

The importance of information and communication technologies (ICTs) for SMEs in the State of Guanajuato

La importancia de las tecnologías de información y comunicación (ICT's) para las Pymes en el Estado de Guanajuato

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Received July 20, 2018; Accepted December 15, 2018

Abstract

Objectives, methodology Learn the basic concepts and evolution of Information and Communication Technologies, as well as on the impact of These Organizations. Know the new methods to deliver information services to clients. Companies must Recognize That contribution it is difficult to work without help of the instruments and tools: such as Information and Communication Technologies (ICTs). These are a tool in Which companies are supported for sustained growth, as They Improve Their Processes in all areas of the company and optimize the information THEREFORE delivered to decision makers. However, access to ICT is limited by the human, technical and financial resources That the company Possesses. In Mexico, ITS impact as a trigger is greater in competitive companies are using ICT That, HENCE the Importance of studying at a state level the situation of companies in relation to the adoption of ICT. THEREFORE, the objective is to analyze the vision of SMEs in the state of Guanajuato on the adoption and use of ICT as a strategic tool for Competitiveness.

Technology, Information, Communication, System, SMEs

Resumen

Objetivos, metodología Aprender los conceptos básicos y la evolución de las Tecnologías de Información y Comunicación, así como el impacto de éstas en las organizaciones. Conocer los nuevos métodos para entregar servicios de información a clientes. Contribución Hoy en día es imposible concebir una empresa exitosa sin el apoyo de tecnologías de información y comunicación (TIC) para administrar sus procesos de negocio. Por ello, proveedores mundiales de software Empresarial de Planeación de Recursos ERP3 se han asociado con firmas de consultoría para ofrecer distintas soluciones de negocios a sus clientes. A partir del año 2007, tales proveedores de ERP, antes enfocados únicamente a la administración de procesos de negocios BPM4, han comenzado a utilizar mapas de creación de valor a fin de que las necesidades del negocio sean las que determinen la solución a implementar. Inclusive, han incorporado una nueva solución conocida como Business Intelligence, la cual se enfoca en la medición y toma de decisiones con base en indicadores de creación de valor para el negocio.

Tecnología, Información, Comunicación, Sistema

Citation: LAGUNA-CORDOBA, Perla Cristina, GUTIERREZ-RANGEL, Hector Fabian and JIMENEZ-RICO, Artemio. The importance of information and communication technologies (ICTs) for SMEs in the State of Guanajuato. ECORFAN Journal- Republic of Cameroon. 2018, 4-7: 1-12.

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Introduction

Computer today is fully involved with the comprehensive management of a company, and therefore, rules and computing standards should be subject to the generals of this. Computer obviously not properly managed by the company, however, aid decision-making. Its purpose is to detect errors, point out flaws, evaluate and improve the effectiveness and efficiency of each section or body.

Today it is impossible to imagine a successful business without the support of information and communication technologies (ICT) to manage their business processes. Therefore, global provider of Enterprise Resource Planning software ERP3 have partnered with consulting firms to provide various business solutions to its customers.

From 2007, these ERP vendors, previously focused solely managing business processes BPM4, have begun to use maps to create value so that business needs are those that determine the solution to be implemented.

Even, they have added a new solution known as Business Intelligence, which focuses on measuring and making decisions based on indicators of value creation for the business.

It is clear that management systems based on value are increasingly present in information technology, and certainly here to stay in the business world as a solution to achieve the maximization of shareholder wealth.

For 2007 (IESE, CELA, 2008) annual expenditure on Information Technology to gross domestic product GDP in Mexico was 3%, which is quite low compared to the average of Latin American countries, which is 6.8% and the US with 8.3%, which would show the great lag that has Mexico in this area.

The MSMEs are of vital importance in Mexico since the last economic census conducted by National Institute of Statistics and Geography (INEGI) in 2009 states that this business sector reached 99.8% of total enterprises, contribute 52% to GDP and generate 78.5% of employment (INEGI 2010).

Also, in Latin America the MI SMEs account for 99.12% of all businesses and generate 64.6% of employment (Saavedra and Hernandez, 2008). Hence the importance of their study, structured in two parts, first, its theoretical foundation based on the importance of ICT and its application in the MI Small Business and secondly, its methodological approach, development, analysis and conclusions.

Guanajuato is located in the Central Mesa, in the southern part of the Mexican tableland; It limits the north with the state of San Luis Potosi, Queretaro east, south and west with Michoacan Jalisco. With an area of 30.768 km, with a population of 5,486, 372 inhabitants and a gross domestic product of \$ 344, 323,191,000 (INEGI, 2009).

Comprising 46 municipalities, ranks sixth (see Figure 1) with 210.813 economic units, of which 12, 374 correspond to SMEs, one of the most productive states of Mexico.

Methodology to develop

This research is descriptive and correlational.

Characterization of SMEs

Companies in Mexico can be determined by the number of establishments, employed personnel, sector, size, economic activities, among others. By size and occupied in 2014 staff: 94.3% are micro enterprises (up to 10 people), 0.8% smaller (11 to 50), 4.7% medium (51 to 250), and 2% large (more than 251 persons employed) (INEGI, 2015). In Table 1, the classification of companies by size, sector, number of employees and annual sales range, according to the Official Journal of the Federation (2009) is shown. SMEs have different characteristics that favor their growth, they react quickly and adapt to market changes, have a great capacity to generate jobs and adopt technologies easily (Marsch, 2000 and Zorrilla, 2003), the latter always have the resources financial, technical and are digitally prepared. However, it faces a number of difficulties such as high operating costs, so their benefits are reduced; Insufficient financial resources, which causes the human capital training is not adequate, hiring low-profile, quality problems in the product, lack of service and customer support.

Consequently they have problems of competitiveness, higher selling prices, reduced sales. Other aspects are the wrong location business, poor inventory control, difficulty in accessing financing (Marsch, 2000 and Zorrilla, 2003). Therefore they require tools to support them in their internal and external needs, such as ICT.

SMEs are entities or organizations engaged in various activities such as service, industry, trade. They generate employment and economic drivers of any country. In Mexico according to the National Institute of Statistics and Geography (INEGI, 2015), representing 5.89% (289.964, between 11 to 250 employees) of all economic units (4926.061), of which 13,762 are located in Guanajuato.

Nationally and considering all sizes of business level, Guanajuato ranks fifth in total gross production, is also the state that has had better growth in economic units during the period 2008 to 2013 (4.4%), especially in the industrial sector, with an annual average growth in employment of 3.3%.

Hence the importance of using ICT in SMEs to enable them to be more competitive, boosting its market nationally and internationally.

Guanajuato is very competitive, prosperous, with sustained growth, attractive for investors and is one of the main generators of jobs nationwide, considered as the fifth fastest growing state (Villafranco, 2015).

In fact, the state government, indicates that SMEs My trade and services (Márquez, 2014) in the 2012-2018 sector consolidated. Leader in the automotive industry with automakers like Volkswagen, Mazda, General Motors, Honda and Toyota, with growth in production 66% and employment by 36% in 2014 (Horta and Millán, 2015), predicting that 2015 will grow 6.1% annual GDP while that nationwide growth of 3% (Colin, 2015) is expected.

In addition, Guanajuato is the fifth state to have greater growth between 2015 to 2017 (4.2% annual average), while the annual average at country level will be 3.1% (Morales, 2015).

Regarding the use of ICT, the Global Information Technology and Information 2015 indicates that Mexico ranks 69 of 143 countries (World Economic Forum, 2015), 63 ICT impact on new business models, 74 in business Internet, 72 in implementation of ICT among companies and ranks 58 in the preparation subindex measuring digital infrastructure, affordability and ICT skills.

According to CEPAL (2010), allocated investment companies mainly two areas, first, machinery, equipment and facilities and, second, the commercial area. In particular, almost 40% of companies that invested in machinery and equipment in the manufacturing sector made it to expand its production plant, while 30% planned to reduce costs.

Moreover, 20% of invested companies to automate their production process. Into the manufacturing sector, 60% of companies considered operating modern machinery, although also significant percentage (38%) felt that their equipment was outdated.

This polarity among manufacturing SMEs in technology is evident that they integrate into their production process, including certifications, policies to improve quality and productivity as well as the use of patents and licenses.

Noting that the level of ICT adoption

Mexico is low, which should establish strategies to improve their PD, being important to do research on this issue, especially at state and Guanajuato, which is growing steadily and is one of the main generators of jobs, contributing so significantly to the development of the country.

Hence, one objective of this study is to determine whether SMEs in the state of Guanajuato, Mexico are digitally prepared to deal with the changes imposed by a world of globalized business.

ICT situation in Mexico.

Porter and Millar (1985) point out that the information revolution is affecting competition from three aspects:

1. Changing industry structure and alters the rules of competition.
2. Creates competitive advantages, giving companies new ways to beat their rivals.
3. Creates new businesses within existing, often within their own company operations.

There are many problems that SMEs face in adopting ICT, such as lack of financial, technical and human resources.

But one fact is that regardless of the problems which face the SME entrepreneurs should establish clear strategies for improvement in the development of ICT.

ICT is a strategic tool for competitiveness, hence the importance of studying at state level the situation that companies in relation to the adoption of ICT.

It is therefore aims to analyze the vision of SMEs in the state of Guanajuato on the adoption and use of ICT as a strategic tool for competitiveness.

In Business Information Technology and communication have changed the way they relate to customers-suppliers quickly and efficiently through online services such as online purchases-sales, e-banking, mobile devices, networks, etc.

Offering customers new channels (Liljander, Gillberg, Gummerus and Riel, 2006) communication and how to conduct their transactions. Definitions found in the literature, Cobo (2009: 313) conducted an investigation into the concept of ICT proposing the following "technological devices (hardware and software) that allow you to edit, produce, store, share and transmit data in different information systems".

Defining them from the realm of business, they are devices that transmit electronic information that supports the growth and development of enterprises (OECD, 2002) or established tools on computers to support the gathering of information (Haag, Cummings and McCubbrey 2004).

From the above definitions we can point out some features of the virtual organization:

- They are supported in the information and communications technology
- Cooperation and partnerships are a key factor.
- They are supported in real organizations
- They can develop between organizations and within organizations.
- Through electronic interaction between real markets companies it is provided to generate virtual companies along the value chain (Travica, 2005).
- They have great flexibility
- Overcome barriers of space and time and thanks to the Internet can be in several places at once.

Analysis of the definitions and characteristics we might find three groups of virtual organizations, in a first group which meet the definition of virtual organization as a network, the second group from the degree of virtuality of companies in their value chain and the third considering whether they operate only through virtual or electronic markets.

In the first group includes companies like Rosenbluth International Inc, a consortium of travel agencies with global reach, based on intensive use of ICT, with a large database, you cooperate and not compete among members, as well as negotiate as a bloc with suppliers (Travica, 2005), we could also include in this group franchise systems.

The second group could locate companies like Dell, Wal-Mart, HP among others that end up including a large percentage of virtuality along its value chain in order to take advantage of niche markets quickly. In the third group we can locate companies like Amazon, E-bay, E-Dreams, Napster and others.

ICT has played multiple roles in organizations, some of which were considered strategic, have become basic functions to stay in the market. They have influenced the evolution of organizational forms in a first stage, facilitating the passage of functional and divisional structures to these matrix organizations, also changing the relationship centralization / decentralization and verticality / horizontality.

In the same vein have allowed the inclusion of information not only as a support for decision-making, but as a strategic asset that must be continuously improved to protect it and keep it as such.

The emergence of new organizational forms has been possible thanks to the development of ICT and the Internet, enabling remote coordination, interaction, synchronous and asynchronous collaborative work, breaking the barriers of space and time.

It is then required to be digitally prepared to deal with the changes imposed by choosing the most suitable to the needs of the company and successfully implement them and use ICT.

The process of emergence of these new organizational forms has not been a disruptive process, has been rather a continuous process in which each new form incorporating the principal features of the above forms value and adds new capabilities to them.

Thus, cell shape, includes dispersion of entrepreneurship form of division, customer responsiveness of the matrix organization and flexibility of the virtual organization and network.

It is worth noting that these likewise organizational forms pose alternative schemes to traditional forms of ownership concentration, by common forms, as well as control systems, compensation, incentive and profile and capabilities of employees.

The truth is that radically new or organizations today are neither will be the same who knew the pioneers of the science of business management and all due to the development of ICT and the Internet.

In the field of business it mentioned that you have to be competitive, conducting studies on aspects that detonate competitiveness, proposing strategies such as cost leadership, differentiation, customer focus (Porter, 1999), mergers and acquisitions, knowledge management, intellectual capital, partnerships, sustainable development, business strategy, marketing strategy, distribution strategy and logistics, economies of scale and innovation and technologies (Rivers, 2010).

It is then that ICT is considered a tool that promotes and strengthens competitiveness, increasing productivity, lowering costs and thus increases the growth of enterprises to adopt technologies. ICT support the competitiveness of business in the following key aspects (Schereyer, 2000, Bocanegra and Vásquez, 2010):

1. Strategic efficiency.
2. Flexibility in the organizational structure.
3. Synergies inter-organizational.
4. Product innovation.
5. Favors the relationship with partners, customers and suppliers.
6. Costs reduction
7. Differentiation
8. Favors access to new revenue streams and markets.

Therefore, the information provided by ICT, leading to decrease time and costs in the value chain, gaining a competitive advantage. In Mexico, the impact of ICT as a competitive strategy in companies is greater in those who are using TIC (AMITI- CANIETI-FMD, 2006), hence the importance of studying at state level the situation that companies in relation to the adoption of ICT. There are many problems that SMEs face in adopting ICT, such as lack of financial, technical and human resources.

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Factor	authors
direct and explicit support for senior management to adopt ICT's	Damanpour 1991
The existence of technology leaders that support technological change	Sharma and Rai 2003
The technological level of education of workers in technical departments	Pemkumar 1994
The level of technological education of other workers	Pemkumar 1994
The chosen strategy regarding implementation (proactive, reactive, technology leadership, follower, etc.)	Swanson and Ramiller 1997
The level of system integration information technology to business strategy	Fletcher and Wriqth 1995
The size of the company	Young 1999
Organizational culture	Fink 1998

Table 1 definition of factors authors (García, 2013)

ICT currently have a high level of recognition as an instrument for finding solutions in economic activities and as a central force in the transition to a new economic system (Damaskopoulos and Evgeniou, 2003).

However, preparation technologies is very low in Mexican companies, as only 20% of workers have access to a PC "(Phillippe, 2008). Therefore, requires the use of ICT in SMEs is recognized as a means to enhance their competitiveness at the micro and macro levels.

As indicated by Sánchez (2010: 105): It is extremely important that SMEs understand the need for appropriate tools such as e-business information and communication technologies (ICT), electronic-business, large information systems and communication They allow them to maintain an updated global environment, as new trends, new products and raw materials, threats and opportunities that give them power managers to make better decisions that influence the growth of their business knowledge.

ICT integration brings important benefits that help maintain a sustainable competitive advantage; ie companies that adopt ICT can achieve sustainable competitive advantages and achieve differentiation from other companies in their environment.

In this regard, SMEs need to incorporate technology into their business strategies to be more productive and increase their efficiency. The importance of these businesses is that they constitute about 50% of revenues from Mexico, which puts them in a position of considerable importance since, making updating, modernizing the state is achieved.

There are several obstacles to the development of technology projects in enterprises, among which resistance to change and poor definition of them. Therefore, the contribution of ICT in SMEs focuses on:

- Improve communication with employees and partners.
- The relationship with its customers and suppliers.
- Lower costs and operating expenses.
- Increase profitability.

- Improve efficiency in their production processes, recruitment, credit and collection processes, among others.
- Supports achieving the strategic set by the company
- Flexibility in the organizational structure.
- Product innovation, promoting differentiation
- Favors access to new revenue streams and markets.

As is known, ICT is a technology general and therefore can affect all parts of the company and all business processes.

Tools and applications are many, so if you want to conduct an investigation of its impact, it is necessary to study its effect on business performance in order to come to understand its scope, but considering relationships with other organizational factors.

Additionally, knowledge management is a competitive advantage for organizations that may be generating better business practices.

Therefore, for this research, leadership is also essential for drifting skills to generate a unique view from which to effectively interpret the organizational environment for more efficient management processes.

In addition, it is necessary to analyze exporters Guanajuato state, first, in order to identify a socio-demographic profile of them.

ICT, knowledge management and leadership seem to be related to business performance. To the extent it can be proven or not that assumption, one could identify which companies are doing better. Information that can be of great value for future training plans of such companies.

In addition, institutions such as the Development Coordinator Foreign Trade of the State of Guanajuato (COFOCE), the Ministry of Economy, State and Federal Government can take advantage of such studies.

It is therefore a research project, but also linking the university to its environment. The same companies may also be benefited because the project involves conducting its profile in ICT skills, management skills and profile of their leaders what improvements may affect their organizations.

For these reasons, this study is to interest the effect of ICT, knowledge management and leadership in business performance because it is necessary to study their dependence and relationship exporters of Guanajuato as a priority.

Factor	Description
Role of administration	Implementation of more streamlined TIC's when performed in conjunction with the total quality system
Training and socialization	Updating staff is the primary means of socialization of workers in terms of technological change, rather than the actions aimed at changing the attitudes of older workers.
	Job rotation is a key aspect during training and IT training. Workers who do not adapt successfully return to their original positions.
	Worker's age as a factor explaining the lack of adaptation, especially in extreme cases. Middle-aged employees have no trouble adapting to technological innovation.
	A great involvement and business knowledge and use of IT in customer / supplier relationship
The impact of power / hierarchical structure	Fear of administrators or employees of losing part of their responsibilities, powers and recognition at work.

Table 2 Roles deployment of ICT (Manriquez, SMES AND DIGITAL PREPARATION: THE CASE OF GUANAJUATO MEXICO, 2016)

The above issues have been little studied in Mexico and even to a lesser extent in Guanajuato and much less in the sector exporting companies.

On the other hand, there are discrepancies in the results regarding the relationship research between ICT and business performance.

He further emphasized that ICT should relate to other aspects such as management skills or leadership or management knowledge and not in isolation, therefore this study seeks to establish a relationship between the four variables.

Companies must recognize that it is difficult to work without the help of technology, from the use of internet and email as a communication tool to use integrated with suppliers and customers web, accessing most business transactions are made electronically. Why should act with a strategic approach that supports them increase their productivity, efficiency and competitiveness, the results will be reflected in income and better welfare for those who work within the organization, achieved through the adoption tools such as the use of information and communications technologies.

It is then that the Information Technology and Communications are a tool that improves the productivity of a company, making it more efficient in all its activities in the value chain, and enhancing internal and external communication, customer service, activities production, internal and external logistics, administration of human resources and procurement, among others.

The adoption of ICT as a tool for competitiveness

The adoption of ICT, companies must be prepared to choose them, implement them and use them, taking advantage of its benefits, such as improving productivity, sales and profitability (Flores, 2002), product quality, business processes and reduction cost. Finding himself largely benefited from its structure, large companies.

However, companies are not always ready for use ICT, especially MSMEs for lack of resources to implement these tools. Defining the PD as the ability of the company to take advantage of ICT (Jones, Alderete and Motta, 2013; Alderete, 2012; Novick and Rotondo, 2011; Nahiriak, et al, 2007; Mutula and Brakel, 2006; Peirano and Suarez 2006).

Therefore, investigations are conducted around the world by applying different models to determine the digital preparation (PD) of SMEs, such as Stope Model (Strategy Technology Organization People Environment) developed by Al-Osaimi, Alheraish and Bakry (2008) that evaluates the PD at country level and businesses. Jutla (2002), design a partnership model to promote a climate of digital training in SMEs.

Other methods assess the level of preparedness digital e-commerce in SMEs (Tornatzky and Fleischer, 1990; Molla and Licker, 2005; Sparling, Toleman, and Carter-Steel, 2007; Fathian, Akhavan and Hoorali, 2008). In the field of business it mentioned that you have to be competitive, conducting studies on aspects that detonate competitiveness, proposing strategies such as cost leadership, differentiation, customer focus (Porter, 1999), mergers and acquisitions, knowledge management, intellectual capital, partnerships, sustainable development, business strategy, marketing strategy, distribution strategy and logistics, economies of scale and innovation and technologies (Rivers, 2010).

There is little less than 10% of small and medium enterprises that are not connected to internet without email, indicating that in their struggle for survival also lack the resources to adhere to your company's core technologies or do not consider that ICT will help growth.

Although the reality is that the lack of information technologies and gaps in their internal and external communication can take them to be very efficient and effective processes to be limited to the sale in your local and therefore not to expand their business, which will affect its position in the market.

Perceiving that there is a digital divide in the adoption of ICT in Guanajuato SMEs for which the state government to meet their expectations of positioning SMEs, it faces the challenge that you achieve the degree of consolidation in PD, for who are able to cope with the changes imposed interact in a globalized world.

It is then that ICT is considered a tool that promotes and strengthens competitiveness, increasing productivity, lowering costs and thus increases the growth of enterprises to adopt technologies.

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Joint company	digitizable tasks	Benefits
customers	Orders management Billing Customer Control Orders history Product Information available Location of potential customers	More communication channels Less transaction costs Extend business hours Factoring cost reduction Share information constant interaction Status of operations in real time Better inventory management
Between areas or departments	Communication among other areas Monitoring of the production cycle Design area Production planning Inventory control Maintenance management machinery and equipment Staff reports QA Accounting Roster	Greater fluidity of information permanent contact Reduce transaction costs Increased use of the knowledge base Status of operations in real time
providers	Orders management Billing Control of suppliers Orders history Product Information available Locating new suppliers	More communication channels Lower transaction costs Office Hours greater management Factoring cost reduction Share information constant interaction NaS state real-time operations Better inventory management
Financial sector	Postulation credits transfers Capital management	Find better ways of financing
government	one stop shop Support programs advisories Sector regulations Taxes Information on procedures	Windows of opportunity faster care Information on procedures

Table 3 Areas for the implementation of information technologies (Salazar, 2011)

Companies are using robotics, information technology, telecommunications and telematics. How technologies are embedded and influencing the business sector and, therefore, is changing the way they work, posts, tasks and structure of organizations and their relationships with the environment.

Results

For barriers to ICT adoption Rios et al. (2009) have identified the following barriers to the use of ICT by enterprises:

1. ICT costs and implementation times higher that result in uneconomic projects.
2. Schemes nonexistent or inadequate funding.
3. Results lower than expected and unpredictable.
4. Rapid obsolescence level ICT resulting in the need for continued investments to lose value quickly.
5. Technology inflexible and unsuitable for the needs of the company.
6. Process integration with other complicated, time consuming and costly solutions.
7. Greater need for specialization with greater difficulty in finding and keeping skilled people.
8. Resistance to change resulting in poor and low intensity use of ICT.
9. Fashion technology adoption rather than business need.
10. Lack of impetus to ICT projects by senior management.
11. insufficient to support new applications existing infrastructure.
12. Difficulty in justifying the ICT budget before the main directorate.

It is necessary to consider that ICT are present in each stage of the chain value generation. Generating activities modified value in two dimensions, first, in the way these are made, and second, in the way they relate to each other such activities (Hernandez, 2008). Although as pointed Rivers, Toledo, Campos and Alejos (2009), ICT as they do not provide competitive advantages.

- Automation: Influences routine processes. The more than proportional increase in efficiency would respond to the relationship that arises from the possibility of reducing the direct human labor, while records are generated.
- Accessibility to information: The ability to access relevant and accurate information at low cost and in real time allows decisions with the help of a variety of data.
- Transaction costs: The information can be transmitted instantly and inexpensively, reducing coordination costs both inside and outside the company.
- Learning processes: Virtual environments and simulation models facilitate learning and reduce costs.

You can make an investment in advanced ICT and not use them to position themselves strategically or obtain operational efficiency. Remember that to have a higher performance of competing organizations should use their resources strategically, including ICT, and this requires defining clear objectives.

Conclusions

The aim of this study was to analyze the vision that SMEs Guanajuato State on adoption and use of ICT as a strategic tool for competitiveness.

Through a study of 677 companies in the state of Guanajuato about the opportunities and threats posed, the impact on the business model and activities, the benefits, the degree of utilization and adoption, as well as strategies was obtained develop ICT.

In this sense, we can conclude that a high percentage of companies in the state of Guanajuato are aware of the potential benefits and opportunities and threats in the environment that can generate adopt information technologies, as well as changes in the structure, organization of functions, activities and organizational routines that are generated when ICTs are used in the operation thereof.

The use of information technology in SMEs becomes vitally important if we consider that today represent a fundamental element for increasing the competitiveness of such enterprises.

These technologies improve business performance through automation, access to information, lower transaction costs and incorporating learning processes.

Within the constraints faced by SMEs to use ICT are the prevailing culture that shows the impact of its benefits. It is considered that investment is very high and that the benefits will be obtained in the long run.

The main findings can determine that industrial SMEs in Mexico have low chances of survival in the long term, generally produce low specific order and manufacturing processes rather than assembly.

Well, mainly serve the local market, its export level is minimal and have not been incorporated into the productive linkages with companies that export.

In addition, there are very few implementing a formal process of continuous improvement in its plant.

As for the technologies used in plants, of the 19 that were considered merely setting out the application of internet connections with 33.5%, resource planning with 30.5%, activity-based costing with 28.4%, electronic data exchange with suppliers 19% and EDI customer with 18%.

However, as we can see, these percentages are very low, indicating that most industrial SMEs do not apply ICT in their production process, which would be subtracting competitiveness.

This implies that SMEs have realized the advantages of this tool. However, although about 90% of companies know the benefits, only 68% have adopted ICT in their organization, which means that there are factors (unidentifiable in this project) that limit access to ICT.

In a study of top Mexican executives, it found that the low perception of practical value and usefulness of ICT is one of the reasons for low adoption (AMITI, CANIETI and WDF, 2006).

Also, if it relates to the results found with respect to the knowledge that 93% of companies recognize the impact of ICT in the business model and how to carry out their activities, low adoption of ICT may be due to lack of skills to generate changes in the company, fear to make changes in their operations and loss of control (temporary as the organization learns to generate new control mechanisms). On the other hand, it points out that one third of the companies does not formulate strategies to develop ICT in the company in order to support and improve business operations, which means that even though two-thirds of companies use technologies information. Only half conducts integrated and coordinated actions to support its strategic competitiveness in ICTs. Medium enterprises and industry in each of the factors analyzed, show a greater degree of maturity in:

1. La identifying opportunities and threats in the environment when adopting ICT.
2. In recognition of the impact of ICT in the activities of the company and the business model.
3. In the development of ICT strategies.

As for the variables of recognition and commitment, we can conclude the following:

1. In recognition of ICT, most SMEs in the state of Guanajuato are convinced that ICT is a support tool to increase competitiveness, and the sector that best understands this situation are industrial enterprises. However, there is a minority that is indifferent to recognition and less than 10% do not recognize ICT as a tool in the way of doing business. This result is significant for a state that has a projected business growth.
2. Regarding the commitment, just over 60% of SME entrepreneurs support the technological preparation in all areas of your company and 70% agree on the importance of establishing and developing strategies to incorporate ICT.

The commitment of employers in some SMEs is relative, because if properly according to design strategies do not all have adopted ICT or are indifferent to their implementation, in addition to just under 40% of SMEs in the state of Guanajuato are not committed to the implementation of ICT, indicating that they are at a competitive disadvantage, which is why it is necessary to extend the study to analyze the reasons that lead companies to lack of incorporation of ICT in your organization. These findings have several implications for business, academic and government sector. The business sector should be recognized and incorporated in the short term to the age of information and use of ICT to enhance their organizational capacities in order to maintain or improve their competitive position.

Academia should generate further studies on the causes that limit or potentiate the full integration of ICT in business, and the factors that impact the design of ICT strategies focused on business growth.

Finally, for the government, public policy should focus on promoting digital inclusion of all people, especially in the micro and small enterprises.

An important part is to provide training to companies, in connection with the universities to take advantage of ICT in strengthening competitive position, and generally should establish mechanisms to accelerate the adoption of ICT as tax incentives, use of electronic signatures, legal certainty of information and promotion of electronic commerce, among others.

That is, there are several strategies that should be implemented to increase the use of ICT in organizations.

References

Echegaray, A. R. (2016). *Tecnologías de información y comunicación en las organizaciones*. México D.F.: Revista Internacional Administración & Finanzas.

García, M. L. (2013). El uso de las tecnologías de información y comunicación TIC en las micro, pequeñas y medianas empresas (MIPyME) industriales mexicanas. *Revista Venezolana de Información, Tecnología y Conocimiento*, 85-104.

Manríquez, M. R. (2007). Reconocimiento y Compromiso de las TIC en las empresas del Estado de Guanajuato. *Revista Panorama Administrativo*, 3-15.

Manríquez, M. R. (2016). LAS PYMES Y LA PREPARACIÓN DIGITAL: EL CASO DE GUANAJUATO MÉXICO. *Revista Internacional Administración & Finanzas*, 23-38.

Salazar, P. H. (2011). *Influencia de las TIC en las organizaciones: Cambios y aparición de nuevas formas organizativas*. Universidad de Magdalena.