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An Approach Based on Knowledge Management for the Use of ICTs in Mexican SMEs

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Abstract

In the business environment, new and ever-changing necessities emerge. This becomes a challenge for Small and Medium Enterprises (SMEs) which aim to survive in an increasingly competitive market that is strongly influenced by Information and Communications Technologies (ICTs). Although Mexican SMEs show an appropriate level of adoption of ICTs, it has been found that there is a low level of use of these technologies in business processes. On the other hand, considering this scenario, it becomes relevant to propose an innovative approach where the adoption of ICTs is treated as a dynamic and interactive process directly linked to Knowledge Management (KM), which also allows the development of competencies and skills so that Mexican SMEs are able to face new knowledge environments. The objective of this paper is to make a literary review that reveals the low level of use of ICTs in SMEs, particularly in the Mexican environment, with the aim of proposing a novel approach where enterprises consider KM in the implementation of ICTs.

Keywords*: Knowledge management, SMEs, ICT, Business process.*

1. INTRODUCTION

The presence of Information and Communications Technologies (ICTs) is increasingly evident in the business context, and its application grows along with the technological advances, and above all thanks to the widespread use of Internet. Just like large corporations, Small and Medium Enterprises (SMEs) have been implementing these technologies for their business processes. Nevertheless, most of the SMEs have not obtained favorable results in the implementation of ICTs. Lack of knowledge on the potential and application of these technologies has made the technological adoption limited only to equipment acquisition and computer systems lacking activity-oriented planning to obtain the maximum benefit of their application in the business processes. In a globalized trading environment, efficient production and delivery methods are no longer the main factors in creating a competitive advantage; knowledge must also be harnessed (Pool et al., 2014). Like large enterprises, SMEs also need Knowledge Management (KM) in order to

be more competitive (Yuan, 2007), since in a knowledge-based society, a company's ability to create, maintain and transfer knowledge has a major impact on performance (Nurach et al., 2012). Even though ICTs are very important in SMEs, in the Mexican environment, they have not yet been used to realize their full potential. It is essential to know the background, the current situation and the reasons why ICTs in SMEs are in this problematic situation. Once this is understood, it will be possible to develop proposals for SMEs to take advantage of ICTs in a more effective way and obtain from them the greatest possible benefits, allowing SMEs to be more competitive, not only in the national environment but also internationally.

The objective of this paper is to make a literary review that reveals the low level of use of ICTs in SMEs, particularly in the Mexican environment, which gives rise to a different approach where companies consider KM in the implementation of ICTs.

2. MEXICAN SMEs AND ADOPTION OF ICTs

2.1 Characteristics of Mexican SMEs

As in other parts of the world, SMEs in Mexico are of high importance for the local and national economies, since they are involved in the manufacturing and distribution of goods and services that satisfy the needs of the society. They are also a source of employment, utilize the internal resources of rural areas and small urban centers, provide income through tax payment and constitute a broad field of expertise (Sánchez and Sarmiento, 2011). SMEs have a low survival level and face serious problems according to some statistics. Some of these problems are related to lack of financial access, poor management capacity, misinformation on market opportunities, lack of recent technologies and work organization methods, and the limited information about access to innovation and research funds. Nevertheless, these organizations present areas of opportunity in the integration of their business processes in relation to ICTs (Menchaca et al., 2013).

In Mexico, seven out of 10 jobs are generated by SMEs (Menchaca et al., 2013). Based on the survey conducted in 2012 by the National Institute of Statistics and Geography (INEGI), the country has 5,144,056 companies. 95.2% (4,897,141) of the companies are microenterprises, 4.3% (221,194) small enterprises, 0.3% (15,432) medium firms and 0.2% (10,288) large firms. The SMEs generate 72% of employment and 52% of Gross Domestic Product (GDP). The SMEs make up 99.8% of formal economic activity and 78.5% of employment in Mexico (INEGI, 2012). Mexican SMEs generally face a problem related to little or no investment or implementation of technology, as well as lack of support from government and/or chambers of commerce (Ávila et al., 2014). The SMEs have certain characteristics, which are determinants for growth or failure. One of them is lack of knowledge of business management by the main partner and close associates. In their conformation, they have limited economic and material resources. The most serious effect of this is the limitation of being able to grow as a business which destines SMEs towards a decline, or even to disappearance due to the lack of specific objectives (Romualdo et al., 2015). The SMEs are one of the indispensable entities that make economic self-sufficiency possible around the world, and there are key areas in their activities both in their internal and external environments to be able to sustain themselves. Some of such key areas are: management, marketing, finance, production, distribution, investigation and development, governmental policies and regulations, and the business environment (Rashid, 2012).

2.2 Information and Communications Technologies

Regarding the concepts of technologies and information systems, there are several definitions in literature. An Information System (IS) is an Information Technology (IT) solution, encompassing a set of interrelated components for processing, storing and distributing information. It is also considered a crucial tool in the transformation of business processes as well as support in decision-making (Laudon and Laudon, 2007). Some authors include communications to the IT concept by extending the definition to what is known as Information and Communications Technologies; understanding ICT as everything related to information technology and related technologies, i.e., hardware, software and telecommunications requirements, where the use of the internet is included in this field (Aguilar-Jiménez et al., 2012). ICT innovations continue to be the main drivers of change in almost all business processes. These processes have become more complex, heavily dependent on information systems and can encompass several organizations (Weske, 2010; Künzle et al., 2013; and Wetzstein, 2016), which has been increasing due to technical innovations, improvements in work organization and the use of information technologies (Van der Aalst, 2013). However, it should be noted that many of the ICT-centric approaches to business process support have failed because they have been dominated by the complexity of the selected ICT solution, rather than the focus on a true process alignment of business in relation to ICT (Becker et al., 2013).

2.3 ICTs Environment in Mexican SMEs

The use of ICTs in companies increases their economic growth, since the application of ICTs facilitate the use of information and improves the level of education of the labor force favoring economic growth. This is a measure the SMEs in Mexico should use more often in their productive processes to become more competitive (Heredia, 2014).

According to Rios et al. (2009), in Mexico, SMEs give little importance to ICTs mainly due to the following factors: economic factor (lack of financial resources to invest in ICTs); digital gap characterized by the digital culture; poor understanding of the benefits of the adoption of ICTs in SMEs; ignorance of opportunities (lack of government programs); lack of a national strategy (focused on the development of SMEs) that promotes society in general; and low level of integration in the production chains.

In the National Digital Agenda Document, to identify the actions that promote competitiveness in Mexican organizations, an evaluation was carried out based on three aspects: organizational maturity or adoption of best organizational practices, ICT capacity and ICT management. According to the document, the degree of organizational maturity of Mexican companies is deficient. The results of the self-evaluation survey about the adoption of the four best organizational practices (innovation, governance, human capital management and ICT capacity) indicate that almost half of the enterprises showed an adoption level of 5 or lower, on a scale of 1 to 10. The lack of organizational maturity was detected in companies of all sizes; there are highly mature SMEs and largely immature companies. However, the differences in the adoption of best organizational practices are substantial, among companies of varied sizes: SMEs registered an average of just over 5 and corporates over 7 (ANIEI, AMIPCI, AMITI, CANIETI, 2011).

Another feature of Mexican companies according to ANIEI, AMIPCI, AMITI, CANIETI (2011) is a low ICT capacity, understood not in terms of the adoption of ICT, but in terms of its use to articulate processes and data in seven areas: sales and distribution, procurement, development, finance and administration, production and operations,

marketing, planning and collaboration. In this sense, the trend observed in Mexican companies is directed towards a greater articulation of data and processes related to finance and administration in contrast to those that are associated with sourcing, marketing, sales and distribution. A research carried out in 2014 covering a total of 100 SMEs—25 in each of the states of Sonora, Puebla, Hidalgo and Coahuila—in relation to electronic invoicing and use of ICTs in its business processes, provided very interesting results: 85% of the companies that were surveyed have computer equipment, but only 45% consider it necessary for the operation of their business and only 41% carry out their own operations using the computer equipment (Estavillo et al., 2016).

2.4 Problem in SMEs in Relation to ICTs

The SMEs are often seen as flexible organizations that can easily adapt to new technological innovations. However, their size and lack of necessary knowledge and skills can obstruct the adoption of ICTs. For this reason, many SMEs with limited internal resources, including lack of knowledge and skills in information systems, turn to external consultants for help to strengthen technological processes (Bradshaw et al., 2012). The use of knowledge in SMEs is often flexible and unstructured and socially embedded in experiences and interpersonal relationships. Decisions are based primarily on tacit knowledge such as intuition, experience, attitudes and values. The form of business management, without procedures and routines of knowledge, can lead to a lack of success in the adoption of ICTs (Rantapuska and Sore, 2011). On the other hand, many organizations fail to invest in ICTs, which is especially true in SMEs, since ICT management is often based on a short-term vision and informal practices in decision making. They generally take the implementation of ICTs as any other investment in the organization seen only as acts of purchase, without fully understanding its linkage to the strategy and objectives of the company. In addition, the investment process in ICTs is a technical one and very little attention is given to its social nature (Rantapuska and Sore, 2011). Theories that explore the implications of interactions between social and technical integration are necessary, since what makes an IS unique is the social integration of technology (Chinedu et al., 2014).

As for the adoption of ICTs, it is necessary to understand its interrelations with the characteristics of SMEs, since there are ICT applications for different industries and different business sectors (Sin Tan et al., 2010). Studies that report on the practical use of ICTs tend to focus on experiences of large organizations, where strategic alignment is a key factor in the success of the investment and the benefits of ICTs. The SMEs, on the other hand, operate normally without dedicated information technology specialists, which means that the maximum potential of these technologies is not obtained (Wilkin, 2012). The lack of technological skills in the workforce is a major obstacle to the adoption of ICTs, as well as the proliferation of ICT tools and applications, which has recently generated that SMEs have difficulties to select the appropriate applications (Evangelista et al., 2013). Compared to large corporations, most SMEs perceive barriers to ICT implementation in their business operations as an expensive, risky and complex procedure (Chong et al., 2012).

In Mexican SMEs, the most frequent problem in relation to technology is precisely the lack of technological resources, since SMEs do not have enough capital to invest in new machinery and technology, making it impossible to implement significant improvements in their processes. While it is true that technological development occupies a decisive space when improving competitiveness, it is not a question of developing or acquiring the first-

line technologies which can be left out of the reach of these companies, but to integrate the creation and application of the work knowledge that it has with the organization, orienting them towards the improvement of processes, products and/or services, incorporating the company to an active and continuous participation in the field of learning and innovation (Martínez and Alvarado, 2013).

Several authors such as Esparza et al. (2012), Builes (2015) and Estavillo et al. (2016) have in one way or another agreed that the problem of Mexican SMEs in relation to ICTs is mainly the lack of knowledge of these technologies and how to align them to business processes, which is due to lack of knowledge of the benefits that ICT implementation can bring to improve productivity in the company.

3. THE KNOWLEDGE MANAGEMENT APPROACH FOR THE USE OF ICTS

3.1 Knowledge Management

In the last few decades, numerous concepts related to the term 'knowledge' have merged, some of them are: intellectual capital, knowledge worker, knowledge transfer, organizational learning, knowledge economy, etc. This phenomenon clearly shows the fact that knowledge is currently regarded as an asset and a valuable resource of the enterprise (Yuan, 2007). For most organizations, KM is a novel solution, which aims to boost and optimize the transferring of knowledge in the organization. For this reason, knowledge should not be seen only as data or information, as it has its roots in the social context and human experience and requires management of attention to people and culture, as well as organizational structure and information technologies (Wilfredo and Esteves, 2013).

Regarding the resources of organizations, Intellectual Capital (IC) is made up of three factors: human capital, structural capital and relational capital (Bontis, 2002). Human capital can be defined as the knowledge, skills and abilities of employees (Bhartesh and Bandyopadhyay, 2005). It considers the knowhow, experience and talent of employees and managers in the organization (St-Pierre and Audet, 2011). Structural or organizational capital is defined based on the internal structure of the organization. It includes patents, structure, policies, culture, processes, as well as technology used in the company (El Tawy and Tollington, 2012). As for relational capital, it is represented by the external environment of the company, that is, all the relationships that an organization establishes with suppliers, customers, competitors, government and the community (Cohen and Kaimenakis, 2007).

KM is essentially focused on people, how to create, share and use knowledge. It is not about creating a new department or acquiring a new computer system. It is about making changes in the way all members of the organization work and providing people with access to relevant information resources (Shannak et al., 2012). There are many KM definitions of different authors in different contexts and times, such as Nonaka and Takeuchi (1995), which define KM as the company's ability to create new knowledge, disseminate it in the organization and incorporate it to all of its processes. Brooking (1996) defines KM as the activity that is concerned with strategy and tactics to manage people-centered assets. Another definition given by Wiig (1997) mentions that it is the function that plans, coordinates and controls the flows of knowledge that occur in the organization in relation to its activities and its environment to create essential competencies. For Davenport and Klahr (1998), KM is the systematic process of searching, organizing, filtering and presenting information with the aim of improving the understanding of people in a specific area of

interest. Stankosky (2008) defines it as the process of effectively using intellectual assets to improve organizational performance.

KM is a broad area of research where academics and industry formulate solutions and methodologies from different perspectives including business, management, economics and ICTs (Mustapha, 2012). It should be kept in mind that business activities become more and more complex, involving many aspects of knowledge: legal, financial, organizational management, information technology, and so on. In this business context, like large organizations, SMEs also require KM to be more competitive. The question here is how SMEs should apply KM (Yuan, 2007). The decision of a company to invest in innovation has become a strategic issue mainly related to the KM process, since innovation reflects a company's ability to access, understand and utilize knowledge, and is viewed as one of the main sources of competitive advantage (Díaz-Díaz and De Saa-Perez, 2014). KM offers sustainable competitive advantages that ensure the survival or promotion of the organization, as it contributes to the organization's performance and the flow of knowledge, affecting people, processes, products and structures in an attempt to minimize risk, efficiency and create innovative processes or products (Majors, 2010).

IC has become a key factor for the success of SMEs, as it is one of the core business assets that helps to promote competitive advantage for value creation. In emerging economies, where the role of SMEs is crucial in local development, the impact of the IC is even stronger, as the public and private sectors recognize the importance of SMEs in contributing to economic growth, employment and social welfare (Daou et al., 2014). In a knowledge-based society, a company's ability to create, maintain and transfer knowledge has a significant impact on its performance. Each organization has its own way of dealing with data, information and knowledge, and creates its own structures, jobs and systems for that purpose, so it is important to consider that knowledge is built by the information available within an organization. ICTs are a key tool in the KM creation process, and its performance can affect the efficiency of work processes as well as the performance of management activities (Nurach et al., 2012). Today, a company must be flexible and adaptable to global economic situations. SMEs must become knowledge learning and production organizations, so that the whole company can learn while it operates. The knowledge economy requires organizations to integrate their activities, processes and systems to utilize their resources more efficiently.

3.2 ICTs' Experience in Mexican SMEs

An investigation carried out by Maldonado et al. (2010) showed that ICTs represent a great opportunity for SMEs to improve their competitiveness level considering efficiency and productivity measures, finding that the companies with greater degree of use of ICTs obtained a higher performance in all the areas of the organization. Another study on the use of ICTs in Mexico was carried out by Esparza et al. (2012), where the results state that companies that are more aware of the importance of ICT adoption tend to be better organized, with better trained human resources and with a clear vision of the benefits of the application of ICTs as tools of competitiveness and increased productivity.

It is evident the positive role that the adoption of ICT can have as a determining factor on the level of competition of the markets, as well as the requirements of the customers and suppliers (Nguyen, 2009; and Koellinger and Schade, 2010). It has been observed that ICTs have enabled small organizations to participate in global markets using websites for the marketing of their products, which contributes to the growth and profitability of enterprises

and provides a basis for their transformation from micro to a medium level. It is therefore essential that SMEs are encouraged to adopt ICTs more rapidly (Taylor, 2015). The implementation of ICTs provides competitive advantages that encompass several aspects of the operational nature and strategic nature. In respect of the operational nature, it brings benefits such as increased efficiency and, automation of routine procedures, while with regard to the strategic nature, it contributes to the improvement of business processes. For example, the adoption of KM and the establishment of strategic alliances with other companies (Chaverra and Arias, 2012), generate processes of differentiation and specialization that allow to improve its business development structure, as well as the creation of new business processes, which increases the level of competitiveness of the company (Ollo and Aramendía, 2012).

In relation to the benefits of KM, a study by Vazquez-Avila et al. (2012) in 418 Mexican manufacturing SMEs in the state of Jalisco, Colima, Querétaro and Aguascalientes found that the level of competitiveness of these companies rose by 59.2% in terms of IC favorable results were also found with an increase of 40.8% in the level of competitiveness. This was reflected in favorable trends such as better use and development of information technology, improving the competitiveness of the organization, seeking external consulting as support, better coordination in the development of different areas, improvement to acquire knowledge about new products, as well as its relationship with sources of knowledge to face problems and challenges. Another study carried out by Perez-Soltero and Leal (2017) showed how the identification of key business processes and KM facilitated innovation and improved customer service and work environment.

As can be seen, there are SMEs where there is evidence of positive results in relation to how KM influences the best use of company's resources. This provides a guideline to propose a conceptual model aimed at improving the level of utilization of ICTs in business processes, where this model integrates the processes related to the implementation of ICT and the processes of KM. There are also positive aspects in applying a system in terms of improving KM processes mainly in the identification, documentation and use of knowledge (Perez-Soltero et al., 2015).

3. CONCEPTUAL MODEL FOR THE USE OF ICTs IN MEXICAN SMEs AND THE KM APPROACH

KM has so far focused on processes and structures within large organizations in order to improve their performance and competitive position, where some observations show a positive relationship between KM and organizational performance (Edvardsson and Durst, 2013). An important aspect that surrounds SMEs is the need for constant learning which they must satisfy, since the entrepreneurial dynamism is a requirement for organizations that want to survive. This implies a continuous acquisition of knowledge in all the aspects related to the planning and operation of companies, but above all in the knowledge to detect and attend to their own needs as well as of the clients and how to respond to them, which has been the basis for some companies to reorient their strategy, in order to obtain better levels of performance (Martínez and Alvarado, 2013). The sustained success of SMEs is possible due to not only the use of ICTs, but also the ability of the organization to adopt and best utilize the emerging ICTs for the innovation and constant competitiveness of businesses. The emerging ICTs in this context include any new ICT development or enhanced ICT applications. Some of the examples include Web 2.0, cloud computing, social network systems, open source applications, smart digital phones and mobile phones.

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The potential contribution of ICTs to improving the competitiveness of SMEs has been recognized in previous research and reflects a change in the approach to the use of ICT as the central support function of business processes (Majors, 2010). There is a relationship between the adoption of ICTs and their result in productivity, as long as they incorporate other variables such as human capital quality, innovative capacities and organizational changes (Balboni et al., 2011). ICT is an important part of the structural capital that companies possess, since it offers the possibility of streamlining processes, contributing to the generation of innovation, as well as obtaining more truthful, timely and reliable information that leads to the creation of value and the generation of knowledge for the company to be competitive in the long run (Demuner et al., 2014). So, it is important to consider SMEs as an open system, as they are dependent on their environment due to content exchange, information and knowledge (Majors, 2010; Majors, 2013; Wilfredo and Esteves, 2013; and Abd Rahman et al., 2016). The application of ICTs in organizations in the information society is necessary, the point here is understanding how this can be achieved. Figure 1 shows a conceptual view of the aspects to be considered for the use of ICTs in Mexican SMEs.

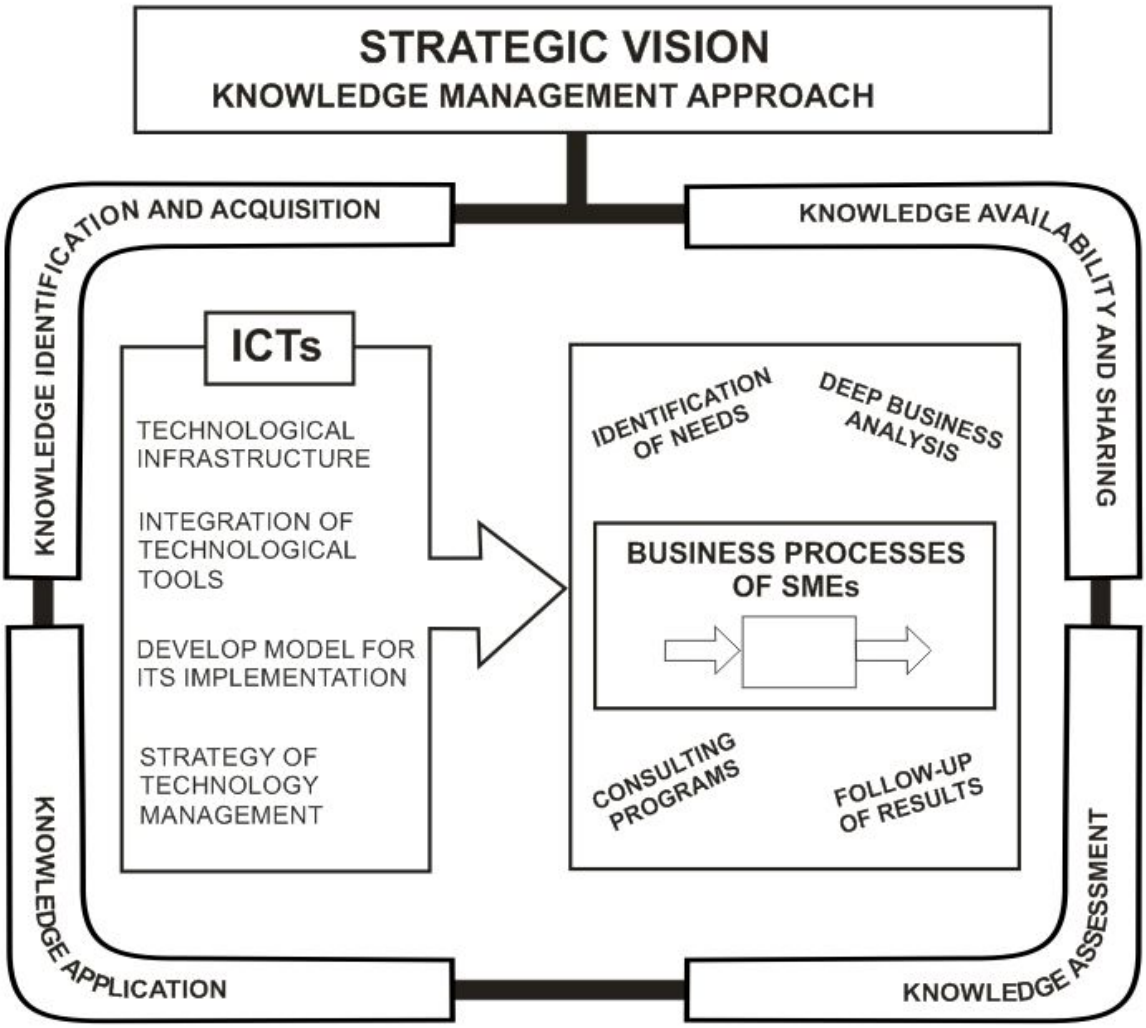

Figure 1. Conceptual Model

Initially, it is required of the top management to strategically think about ICTs implementation. It involves responding to questions like How? For what? Why? and Who? Implementing them by simple fashion, can end up their being a failure and an unnecessary expense for the company (Chaverra and Arias, 2012). It is important that each SME develops or adopts a model for the implementation of ICTs within the organization, since the dynamics of one company with respect to another can vary (Castillo and Jumbo, 2010). In relation to technology, it is necessary to undertake different management strategies, such as an organizational structure to meet the new and changing needs of the environment, where the integration of ICTs is conceived as a progressive process of developing competencies in the management of transferring of skills to face new knowledge environments (Orjuela, 2010).

As a consequence of ICT investment, which in turn involves investment in the human factor, companies need to introduce consulting, supervision, design and implementation programs to guide them in the correct use of these technological tools (Builes, 2015). For example, there are positive results in some SMEs in the manufacturing sector where the influence of ICTs is important so that the relationship with suppliers is effective and collaborative, since supply chain management helps to improve logistical control, management of information related to purchases, flow of resources and reduction of costs related to the movement of materials. However, it is important to mention that the use of ICT in the operational activities does not guarantee the adequate performance of these companies, since this depends not only on the type of technology used, but also on the degree of adaptation of the technology to the needs of the business (Colin et al., 2016). The findings in the literature reveal that while significant efforts have been made to study the adoption and dissemination of ICTs, the diversity of research in terms of theory and methodology is very low. Research theories and models should address the adoption of ICTs as a dynamic, interactive and evolving process, rather than a static one-time action (Chinedu et al., 2014), so it is relevant to consider that the success of the use of ICT should not be measured merely by the number of computers that companies acquire, nor by having an internet connection, nor by many other merely tangible factors. What really matters is that companies improve their competitiveness by taking advantage of the opportunities ICTs offer, considering the differences that exist in each business sector as well as the interrelationships with other SMEs to propose adequate strategies for the implementation of ICTs (Greenan, 2003). This entails reinforcing the idea that a rigorous business analysis as well as the identification of needs and the monitoring of results are important precursors to ICT adoption initiatives (Bhaskaran, 2013). Similarly, the design and implementation of KM practices should focus on the KM processes applied to the implementation of ICT, from knowledge identification, acquisition, application and evaluation, carried out within an organizational culture that fosters the identification and acquisition of knowledge from external sources, as well as the availability of knowledge sharing within the company.

4. DISCUSSION

Considering the above and similarly to what happens in SMEs at the international and Mexican levels, it is observed that poor or no identification and use of knowledge of ICT predominates to integrate them in the business processes, generating a problem of low level of exploitation of these technologies, which negatively affects the implementation of actions aimed at improving productivity in SMEs.

On the other hand, as described by Estavillo et al. (2016), there is a good level of adoption of ICT by SMEs, but there is a low level of use in the application of business processes due to the lack of knowledge to take advantage of the use of technology, so it is important to formulate strategies, including entrepreneurs, service providers, integrated supply chain companies as well as government, to get companies to incorporate the appropriate application of ICT. It is important to take into account that there are SMEs willing to work in favor of continuous improvement, taking advantage of simple structures with few hierarchies that favor interlabor relations (Perez-Soltero et al., 2013).

For all of the above, it is pertinent to propose a new approach based on KM that integrates the business processes and that allows to improve the level of use of ICTs to be able to generate a competitive advantage. In relation to the opportunities in the country, it is very important to take advantage of the support for innovation and technological development in Mexico, since according to the publication of the year 2013 by the Organization for Economic Cooperation and Development (OECD), a new advancement in government policy during the period 2007-2012 was the creation of the Technological Innovation Fund, which offers financing for Mexican SMEs to develop their innovative ideas. This reflects a major change in public policy because, prior to 2007, funding for innovation was directed primarily at larger enterprises (OECD, 2013). In terms of innovation and ICT, since 2010, the OECD has proposed the introduction of reforms to increase competition and stimulate innovation, growth and competitiveness of the Mexican economy. The development of ICT infrastructure will be particularly beneficial to SMEs, but they are affected by inadequate access to technology and low participation in knowledge networks (OECD, 2012). There is a significant consensus that ICTs have important effects on productivity, profitability and competitiveness when adopted and used effectively by SMEs. Although several SMEs are adopting applications, it has been found that most SMEs are not making the most of the potential of ICTs (ANIEI, AMIPCI, AMITI, CANIETI, 2011; and Estavillo et al., 2016). Therefore, a greater understanding of how SMEs consider their requirements in the implementation of ICTs is needed (Consoli, 2012). Developing countries show significant growth signals when implementing ICTs in their business processes. Despite not reaching the same levels of progress in developing countries, emerging countries have been able to improve their levels of productivity and competitiveness, but the mere application of ICTs in productive processes does not lead to an improvement in productivity, since two main aspects that promote productivity in companies should be considered: first, investment in ICT, and secondly, investment in the human factor. This confirms the need to introduce consulting, supervision, design and implementation programs to help these companies in the correct use of these tools, for which a strategy is required that considers both decisions regarding technology, organization and the skills of the staff, including the design of a model on the basic competencies that IT staff and ICT users should have to achieve an adequate use of resources oriented to business processes (Builes, 2015).

5. CONCLUSION

Because of the importance of SMEs in the socioeconomic context, it is relevant to know their problems, which are often diverse (Alderete, 2013). In addition, it should be considered that not all SMEs must adopt ICT tools in the same degree of sophistication and that there is no "one-size-fits-all" factor, as there are ICT applications across different industries and different sectors. This points to the need for a comprehensive examination of the intention to adopt ICTs to know the benefits and barriers and their interrelations with

the characteristics of SMEs (Sin Tan et al., 2010). As a result, managers must establish the ideal contextual conditions to drive and optimize the use of the organization of KM practices and initiatives through the design of tools such as the practical management of human resources and defining the corporate culture (Donate and Pablo, 2015), so that SMEs can develop skills to absorb knowledge from external sources, i.e., the ability to recognize, to capture and to assimilate external knowledge, in order to have access to cutting-edge knowledge despite their own limited resources (Filippini et al., 2010). So a very successful strategy can be in establishing ICT implementation projects based on a comprehensive approach that encompasses both the human and technological aspects, applying the processes related to KM. In this context, it is important to consider that the aspects for the use of ICTs in SMEs should be integrated into a strategic vision where KM is one of the most important.

Considering technological needs that are required to improve business processes, the first point is to identify and acquire the necessary knowledge to ensure that the implementation of ICTs is applied from the beginning. Some aspects to be considered for the use of ICTs in Mexican SMEs include the strategic vision with a KM approach that surrounds the relationship between ICTs and business processes, but it must be considered that the four main points that make up this strategic vision are processes of KM that include: knowledge identification and acquisition, knowledge availability and sharing, knowledge application and finally knowledge assessment. This KM approach will provide concrete bases to be considered in the implementation of ICTs, such as an adequate technological infrastructure, integration of technological tools, development of a model for its implementation as well as defining a technology management strategy. This approach will lead to a better implementation of ICTs in business processes, since the needs to be covered will be known from the outset, and the consulting programs will be required with an integral follow-up of the results.

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