

A Methodology for the Development and Implementation of Knowledge Management Strategy in a Mexican SME Trading Company

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Abstract

Knowledge Management (KM) has become a key factor in the performance of organizations. The literature shows results of the application of KM mainly in big companies, although there are a few studies that target Small and Medium Enterprises (SMEs). Based on the literature related to the implementation of knowledge management strategies in SMEs, there is a gap in understanding how these strategies allow improvements in the development process of the areas involved in them. The objective of this study is to illustrate the application of a strategy of KM in SMEs that contributes to the improvement of organizational processes while responding to favor internal organization changes. The case study approach is used to develop and implement a methodology for implementing a Knowledge Management Strategy (KMS) in a medium enterprise located in the northwest of Mexico. To complete this, it was necessary within the methodology to determine the area to develop and implement the strategy of KM, having chosen marketing area as the area of interest, based on elements that were considered key to the company. The main results obtained were the identification of key knowledge, where it is and who possesses it; the detailed specification of process activities and the structure of existing knowledge and its conservation; and a decrease in the time to find the information and/or knowledge required for the development of processes in the area of marketing.

Keywords: *Strategy, knowledge management, processes, knowledge, key factor.*

1. INTRODUCTION

The organizations are in a highly competitive environment, where the difference is marked by the use of the knowledge of its members. Therefore, companies feel the need to handle correctly this asset in order to meet the changing needs. One challenge that is required for enterprises to continue to remain active is to conduct strategic elements to the creation of competitive advantage through Knowledge Management (KM) and simultaneously achieve immersed,

enhanced knowledge in individuals and the organization in order that it is at the disposal of others. In this sense, this project aims to develop and implement a Knowledge Management Strategy (KMS) to identify, preserve and use the knowledge of the processes of the marketing area in order to apply it and create a scheme as a response to the new changes.

This paper presents a framework that explains the concepts related to this work; subsequently, the proposed methodology is shown through revised elements where it is given how to develop and deploy it. To validate the methodology, a case study is developed in a trading company located in northwestern Mexico that explains each of the stages and the results obtained. Finally, the conclusion is presented.

2. CONCEPTUAL FRAMEWORK

In this section, a literary analysis that supports the development of the study is contemplated. The main topics to be discussed are: general knowledge and KM, and KMS and related studies. From this point, each section is developed.

2.1. The Generality of Knowledge and KM

The knowledge within organizations is a strategic resource Sirbu et al. (2009) defined it as a combination of experience, values, contextual information, and expert insight that provides a framework for evaluating and combining new information and experiences (Davenport and Prusak, 1998). Choochote and Nurse (2012) refer to the term knowledge as full use of information and data, which at the same time is related to the potential capabilities of people, competencies, ideas, intuitions, commitments and motivations. According to Ichijo and Kohlbacher (2006), the use of knowledge by the organizations has to be effective in order to distribute it to all departments belonging to it. In this sense, knowledge is a crucial and important asset to achieve competitive advantage and success for organizations to survive in new and unusual situations. Wan and Ardjuny (2011) argue that the need to manage knowledge in these times has become a key element in many organizations. Choi et al. (2008) mention that there is growing evidence that companies are increasingly investing in KM initiatives and in establishing management strategies seeking to acquire and exploit this resource in the best possible manner. In relation to this, Evangelista et al. (2010) mention that KM is a critical area for managers of Small and Medium Enterprises (SMEs) in the competitive environment. However, there is general agreement about benefits of KM that are not fully exploited by SMEs. In fact, from the vast literature on KM, there is a lot of research that describes how big companies are successfully practicing KM, but there are also small contributions to the critical success factors of KM from SMEs. Beylier et al. (2009) argue that KM cannot be considered in the same way in SMEs as in big companies, which indicates that the KM can be achieved within SMEs by creating a culture of knowledge sharing. Such companies are organizations that represent more than 80% of all companies that exist in Latin America, which contribute most to employment generation. So find out if the KM impact on the effectiveness of these businesses can contribute to its improvement and, therefore, the growth of an important economic sector in developing countries (Pedrajas-Reja et al., 2009). Therefore, KM has become an important factor to the organization's performance (Bosua and Venkitachalam, 2013). KM is understood as learning management, obtained at a time and place, so that it can be transferred and applied in another place and time,

seeking to obtain the desired results in less time and with fewer errors (Aledo, 1998 cited in Berrocal and Pereda, 2001). According to Uriarte (2008), KM is understood as the process by which organizations add value to their assets using the knowledge, understanding that KM is linked to the process of identification, acquisition and maintenance of knowledge which is essential for the organization. Sha'ar (2012) states that KM is one of the requirements to be taken into account in the setting of modern management, and maintaining and developing the knowledge assets by documenting, storing and making available to all explicit and implicit assets would be an effective way to provide services to the public, including access to contribute to the achievement of sustainable quality. In this scenario, the main goal of KM is to establish guidelines to use existing knowledge to gain competitive advantage. According to its definition, KM consists of the implementation of processes that help manage knowledge in an organization. Table 1 shows a summary of these processes, with differences and variations in the terminology used.

Probst (2002)	Biloslavoy Trnavčević (2007)	Omona et al. (2010)	Dalkir (2011)	Momeni et al. (2011)
Identification	Generation	Planning	Acquisition and application	Acquisition
Acquisition	Storage	Capture	Capture and/or creation	Transfer
Development	Transfer	Organization	Transformation and sharing	Application
Distribution	Use	Recovery		Protection
Preservation		Use		
Use		Maintenance		
		Evaluation		

Table 1. Summary of KM processes. Adapted from Barcelo-Valenzuela et al. (2013).

Usually, the process to carry out KM involves a variety of techniques or tools to capture, organize and store staff knowledge of the organization, so that it can be transformed into an intellectual asset that can provide benefits and can be shared. Nowadays information technologies have tools that allow support to the processes of collection, transfer and systematic information management along with systems designed to make better use of such knowledge (De la Puente, 2010).

2.2. Strategy of Knowledge Management and Related Studies

The only competitive advantage of the company in the future will be in their ability to learn faster than their competitors (Hansen, 2002). Hence, effective KM is the primary concern of contemporary business managers (Long and Chang, 2009). In this sense, Earl (2001), DeSouza and Awazu (2005) question how a company should determine what knowledge is appropriate or what knowledge should be developed to achieve competitive advantage, creating thus a need to define first what is called KMS (Hansen et al., 1999).

KMS, according to Zack (1999), refers to focusing on aligning both their resources and knowledge capabilities to the intellectual requirements of its strategy, reducing or eliminating the gap called knowledge. Masa'deh and Shannak (2012) define KMS as one that plays an important role in supporting the creation, transfer and application of knowledge inside and outside the workplace. Bettiol et al. (2012) mention that KMS serves as a map to guide organizations towards more efficiency and to essentially improve all KM processes such as creation,

codification, transfer and reuse. Accordingly, two perspectives of KMS have dominated KM significantly (Oluikpe, 2012). Coding and customization being the best known in the community of KM, many authors have proposed different classifications. However, two approaches are distinguished mainly: the guidance to systems and people (Choi and Lee, 2002). Considering, according to Hansen et al. (1999), a strategy of personalization and encoding, the first one helps increase the flow of knowledge in the organization through networking and interaction, and the second focuses on the capture, coding, storage and dissemination of explicit knowledge to be used according to organizational objectives (Kwong and Kwok, 2009). Therefore, not every strategy that is implemented in an organization has to take as a final result the documentation of knowledge, but that can be harnessed through interaction among individuals that relate to each other. Thus, there exist KM instruments according to their classification. Table 2 shows a map for the diagnosis and measurement of the orientation of a company to the KM. Using this map, a company can distinguish between coding and personalization strategies, and measure how the company is focused on the exploitation of the knowledge face-to-face or exploitation and reuse of codified knowledge (Meroño-Cerdan et al., 2007).

KM instruments and Strategies	
Coding Strategy	Personalization Strategy
System decision support	Initiatives spontaneous knowledge transfer
Groupware	Mentoring
Document repositories	Equipment/Communities of Practice
Knowledge Maps	Groupware
Workflows	Video conference
Shared databases	Yellow pages
	Discussion Forums

Table 2. *KM instruments and Strategies. Adapted from Merono-Cerdan et al. (2007).*

Therefore, Table 2 is a first attempt in the literature to provide a scale or map for diagnosis and measurement of coding and customizing KMS.

Organizations are affected when employees who play a significant role with their experience, skills or training leave for various reasons. Models and methodologies related to KMS are developed to address this problem within organizations and to respond to the constant changes. Thus, as part of a KMS, a series of steps must be performed. According to Pereira (2011), there are six basic steps that we have to consider (Table 3).

Number	Steps (methodology) to be followed as part of KMS
1	Knowing what is the prospect of more meaningful business for the near future.
2	Determine which "areas of knowledge" are the most significant for the chosen company.
3	Define key performance indicators to be used in the applicable business to the selected perspective.
4	Determine the current and future impact of the knowledge areas in key performance indicators.
5	Knowing which is the state of the knowledge areas and where there is opportunity area.
6	Knowing what the plan will be implemented based on the above and how to monitor progress would be.

Table 3. *Steps to follow as part of a KMS (Pereira 2011).*

Meanwhile, Matos et al. (2006) refer to the group of Integration and Re-Engineering of Systems (IRIS) of the University Jaume a KM-IRIS methodology to develop a KM system. This methodology is mainly to identify, extract, process, store, and share knowledge and it proposes techniques and/or tools to develop phases. Following the stages or steps of a methodology for

KMS is necessary to take into account elements and/or aspects of the design of a KMS. Lopez and Meroño (2010) listed a number of items according to the type of strategy (Table 4).

	Codification	Personalization
Economic motivation	Knowledge reuse	Developing new solutions and knowledge
Knowledge Managed	Explicit	Tacit
Focus	People to documents	People to people
Use of IT	Major investment in IT: Connecting people reusable knowledge	Moderate investment in IT: facilitate discussions and exchange of tacit knowledge
Main tools	Applications of decision support Document repositories Knowledge Maps Workflow Databases Best Practices	Mentoring programs Groups Video-conferencing Experts Directory / Yellow Pages Email Discussion Forums
RRHH Policies	E-learning Giving for using and contributing to databases	Mentoring Giving for sharing knowledge directly or with peers
Advantages	Achieving economies of scale Time savings No need to "reinvent the wheel" More rapid and comprehensive access and distribution	Simple cataloging of knowledge More flexible and adaptable Knowledge Improving the quality of the task Improved image with customers Manages not codified knowledge

Table 4. Elements to be considered according to the type of EGC. Adapted from Lopez and Meroño (2010).

3. METHODOLOGY

Taking into account the review and analysis of the literature on KMS, an integrated methodology aimed at SMEs is proposed to help improve their knowledge processes, facilitate its implementation and also favor response to internal changes in the organization. KM processes proposed by Probst et al. (2000), Biloslavo and Trnavčević (2007), Dalkir (2011), and Momeni et al. (2011), models and methodologies of KMS from authors such as Matos and Chalmeta (2009) and Pereira (2011), aspects and elements considered in the design of a KMS from Lopez and Meroño (2010), among other literature reviews in the context of SMEs, were taken into account. This allows us to propose an integrated methodology, structured from important elements of literature review, seeking to manage the knowledge of the processes taking place in the area of interest within the company. The proposed methodology has important additional elements that other methodologies of KMS do not include, for example, activities that employees should develop in the processes within the area of interest are defined, and it also provides a set of recommendations to build a plan of KMS to identify, preserve and use knowledge. The methodology describes each stage, monitoring of application, tools to use, and what is expected as a result at each stage (Figure 1).

STAGES OF THE METHODOLOGY	OBJECTIVE	TOOLS
1. Identify and analyze the area of interest	Determine the area of interest and perform KM analysis of this and to identify the important processes of the same.	-Initial meetings -Documentary information -Format comparison chart areas -Interviews and quiz -Microsoft Office Excel
2. Define process activities	Define the activities required for each major process area of interest.	-Interview -Microsoft Office Excel -Format Array of activities

3. Develop and implement an KMS	Contemplating KM processes to manage knowledge of the processes of study area.	<ul style="list-style-type: none"> -Meetings -Interviews -Yellow-pages -Maps Knowledge -Microsoft Office Excel -Software Seafire -Documents existing -Quiz
4. Validate the KMS	Check the validity of the KMS in the area of interest.	<ul style="list-style-type: none"> -Interviews -Microsoft Office Excel -Comparison table -Summary table of documental information

Figure 1. Methodology for the implementation of a process-based KMS area of interest.

The following describes each stage of the proposed methodology, how to carry out each stage, and the expected results of each one.

Stage 1: Determine and Analyze the Area of Interest

It focuses on the general and strategic information of the organization to determine and conduct an analysis as to how they work and use of knowledge in the area of interest determined. To do this, one is required to know the areas involved and determine what is the area of interest. This consists of conducting meetings with the leaders of the organizations, making visits, conducting interviews with each responsible for the areas and obtaining documentary information. From this, a checklist is used to determine the area of interest (Table 5).

Area Name	Elements to determine the area of interest				
	It relates to the organizational objective	It is considered the first three most important areas	Seats to perform directed to the goal	It is considered the main source of income	It starts where the main business of the company

Table 5. Elements of comparison as a basis for determining the area of interest.

Also at this stage, the processes of the area under study are identified. It also identifies which ones are the most important of all processes involved in each job. This is obtained from an interview conducted with employees. Having obtained this, an assessment of the KM in the selected area is done to see the state in which it is in regard to the implementation and use of KM processes, mainly in the identification, conservation and utilization of knowledge. To make this diagnosis, one can choose and implement an existing questionnaire and/or redesign it from observations made by going to the company; as a result of this application, it will collect and store the results to analyze the area and thus know the current situation of existing KM.

Stage 2: Define Process Activities

Its purpose is that the activities performed in the area under study are adequate, so that in this way the company goals are met following a defined job. The activities within the processes of the area under study are derived from obtaining information and/or documentation provided by the personnel involved in the processes obtained in the area and from the application of an interview aimed at staff involved in a selected area. It can be used for the collection of the results obtained, a matrix of the activities of each process (see Table 6). Later, this information is analyzed in

order to see which activities were performed by each one of those involved in the interview, all with the purpose of development and implementation to perform an easier KMS.

MATRIX OF PROCESS ACTIVITIES IN THE AREA OF INTEREST.		
Name of the process: _____		
Responsible for the process: _____		
Name of activity	Defining the activity	Knowledge required for implementation

Table 6. Matrix of process activities in the area of interest.

Stage 3: Develop and Implement the KMS

For the development of a KMS, a process of KM is contemplated in an integrative manner to achieve and adequately manage knowledge of processes of the analyzed area. The implementation of strategy is performed with the development of each of the stages included in the KMS, which is developed as part of the methodology for carrying out the implementation (Figure 2).

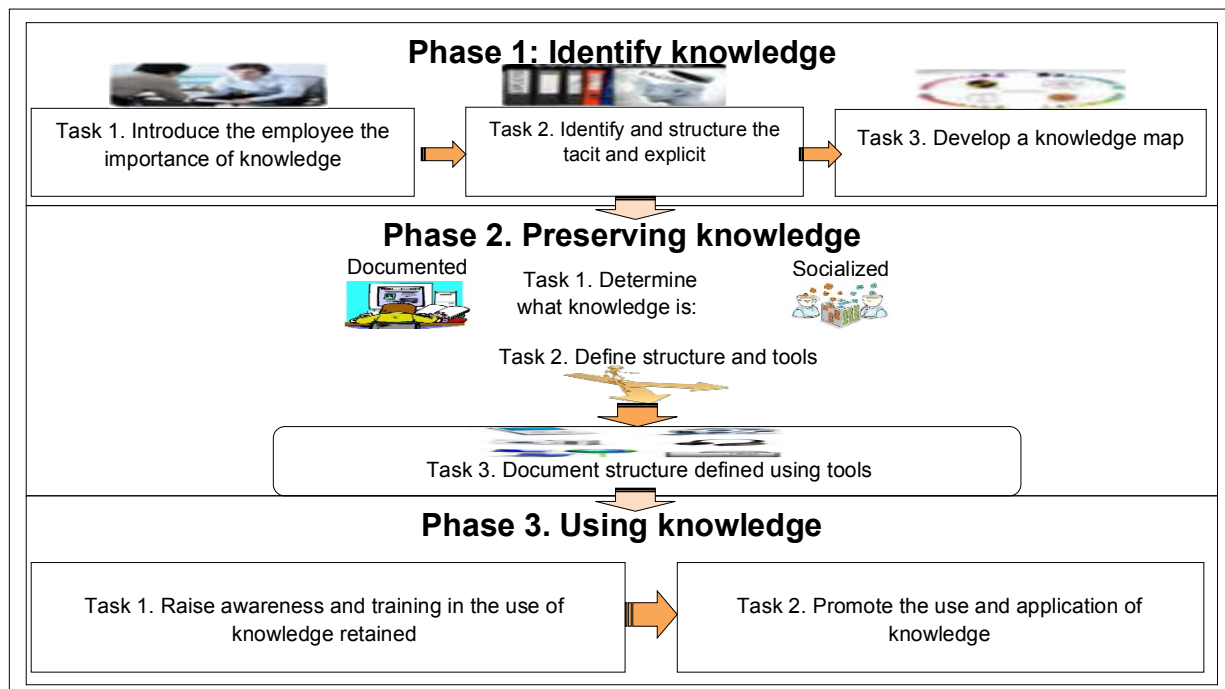


Figure 2. Phases KMS to manage knowledge.

Phase 1: Identify Knowledge

The objective of this phase is to identify both tacit knowledge as explicit, which is within the area of interest, and later safeguard it through strategies to retain knowledge and use it for future development and growth of the organization. In this way, one can seek to know the set of essential elements to identify and associate this with processes, activities, manuals, procedures,

considered as knowledge that is tangible as well as locate the intangible or tacit knowledge of experts related to experiences, skills, mental models that the staff has. To develop this phase, tools such as interviews, yellow pages, knowledge maps are used, among others.

Phase 2: Preserve Knowledge

This phase is related to one of the processes in which KM captures or retains the knowledge that exists within the processes of area of interest, ensuring that knowledge is available to employees, and it is the basis for possible changes within the company, as well as the same knowledge is transferred among employees so that it can be applied and used when they require it. To do this, one need to determine what knowledge must be documented and what socialized. Since this takes place as defining the knowledge structure, it means performing the taxonomy of the knowledge that has been identified, considering which is encoded and socialized. As a result, a document showing the structure of knowledge is obtained. Therefore, it determines what kind of tool is used to preserve the knowledge according to the way it is (tacit or explicit). The determination is made based on the types of tools that have been revised, and according to the features that the tool has to retain knowledge. Added to this, the structure defined in the particular tool is documented.

Phase 3: Use Knowledge

Make proper use of the knowledge that has been captured based on the documentation and socialization, promoting with this a scheme of response to the changes in the organization. For this, it requires awareness and training in the use of retained knowledge; this can be through an individual meeting with each person's area of interest, where the staff are made aware of the way how knowledge is preserved, as well as, you can let them know the kind of knowledge that exists, who owns it, how to access it, what kind of tool is used to preserve, among other things; for this, you can use a training plan for the use of knowledge as a support tool. Besides this, you must promote the use and application of knowledge by encouraging the employee to use and establish this KM process as part of their work.

Stage 4: Validate the KMS

Validate that the KMS is appropriate for the company. This stage is related to everything that has been developed in the previous stages, because each one is designed with the goal of advancing the KM and thus contributes to improving the processes within the study area for at the end to validate the implemented. Validation consists of applying a tool to verify that applying a KMS serves as a basis for KM and possible changes that an organization faces, both internal and possible expansion that allows the generation of new business. This is carried out using tools such as interviews, comparison table format, and questionnaires associated with KM processes, among others.

4. CASE OF A MEXICAN TRADING COMPANY

To validate the methodology, the four stages were implemented in a trading company, which is considered a medium enterprise with 37 employees, composed simultaneously of three companies: a service provider, a manufacture of custom clothing, and one engaged in trade of goods and industrial equipment, aimed at the mining industry, maquiladora, aerospace and automotive. The trading area is chosen as the object of study for the implementation of the

methodology, because this area is the main source of income and where many processes and functions involved are done to market the items. Notably, the company under study is undergoing internal changes such as restructuring processes and hiring new personnel. Moreover, since its inception, it has never developed strategies to manage and take advantage of knowledge possessed by the personnel due to the large number of processes involved in marketing products and lack of clear definition of the activities carried out within the area of trading process, making it difficult to respond to internal changes occurring in the business, hiring new staff, or defining work plans for future expansion. What follows is a description of how the stages were implemented and the results therein.

Stage 1: Determine and Analyze the Area of Interest

It was determined that the area of interest to develop the study would be the trading area, carrying out the following: a meeting with management, visits to the organization addressing each of those responsible for trading, projects, warehouse, finance, management, systems and textopres (areas that make up the trading company), which were given an interview to know the importance of the goal area, among others. Documentary organizational information provided by management staff was analyzed, where information related to the company and its different areas, objective, mission and vision of this was obtained. Also unveiled was the organizational structure they were working, which was complemented by the interview. A checklist of the table shown in the methodology was used (Table 7).

Area Name	Elements to determine the area of interest				
	It relates to the organizational objective	It is considered the first three most important areas	Seats to perform directed to the goal	It is considered the main source of income	It starts where the main business of the company
Trading	Yes	Yes	Yes	Yes	Yes
Finance	Yes	No	No	No	No
Warehouse	Yes	Yes	Yes	No	No
Projects	Yes	No	No	No	No
Textopres	Yes	Yes	No	No	No
Systems	No	No	No	No	No
Management	No	No	No	No	No

Table 7. Table of comparative elements to determine the area of interest.

This checklist allowed determining that the area would be trading area to meet most of the comparative elements.

In addition to selecting the area, the identification of processes in trading area was obtained as to how to perform them and their information suppliers; to do this, an interview was conducted aimed at employees of each job's specific area, the determinants of which were the important processes that require customers as information suppliers, the order of importance of carrying out the process, and why and where the responses obtained revolved directly in the process of quote, sell, order, purchasing, billing, collection and credit.

As part of this stage, an analysis of the KM in the trading area was also carried out. To make this diagnosis, adapted from Perez-Soltero et al. (2011), several questionnaires were revised taking into count the processes mentioned before, and it will facilitate the analysis, from this point, that one of them was chosen and applied; it was redesigned based on the observations made at the moment to revise the questionnaire and adapt it to the enterprise. The questionnaire was applied

to 12 employees in the trading area, evaluating seven processes of KM from an individual perspective and area. The results were obtained, with each one of the data an individual average for each process evaluated, and from these results, a general average was obtained to know the areas of opportunity per process. Figure 3 shows the results.

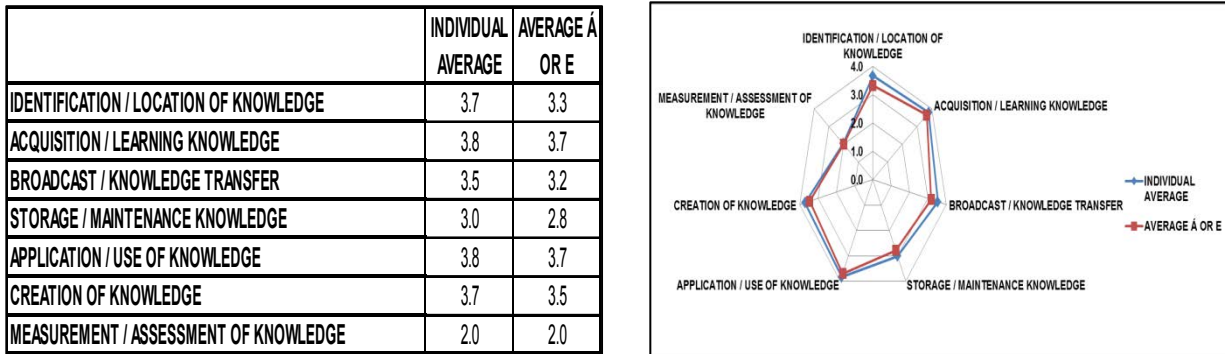


Figure 3. Overall average of each KM process.

It was decided that the processes that have a score of 3.5 or less would be considered an opportunity to serve as a reference when implementing a KMS. Based on Figure 3, the average shows that area of opportunity is in the process of measurement/valuation, storage/maintenance, dissemination/transfer and identification/location of knowledge.

Stage 2: Define Process Activities

For this stage, the activities of the sales process, order, quote, credit, billing, collection and purchases are defined, these areas were considered by employees and those responsible as the most important areas to carry out commercialization. Added to this, the definition of the activities was obtained from information and/or documents provided by the staff of each process and the implementation of an interview (see Figure 4).

ACTIVITIES FOR INTERVIEW PROCESS AREA OF INTEREST

Name of the process: _____

Responsible for the process: _____

1. How many activities carried out for the development of the process performed?
2. List the activities that it considers most important.
3. Briefly define each of the activities listed.
4. Indicate the knowledge required to perform the activities listed.

Figure 4. Interview for the activities of the process area of interest.

As a result, the implementation of the interview and the detailed activities of the important processes in the trading area were documented. Such documentation was to make use of a table designed for this stage, where the process the owners unveiled was expressed (an example of the activities of accounts process in Table 8).

ACTIVITY MATRIX COLLECTION PROCESS			
Responsible for the process: Angelica Aguinaga			
Number of activity	Name of activity	Defining the activity	Knowledge required for implementation
1	Update Database	Is to update information collection report, which has the record of clients that are required to collect	* Report collection * Customer information * Handling Excel
2	Talking on the phone	Be in touch with the customer after they are made to get the physical and / or electronic invoice, in order to obtain payment of the invoice	* Terms of payment * Customer Contacts * Handling phone
3	Send email	Send mail client as payment reminder of what were billed without losing sight of the relationship with the same	* Email * Terms of payment * Email Handling

Table 8. Example of defining activities of the collection process.

Stage 3: Develop and Implement KMS

Three phases of KM processes were applied as part of the strategy.

Phase 1: Identify Knowledge

In this phase, the employees were made aware of the importance of knowledge; also tacit and explicit knowledge were identified and structured. This is done from performing meetings with area managers and application of interviews to employees to know their skills, experience and knowledge, among other things; to request the records of the employees of the processes chosen, to know their experience and academic training, and thus know what they know and how they manage it. Following this information, yellow pages and maps of knowledge for each employee in trading area were developed; this was documented for later use, taking with it the representation of existing knowledge, in order to identify the knowledge possessed by employees responsible for the process.

Phase 2: Preserve Knowledge

Firstly, it was important to determine what knowledge would be documented from the information obtained in Stage 1. To determine this, a selection of knowledge was made to carry out an evaluation process and filter out explicit or tacit knowledge. Employees of trading area (principally personnel in charge) determine what knowledge is most important to retain and how it is more likely to be available to others. From this, a knowledge structure is defined, performing a classification of knowledge, and thus an outline of the information, documents and knowledge of the workers who perform their jobs (Figure 5).

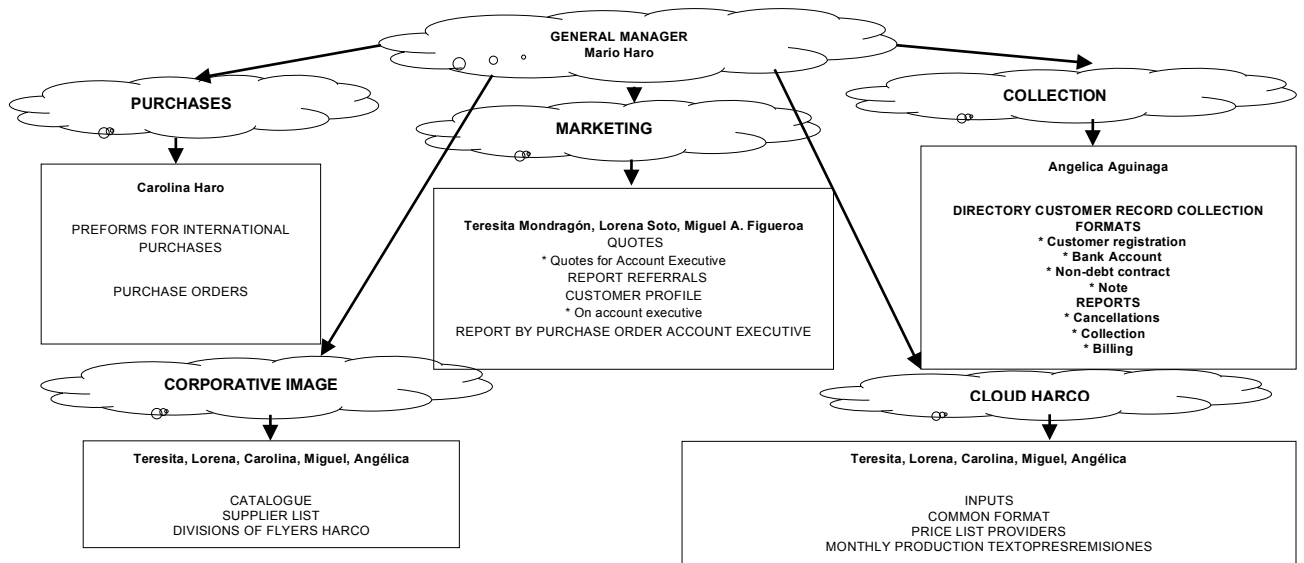


Figure 5. Structure of information and knowledge in the area of marketing staff.

As one of the results, the tools used were determined to preserve the knowledge according to the way it was identified, how it should be preserved, in this case supported by knowledge maps and yellow pages, which serve to identify existing knowledge in the jobs or processes. Furthermore, we try to use a tool that would serve to preserve the knowledge that was identified, together; this is due to the fact that the location of the knowledge and/or information was known only by who handled such information and/or knowledge. It required an informatics tool that was feasible for the company to acquire and easy to use by employees. It was decided to choose Seafile, which allows you to create a private network for use in the workplace or with friends.

Following this, the structure was documented using the tools defined. Figure 6 shows the structure defined in Seafile tool.



Figure 6. Example of the groups formed on the basis of defined structure.

For documentation of knowledge and/or structure information, we went with employees to explain the use of the tool and the structure in which the knowledge and/or information in their workplace would be.

Below is an example of how a file was documented, folder 'Account' was chosen and used for customers to make payments at the time they performed the collection process (Figure 7).

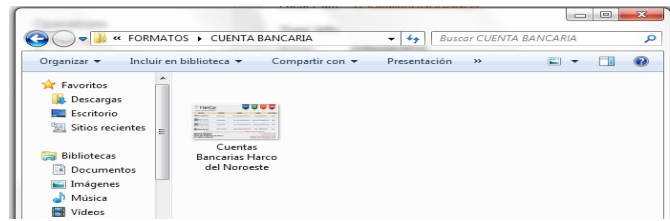


Figure 7. Picture Format bank accounts of the company.

From this figure, you can see how the structure of knowledge was defined: it was possible to document a software that allows the preservation of knowledge and/or information, and synchronization of it to be shared with other members.

Phase 3: Use the knowledge

It was made a conscientization and training for staff in the use of retained knowledge. This was done personally with each of the employees responsible for the processes of the given area. The training plan was to make known to each employee identifying the personnel handling the knowledge and/or information as it plays, knowing the location of knowledge and/or information, knowing what knowledge and/or information is preserved and what kind of knowledge and/or information it is; also the use of such knowledge is preserved. All this is to create and maintain an environment where they can respond to changes that occur in the company, or to situations which require the knowledge of others to respond to the client. Furthermore, the use and application of knowledge is promoted through various means, including e-mail to notify about updates. They were released once the circumstances presented themselves, which required use and application of knowledge that had been preserved, and it emphasized that this management process would be a part of their work processes to continue to preserve the knowledge and generate improvements.

Stage 4: Validate the KMS

The validation consisted of carrying out the implementation of the questionnaire that was initially used as a diagnostic of how KM was in the area of interest, in order to see how the processes to implement KM were improved at the moment of applying the KMS. It should be noted that the questionnaire was applied to 12 employees in the beginning, out of which 9 new people were now involved due to personnel changes that took place during the course of the study. From the implementation and the results obtained, a comparative analysis of the results before and after applying the KMS was performed. The overall averages of each of the processes were taken as reference in this regard (Table 9).

	BEFORE APPLYING KMS		AFTER APPLYING THE KMS	
	INDIVIDUAL AVERAGE	AVERAGE Á O R E	INDIVIDUAL AVERAGE	AVERAGE Á O R E
IDENTIFICATION / LOCATION OF KNOWLEDGE	3.7	3.3	4.1	3.9
ACQUISITION / LEARNING KNOWLEDGE	3.8	3.7	4.0	3.9
BROADCAST / KNOWLEDGE TRANSFER	3.5	3.2	4.3	4.1
STORAGE / MAINTENANCE KNOWLEDGE	3.0	2.8	4.1	3.9
APPLICATION / USE OF KNOWLEDGE	3.8	3.7	4.3	4.2
CREATION OF KNOWLEDGE	3.7	3.5	3.9	3.7
MEASUREMENT / ASSESSMENT OF KNOWLEDGE	2.0	2.0	2.4	2.3

Table 9. Comparative table of averages before and after application of the KMS.

In general, the averages, according to Table 9, increased after the application of the KMS, mainly in the processes of identification, documentation and use of knowledge as spreading/ transfer of knowledge. As for the processes of creation, measurement and acquisition, an increase in average is shown; however, these were not as significant. The above results allow us to see that applying the KMS improves knowledge processes, resulting in the strategy to comply with the stated objective, that knowledge was identified, preserved and used for the benefit of the company and as a basis to deal with changes that occur in the organization. In addition to this analysis, interviews with employees and managers were conducted in order to validate the KMS based on their perceptions and assessment of the implementation and the benefits it has brought. Following the responses and the analysis, a comparative table of area marketing was generated depicting the status before and after the application of the KMS (Table 10).

COMPARATIVE TABLE OF BEFORE AND AFTER THE KMS APPLY AREA MARKETING	
BEFORE KMS	AFTER THE KMS
Knowledge structure or definition of the process activities of marketing area had not.	Documentation of process activities in knowledge maps, where the activities take place in the process and knowledge and / or information required to develop this activity is indicated.
The knowledge possessed each of the employees who played the position within the area, and only they knew where was located in the tool.	As for the preservation of knowledge, employees can have access to knowledge more easily, because this is available to them within the applied tool to preserve knowledge and being able to share and access when required.
Search times were previously time-consuming, since locating a document or the knowledge required to develop a process by other persons or manager of the process lasted longer (about 5-10 min.), Since no an order of the information that was documented be had.	Having the knowledge and / or structured information and a tool that allows access to several people reduced the response time to locate specific knowledge required (1 to 3 min.) This was monitored once the knowledge and / or information was available to employees when they needed to make use of some knowledge for process performance.
It did not identify the personnel handling certain knowledge.	Yellow pages as documentation of skills and experiences that drove each of the employees, making available all members of the marketing area.

Table 10. Comparative table before and after application of the KMS.

Table 10 shows the changes that occurred after implementing KMS in the trading area, which also allowed the company to show the results obtained after applying the methodology focused on improving KM.

5. CONCLUSIONS

In the environment of an SME line of business, proper and efficient use of knowledge resources is of vital importance, and hence the methodology proposed to implement and develop KMS focused on identifying, preserving and using knowledge favored to solve problems in less time, having access to knowledge of the processes, and locating personnel and knowledge efficiently.

The development and implementation of this methodology that encompasses a KMS provides a tool to manage knowledge in an SME and helps achieve a knowledge base to deal with changes and future expansions of it, thus allowing the development and growth of employees and consequently of the organization. Also in support of this approach, you can get a current assessment of KM processes, which in turn serves as criterion for decision making on the implementation of KM initiatives and helps to identify and accurately determine the area of greatest interest to apply the KMS and to define the activities of the important processes, for better organization and productivity in response to changes. Furthermore, replicating each stage of the methodology is feasible for the other areas of the company, as it is designed to determine the areas of greatest interest and importance and to manage the knowledge processes of each one of the areas of the rest of the enterprise.

REFERENCES

- Barcelo-Valenzuela M, Ramírez.-Quihui L I and Perez-Soltero A (2013), *El conocimiento Organizacional; una vía para Oportunidades de Mejora: Caso UT Hermosillo*, pp. 186-195.
- Bettiol M, Di Maria E and Grandinetti R (2012), “Codification and Creativity: Knowledge Management Strategies in KIBS”, *Journal of Knowledge Management*, Vol. 16, No. 4, pp. 550-562.
- Berrocal F B and Pereda S M (2001), “Formación y gestión del conocimiento”, *Revista Complutense de Educación*, Vol. 12, No. 2, pp. 639-656.
- Biloslavo R and Trnavčević A (2007), “Knowledge management audit in a higher educational institution: a case study”, *Knowledge and Process Management*, Vol. 14, No. 4, pp. 275–286.
- Bosua R and Venkitachalam K (2013), “Aligning strategies and Processes in Knowledge Management: A Framework”, *Journal of Knowledge Management*, Vol. 17, No. 3, pp. 331-346.
- Beylier C, Pourroy F, Villeneuve F and Mille A (2009), “A Collaboration-Centred Approach to Manage Engineering Knowledge: A Case Study of An Engineering SME”, *Journal of Engineering Design*. Vol. 20, No. 6, pp. 523-542.
- Choi B and Lee H (2002), “Knowledge Management Strategy and its Link to Knowledge Creation Process”, *Expert Systems with Applications*, Vol. 23, pp. 173-187.
- Choi B, Poon S and Davis J (2008), “Effects of Knowledge Management Strategy on Organizational Performance: A Complementarity Theory-Based Approach”, *Omega*, Vol. 36, No. 2, pp. 235-251.
- Choochote K and Nurse R (2012), “A Simple Knowledge Management Strategy Model for SMEs in Developing Countries”, *World Academy of Science, Engineering and Technology*, pp. 189-192.
- Dalkir K (2011), *Knowledge Management in Theory and Practice*, second edition. Cambridge, MA: MIT Press.
- Davenport T H and Prusak L (1998), *Working Knowledge: How Organizations Manage What They Know*”, Harvard Business School Press, USA.
- De la Puente M (2010), “Gestión del conocimiento y Minería de datos”, *Consultora de Ciencias de la Información*, Vol. 19, pp. 1-21.

- Desouza K C and Awazu Y (2005), "Maintaining Knowledge Management Systems: A Strategic Imperative", *Journal of the American Society for Information Science and Technology*, Vol. 56, No. 7, pp. 765-768.
- Earl M (2001), "Knowledge Management Strategies: Toward A Taxonomy", *Journal of Management Information Systems*, Vol. 18, No. 1, pp. 215-233.
- Evangelista P, Esposito E, Lauro V and Raffa M (2010), "The Adoption of Knowledge Management Systems in Small Firms", *Electronic Journal of Knowledge Management*, Vol. 8, No. 1, pp. 33-42.
- Hansen M T (2002), "Knowledge Networks: Explaining Effective Knowledge Sharing in Multiunit Companies", *Organization Science*. Vol. 13, No. 3, pp. 232-248.
- Hansen T M, Nohria N and Tierney T (1999), "What's Your Strategy for Managing Knowledge", *Harvard Business*, Vol. 77, No. 2, pp. 106-116.
- Ichijo K and Kohlbacher F (2006), "Global Knowledge Creation–The Toyota Way", *Int. J. Automotive Technology and Management*, Vol. 7, pp. 116-134.
- Kwong P and Kwok C (2009), "Organizational Culture and Knowledge Management Success at Project and Organizational Levels in Contracting Firms", *Journal of Construction Engineering and Management*, Vol. 135, No. 12, pp. 1348-1356.
- Long Wu I and Chang Lin H (2009), "A Strategy-Based Process for Implementing Knowledge Management: An Integrative View and Empirical Study", *Journal of the American Society for Information Science and Technology*. Vol. 60, No. 4, pp. 789-802.
- Lopez N C and Meroño C A L (2010), "¿Condicionan las características estructurales de la empresa su estrategia de gestión del conocimiento?", *Revista Europea de Dirección y Economía de la Empresa*, Vol. 19, pp. 69-86.
- Masa'deh R and Shannak R O (2012), "Intermediary Effects of Knowledge Management Strategy and Learning Orientation on Strategic Alignment and Firm Performance", *Research Journal of International Studies*, pp. 112-128.
- Matos G, Chalmeta R R and Coltell O (2006), "Metodología para la Extracción del Conocimiento Empresarial a partir de los Datos", *Información Tecnológica*, Vol. 17, pp. 81-88.
- Matos M G and Chalmeta R R (2009), "Estrategia de Gestión del Conocimiento en una Pequeña Empresa", *International Society for Knowledge Organization*.
- Meroño-Cerdan A L, Lopez-Nicolas C and Sabater-Sánchez R (2007), "Knowledge Management Strategy Diagnosis from KM Instruments Use", *Journal of Knowledge Management*, Vol. 11, No. 2, pp. 60-72.
- Momeni M, Shaabani E, Ghasemi R and Abdullahi B (2011), "Canonical Correlation Analysis between Knowledge Management and Core Competencies: A case Study in the Iranian Automotive Industry", *American Journal of Scientific Research*, Vol. 25, pp. 70-81.
- Olukpe P (2012), "Developing a Corporate Knowledge Management Strategy", *Journal of Knowledge Management*, Vol. 16, No. 6, pp. 862-878.
- Pedrajas-Reja L, Rodríguez-Ponce E and Rodríguez-Ponce J (2009), "Gestión del conocimiento, eficacia organizacional en pequeñas y medianas empresas", *Revista Venezolana de Gerencia*, Vol. 48, pp. 495-506.
- Pereira A H (2011), "Implementación de la Gestión del Conocimiento en la empresa", *Centro de Gestión de Conocimiento, CEGESTI*, Vol. 135, pp. 1-6.

- Perez-Soltero A, Leal S V, Barcelo V. M, Vanti A A and Torres G C A (2011), “Diagnóstico de los procesos de la gestión del conocimiento: Caso de una empresa del sector restaurantero del noroeste de México”, *Produção em Foco*, Vol. 1, pp. 1-23.
- Probst, G., Raub, S., Romhardt, K. (2000). *Managing Knowledge: Building Blocks for Success*. New York: John Wiley & Sons.
- Sha’ar H A (2012), “The Impact of Knowledge Management in Achieving Qualitative Services in Jordanian Telecommunication Sector”, *European Journal of Social Sciences*, Vol. 33, pp. 270-288.
- Sîrbu M, Doinea O and Goirgiana M (2009), “Knowledge Based Economy – The Basis for Insuring a Sustainable Development”, *Annals of the University of Petroani, Economics*, Vol. 9, pp. 227-232.
- Uriarte F A (2008), *Introduction to Knowledge Management*, ASEAN Foundation, Jakarta, Indonesia.
- Wan Y W F and Ardjuny O S (2011), “Knowledge Management Strategy and Design: The Role of Corporate Culture”, *The International Journal of Interdisciplinary Social Sciences*, Vol. 6, pp. 145-156.
- Zack M H (1999), “Developing a Knowledge Strategy”, *California Management Review*, Vol. 41, pp. 125-145.