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INFLUENCE OF INFORMATION TECHNOLOGY ON COMPETITIVE STRATEGIES FOR SMES

Saylis Cabrera Sierra[1]
José G. Vargas-Hernández, MBA; Ph.D.[2]

Summary

This research proposes the use of Information Technology (IT) as a way to generate efficient strategic management in small and medium-sized enterprises (SMEs) to achieve economic advantages. It essentially focuses on the ways in which the storage, retrieval, transmission and manipulation of information is carried out, since the way in which it is handled is of vital importance in understanding individual and organizational behavior. The main research question is the following: Why does IT become a competitive strategy for SMEs? As part of the research methodology for the development of this work, the related existing literature was thoroughly reviewed and success stories associated with the topic were analyzed.

Keywords: Strategic management, information, SWOT matrix, information technologies, competitive advantages.

JEL: D83, G14, L10, L86, O32, Q55

"The role of a strategist is to try to influence the structure of the industry in which he competes, and not just accept the rules he imposes on him."

Michael Porter

1. Introduction

The purpose of this research work is essentially focused on the study of the existing literature on the influence of IT in the management of strategies in SMEs to achieve and subsequently maintain competitive advantages within an organization in the market where it is framed. Although it is true that it is not possible to generalize too much in aspects related to the implementation of new technologies, because each company conceives different or perhaps the same processes, but they do not follow the same strategies, the hypothesis of the current trial is that they can be achieved quality strategies associated with business processes in terms of IT services, which as a result result in competitive advantages.

[1]Master in Business and Economic Studies University Center for Administrative Economic Sciences. University of Guadalajara.

[2] josevargas@cucea.udg.mx- Research professor. Department of Administration University Center of Administrative Economic Sciences. University of Guadalajara

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Strategic information management is structured by a set of actions through which data can be obtained that meet the quality, persistence, and costs that meet the needs of agents and administrators in a firm. To achieve this purpose, IT is an essential concept. The basic objective of information management is the organization and implementation of the organization's information resources, which may be of external or internal origin, to guarantee operability, knowledge and adaptability to constant changes in the environment (Font, Lazcano and Ruiz, 2014).

Today companies are seen as huge information processors and the correct use of it helps to reduce uncertainty in organizations in increasingly competitive environments and to make much more efficient decisions by the authorities in charge of it. As a consequence of the globalization processes and the accelerated development of IT, there has been a novel advance in the information industry. Taking into account this development framework, the way in which the storage, recovery, transmission and manipulation of information is carried out in a company is essential, since the way in which these activities are carried out is of vital importance in the understanding of individual and organizational behavior,

Technology in general is gaining enormous importance in the processes of innovation, communication and in the efficient use of resources and dynamic capabilities in a company. Due to the facilities and options provided by IT in particular, their use is increasing worldwide, as organizations realize that they constitute strong points to achieve competitive strategies both locally and internationally. IT is currently providing the occurrence of changes in the way companies compete, which results in whether or not there are competitive advantages for the company that uses them. These technologies are also responsible for making important changes within the links of the value production chain in organizations.

The current expansion from the point of view of the activities that are dedicated to the elaboration, processing and distribution of information has caused that one may be thinking that the strategic variable by preference may become information, taking into account the role relevant that it plays in all the processes of the company, which can be internal or external.

2. Background to the problem

In order to make governance more efficient in companies and that the decisions made respond correctly to the objectives of the organization, the solution may be that companies have a clear understanding of the spectrum of advantages that IT provides. The main research question of this work is the following: Why do IT become competitive strategies for SMEs? Other supplemental questions are asked that somehow help frame the context in which the research is based: Why is IT so necessary in a company? What represents the correct use and storage of information for SMEs?

For a company to be efficient and at the same time competitive, the authorities must minimize the risks of uncertainty that inevitably exist in the market, and the strategic actions carried out by the decision-making authorities must be seen as flexible and adaptable mechanisms. to the

changing conditions of the environment. Information allows companies to generate efficiencies in all their processes, it is a very powerful weapon that can also be used to get to know the competition and generally the market in which you are competing. In general, the use of information helps to know the SWOT matrix of the company, which is a strategic planning tool, which provides an internal analysis of the organization,

Many entrepreneurs ask themselves the following question: What IT can I use in my business? To answer this question, it is valid to point out some concepts. First of all it is important and also necessary to understand what technology is. In the Dictionary of the Royal Spanish Academy (RAE), the word technology is defined as a "Set of theories and techniques that allow the practical use of scientific knowledge", as well as considering it as a "Set of instruments and procedures industries of a certain sector or product ”(RAE, 2017, p.5677).
The definition of IT is somewhat prolific, so a compilation was made based on the literatures that most converge after having analyzed several authors. According to Benjamin and Blunt (1992), IT comprises technologies that are based on computers and communications, used for the acquisition and storage of information, in addition to allowing it to be manipulated and transmitted to people and businesses, both internal to the company as external. On the other hand, Huber (1990) refers that IT allows companies to improve the management and integration of the needs to perform information processing in all its functional areas.

They are also defined as innovation processes that facilitate and enable the processing and accumulation of large amounts of information, in addition to the fact that they can be distributed using social communication networks. One of the advantages of networks is that it facilitates the creation of information systems that have a common base, which allows the way of accessing information to be transformed and the scope of the network has global dimensions. IT is also a tool that is used to share, distribute and centralize information. They are means that use both telecommunications and technologies associated with computing with the ultimate goal of transmitting information (Fernández, 2005).

Porter and Millar (1985) in their article entitled How information gives you competitive advantage ask some questions: How do advances in IT affect competition and are they sources of competitive advantage? What strategies should a company follow to exploit technology? The authors suggest that managers must first understand that IT is more than just talking about computers. This type of technology must be conceived in a broader way to encompass the information that companies create and use. In the same way, it is evident that the information revolution is affecting competition in several ways: It changes the structure of the industry and, in doing so, alters the rules of competition.

IT is a sector that, in summary, encompasses not only all the internal and external information that a company creates and uses, but also is based on the wide spectrum of technologies, which are becoming increasingly convergent and linked, and which are the ones that They are in charge of processing said information so that they generate greater efficiency (Porter, 1987).

It is a real and convincing fact the increasing importance of IT in the modernization of companies and therefore in their process of creating strategies to achieve and maintain competitive advantages in the market. Jones says that one of the biggest costs a company incurs

comes from the time that managers and employees spend in meetings and boards, making decisions and solving problems. IT are tools that help and reduce these times and therefore the costs incurred by organizations associated with these issues; This makes managers and employees improve their productivity by spending less time finding solutions to their problems (Jones, 1999).

It was found that there are three types of IT that are very useful: Teleconference Systems, information transfer and retrieval systems, and those associated with personal information processing (Monger, 1988).

The use of Tele-Conferences helps in the occurrence of communications even being far away, as a final result costs are reduced, since it would no longer be necessary to spend on transportation or incur the expenses associated with installing people. In the same way, you would be saving a lot of time because you only need to call a meeting in which all the parties involved participate. In these times of global competition it is very important to use virtual media to enhance competitiveness.

In the same way, the information transfer and recovery systems are based on the use of networks and personal computers interconnected with each other, which allows users to share files and digital information. Finally, there are the personal information processing systems, which also provide the efficient use of the time and efforts of all the individuals in the company.

From the point of view of SMEs in the international arena, technological resources are incorporated that have allowed to improve processes and achieve greater economic performance, where the methods used have been developed with resources based on the paradigm of new IT. However, one of the errors that slow down the development of SMEs is the absence of strategic analysis. The lack of accurate, reliable and real-time information that provides statistics on the company's performance can lead to incorrect and inefficient decision-making.

In general, SMEs experience challenges that are no different from those faced by large companies. By definition they have fewer staff, budgets are more limited, and technology platforms far less complex than their larger competitors. However, they are subject to the same demands, so they must try to optimize the quality of their services and products to achieve the firm's objectives, as well as minimize costs and adapt the activities of their IT departments to the requirements of the company. company.

In order for a company to be competitive, the authorities must minimize the risks of uncertainty that inevitably exist in the market and the strategic efforts made by the decision-makers must be seen as flexible and adaptable mechanisms to changing conditions. of the environment. In order to make governance in companies more efficient and that the decisions made respond correctly to the objectives of the organization, the solution could be to have a correct information structure, external and internal, through IT.

Goldhar and Jelinek (1985) conclude in their research that it is possible to achieve a number of competitive advantages in a company through IT. Among these are the achievement of differentiated and personalized products following consumer preferences to maximize profits.

Innovation is implemented thereby greatly improving product design. There are more direct sales and the productions are carried out in a more focused way in relation to the real variations in the demands. More focused marketing work is done to highlight the capacity of production processes. In addition to the fact that there is a differentiation of costs together with rapid changes in the differentiation of the products, which accelerates their life cycle.

3. Theoretical - conceptual review

Companies are huge processors of information and the correct use of it helps to reduce uncertainty in organizations and to make more efficient decisions by authorities (Arrow, 1974). The current and constant evolution of IT has had a profound effect on the administration of organizations, improving the ability of administrators to coordinate and control the activities of the organization and helping them make much more effective decisions. Today the use of IT has become a central component of any company or business that seeks sustained growth. The following figure shows the results of making correct use of IT in organizations.

Figure 1. Results of making a correct use of Information Technology.
Source: self made.

The theoretical-conceptual review carried out in this research shows that there are many authors who believe that the incorporation of IT in SMEs can provide enormous competitive advantages if the use of such technology is correct. The vision of industry-based strategy is supported by the five forces framework that was propagated by Michael Porter in 1981, this model forms the backbone of the theory or more commonly called as the industry-based point of view. The so-called Porter's diamond was made up of the following elements: Intensity in rivalry between competitors, the threat of potential entries, the bargaining power of suppliers, the bargaining power of buyers, and the threat of substitutes (Porter, 1981).

Subsequently, Porter himself made a series of adjustments to the competitiveness model that he himself proposed some years ago, due to the changing environment and the uncertainty that these transformations brought to the industry. In 1991, he focused his analysis on the concept of the company's value chain, which consists of carrying out an exhaustive analysis of the different activities of the firm with the aim of discovering where and how to obtain competitive advantages. Proper management of the links between value activities is usually a good way to

obtain competitive advantages due to the difficulty that competitors face when grasping the relationships between the different departments of the company (Porter, 1991).

There are other authors such as Andreu, Ricart and Valor (1991) who state that obtaining competitive advantages can be mediated through ITGAs (Information Technology Strategic Generic Actions). This concept tries to convey the idea of standard actions through the application of which sustainable competitive advantages can be achieved.

Another of the great theorists states that there are three orientations to find competitive advantages and that is through cost leadership, differentiation and focus (Porter, 1987). Through the low cost strategy, what the company intends is to be the leading producer of costs in the industrial sector in which it is located. This advantage can be obtained through economies of scale, achieving preferential access to raw materials and also through the use of IT, which is the point of greatest interest for this research.

Following some of Porter's (1991) guidelines, IT achieves sustainable competitive advantages taking into account a series of circumstances, among which are that the implementation of this type of technology reduces costs or increases the differentiation of companies and in consequence results in sustainable technological changes. Similarly, these changes and the implementation of IT can modify the general structure of the industrial sector. IT influences Porter's five competitive forces mentioned above. As an example of this, it is possible to increase the bargaining power of suppliers through these technologies or constitute potential barriers to entry for producers, since a large investment is required for their implementation.

One of the basic tools to recognize the role played by IT associated with competitive advantages is the value chains of the company (Porter, 1985). In the same way, for Porter (1980) these constitute a theoretical model in charge of describing the development of the activities of a business organization and what is sought is to identify sources of advantages in competition but in activities that generate value. In this sense, IT behaves as a valuable resource to add value to these activities in companies. These technologies have become a central element of any industrial company that seeks growth in the market, providing a sustainable base for production, trade, human resources, R&D activities, etc. to generate a final product that customers value.

IT can be used in all activities that add value to the company, which is a key factor in achieving competitive advantages. Technologies alone are not important, they are significant if they affect the generation of competitive advantages in organizations (Porter, 2007).

4. Review of the empirical literature

According to statistics from "Google Trends", analyzed personally in April 2018, it is reported that during the last 5 years (from 2013 to the present) Mexico has reached the second position in searches associated with the words "Information Technology" Thus, it is evident that this concept has gained in importance and that both isolated individuals and companies recognize that it is one of the main means of achieving a successful organization and achieving competitive advantages both in local and international markets. Figures 2 and 3 show the results of the searches associated with the term "Information Technology", filtering for the last 5 years and the

interest over time, as well as the regions that have most searched for this concept based on a scale from 0 to 100,

Google Trends is a free and open access tool provided by Google, which allows you to compare the search popularity of various words or phrases; In this way, it is possible to know the search level of a term (keyword) during a determined period of time, allowing to identify the variations in the searches in relative values based on a scale from 0 to 100, where 100 represents the highest point in levels of searches carried out regarding a term or keyword.

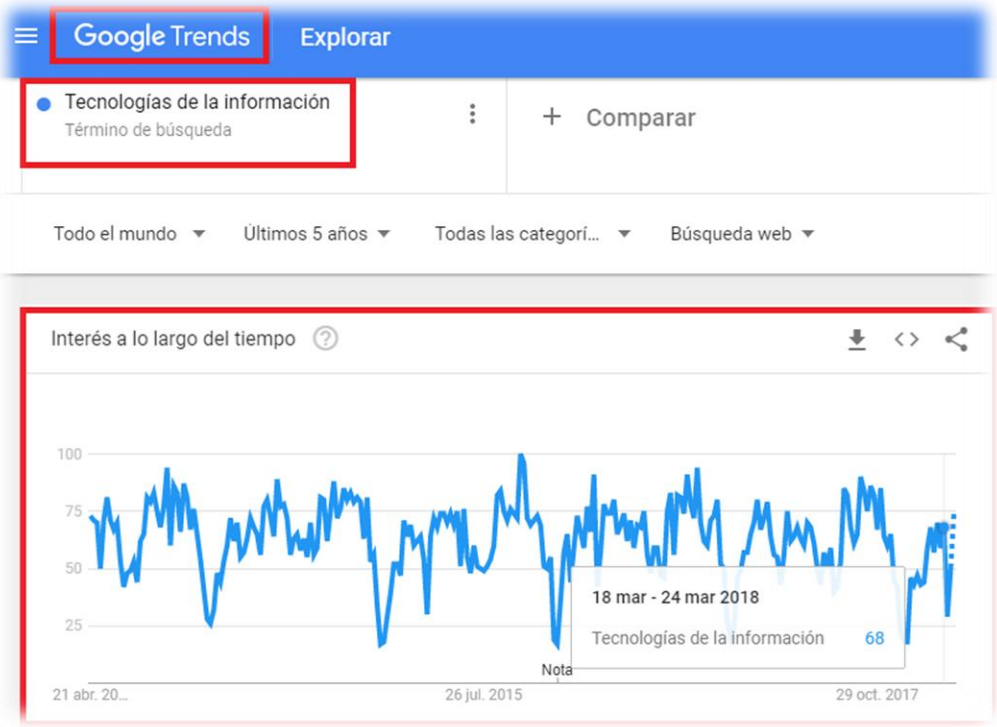

*Figure 2.*Google Trends results. Search term "Information Technologies". Source: Google Trends, 2018.

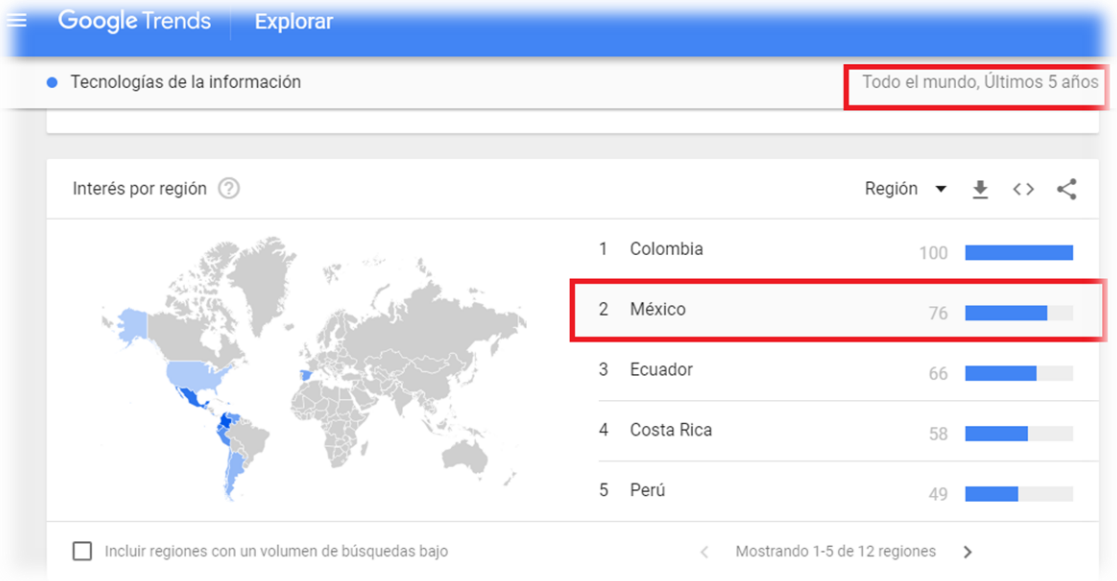

Figure 3. Google Trends results from exploration by regions around the world.
Source: Google Trends, 2018.

In balance with the environment, both the Mexican government and isolated companies and individuals recognize IT as an important concept that should not be neglected to achieve significant efficiencies in their objectives. So much so that the Ministry of Economy (SE) shows that for some years there has been a Program for the Development of the Software Industry (PROSOFT) and Innovation.

Being an SE program, it becomes a public policy that allows promoting the IT sector in Mexico and innovation in strategic sectors. The general objective of this program is to promote some of the industrial sectors that fall within the strategic category so that they contribute to the generation of innovations. The call is aimed at companies in the mature (textile, steel, food, etc.), dynamic (automotive, chemical, electrical, etc.) and emerging (biotechnology, IT, pharmaceutical, etc.) sectors. Proposals must be related to IT innovation among other associated technologies. The PROSOFT Fund is seeking to provide support to companies in the IT services sector so that they can increase their competitiveness in national and international markets and ensure their growth (SE,

In the same way, the online article says that “This self-financing infrastructure, based on the creation of semi-public goods, will allow the generation of Industrial Innovation Centers that promote the development of suppliers, clusterization, value chains, and the development of human capital and specialized skills to facilitate the processes of adopting information technologies for the control and design of production processes aimed at increasing the productivity of manufacturing activities. ” (SE, 2016).

On the other hand, in 2016 the National Institute of the Entrepreneur (INADEM) launched the call 5.1 of the project called "Incorporation of Information and Communication Technologies to micro and small companies". The objective of this program is to provide support to micro and

small companies in Mexico in the incorporation of these technologies, so that they can optimize their administration, production and trade capacities and strengthen competitive advantages within national and international markets. The support provided by INADEM is based on meeting Internet connectivity needs, computer equipment and specialized software. Even companies receive specialized technical advice or management in their own business centers (SE, 2016).

There are a considerable number of examples where competitive advantages have been found through the efficient use of IT, which are documented in different publications, both specialized and popular, and in national and international companies.

You can find examples of organizations that have won the National Technology and Innovation Award (PNTI), which is a Public Policy Instrument created by Presidential Decree in 1998 and that rewards companies that innovate and develop technologies in Mexico to solve problems of high impact. The recognition is granted to Mexican companies that implement a model that offers them the possibility of competing in the national and international market. Companies that generate technology and innovation management models that create new business models, products and services or that provide additional value to existing ones are awarded (SE, 2017).
According to the SE (2017) in the XVII edition of the PNTI, some of the winning companies turned out to be the following: Rotoinnovación SA de CV, Semillas Papalotla SA de CV and Tooriginal Solutions (in the Technology Management category), Horma SA de CV and Tecnología EOS SA de CV (in the Product Innovation category), Tecnotiferet SA de CV and Termoinnova SA de CV (in the Process Innovation category).

Rotoinnovación chose to create a Technology Management model focused on developing the innovations necessary to increase its competitive power, which has generated various projects in the fields of: Basic Science, Applied Research, Technological Development, etc. Its model emerged with the creation of a technological roadmap and has a high distinction for adapting the company's strengths and opportunities to the environment, being in synergy with the development of technological projects and business guidelines. The company has implemented in its model, surveillance activities that enable the analysis of data generated from permanent monitoring of the technological and market environment, with which they can capture key information on capabilities, customers,

According to SE (2017), another of the companies awarded this award is Semillas Papalotla, which developed its own management model, which has been a primary element of its evolution as a company. Given its relevance, the model is highly linked to the way the company operates, it is part of its organizational culture, it is self-managed and all business sectors participate directly in its implementation. In its processes, intelligence and technological foresight provide strategic information to the entire organization to acquire and develop technology, among other activities that result from this process.

For Semillas Papalotla, technology management includes an efficient system for information management, periodic delivery of reports, high internal collaboration, and a small and flexible horizontal and vertical administrative organization that is capable of taking advantage of external human resources. , in which all opinions count, there is no exclusion principle, each employee

has the opportunity to grow and obtain well-defined benefits for their participation. Among its strategies, this company carries out a very efficient administration of its intellectual property, through tasks such as: protection of confidential information and secrets of the organization, promotion of brands, commercialization of its innovations, etc.

In the Technology Management category, there is also Tooriginal Solutions, which considers five elements in its model: monitoring, planning and research to carry out technological development and innovation. On the other hand, its surveillance activities facilitate the obtaining of data and information about its technological, innovation and market environment, as well as the possibility of evaluating the efficiency, effectiveness and impact of the business (SE, 2017).

The SE (2017) refers that the Horma SA de CV company model allows it to advance in its innovation processes, which helps it to develop existing systems, processes and technologies, as well as to evaluate new technologies for making efficient decisions that sustain your competitive strategy with positive impacts. Through technological surveillance, information is obtained from abroad on science, technologies and innovations that are closely linked to products, processes and services in the competing sectors and in some other selective sectors, identifying the impacts for the organization. The information generated is disseminated by means of controlled copies, thereby revealing potential solutions for the problems encountered.

For its part, Tecnología EOS SA de CV is an organization that created a model based on the protection of technological heritage. In order to safeguard the most sensitive information, EOS Technologies signed confidentiality agreements with all those involved in the project, both internal and external. In addition, they also implemented in their internal control and supervision computer systems, levels of access to information to allow data, in the project development process, to be available only to those who required it (SE, 2017).

In the same way, on the official site of the SE (2017), regarding the company Tecnotiferet SA de CV, it is necessary to obtain information for the implementation of strategies that promote technological innovation in their technological and competitive surveillance processes, resulting in the state of the art. In addition to this process, it also acquires tools that make it possible to have more external information, such as market studies, academic articles, statistics and specialized print media.

The last example corresponds to the company Termoinnova SA de CV, which in its technology surveillance process aims to search the environment for information that allows identifying threats and development opportunities for technology innovation that are ultimately channeled into positive impacts. for business. One of its strategies is to collect information that comes from the technological surveillance process in order to identify the elements of competition.

5. Research method

With the aim of knowing and evaluating the needs to implement IT to generate competitive advantages in SMEs, this essay used a compilation of documentation presented in books and

different articles from magazines and from companies specialized in the subject matter and that are proposals on its official pages.

A group of SMEs that have IT implemented in their value chain generation activities was chosen to make a real measurement of the benefits that these organizations have achieved. These firms have been awarded prizes that show that they constitute success stories with their current technology models.

According to the objectives pursued by this research, based on the classification made by Hernández, Fernández and Baptista (2014), it is argued that it is descriptive, since it refers to the description, registration, analysis and interpretation of the current nature and processes of the phenomena studied, related to the need to incorporate IT in SMEs.

In this sense, a descriptive research was carried out, since it was necessary to somehow study the standard of use in terms of IT, in order to define the most representative aspects of the study phenomenon that allowed the formulation of the proposal of using IT as a method to achieve competitive advantages.

Regarding the research design, Hernández and other authors (2014) define it as the strategy developed in order to obtain the necessary information for a given study. Similarly; Arias (1991), exposes that this modality refers to the location of the research according to the method or methodology used, understanding by them the techniques and procedures necessary to carry out the proposed research.

On the other hand, according to the approaches of Sabino (2007) this research has a non-experimental design, since the variable is not manipulated, so that only the phenomenon is observed or analyzed as it is presented in its real context , for the collection of data in a single moment, this last aspect is called transactional or transversal.

In the same way, this investigation can be considered as one focused on its objective, with the purpose of analyzing the occurrence of one or more variables at a given moment; that is to say, the one whose purpose is to investigate the incidence and the values in which one or more variables is manifested, in order to provide their description, but which take the information in a single moment, in a single time, in order study reality as it manifests (Hernández, et al., 2014).

6. Analysis of results

For the analysis of results, the impact that IT had on some of the award-winning companies during the 17th edition of the PNTI that were mentioned above was investigated, as well as some figures related to the favorable repercussions of the economic management model. implemented by these organizations, always associated with the case study technologies of this research.

According to the PNTI (2017) Rotoinnovación, SA de CV has achieved results that increase its competitiveness and that as a consequence achieve impacts in various aspects within society, as established below: It is a certified company and also with certified products. He is a member of

the Mexican Network of Transfer Offices. They obtained two trademark registrations before IMPI, among many other merits.

In order to analyze the impact of Technology Management for SMEs Rotoinnovación SA de CV, this fact can be visualized in Figure 4 shown below:

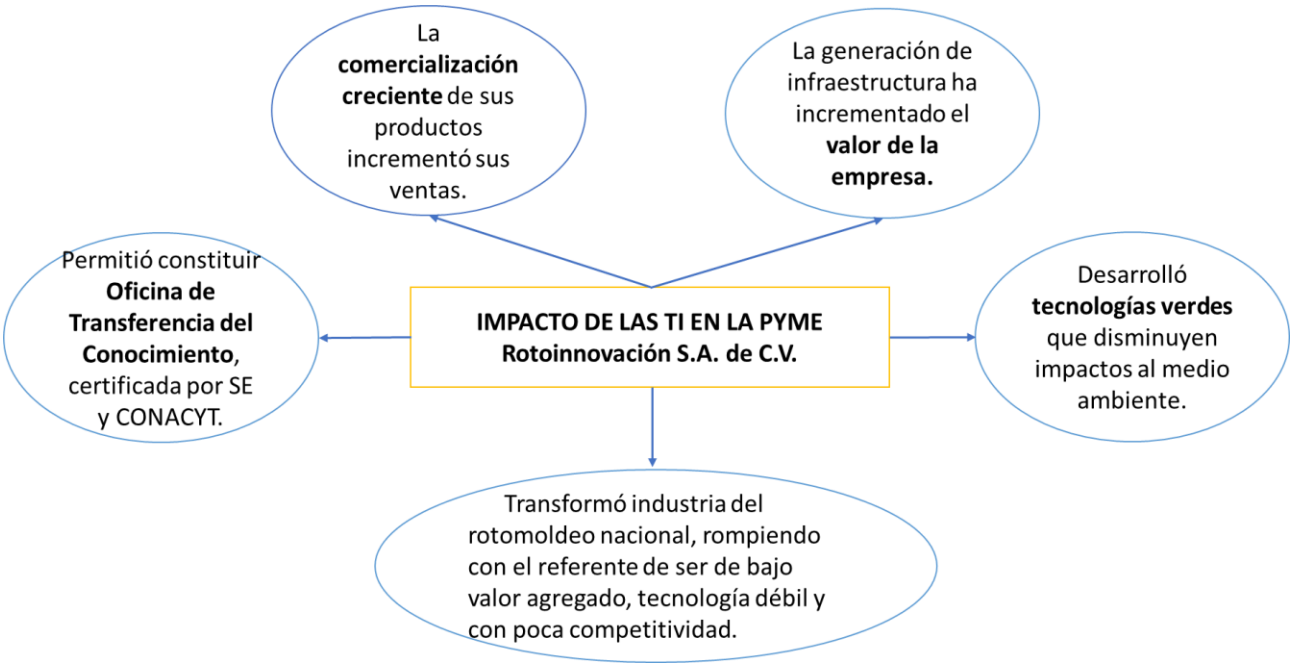

Figure 4. Impact of Technology Management for SMEs Rotoinnovación SA de CV
Source: Own elaboration based on PNTI (2017).

For the SME Semillas Papalotla SA de CV the impact of Technology Management is observed as follows:

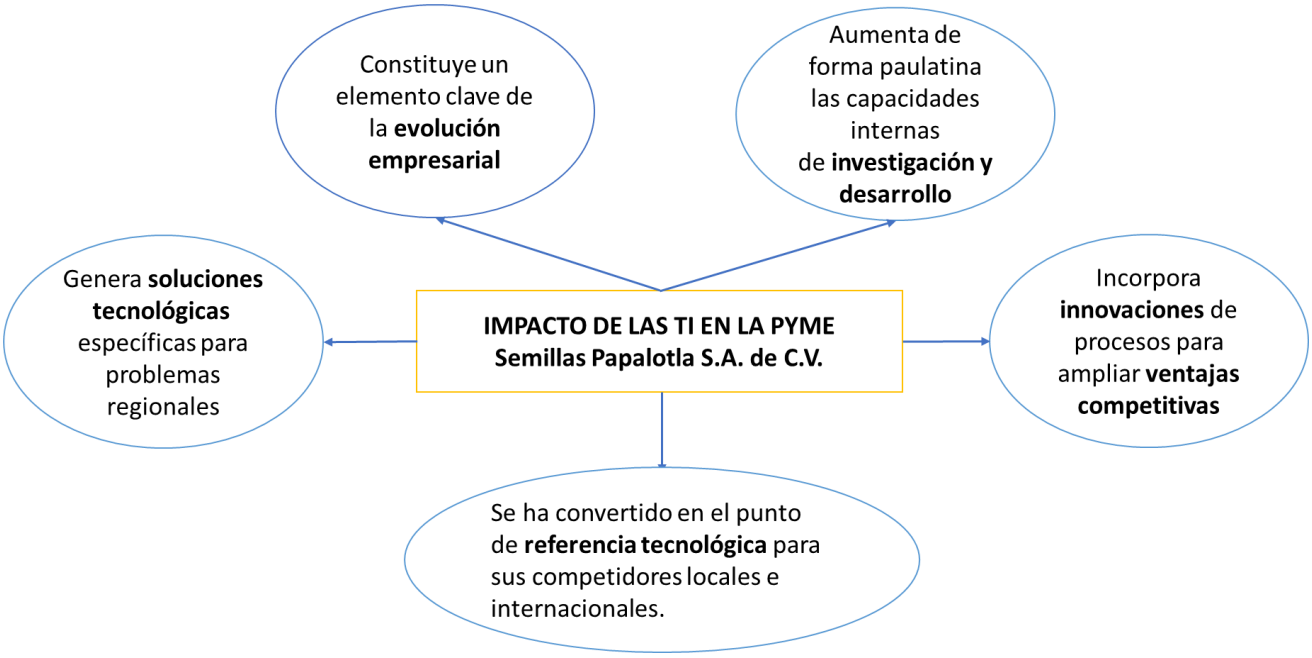

Figure 5. Impact of Technology Management for SMEs Semillas Papalotla SA de CV
Source: Own elaboration based on PNTI (2017).

The Technology Management model has allowed Semillas Papalotla to progressively increase its internal R&D capabilities. Until 2014, the company had introduced three new products to the market that are being marketed in 48 countries (Figure 6); increased its R&D staff by 80%; as well as managed to increase the number of projects to expand their target markets and were developing 6 new products and 3 innovative processes. Sales of the new products until 2014 represented more than 75% of the company's sales; The new technological offer allowed for a 28% increase in the markets of influence and 12 new countries take advantage of this technology (PNTI, 2017).

Indicadores		Descripción de indicador	2012	2013	2014
Indicadores de recursos	Financieros	Gasto en I+D/ventas	8.2%	7.7%	6.7%
	Humanos	Personal dedicado a I+D/total de personal	10/70 14.3%	15/78 19.2%	18/85 21.2%
	Infraestructura	Activos dedicados a I+D/activos totales	18%	21%	22%
Procesos de dominio	Mercado	Activos dedicados a I+D/activos totales	8	10	11
	Producto	Número de proyectos de nuevas líneas de producto financiados por Semillas Papalotla durante los últimos tres años	4	5	6
	Producción	Número de proyectos de innovación de procesos financiados por Semillas Papalotla durante los últimos tres años	2	3	3
Resultados	Financieros	Porcentaje de ventas de nuevos productos /ventas totales	84%	75%	77%
	Posicionamiento	Porcentaje de participación de mercado obtenida por nuevas líneas de producto	8.9%	10.1%	8.5%
	Indicador global	Aumento en el valor de la organización debida a su gestión de tecnología.	100%	122%	209%
Otros	Comercialización de la innovación	Número de Híbridos de Brachiaria en el Mercado	2	2	3
	Cobertura de la innovación	Número de Países que producen los híbridos de la empresa	36	44	48

Figure 6. Impact indicators for SMEs Semillas Papalotla SA de CV
Source: PNTI (2017).

Taking into account the impact of Technology Management for SMEs, Horma SA de CV can be analyzed in Figure 7:

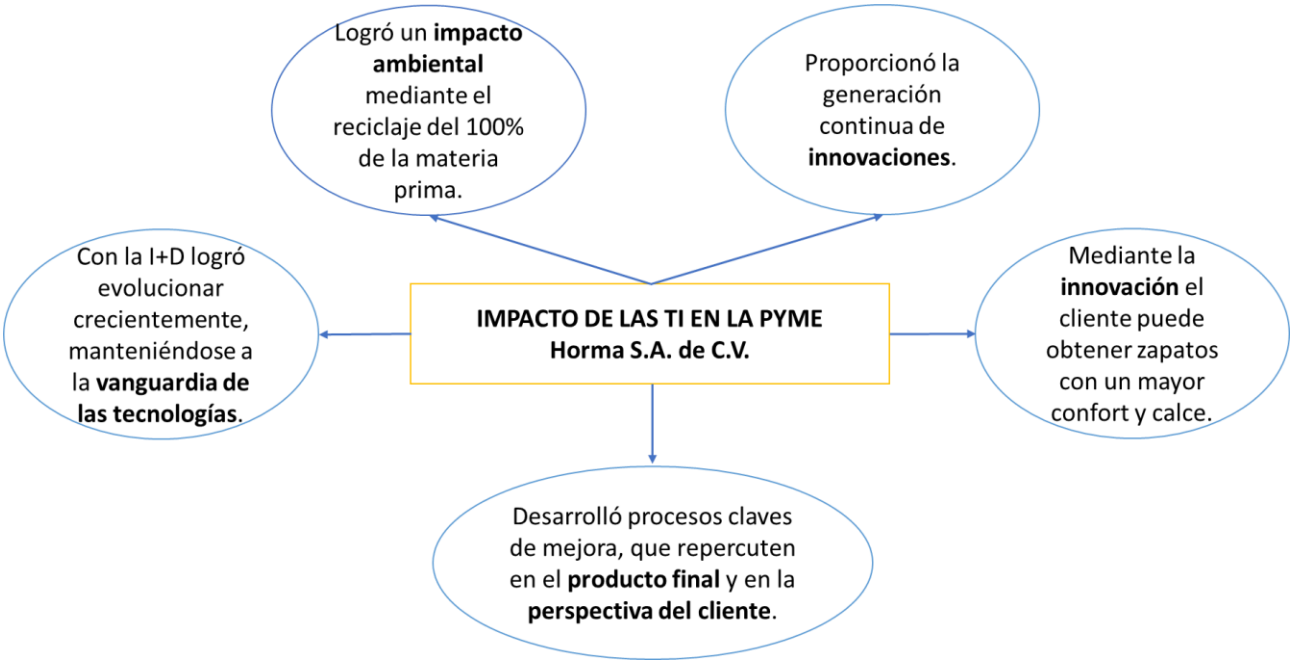

Figure 7. Impact of Technology Management for SMEs Horma SA de CV
Source: Own elaboration based on PNTI (2017).

On the other hand, there is a growth in sales in the last 5 years, associated with the innovation made in the product line and the assimilation of technology (Figure 8).

Figure 8. Sales growth indicators for product innovation for the SME Horma SA de CV
Source: PNTI (2017).

With the indicators shown in Figure 9 the company can determine the development of growth and development of the project, both internally and externally, to determine possible modifications to it.

Indicadores	Descripcion de indicador	2012	2013	2014
Impactos para la competitividad	Promedio anual de incremento en ventas totales por el nuevo producto (%)	+ 3% EN TERMINOS REALES	+ 3% EN T ERMINOS REALES	+ 5.9% EN TERMINOS REALES
	Promedio anual del incremento en utilidades por el nue-vo producto (%)	18.45%	+ 32.9%	+29.92 %
	Tipo de impacto en la cadena de proveedores y/o clientes	Muy Positivo con un nivel competitivo en desarrollo de nuevos productos.	Muy Positivo con un nivel competitivo en desarrollo de nuevos productos.	Muy Positivo con un nivel competitivo en desarrollo de nuevos productos.
Otros impactos	Nivel de integración nacional de insumos	ALTO 70%	ALTO 78%	ALTO 85%
	Generación de empleo	2 EMPLEADOS	2 EMPLEADOS	3 EMPLEADOS
	Beneficio ambiental	Reducción de productos no renovables	Reducción de desperdicio	Reducción de maquinaria
	Propiedad intelectual	Escalado de patronaje para calzado	Modelo de utilidad	Reg. Marca de horma 4g
	Social y geográfico	Crecimiento en el país	participación a nivel internacional	Dominio de mercados nacionales.

Figure 9. Impact indicators for the SME Horma SA de CV
Source: PNTI (2017).

Conclusions

As initial questions of the present investigation they were had: Why the IT become competitive strategies for the PYMES? Why is IT so necessary in a company? What represents the correct use and storage of information for SMEs?

With the realization of the current test and the analysis of examples of success cases associated with the implementation of technology management, it was possible to answer the questions raised and it was found that quality strategies associated with business processes can be achieved in terms of IT services, which as a final result become competitive advantages. In general, the correct use of IT helps to reduce uncertainty in organizations in increasingly competitive

environments and to make much more efficient decisions. These technologies are also responsible for making important changes within the links of the value production chain in organizations.

The implementation of this type of technology reduces costs or increases the differentiation of companies and consequently becomes sustainable technological changes. Similarly, these changes and the implementation of IT can modify the general structure of the industrial sector.

It is also concluded that IT can be used in all activities that add value to the company, which is a key factor to achieve competitive advantages. Technologies alone are not important, they are significant if they affect the generation of advantages to generate competencies in organizations.

Bibliographic references

Andreu, R., Ricart, J., and Valor, J. (1991). Strategy and Information Systems. Mac Graw Hill.

Arias, F. (1991). Introduction to research methodology in management and behavioral sciences. Editorial Trillas.

Arrow, KJ (1974). The Limits of Organization. New York, United States: WW Norton and Company.

Benjamin, I., and Blunt, J. (1992). Critical IT (Information Technology) issues: The next ten years.
Sloan Management Review, 33 (4), 7-19.

Carrión, G. (1998). Gloria Ponjuán Dante. Information management in Organizations: Principles, concepts and applications. DOI: 10.22201 / iibi.0187358xp.1998.24.3867

Dictionary of the Royal Spanish Academy (RAE), (2011). Spanish dictionary. Adobe Digital Editions, stylish eBooks.

Fernández, R. (2005). Conceptual framework of new technologies applied to education. La Mancha, Spain: University of Castilla. Recovered fromhttp://www.uclm.es/profesorado/ricardo/DefinicionesNNTT.html

Font, EM, Lazcano, C., and Ruiz, MA (2014). Strategic information management in organizations: A methodological proposal. Magazine of Science, Technology and Innovation, 1 (1), 1-10.

Google Trends (2018). Viewed at:https://trends.google.com.mx/trends/

Hernández, R., Fernández, C., and Baptista, M. (2014). Investigation methodology. McGraw-Hill / Interamericana Editores.

Huber, G. (1990). A Theory of the Effects of Advanced Information Technologies on Organizational Design, Intelligence, and Decision Making. The Academy of Management Review, 15 (1), 47-71.

Jelinek, M. and Goldhar, J. (1985). Variety economies based on new technology. Harvard Deusto Business Review, 22 (1), 71-80.

Jones, G. (1999). Organizational Theory. Texas, United States: Texas A&M University.

Monger. R. (1988). Mastering Technology. New York, United States: The Free Press.

National Technology and Innovation Award (PNTI), (2017). Organizations Winning the National Technology and Innovation Award® XVII Edition. Recovered from http://pnt.org.mx/ganadorasxviiedicion

Porter, M. (1980). Competitive Strategy. New York, United States: Free Press. Chapter 2.
Porter, M. (1981). The Contributions of industrial organization to strategic management. The Academy of Management Review, 6 (4), 609-620.
Porter, M and Millar, V. (1985). How information gives you competitive advantage. Harvard Business Review, 63 (4), 149-160.
Porter, M. (1985). Competitive Advantage. New York, United States: Free Press.
Porter, M. (1987). Competitive advantage. Buenos Aires, Argentina: CECSA.
Porter, M. (1991). Toward a dynamic theory of strategy. Strategic Management Journal, 12 (Special Issue: Fundamental Research Issues in Strategy and Economics), 95-117.
Porter, M. (2007). Competitive advantage. Creation and sustenance of a superior performance. Sixth reprint, Editorial Grupo Editorial Patria, Mexico.
Sabino, C. (2007). The investigation process. Humanitas Publishing House.
Ministry of Economy (SE) (2016). Program for the Development of the Software Industry (PROSOFT) and Innovation 2018. Mexico City, Mexico. Recovered fromhttps://www.gob.mx/se/acciones-y-programas/programa-para-el-desarrollo-de-la-industria-de-software-prosoft-y-la-innovacion-2016
Ministry of Economy (SE) (2016). INADEM launches the Call 5.1. Recovered fromhttps://www.gob.mx/se/articulos/lanza-el-inadem-la-convocatoria-5-1
Ministry of Economy (SE) (2017). 19th Presentation of the National Prize for Technology and Innovation (PNTI). Federal District, Mexico: General Directorate of Social Communication. Recovered fromhttps://www.gob.mx/se/articulos/19a-entrega-del-premio-nacional-de-tecnologia-e-innovacion-pnti?idiom=es