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To know or Not to Know?
Knowledge Management & SMEs Service Sector in México

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Abstract

Knowledge management is fundamental to the survival of SMEs. This paper describes the results obtained regarding the processes of knowledge management in thirty SMEs in the service sector, located in the city of Chihuahua, MX. The spiral model of organizational knowledge creation by Nonaka and Takeuchi was used as a reference, along with its dimensions of: Socialization, Internalization, Externalization and Combination. An instrument aimed at this SME's employees was developed. The results described the values assigned by the employees to these different dimensions, which were later analyzed using descriptive statistics, correlation and linear regression. It was found that the category of Externalization contributed with the highest value, followed by Combination and Socialization dimensions. Meanwhile, Internalization activities subtract value to the process of knowledge management. This allows us to conclude that there's a distinct lack of strategies and processes that encourage the generation of organizational knowledge for these SMEs, particularly in conversion from explicit to tacit knowledge.

Key Words: *Sice Model, Service Organizations, México, Knowledge Generation, Organizational Knowledge.*

Introduction

The importance of knowledge and the generation process behind it, is a topic of growing interest among SMEs, to ensure their survival and growth in the long term. Although the use of these terms is relatively new, the generation of knowledge as a strategic resource has been recognized since antiquity. Several

authors such as Galbraith (1973), Edvinsson & Sullivan (1996) through Drucker (2001), and others, questioned and recognized the importance of a new element in business: knowledge.

Small and medium enterprises comprise a category covering a large percentage of the economic sector in different countries in the world. They are the most disadvantaged in terms of information management, despite having great potential for it. One of the main reasons for this is the lack of strategies and processes to manage it.

The aim of this study was to describe the processes related to the knowledge management presented by SMEs belonging to the service sector in the city of Chihuahua, from the perspective of employees thereof. For a description of these processes the Nonaka and Takeuchi model was used. This model recognizes the dimensions of Socialization, Internalization, Combination and Externalization (SICE model), for the generation and conversion of tacit knowledge to explicit knowledge.

SMEs have always presented deficiencies in knowledge generation and its corresponding management, both necessary to ensure their long-term survival. According to reports from the Interamerican Development Bank (IDB, 2003), the lack of technological capacity for information management is one of the main reasons for premature mortality on these business ventures.

If SMEs are able to develop such capabilities, both technological and intellectual, it would enable them to transform data into information and eventually knowledge. This would allow them to capitalize on their advantage, and incorporate it into their services, so that they could offer sustainable competitive advantage long term.

The lack of strategies and processes that favor the generation of knowledge in business is a fundamental problem. Therefore, it is necessary to know what is the current situation regarding these elements in the different sectors and describe the process in which this knowledge is generated, transformed and shared. Only then can they propose new strategies to support and apply the knowledge necessary for their survival.

From the situation previously described, the following questions arise: How is knowledge managed in SMEs in the service sector of the city of Chihuahua, MX. from their employees' perspective? What processes and dimensions, according to the SICE model, contribute to the knowledge management of these companies?

Literature Review

Integration of Concepts: Knowledge Generation

Knowledge production is undergoing major changes derived from the rapid scientific and technological progress (Ziman, 2000). It has gone from a linear model, where problems are defined in the academic, socially irresponsible, disciplinary field governed by scientific standards, validated and evaluated by specialists; to an interactive model, produced within a transdisciplinary, heterogeneous, socially responsible and reflexive context of application, (Gibbons *et al.*, 1994).

Types / Kinds of Knowledge

Different authors provide different types or classifications of knowledge: Foray & Lundvall (1996) distinguish between four different dimensions: 1. Know what, related to the "facts". 2. Know why, is the scientific knowledge per excellence: nature laws, human mind and society; 3. Know How, is the skill and /or ability to do something; 4. Know who, is the mixture of different types of skills, including social, and it implies all of the above mentioned.

Polanyi (*apud* Casas & Dettmer, 2006), distinguishes between tacit and explicit knowledge. Tacit knowledge is the one that individuals and organizations use to achieve a practical purpose, but is not easily explained or communicated. Explicit knowledge is the one formally expressed through a code and therefore can be easily communicated. Both categories are complementary.

Knowledge and Businesses

Companies need knowledge to create innovations. These innovations can be described as learning mechanisms, which vary depending on the type of knowledge and where learning takes place. It has been investigated too few in matters of economies of knowledge. These last ones can impulse significant changes in the organization, especially in the small and medium companies, which represent a very important sector in the economy of any country, because probably each one has by itself a medium impact; but together have a relevant contribution (Martinez Serna, Vega Martinez & Vega Martinez, 2016)

Johnson (1992) presents four different types of learning, according to their grade/level of interaction. Each group's activities aim at increasing knowledge, in order to stimulate innovation: 1. Learn by doing; 2. Learn by using; 3. Learn by interacting; 4. Learn by seeking. The above concepts establish the close link that emerges between the learning and innovation processes, a link which is achieved through interactivity and accumulation of knowledge.

In recent years, the terms "knowledge society" and "knowledge-based society" have been commonly used. Historically, knowledge has played an important role in the development of society and the economy. What has changed is the speed at which this knowledge grows (Stehl, *apud* Casas & Dettmer, 2006). Technological advancement has been the cause of this exponential growth of knowledge, and its equally fast obsolete rate.

Much of the available knowledge is technical, and requires specific and extensive training to be acquired. This knowledge is tacit, and therefore is not easily communicated. Systems require effective training and communication; hence the importance of the educational system that supports this knowledge society.

Although various classical economists like Adam Smith, Freeman, among others, argue that technological change and other innovations are the main cause of the increase in productivity, this aspect had not been much studied. Until an "evolutionary" stream of economists like N. Rosenberg, G.Mensch, C. Freeman and others, conceived the technological development as an evolutionary, dynamic, cumulative and systemic process (Vence, cited in Casas & Dettmer, 2006) with innovation as a key factor within this process.

Nonaka (1991: 96) states that "in an economy where the only certainty is uncertainty, the only reliable source to achieve a lasting competitive advantage is knowledge" Therefore, it is necessary that businesses, besides creating knowledge, inquire how it is created so that in turn, this knowledge will impact on their technological capabilities (Arias, 2003).

This is why companies should focus their efforts in documenting their processes, besides collecting skills, experiences and learning all basic components of tacit knowledge. This knowledge must be formalized to keep the accumulated skills and that are the basis of its competitiveness.

According to the above, in order to obtain the benefits of valuable knowledge for the company, knowledge must be made "explicit" or structured. Thus tacit knowledge is perceived as a process rather than a product. Knowledge becomes a new resource for the competitiveness of the company.

As established by Nonaka and Takeuchi (1999), those companies that have succeeded in linking the tacit with explicit share three features in terms of knowledge creation: 1) Express the inexpressible, using

figurative language and symbolism; 2) Disseminate knowledge, that must be shared to others; 3) New knowledge is generated surrounded by ambiguity and redundancy. These authors derived a theory of knowledge creation in the organization, from which a guide for the business has been developed. This model consists of two dimensions in the process of knowledge generation. These dimensions result in a spiral of knowledge that is created with the dynamic interaction that occurs between different forms of knowledge conversion.

In this model the onset is Socialization, understood as the conversion of tacit knowledge to tacit. Subsequently, tacit knowledge becomes explicit; this leads to the Externalization dimension, which gives way to the Internalization, where explicit knowledge becomes tacit, and finally there comes the Combination process, where implicit knowledge becomes explicit. This series of conversions continue to form the spiral of knowledge, but each time at a higher level.

In addition, there is a study by Awazu and Desouza (2006), who use the SICE model as a framework to study 25 SMEs in their cycle of knowledge generation. This leads them to describe five peculiarities found in this cycle for such companies. Their results reflect the following: 1) Domain of Socialization activities; 2) Common / shared knowledge; 3) Loss of knowledge; 4) Use of external sources of knowledge, and 5) Knowledge management is people-centered.

The instrument applied to the employees of these SMEs is generated from this spiral model of organizational knowledge generation. All of the SMEs belong to the service sector and are located in the city of Chihuahua, México.

Materials and Methods

This was a descriptive field investigation, not experimental, applied to 30 SMEs, located in the city of Chihuahua. It was a convenience sampling, since subjects were selected according to their availability, accessibility and proximity to the researchers.

For the development of this report, all the companies surveyed had at least five employees with more than two years of employment there. Ten of them were technology-based, and the other 20 provided other kind of services, such as finance and food. In the case of Mexico, the service sector is one of the main triggers of economic activity in the country.

More than 60% of the economically active population belongs to this sector (Mendez, 2012). This is an area of coexisting contrasts, in which one can find services with a high level of professionalism, like technology-based companies, but also poor quality and low income services, like food businesses (Coll-Hurtado and Córdoba, 2006). This contrast is reflected in the sample.

An instrument was developed and applied to employees of these companies. The 35 question instrument aims to evaluate parameters, by means of a Likert scale, with seven response options from "strongly agree" to "strongly disagree". These questions were related and categorized as: Socialization, Internalization, Externalization, Combination, Innovation and Knowledge Management.

The encoding of the information was performed with the SPSS tool, version 17, which allowed for different statistical analyzes, reliability, descriptive, frequency, correlation and linear regression.

Results

Reliability analysis, mean values and their respective variance obtained the following values, according to each of the dimensions:

Table 1. Analysis of reliability, means and variances.

Dimension	Cronbach	Mean	Variance
Socialization	.689	4.74	.940
Externalization	.878	5.62	1.210
Combination	.718	4.64	1.037
Internalization	**.640**	4.75	1.341
Innovation	.811	5.63	1.555
Knowledge Management	.921	5.92	.723
All	**.946**	5.35	.607

Table 1 shows that the lowest values, reliability, belong to the dimensions of Internalization and Socialization, followed by Combination and Innovation, and Knowledge Management and Externalization being the highest. Still, all of them with acceptable values, which confirms the reliability of the data obtained through the instrument applied. From above, it can be established that the instrument as a whole is reliable, with a value of .946.

The averages show a similar behavior at the extremes: the highest values belong to the activities of Knowledge Management and Innovation, followed closely by Externalization, and the lowest values are for Socialization and Combination, both also with a slight difference.

Descriptive Analysis by Dimensions

There were with six questions for the first category, Socialization. The highest average corresponded to "allows and encourage simulation based on experts observation" (5.42), followed by “informal training is given thru experts´ observation” (5.32). The lowest value was for “visit to competition is encouraged in order to know their processes and products” (3.48).

The second category, Externalization, was comprised by seven questions. The highest average was obtained by "it is indispensable the creation of manuals and documentation of best practices, for product and process" (6.0). Followed by “the use of deductive and inductive thinking is common among employees” (5.85) next to “there are data bases of products and processes updated continuously” (5.75). The lowest value was (5.33), corresponding for two statements: "employees use metaphors and analogies to illustrate concepts and ideas" and for “subjective opinion is allowed at all levels”. It is noticeable that for this dimension the values were among the highest, ranking all of them above 5.

The third category, Combination, contained seven questions. The opinion expressed for "Dialog with customers and documentation of complains and suggestions is a common practice" had an average of 5.78, the highest value in the group. Followed by “employees have access to specialized literature and courses” (5.32). While "we [the enterprise] continuously publish internal information access to the open public" reached an average of 3.62.

In the fourth category, Internalization, with three questions only, mean values were, from highest to lowest: "encourage simulation/experimentation of process and products derived from complaints, suggestions from customers" (5.31), followed by “allows simulation and experimentation of process and products from oral history, manuals, etc.” (5.13), and the lowest value went to "simulation /experimentation with process and methods from competitors" with 3.85. The fifth category was Innovation, with six questions. The median values ranked from 6.12 to 5.22. The highest median belonged to “our staff is competent and professional" (6.12), and the lowest average was for "Strategy, mission, values and goals are clearly defined” (5.22).

Finally, for the sixth dimension corresponding to Knowledge Management, sixteen questions were developed. The media values ranked from 4.41 up to 6.54, showing the greatest dispersion from all

dimensions. Between the highest were, from highest to lesser values: "I am responsible of my work" (6.54), "I show respect for my colleagues" (6.52), "I have skills that allow me to solve problems" (6.41), "I applied my knowledge to solve problems" (6.32), "The company allows me to apply my knowledge" (6.30). Among the lowest values were: "Suggestions are recorded" (4.41), "I know the company´s rules and values" (5.48).

Frequency Analysis Values Responses

It is established that the values assigned to the answers can be considered "high" with scores of 4, but with a trend towards higher values of the scale, between 5 and 6.

Correlations between Dimensions

To perform this analysis, average responses were calculated for each category: Internalization, Socialization, Combination, Externalization, Innovation and Knowledge Management and the following results were obtained:

Table 2. Correlations (Pearson)

	Socialization	Externalization	Combination	Internalization	Innovation	Knowledge Mgmt
Socialization						
Externalization	.593*					
Combination	.543 *	.540*				
Internalization	.413*	.463*	**.714***			
Innovation	.606*	**.687***	.627*	.577*		
Knowledge Mgmt.	.499*	**.713***	.399*	.207	.609	

* Significant correlation at 0.01 level.

In general, almost all correlations show high values between them, except for the .207 value obtained by the correlation between Internalization and Knowledge Management. Among the highest values observed are correlations between activities of Internalization and Combination (.714), followed very closely by Exteriorization and Knowledge Management (.713), then Innovation and Externalization (.687).
Subsequently the corresponding linear regression was obtained, leaving the equation as follows:

Table 3. Linear regression. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	**(Constant)**	**2.426**	**.482**		**5.031**	**.000**
	Socialization	.073	.110	.077	.659	.513
	Exteriorization	**.424**	.099	.547	4.298	.000
	Combination	.125	.126	.146	.994	.325
	Internalization	**-.275**	.105	-.350	-2.616	.012
	Innovation	.265	.125	.292	2.122	.039

a. Dependent Variable: Knowledge Management

This establishes an important value for the "weight" of Knowledge Management activities by themselves, meaning those processes already performed by these SMEs (2.426), without performing any other activity that seeks to encourage this process. However, the activities of Socialization and Combination don't add much value, while Externalization is the one that really brings the greater value to this internal process of Knowledge Management, followed by Innovation activities. It is noticeable that Internalization activities subtract value to the equation.

Discussion and Conclusion

In accordance to the description of previous results it is interesting to note some contrasts, such as: In the dimension of Socialization, it is established that the external experts' observance is the most valuable activity within this area, but competition is not considered as relevant as experts, by the employees. It is a noticeable gap between the values obtained, from 3.48 up to 5.43.

For the category of Externalization, it is clear that the most critical activity is the creation of documentation that supports processes and products, which are not always available. This shows a clear void in basic activities related to knowledge generation, like the formalization and documentation of it.

Combination activities are the most common of best practices oriented towards dialogue with the customer, documenting complains and suggestions, employees with access to specialized literature and courses, and formal training. Again, there is no contact with competitors or communication oriented to general audience. This denotes that there is no dynamic sharing of the knowledge generated, coinciding with the gap observed in activities oriented to the Externalization of knowledge.

Regarding Internalization, where implicit knowledge becomes tacit, the numbers show a significant dispersion, from 3.85 up to 5.34, even with a few questions. Again, the common practices in the sector are evaluated the best, like the simulation/experimentation with process and products, complaints and suggestions from customers are favored in the sector. In congruence with Socialization and Combination results, the lowest score belongs to the simulation/experimentation with process and products originated from competition.

For the Innovation section, the employees perceived themselves as competent and professional, with high regards to the relevance of their role in the innovation process, based on their ideas and knowledge. However, they do not have a clear comprehension of the company's strategy, mission, values and goals.

Activities directly related to Knowledge Management, already have a specific relevance by themselves, as established in the linear regression equation. Most of the median values are among the highest in all the survey: 15 out of 16 questions obtained evaluations between 6.54 and 5.48, a very close score. But the lowest value points out one major deficiency: there is no record keeping for suggestions. This reaffirms a fundamental lack in Knowledge Management processes.

As a global assessment of the results, it is concluded that these SMEs effectively showed a certain gap regarding strategies and processes that support organizational Knowledge Management, particularly in relation with Internalization, Socialization, and Combination activities. The first one, with a special consideration due to its nature: how employees have difficulties "appropriating" the available knowledge.

It is essential to suggest implementing strategies supported by processes involving Socialization, Combination and specially Internalization activities, where the knowledge is shared by all the organization's members and it becomes "appropriated" by all of them. As suggested by the linear regression obtained, the conversion of explicit knowledge to tacit knowledge becomes difficult for the employees of these SME's.

Since then, these companies have achieved an important generation of this knowledge, in great measure thanks to the convergence of activities carried out as Externalization and Innovation. On the other hand, Socialization and Combination activities do not add very much to the process of Knowledge Management, so it becomes necessary to support them with new approaches, in order to make them more effective. These results contrast with those obtained by Awazu and Desouza (2006), where there was a predominance of Socialization activities, which in this case is the dimension with the lesser value, accordingly with the linear regression equation. There is a parallelism, related with the use of external knowledge sources, like experts, but "anchored" to people. All these statements come from the employee's perspective.

The proper generation and management of these processes will enable their incorporation into the various services provided by these SMEs. Furthermore, this will allow them to become more competitive through the application of the knowledge obtained and guarantee a much needed, long-term survival. This last one, increasingle important in developing countries, as México, where it is so crucial to reorient efforts, especially on the support of the small and medium enterprises, as stated by Martinez Serna, Vega Martinez & Vega Martinez (2016).

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