

Analysis of Knowledge Management in Companies Involved in Innovation Activities in Yucatan, Mexico

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Abstract

In recent years there has been a reassessment of the importance of knowledge in organizations. This has led to the need for knowledge management as a process for the acquisition, development, and use of knowledge, both tacitly and explicitly, for the achievement of business goals, the maintenance of sustainable competitive advantage, and innovation. The aim of this paper is to analyze knowledge management in companies involved in innovation activities in the state of Yucatán, México, through a quantitative, descriptive, non-experimental study, which was conducted by means of a survey given to a sample of 73 managers of these companies. The results show that, in these companies, knowledge management is at a highly-developed stage. The storage and application practices are those which companies have worked harder, whereas protection and acquisition of knowledge have received less attention. They have focused on storing information that represents valuable knowledge and applying it, mainly for the improvement everyday tasks that contribute to streamline processes and redesign of products and/or services.

Keywords: Knowledge management, innovation, innovative companies

1. Theoretical Framework

In recent years there has been some consensus in distinguishing three periods in the development of human history, based on economic criteria: the agricultural age, the industrial age and the knowledge age (Gorey & Dobat, 1996). In the agricultural age, the main economic assets were land and labor, which were of greater importance than capital assets or knowledge. In the industrial era, capital became more important, and, as an asset, land was of secondary importance, with labor remaining an asset of significant importance. However, for a long time now, the industrial age has been left behind in search of an economy based on information and knowledge. The latter is characterized by the consideration of knowledge as one of the foundations of organizational structure and corporate culture. Given this new environment, organizations need a structure and system of operation consistent with the requirements of the business environment to ensure desirable levels of competitiveness.

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1.1. Knowledge and its Importance in Business

While there is no general definition of the term knowledge, it can be described as a concept with multiple meanings (Nonaka, 1994). Alavi and Leidner (1999) argue that information becomes knowledge once it has been processed by the mind of an individual. Knowledge again becomes information when it is articulated or communicated to others by means of a written text, in an electronic format, through oral expression, or otherwise. Andreu and Sieber (1999) mention that knowledge tends to be an asset that develops with time and effort, and depends on both the pathway and context. Bearing this in mind, competitive advantage substantially based on knowledge will tend to be relatively more sustainable than others. If this is the case, the value of knowledge tends to be greater in the context of the company that knows how to use it to compete in a hypothetically open market⁴. The fundamental aspects of knowledge are basically three characteristics:

1. It is personal⁵, which is to say that it originates and resides in people who assimilate it as a result of their own experience (i.e. of their own 'making', whether physical or intellectual), and incorporate it into their personal knowledge archive, convinced of its meaning and implications, and articulating it as an organized whole that gives structure and meaning to its various parts.
2. As opposed to that which occurs with physical goods, it can be repeatedly used without being consumed. It allows us to understand the phenomena that people perceive (each in their own way, according to what their knowledge means at any given time), and evaluate the phenomena in the sense of judging their relevance for any given moment⁶.
3. It serves as a guide for action for people, in the sense of deciding on what to do at all times, because such action is generally aimed at improving the outcomes of the perceived phenomena for each individual (even changing them if possible).

In short, knowledge is internalized information, namely, its origin is in the mind of the person who builds it as a result of their beliefs, experiences, intelligence, intuition, judgment and values. Therefore, it is personal, unconscious, intangible and invisible. It is an asset that increases when it is accumulated and reused and may extend further to a higher level, which is wisdom. One of the best known classifications of knowledge is proposed by Polanyi (1966), who notes that there are two dimensions; knowledge about the object or phenomenon we observe, known as focal knowledge, and knowledge used as an instrument or tool to manage and improve the interpretation of the observed, which is known as tacit knowledge. Both complement each other; tacit knowledge works as a framework or background that allows for the action of observing what is in the spotlight. Nonaka (1994) calls these dimensions of knowledge "explicit" and "tacit". Another classification of knowledge is between the individual and the collective. In the former, people use basic skills⁷, mental models, and scales of values or evaluation schemes, depending on the context in which they are operating, and action plans to deal with certain situations. On the other hand, if the definition above is applied to the concept of collective knowledge, the result is the collective ability of a group of individuals to solve problems with a certain degree of effectiveness (Spender, 1996; Andreu & Sieber, 1999). In organizations, knowledge can be applied in the design and implementation of actions that distinguish them in their competitive field, and, therefore in the process of knowledge development, which, for the company concerned, results in an increased potential for action. One way to make the concept of knowledge operational is to focus it on the fundamentals of business activity, such as problem solving and innovation (Andreu & Sieber, 1999). Companies are the most active agents that promote and create innovations since each is a set of resources and capabilities, which learns and accumulates knowledge, experience and skills (Jasso, 2004).

⁴ Andreu and Sieber use hypothetical because it is precisely the characteristics of knowledge that make it difficult to suppose its existence.

⁵ These authors point out that there are representations of knowledge that cannot reside in people, as they speak of collective or organizational knowledge; however, they do mention that this also originates and resides in people.

⁶ Andreu and Sieber (1999) comment that it is clear that the result of such an understanding and evaluation brings additional knowledge that, once it is put in the context of the above, is incorporated into the overall structure of knowledge for each person. Of course, this result can also be "negative" in the sense of "discrediting" certain pieces of knowledge contained in the global structure; in such cases, parts of "discordant" knowledge are removed or relocated in the context of the overall structure.

⁷ For example, the ability to perceive and understand situations according to a mental model, to evaluate situations according to a predetermined framework, or the ability to solve problems by applying a specific action plan.

One of the main requirements for innovation is knowledge, which today is a competitive factor and plays an increasingly important role. In this sense, knowledge management allows for the implementation of programs that help organizations achieve this added value that distinguishes them from others (Montoro, 2008).

1.2. Knowledge Management

While knowledge is a resource that has unique characteristics and is a source for generating competitive advantages, its existence does not lead to the development of these advantages without effective management. This is the problem that knowledge management tries to solve (Vidal, 2009). The term, which has been widely discussed, emerged in the nineties with the transformation of economies, global changes and rapid technological advances. It can be understood as a process that continually ensures the development and implementation of all types of relevant knowledge in a company in order to improve its ability to solve problems, and thus contribute to the sustainability of its competitive advantages (Andreu & Sieber, 1999). It refers to a dynamic process, not something that is designed, implemented and used. Alavi and Leidner (1999) consider knowledge management a process for acquiring, organizing and communicating both the tacit and explicit knowledge of employees so that others can make use of it and thus be more effective and productive in their work. Its main challenge is the capture and integration of knowledge. Consequently, the ability to integrate and apply the expertise of the members of the organization is critical to the ability of a company to create and maintain a competitive advantage. For Montoro (2008, p. 63), it is the "discipline that is required to examine the design and implementation of systems whose main goal is that all the tacit, explicit, individual, internal and external knowledge involved in the organization can transform and become organizational knowledge. That knowledge in turn, being accessible and shareable, allows individual knowledge to increase for all its members and directly results in enhancing the contribution of these individuals in achieving the objectives of the organization." That is, it deals with the study of the design and implementation of systems whose main goal is to convert all knowledge into value for the organization.

Table 1 shows other knowledge management definitions, with most agreeing that it is a process.

Table 1: Knowledge Management Definitions

| Authors | Definition |
|-----------------------------|---|
| Nonaka & Takeuchi (1999) | Collection of processes to manage the creation, dissemination and leverage of knowledge in the company to meet the objectives of the organization. Their model of the Knowledge Creation Process is characterized by the generation of knowledge through the combination of tacit and explicit knowledge. It becomes a permanent spiral of the internal transformation of knowledge that is developed through four phases: socialization, externalization, combination and internalization. |
| Bueno (2000) | An operation that plans, coordinates and controls the flow of knowledge that occurs in connection with its activities and its environment, in order to create core competencies. |
| Canals (2003) | It is a way to create conditions that facilitate better flow of knowledge. Suggests that knowledge, when considered as that which enables an organization to act within its environment, is more than the sum of knowledge of each person separately. |
| Valhondo (2003) | The set of processes for creating, capturing, storing, sorting, organizing, retrieving and using knowledge in organizations. |
| Arbornies (2006) | Process of creation and sharing through the articulation of organizational systems that take advantage of the ability and knowledge of all involved. |
| Nagles (2007) | Logical, organized and systematic process to produce, transfer and apply a harmonious combination of understandings in specific situations. |
| Donate & Guadamillas (2010) | Strategic design of the processes of the creation, archiving, transfer and application of the organization's knowledge to achieve competitive objectives. |

Source: Author's own work

Knowledge management, therefore, is the process that deals with the design and implementation of practices for the acquisition, storage, sharing, application and protection of knowledge, in order to improve the ability of organizations to solve problems, innovate and contribute in order to obtain competitive advantage.

Nagles (2007) notes that one way to make knowledge management visible is precisely through the design of new products, services, processes and management systems, namely, through innovation. Therefore, innovative efficiency and technological advancement are related to the strength and depth of the knowledge base of the company. This relationship also occurs in the opposite direction, in that the innovation process generates explicit knowledge that is incorporated into processes and products as well as tacit knowledge, which, alongside the former, renovates and adds to the base knowledge of the firm (Donate & Guadamillas, 2008). Based on a literature review, Table 2 presents an explanation of the dimensions that make up knowledge management for the purpose of this study.

Table 2: Description of the Dimensions of Knowledge Management

| Dimensions of knowledge management | Description | References |
|---|---|---|
| Acquisition | Practices conducted within an organization with the purpose of incorporating, through its members, new knowledge (knowledge that is built for the first time in the organization, i.e., it is new to the organization even though it may be existing knowledge elsewhere). This is by means of the interaction between tacit and explicit knowledge at an individual level, with the goal that this becomes collective knowledge. | OCDE (2003) Benavides & Quintana (2003) Montoro (2008) Donate & Guadamillas, (2010), Valhondo (2003) Arbornies (2006) |
| Storage | Series of practices for the timely retention and storage of knowledge for later retrieval. Explicit knowledge is easier to code but tacit knowledge requires direct transfer of the knowledge possessed by one person to the head of another, where it is stored. In this last case, sharing (or transfer) and storage are inseparable operations. | OCDE (2003) Donate & Guadamillas, (2010) Benavides & Quintana (2003) Montoro (2008) Valhondo (2003) Arbornies (2006) |
| Sharing | Practices aimed towards knowledge effectively reaching the members of the organization who need it, through the dissemination of documents and interactions between people. | OCDE (2003) Benavides & Quintana (2003) Donate & Guadamillas (2010) Montoro (2008) Valhondo (2003) Arbornies (2006) Camelo, Garcia & Sousa (2010) |
| Application | Practices aimed at the use of knowledge which affects the development of new products and improvement in processes. When knowledge is shared within the organization, it is absorbed and incorporated into processes, products and services, a process which is assumed to result in a change in the state of knowledge from an individual to an organizational level. | Benavides & Quintana (2003) Valhondo (2003) Arbornies (2006) Nagles (2007) Donate & Guadamillas (2010) |
| Protection | Practices to prevent leakage of valuable knowledge and protect it from illegal use outside the organization, some of which include granting recognition and rewarding creative staff, obtaining patents, licenses, copyrights, etc. | Valhondo (2003) Donate & Guadamillas, (2010) |

Source: Author's own work

An important aspect of knowledge management is that it contributes to building organizational memory through capture and storage. According to Benavides and Quintana (2003), it comprises all the knowledge generated and is characterized by the process by which this asset is captured, maintained and accessed.

Information and communication technologies are very useful for the capture, storage and dissemination of explicit knowledge. However, in the process of doing their work, individuals generate tacit knowledge that remains largely in their mind and is hard to externalize. In these cases, social networking can be a powerful tool to retrieve and store the tacit knowledge of members of the organization, in that individuals often prefer to learn by interacting with other people rather than with documents.

1.3. Previous Studies on Knowledge Management in Organizations

Most of the studies on knowledge management have been conducted in other countries. However, there have been studies conducted in a more familiar context that may help to better understand the situation facing Mexican companies in the context of knowledge management. Garcia and Cordero (2010) conducted a study on the degree to which knowledge management processes are implemented in two groups of companies selected from the states of Carabobo in Venezuela and Tamaulipas in Mexico. From the results, they concluded that the various activities of the knowledge management process are present in the administrative practices of the companies selected, with the differences, although slight, sufficient to allow the conclusion that the Venezuelan companies analyzed have more homogeneous responses and develop more knowledge management activities than Mexican companies. Knowledge transfer or sharing practices are those most performed in the Mexican companies whereas the practices relating to application of knowledge are the least performed. There is little attention to the generation of a suitable context for knowledge management (climate of collaboration, trust, and shared values), compared to the Venezuelan companies, which have a higher level of development in all processes (creation, external acquisition, organization, transmission, use and generation of knowledge). Another study by Perez-Soltero, Leal, Barcelo, and Leon (2013), analyzed the knowledge management in small and medium enterprises in the restaurant industry in northern Mexico, in order to identify areas for improvement in their production processes. They analyzed the stages of identification, storage, creation, distribution, use and measurement of knowledge, and concluded that the use or application of knowledge is found to be more developed because past experiences are used to make better decisions and improve tasks, processes and services. The storage of knowledge was found to be in third to last place, which means that there is no place to store knowledge and experience. The measurement of knowledge was found to be in last place, from which it was concluded that companies do not measure or evaluate each person's knowledge, and that it is unknown how much has been learned over a period of time.

In Yucatan, Barroso (2011) conducted an exploratory study using a questionnaire given to the directors of 100 companies in Merida from different sectors and of different sizes, in order to determine the origin and application of knowledge in organizations, check their transfer mechanisms (should they have them), and whether they had links with academic and governmental organizations that support innovation and knowledge generation. Barroso concluded that most managers described their acquisition of knowledge as having occurred through what their workers possessed at the moment they were hired, and through direct contact with customers, competitors and their experience in the market. Training through attending seminars and conferences was a source of knowledge for less than 50% of the companies. Regarding use or application, Barroso notes that companies use knowledge for innovation activities geared to marketing (commercial), and the design of new products and services (manufacturing and services). There is internal transfer (sharing) both through training to improve processes or know-how, and through technology. None of the companies reported having links with government bodies or agencies, and only six reported having links with higher education institutions that help them with processes and marketing.

2. Method

This study is a quantitative, descriptive, non-experimental study. To gather the information, an instrument was designed and validated to be applied with a sample of managers of companies engaged in innovation in Yucatan. The population sample was considered to be the 140 companies registered in January 2013 in the National Register of Scientific and Technological Institutions and Enterprises (RENIECYT)⁸.

⁸RENIECYT (acronym in Spanish, Registro Nacional de Instituciones y Empresas Científicas y Tecnológicas) is an instrument of support for scientific research, technological development and innovation in the country, operating under the authority of the National Council for Science and Technology (CONACYT: Consejo Nacional de Ciencia y Tecnología), which identifies institutions, centers, organizations, companies and individuals or entities from the public, private and social sectors that conduct scientific and technological research, technological development and production of basic engineering or technology-based products. It is a database of registered organizations in the Integrated System of Scientific and Technological Information.

This database was used because it focuses on companies engaged in activities aimed at research, science and technology, and due to the fact that there is not currently a record of innovative companies in Mexico or in the state of Yucatan. Accepting that the proportions of businesses in different sectors were unequal, random sampling stratified by industry was used.

To determine the sample size, this formula was applied for cases when the size of the population is known:

$$n = \frac{NZ^2S^2}{NE^2 + Z^2S^2}$$

where:

n = sample size

N = Population size

Z = Confidence level expressed in standard error

S = sample standard deviation

E = maximum tolerable error

For purposes of this investigation, the values were:

N = 140

Z = 1.96 (confidence level 95%)

S = 4001 (obtained from the pilot)

E = 0.1

n = 73

Table 3 shows the resulting population proportions of the sectors and size for each stratum after applying these proportions to the sample of 73 companies.

Table 3: Size of Strata by Sector

| Sector | Proportion of population | Stratum size |
|------------|--------------------------|--------------|
| Service | 55.00% | 40 |
| Industry | 29.28% | 21 |
| Commercial | 15.71% | 12 |

Source: Author's own work

The instrument was developed based on the theoretical review in order to identify the dimensions to be considered for the construct of knowledge management, resulting in the acquisition, storage, sharing, application and protection of knowledge. A pilot test was applied and exploratory factor analysis was performed using the method of principal components to identify the dimensions (Moral, 2006). A Likert-type scale was used, where 1 = Strongly Disagree, 2 = Disagree, 3 = Agree and 4 = Strongly Agree. The Cronbach's Alpha values of the final instrument, which was composed of 43 items divided into five dimensions, are shown in Table 4.

Table 4: The Cronbach's Alpha of the Instrument

| Variable | Dimensions | Items | Cronbach's Alpha sub variable | Cronbach's Alpha variable |
|----------------------|-------------|--|-------------------------------|---------------------------|
| Knowledge management | Acquisition | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 | 0.835 | 0.954 |
| | Storage | 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 | 0.816 | |
| | Sharing | 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36 | 0.919 | |
| | Application | 37, 38, 39 | 0.803 | |
| | Protection | 40, 41, 42, 43 | 0.801 | |

Source: Calculations taken from statistical analysis.

For the analysis of the data, t tests for the samples were applied in order to determine whether there are significant differences between the dimensions of knowledge management, with ANOVA tests used to identify whether there were significant differences between the dimensions considering the size of the companies.

3. Results

With the average scores for each dimension, a global index for knowledge management, was calculated as a composite variable. Table 5 shows the measures of central tendency and dispersion of knowledge management index, and of each of its component dimensions, obtained from the data collected in the fieldwork. The knowledge management index was $\bar{x} = 3.2363$. While overall dimensions scores were good, storage scored the highest rating and acquisition the lowest.

Table 5: Measures of Central Tendency and Dispersion of Knowledge Management

| Knowledge Management and dimensions | Arithmetic Mean | Standard Deviation |
|-------------------------------------|-----------------|--------------------|
| General Index | 3.2363 | 0.40417 |
| Acquisition | 3.0913 | 0.44143 |
| Storage | 3.4000 | 0.39229 |
| Sharing | 3.2266 | 0.47347 |
| Application | 3.3059 | 0.52925 |
| Protection | 3.1575 | 0.62153 |

Source: Compiled from database.

The analysis obtained for each of the different practices of knowledge management are presented below.

Acquisition. As shown in Table 5, the acquisition of knowledge obtained $\bar{x} = 3.0913$, the lowest score. It is noteworthy that a high percentage of managers expressed favorable responses primarily when asked if the company is conducting market research in order to learn about the market, new technologies, products and / or services, with 94.5% indicating *agree* or *strongly agree*. Also, 89.1% of managers showed favorable responses to the question as to whether companies have mechanisms to hear and listen to suggestions, opinions, needs and complaints from customers.

Importantly, the practice of participation in courses run by government agencies proved less frequent with only 56.2% stating their participation, with 75.3% also stating that collaboration with universities is irrelevant and not practiced.

Storage. This dimension had the highest score, $\bar{x} = 3.4000$ and, in general, all survey items had very favorable responses. It was observed that companies create databases, and that electronic media are used to capture and store relevant information, since 98.6% of managers said they agreed or strongly agreed. They mentioned that the companies have catalogs and specific files for important documents (95.9%), with the preparation of reports and information on the market, new technologies and products and / or services found to be an established practice in only 78% of companies, the lowest percentage.

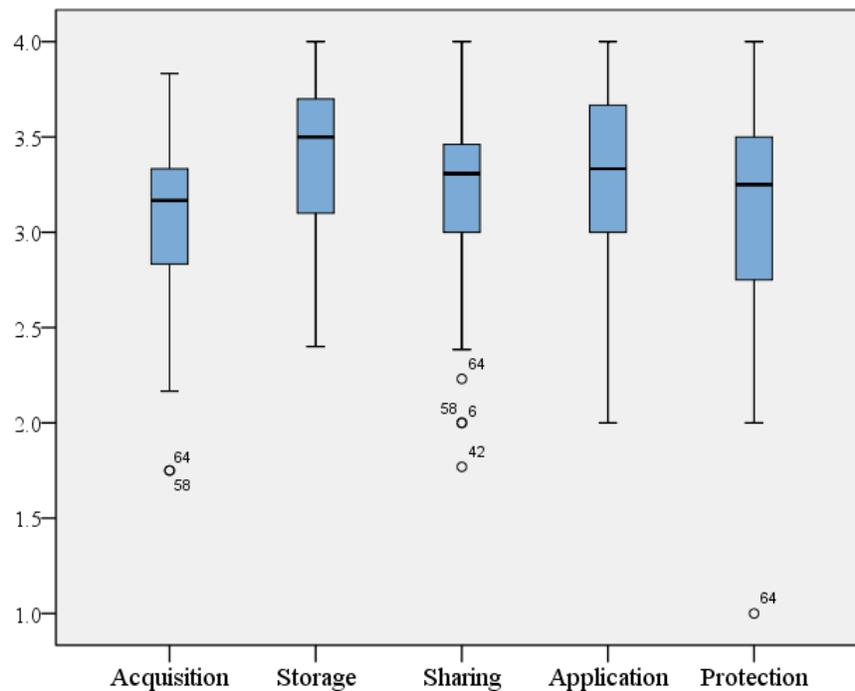
Sharing. The score obtained was $\bar{x} = 3.2266$, and it was found that the majority of managers (95.9%) responded that they strongly agreed or agreed that for the sharing of knowledge, experts within the company act as advisors to less experienced staff. The directors also said their employees are often motivated to share their knowledge with upper management (91.8%), organize formal training courses provided by experts, and have regular meetings to receive feedback on their activities (90.4%). The development of internal newsletters to share important information proved to be a practice with the lowest percentage in this dimension, as 65.7% of managers said they agree or strongly agree. Above and beyond external knowledge sources, knowledge is also increased by the exchange that occurs between their own staff.

Application. This was the second best evaluated dimension with a score of $\bar{x} = 3.3059$. According to the managers, application practices are conducted in a high percentage of businesses, which is to be expected since they are companies that perform innovation activities regularly, which requires the application of individuals' knowledge in organizational processes as well as products and / or services offered.

It is noteworthy that 95.8% of managers said they agreed to a lesser or greater extent that workers use the lessons learned and best practices for implementation in their work and projects. It was also found that 90.4% reported undertaking the redesign of processes, products and services, and 86.4% reported undertaking the design of processes, products and services.

Protection. The score obtained for this variable was $\bar{x} = 3.1404$. It was observed that the most undertaken practice to protect knowledge is the retention, as much as possible, of those people with experience and knowledge of the business, since 95.9% of managers said *agree* or *strongly agree*. Although it can be considered that obtaining patents, licenses, copyrights and / or trademarks is established in this type of company, namely, one engaged in the practice of innovation, it was found that only 64.3% of directors agreed with this, which is to say that 35.7% do not consider it an established practice. Given that the variables described above represent different aspects of knowledge management, Figure 1 shows the comparative box and whisker plots for them. The variables with the highest and lowest value can clearly be seen. The others exhibit a similar central tendency.

Figure 1: Box and Whisker Diagrams for the Dimensions of Knowledge Management



Source: Compiled from database.

Hypothesis tests were conducted for two samples related to the dimensions, with the intention of confirming whether the storage and acquisition of knowledge were significantly different from all others. The results are shown in Table 6.

Table 6: Significant differences between the dimensions of Knowledge Management (n=73)

| Variable 1 | Variable 2 | t | Sig (2 tails) $\alpha = .05$ |
|-------------|-------------|--------|------------------------------|
| Acquisition | Storage | -6.111 | .000 |
| Acquisition | Sharing | -3.376 | .001 |
| Acquisition | Application | -4.175 | .000 |
| Acquisition | Protection | -1.016 | .313 |
| Storage | Sharing | 4.035 | .000 |
| Storage | Application | 1.731 | .088 |
| Storage | Protection | 3.753 | .000 |
| Sharing | Application | -1.619 | .110 |
| Sharing | Protection | 1.193 | .237 |
| Application | Protection | 2.634 | .010 |

Source: Compiled from database.

As can be seen, the acquisition of knowledge is significantly different from all other dimensions except protection, with the dimension of storage also significantly different from the others except for application. It can also be seen that companies have put the most work into storage and application practices, followed by sharing, then protection and acquisition the least. The variable of company *size* was analyzed as a possible factor in the differentiation of knowledge management, for which the criterion of the number of employees was considered, as obtained from the Ministry of Economy (Official Journal of the Federation, December 30, 2002). The sample of 73 companies was composed of the following: 24 micro-enterprises, 33 small business, 9 medium-sized business and 7 large businesses. Once the ANOVA test had been applied and no such differences found, next step was to verify whether there was any correlation between the dimensions and size, with the results summarized in Table 7.

Table 7: Significant Differences by Company Size

| Knowledge management and its dimensions | Arithmetic mean | Standard deviation | F | Sig. |
|---|-----------------|--------------------|-------|-------------|
| Knowledge management | 3.2363 | .40417 | 1.205 | .315 |
| Acquisition | 3.0913 | .44143 | .034 | .992 |
| Storage | 3.4000 | .39229 | .512 | .675 |
| Sharing | 3.2266 | .47347 | .537 | .658 |
| Application | 3.3059 | .52925 | 2.783 | .047 |
| Protection | 3.1575 | .62153 | 2.008 | .121 |

*Significant difference of .05

Source: Author's own work

An analysis of the dimensions shows that there are no significant differences in the practices related to the acquisition, storage, sharing and protection of knowledge due to the size of the companies; however, result for application dimension shows that the size of the companies is indeed a differentiation factor for this practices. In Table 8, the arithmetic means are shown only for this dimension.

Table 8: Arithmetic Means by Company Size

| Dimension | Micro | Small | Medium | Large |
|-------------|--------|--------|--------|--------|
| Application | 3.0694 | 3.4545 | 3.2963 | 3.4286 |

Source: Compiled from database.

To identify where the difference occurs, a multiple comparison analysis was conducted, which shows that the application of knowledge in the micro-enterprise is significantly different from the level reached by the small business. Namely, the efforts of micro-enterprises in this dimension are not comparable to small, medium and large companies, which have higher ratings. This confirms that small businesses are making more efforts to effect improvements in the execution of their daily tasks, and the design or redesign of processes, products and / or services, most likely so as to address the demands of today's market and ensure the growth of the company.

4. Findings

Being 4 the maximum value for knowledge management index, the obtained value of 3.23 was considered good. Companies involved in innovation activities in Yucatán are geared towards both the storage of information deemed valuable knowledge, and the application of existing knowledge primarily by improving work practices and introducing more efficient processes for the analysis and redesign of processes, products and / or services. The latter can be understood due to the nature of business, which demands the engagement in innovation practices. This finding confirms Nagles (2007) description of innovation as a way to externalize the degree of development of knowledge management, without the company having an active awareness of it. It can be concluded that the most commonly applied practices are those involved in storage and the least commonly applied are those involved in the acquisition of knowledge. Regarding storage practices, companies focus primarily on the development of databases and use of electronic means for storing valuable everyday information. This encourages the construction of organizational memory, which coincides with Benavides and Quintana (2003), who mentioned that storage is essential for this.

The application of knowledge is mainly reflected in the use of experience for improved task completion and decision making, which also encourages the product redesign or design of new products, services and / or processes carried out by the company. It was also found that the efforts of micro-enterprises regarding these enforcement practices are not comparable to those of small businesses, which show great progress in this regard. The most common knowledge sharing practice is that of experts acting as consultants to the staff with less experience, coinciding with Perez-Soltero, Leal, Barceló and Leon (2013), who found that this practice is the most commonly applied for the sharing of experiences and knowledge in the companies in which they conducted their research. Although managers of innovative companies are interested in sharing practices as a way of increasing the knowledge and skills of their employees, from their responses, their immediate concern seems to be that knowledge is not exclusive to one person as it could negatively impact business operations. The dimension of knowledge protection is one of the least developed in the companies studied here. The companies focus on mechanisms to ensure the retention of staff recognized for their knowledge and experience of the business. The obtaining of patents, licenses, copyrights and / or trademarks are the least common practice undertaken in this dimension.

Knowledge acquisition mostly occurs through observation and monitoring of the market, as well as through the suggestions of customers and suppliers, coinciding with the findings of Barroso (2011). There is little acquisition through either participation in courses and workshops given by government agencies, or through links with universities. According to the above, one can say that the companies featured in this study do manage their knowledge, but not necessarily in a conscious and formal manner. Although innovations have been generated as a result of these efforts, they are more reactive and not proactive in nature. They are usually the result of both the assimilation of new knowledge and technologies, and the companies' own internal processes.

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