

## The automation of processes and their relation with the competitiveness of the Guanajuatenses MiPyMes

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### Abstract

The automation of processes, terms so commonly known today by specialists in the business area, but a challenge for the Guanajuatenses MiPyMes, because the situation inside the organizations is precarious, and in this sense most of them are They find working with artisan processes and applying the administration and the basic business management. Therefore, incorporating information technologies and in general performing the automation in all its processes represents a great challenge.

The purpose of the present investigation was to determine the relationship between the automation of the processes in the MiPyMes established in Guanajuato with the competitiveness, for it was applied an instrument of 20 items, structured according to the Likert scale; The application was made through electronic and personalized means to 379 managers of micro, small and medium enterprises and the results obtained allow to infer that there is evidence that the level of automation, the use of TICS, the age of the responsible And / or manager and their academic training affect the way in which they manage their internal and external processes and infer in their competitiveness.

### Automation, processes, competitiveness, MiPyMes

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## Introduction

Technological advances in recent decades in the global environment have greatly influenced the functioning of organizations and have generated increased productivity and use of resources, being able to claim that almost 100% of global industrial production is controlled by automatic or semi-automatic control systems. Therefore, currently the automation of processes plays an extremely important role in companies, since the use of ICT, knowledge management, innovation management and technology management increasingly influence the competitive level they have. In the global environment we live, it is more important than ever for organizations to simplify operations so that managers and CEOs can focus more time on activities that generate income. Regardless of whether it is a micro, small, medium-sized company or a large corporation, defining the activities by roles and areas to automate the processes, makes operations more efficient, thus reducing costs and increasing revenues.

Considering the studies conducted in Mexico by Aragón and Rubio (2005) and Bojórquez and Pérez (2011), the internal factors on which the MSMEs should base their competitive advantage are: financial capabilities, technological position, innovation, marketing capabilities, the management and management of human resources, sales, as well as the use of information and communication technologies. Therefore, the identification of internal success factors in micro, small and medium enterprises is crucial, since this type of organizations generate two thirds of employment in Mexico, (Bojórquez and Pérez, 2011), contribute with 52% of the Gross Domestic Product (GDP) and 72% of employment in the country (PROMÉXICO, 2014).

If the importance of the MSMEs is considered for the economic development of the state of Guanajuato and the country itself, and given the strong competition and financial crisis that this business unit is going through, the main objective of this study is to determine the relationship between the automation of the processes and competitiveness, through the analysis of variables such as the use of ICTs, academic preparation and the age of the manager, in order to propose actions that contribute to guarantee their permanence, growth and consolidation.

The importance of the research presented here is relevant, since the MSMEs are of great importance for the development of the rural economy, at the state and therefore national level.

For the design of the instrument, the following variables were considered: competitiveness, the automation of organizational processes through the use of Information Technologies, the level of manager preparation, and items related to the age of those responsible for the MSMEs, time they have in the position, among others, in such a way that they allowed to obtain information regarding the indicators in question.

Considering the information presented in the previous paragraphs, the present investigation aims to present evidence on the importance of the automation of processes in the MSMEs established in Guanajuato and its relationship with competitiveness, considering indicators such as the use of information technologies, age and academic preparation of the manager and additionally obtain information regarding the incorporation of the innovation and the time the manager has in the position.

The research work presented here was conducted in the state of Guanajuato with a sample of 379 MSMEs during the second semester of 2016 and is structured according to a sequence, which is presented below: the introduction, review of Literature, methodology, analysis and interpretation of results to finally present the conclusions and the contribution to the area of knowledge.

### Justification

According to the information provided by INEGI (2015), 3,687 micro, small and medium-sized enterprises open in Guanajuato in two years and have generated 7,978 jobs and a private investment of 482.9 million pesos; The Rapid Business Opening System operates in 36 municipalities. This was achieved through the System of Quick Opening of Companies (SARE in Spanish) that the government of the state of Guanajuato coordinates in 36 municipalities. Meanwhile, on May 6, 2015, Dr. José Manuel Cabrera Sixto, then rector general of the University of Guanajuato, said that according to INEGI data (2015), in Mexico there are just over 4 million companies, which 99% are small and medium, they generate 52% of employment in the country, which makes them the backbone of the state economy. Regarding the same topic, Heredia (2011) mentions that in Mexico, micro, small and medium enterprises constitute 90% of companies, 42% of employment, and contribute with 83% of GDP.

### Problem

The use of ICTs, automation of processes, seniority, innovation, product quality and / or service and sales are classified as success factors in the MSMEs according to (Bojórquez and Pérez, 2011).

Therefore, it is possible to infer that the automation of processes is one of the main causes of the economic downturn of micro, small and medium-sized companies established in the State of Guanajuato, which generates internal problems such as poor performance, excessive costs in labor payment, limited growth, little positioning in the market and in general the application of the basic principles of business management.

In the state of Guanajuato, 26,716 MSMEs are located, belonging to the different sectors. This is registered as updated by the Mexican Business Information System as of November 15, 2016, however, in accordance with the studies carried out by the Organization to Cooperation and Economic Development (OECD) indicate that of every 100 new companies, only 10 manage to consolidate in the formal market by the tenth year of operation and this is an indicator that is related to management weaknesses, possibilities of failure and therefore Survival mentioned by Molina, Armenteros, Plascencia, Barquero and Martínez (2014) when announcing that 200 thousand new companies are generated each year in Mexico, 65% disappear before two years, 50% bankruptcy in the first year and 30% in the second year, in addition to studies conducted by the Organization for Economic Cooperation and Development (OECD) indicate that for every 100 new companies, only 10 log to consolidate in the formal market by the tenth year of operation.

### Hypothesis

There is a positive correlation between process automation and the use of ICTs with the competitiveness of MSMEs established in the state of Guanajuato.

## Research question

Does the automation of organizational processes involve the use of strategies that contribute to competitiveness and business growth?

## Objectives

### General Objective

To determine the correlation that exists between process automation and competitiveness in MSMEs in Guanajuato.

### Specific Objectives

1. Analyze the existing information on the internal factors that influence the competitiveness of MSMEs.
2. Apply a research instrument in the MSMEs of Guanajuato and analyze the information.
3. Propose strategies that contribute to increase the competitiveness of MSMEs.

## Theoretical Framework

### Competitiveness of MSMEs

Competitiveness for Sánchez (2007) is defined as the ability of a company to penetrate, consolidate or expand its participation in the market, which is expressed by factors such as skill, administrative action, maximization of installed capacity, optimization of financial, human and material resources, without losing sight of market signals.

Considering the information provided by Saavedra-García, Milla-Toro (2012) competitiveness is a multidimensional element because it evaluates internal aspects of small and medium-sized enterprises such as strategic planning, production, quality, marketing, human resources, accounting, finance, systems of environmental management and information systems; Therefore, competitiveness is a key element for the development, growth and sustainability of the MSMEs. According to the above, the elements or internal aspects that are important to analyze are all the elements that make up the institutional philosophy, among which we can mention: mission, vision, political values, rules, objectives, strategies, organizational structure, strategies of marketing, financing strategies, market analysis, distribution channels, and etc.

Frequently the achievement of objectives in organizations is related to competitiveness and directly with the business philosophy applied by their manager or manager, since the objectives are a purpose that establish possible measurable results and provide strength to the long-term management (León, 2013). Every economic organization has at least three general objectives: survival, growth and profits (Arce, 2010).

Hall (1992) states that a sustained competitive advantage is the result of the possession of relevant differentiated capacities, Handy (1990) suggests that companies should be more like universities and emphasize knowledge and positive information that allows access to an equally positive economic rewards. Itami and Roehl (1987) point out that one characteristic of successful organizations is that they recognize that they have learning processes that go hand-in-hand with all their operations and that these activities will have an impact on the performance of the organization.

For Gilbreth and Strebel (1986) these attributes of success must include price, quality, aesthetics, functionality, image availability, and so on. Coyne (1986) classifies these attributes into four types of differentiating capacities: functional, positional, cultural and regulatory.

Under these assumptions, Hall (1992: 140) proposes a framework for analyzing intangible resources and differentiating capacities in organizations, classified in those that depend on people who are functional and cultural and those who do not depend on people, as are the positional and regulatory.

### **Factors that influence the competitiveness of MSMEs**

Among the factors that influence competitiveness, it is possible to mention:

#### **Human Capital**

The term human capital was used for the first time in the research on Human Capital, which Theodore W. Schultz presented in his article published in 1961 in the American Economic Review. Most authors agree that human capital comprises skills, experiences and knowledge, but the economist Gary Becker (1978) adds personality, appearance and reputation.

According to the author Davenport (2000) the term human capital refers to skilled and educated people.

#### **Innovation**

Innovation must be considered as a competitive advantage that has different barriers according to the size of the companies, since innovative organizations are those whose competitiveness is based on the domain they have over an organization, over a certain technology or group of them, this allows them to maintain high innovation rates (Sánchez, 2007).

### **Effective advertising**

Advertising is defined as the art of persuading potential consumers with a message through the media, so that they make the purchase decision. With this resource you can familiarize the consumer with the product or service, its attributes and advantages, aimed at satisfying a constant need of the client and helping to build a brand for a future (Muñoz, 2011).

### **Process automation**

Considering the information provided by Castillo (1998: p.306), what is considered as automation of work processes, helps to understand the recent changes that are taking place in work processes. This author says that "it is considered automated to any company that uses computer services on its own computer, shared or by others, for the execution of one or more functions". On the other hand, Nora and Minc (1992: p.17) affirm that "every technological revolution provokes an intense reorganization of the economy and society and this obviously also occurs in the selected work processes in the productive organizations".

Industrial automation, considered as the management of information in companies for decision making in real time, incorporates computer and automated control for the autonomous and optimal execution of processes designed according to engineering criteria and in line with the plans of the business management (DNP, Colciencias, Strategic Plan of the National Program of Industrial Technological Development and Quality, 2000-2010).

Therefore, the automation of work processes is associated as one of the antecedents of the so-called Management Information Systems (MIS for its acronym in English, Management System Information), which today are determinants for the performance of the administrative function, in as much, that these have solved a great part of the administrative problems within the productive organizations, although also they have generated new ones (greater unemployment, disqualification of the manpower, new diseases of work, resistances on the part of the workers, bureaucratization of organizational structures, the growth of hiring for a specific period of time, a new division of labor, etc.).

### **Importance of process automation**

According to the information provided by Metal Stamping Services JOM in 2016, the importance of industrial automation derives from the great competitive advantages it offers to the companies that undertake such processes, since it ensures its competitiveness and its survival in the market, since there is an imminent need to maintain excellence in production processes, to ensure certified products, without incurring in risks of work accidents that represent costs for industries that have to face an increasingly rational and demanding customer. Therefore, it is a reality that digital processes suppose a great advantage for companies, since they allow them to carry out their work in a more agile and efficient way, without mentioning the important cost and time saving that they entail. And is that the digital era promises great things, a world in which people, processes and technology combine to do all the work with the least possible human effort.

One of the effects where the importance of automation in organizations is appreciated is in the reduction of the use of unskilled labor, since the management of the operators of "intelligent" machines multiplies the individual productivity, measured in units produced by human activity.

The results of the Xerox Digitalization at Work study reveal that, although companies want a more agile digital future, their present is still burdened by paper, because contrary to what is commonly thought that we live in the digital era, in the labor field paper processes are usually the norm

### **Methodology**

The following describes the process of gathering information to carry out the present investigation.

### **Kind of investigation**

An investigation was carried out with a quantitative approach, of non-experimental and transversal design, with correlational scope and explanatory implications. For the analysis of the information the statistical software SPSS was used, considering the indicators of competitiveness, use of ICTs and automation of the MSMEs, as well as the level of academic training of the managers of this type of companies, their age and the time the manager has in the position.

### Determination of the sample and data collection

In this study, the impact of process automation on the competitiveness of the MSMEs of the State of Guanajuato was analyzed. For the development of this research work, reference was made to the database offered by the Mexican Business Information System (SIEM), in which there are registered in the state of Guanajuato as of November 15, 2016, a total of 26,716 MSMEs, which have from 1 to 250 workers.

### Formula Application

$$n = \frac{Z^2 p \cdot q \cdot N}{Ne^2 + z^2 p \cdot q} \quad (1)$$

$$n = \frac{(1.96)^2 \times (.5) (1 - 0.5) \times 26\,716}{(26,716) (.05)^2 + 1.96^2 \times (.5) (1 - 0.5)}$$

$$n = \frac{25\,658.0464}{66.79 + .9604} = \frac{25\,658.0464}{67.7504}$$

$$n = 379$$

### Compilation of information

A structured instrument with 20 items was used considering the Likert scale that goes from 1 to 5 points, where they refer from totally disagree to fully agree and has a reliability of 0.915 according to the calculation of Cronbach's Alpha coefficient, so that according to Nunally and Bernstein (1994), there is an excellent consistency between the variables. The information obtained refers to the perception / evaluation of the variables of competitiveness, use of ICTs and automation. The application of the instrument was carried out through the electronic means and in a personal way at random to owners / managers of these MSMEs establishments (commercial, services, industrial).

To measure the validity of the instrument, it was submitted to Expert judgment (Delphi Method) and the pilot questionnaire was applied. The sample size was 379 MSMEs, considering a 95% certainty and a sampling error of 5%, therefore, the same number of instruments was applied.

### Results

After making the corresponding correlations, the study hypothesis is accepted because there is sufficient evidence to infer that there is a positive correlation between the variables subject to study and that the competitiveness of the MSMEs is related to innovation and process automation. In addition, information was collected showing that scarcely 10% of MSMEs studied have been in operation for more than 10 years, 39.1% have been in existence for 6 to 10 years and 50.9% of companies are under 5 years old.

In the same way it is possible to appreciate that there is a great deficiency of automation in the MSMEs of Guanajuato (82%) and the use of information technologies is very limited (9%). Furthermore, with the information obtained it is possible to infer that the age of the manager has a considerable influence on the automation of the processes and on the use of Information and Communication Technologies (ICTs) within the MSMEs, because when analyzing the information 65.8% of these organizations where the age of the manager is between the 50 to 60 years range are not automated processes and the use of ICT is minimal, in addition to applying a very basic administration.

From the above, it is possible to mention that the automation of processes is a need that has arisen mainly to satisfy a more demanding and competitive market, because it is important that organizations evolve along with society itself and its demands, because currently customers are increasingly rational, therefore, it is advisable to guide the automation of processes to contribute to having competitive companies, as an automated process means a final product of quality and more competitive due to factors such as the standardization of process and products, production speed, production scheduling, continuous waste reduction and high quality standards, etcetera.

Finally, it was found that the automation of processes, the use of ICTs and competitiveness obtain very high Spearman correlation indexes and that there are other indicators that also affect competitiveness, as shown below in the correlations made:

Competitiveness VS Process automation

**Rho = 0.404**

Competitiveness VS Use of ICT

**Rho = 0.506**

Competitiveness VS Manager's Age

**Rho = 0.728**

Competitiveness VS Academic Degree

**Rho = 0.824**

Use of information technologies VS Age of manager

**Rho = 0.934**

Competitiveness VS time the manager has in the position.

**Rho = 0.334**

Now, after analyzing the information collected, it is possible to mention that the age of the manager does affect the automation of processes and the use of technologies and therefore the competitiveness of MSMEs. In the same way, the academic degree is an indicator that shows the availability of managers to automate their processes and to update themselves regarding the use of technology. Regarding the indicator of time that the manager has in the position also shows a positive correlation, this because contrary to what is expected while the employee spends more time in the same position, the more his vision of innovation is limited according to the results that throws the investigation

## Conclusions

Considering the above, if automation is a wonder, a new question arises because the resistance of MSMEs to be automated and the response is very simple, organizations have hundreds, or perhaps thousands of processes, but they have limited resources. That is why it is difficult for them to tackle the entire digital transformation and, at the same time, they need to establish priorities, which implies a slow path and having to wait for the transformation of some processes to give priority to others. However, once the factors that contribute to competitiveness in Guanajuato MSMEs are identified, it is possible to conclude the following points: the automation of processes, the use of ICTs, the age and preparation of the manager are factors that affect the competitiveness of the MSMEs. While Martinez (2010), highlights the importance of innovation and financial resources as key elements for the growth of business competitiveness.



Currently Marketing has used the marketing approach of "outside inwards", which involves recognizing and meeting the needs of the external customer (the last consumer), that is, it means looking for new ways of procuring value for the consumer, through the improvement of the qualitative aspects of the tangible and intangible product and without a doubt this also requires an automation of the internal organizational processes.

In this regard, the MSMEs and in general any type of company, must consider that their current clients at any time can stop being so, because if these clients are not satisfied and do not trust the product or service, they do not perceive the innovation, or if quality ceased to be a priority, they will not hesitate to change brands (Bojórquez and Pérez, 2011).

Undoubtedly and taking into account the concepts of marketing, companies must commit to ensure complete customer satisfaction and this implies being up-to-date in terms of process innovation and automation is one of these indicators that cannot be ignored. By doing so, the company's objectives (including competitiveness and desired economic performance) will be achieved and consumer loyalty will be created by contributing to the future viability of the company (Stanton, Etzel and Walker, 2001).

Finally, the MSMEs with their artisanal processes and their product-oriented strategies, their processes, organizations based on management based on hunches and good intentions, with ignorance of the importance of the client and market strategies to achieve their needs, require specialized advice, since it stands out that approximately 89% of them are unaware of the importance and application of business management and automation as strategies to increase their competitiveness.

## Recommendations

Considering the above information, it is essential to generate strategies based on a thorough analysis of the existing options, in such a way that it is possible to contribute to the competitiveness of the Guanajuato MSMEs and their permanence, based on the automation of processes, innovation and in the use of information technologies, in the same way, propose as an essential strategy the implementation of training for managers, in order to generate a change in business ideology and update in the use of applied technologies in MSMEs management, in the same way, is important to promote the empowerment of human capital through knowledge management and innovation management.

Regarding the factors that measure the quality perceived by the client, it is recommended to promote studies that measure this variable from the perception of the consumer or user in order to be really known if quality products or services are being delivered considering the opinion of the client, because positioning in the market is an important indicator of competitiveness.

As a final recommendation, it is important that the owners / administrators of the MSMEs formally establish the actions to be followed in order to seek improvement actions, but above all, that these actions be communicated to the internal clients to integrate them and engage them (employees), as well as to external clients so that they know that they work thinking about satisfying their needs and desires, in such a way that their welfare is improved. Based on the above, Séto (2004) points out that the true strength of a company is determined by the strength of its relationships with customers, employees, business partners and other collaborators, adding that to achieve this requires the commitment of all participants.

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