fully accepts six out of the nine items analyzed: adoption process; customer size; deadline for expected results; involvement of employees; required experience and organizational culture that favors cooperation, Frame 5. The other elements (size of the operating body; definition of steps, and turnover) are partly covered, allowing us to infer that the model discussed herein can be adopted in the MSE that integrate this research.

Besides the possibility of adjustment, we reinforce that in our opinion and according to Mota's detailing level (2011), the EKC model is the most viable to the reality studied. By focusing on everyday chats, the model makes possible the KM, even among groups of students or friends due to its facility and simplicity.

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Frame 5: Adequacy of the EKC Model to the profile of micro and small enterprises, Sergipe, 2011.

EKC – Von Krogh, Ichijo e Nonaka (2000)	
Questionnaire Items	
Size of the operating body	➖
Turnover	➖
Adoption processes	✔
Size of customers	✔
Deadline for results	✔
Involvement of employees	✔
Definition of steps	➖
Experience	✔
Culture	✔

Source: Mota – 2011 – p.141.

6 FINAL CONSIDERATIONS

The revision of the established categories and goals previously set that revolve around the analysis of models of KM in the micro and small companies in the area of technology in Sergipe (Brazil) allows inferences which are, as in any study of this nature, neither conclusive nor closed. They always allow review and refutation. However, the data collected from those involved and through the technique of direct observation allow us to draw a profile of the technological MSE located in Sergipe, based on detected traces depicting some aspects, such as: number of employees, level of turnover and perception processes from the employees' perspective.

In general, we have recorded a relatively low number of players – 12 (twelve) employees on average – and high turnover, since MSE also hired (also in average), 3.55 collaborators over the six months prior to data collection. Here lies a factor disregarded by the four models described (albeit briefly), and that is a significant clue that the designers of the models do not consider the MSE as target audience. After all, it is apparent that high rates of turnover and new hires affect negatively the organizations studied, as managers, key-employees and representatives of the body operating in general admit. In their opinion, the experience of the newly hired, with a

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few exceptions, is far behind the other team members and, inevitably, the reduced level of experience greatly affects KM practices in the sphere of enterprises.

According to the models analyzed, as Figure 1 illustrates (see caption in item 5.1), none of them meets completely the needs of the MSE, which reinforces the assumption that they are designed and built for medium and large enterprises. Their recommendations always focus on large operating body; experienced employees; possibility of financial investments; attractives for retaining operating body, new hires, etc. Indeed, changes are always possible and previewed by the authors studied. However, the modification of models leads inevitably to different actions and reactions, and most importantly, changes may always cause excessive uncertainty about the adoption of KM.

Figure 1: Summary of the adequacy of KM models to the profile of MSE, Sergipe, 2011.

Questionnaire Itens	EKC	CIK-KM	MKM-SC	PKM-MBP
Size of the operating body	–	–	✗	✗
Turnover	–	✗	✗	✗
Adoption processes	✓	✓	–	✗
Size of customers	✓	✓	✓	✓
Deadline for results	✓	✓	–	–
Involvement of employees	✓	✓	✓	✓
Definition of steps	–	–	✓	✓
Experience	✓	✓	–	✗
Culture	✓	✓	–	–

Source: Mota – 2011 – p.142.

Therefore, the ideal would be a proposition aimed specifically at micro and small enterprises, given the importance of these organizations not only in Sergipe but in Brazil as a whole. Given the absence of such proposal, the best option left for us is the EKC model, due to the higher probability of accommodation to MSE, reinforcing that the negligence towards turnover (which does not only mean the entry of new

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employees, as well as the exit of the experienced ones) is the '*Achilles' heel*' of the four models.

Here, we emphasize that, according to the objectives issued, we did not intend to create a model in any time. This would require, in addition to more in-depth studies, routine monitoring of the MSE for a long time, and experimentation, followed by evaluation of the proposal, review, improvement and new testing. Anyway, the problems identified throughout this investigation, besides bringing analysis on models of KM in micro and small enterprises, can be the starting point for future researches.

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BJIS Brazilian Journal of Information Science

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BJIS, Marília (SP), v.7, Special Number, p.166-188, 1º.Sem. 2013. Available in: <http://www2.marilia.Unesp.br/revistas/index.php/bjis/index>.
ISSN: 1981-1640