

# **RELEVANCE OF TECHNOLOGICAL INNOVATION IN THE BUSINESS COMPETITIVENESS OF MEDIUM ENTERPRISES IN HIDALGO STATE**

*Dra. Dolores Margarita Navarrete Zorrilla*

*Dr. Tirso Javier Hernández Gracia*

*M.C. Ma. Del Rosario García Velazquez*

*M.T.E. Jose Francisco Hernandez Gracia*

Universidad Autónoma del Estado de Hidalgo, México

*M.G.A Jose Gustavo Ibarra Duran*

Universidad Politécnica de Pachuca

*M.A. Juan Alberto Carranza Sevilla*

Universidad Tecnológica Tula Tepeji, México

---

## **Abstract**

Currently the technology innovation is a relevant factor in both the business world, and in the research field, it has a greater importance when it is associated with variables such as competitiveness and the impact is greater because the trend of the variable of technological innovation makes in the future of business development is perceived. On the other hand competitiveness approaching to the current context, is not just the rivalry that puts an economic agent against other economic agents. It generally refers to producer's entrepreneurs, who may compete with each other in several ways, offering higher prices, in order to obtain quality or a higher quality of the necessary factors to attract customers with lower prices, with special offers by advertising among other activities. (Ricossa, 1990).. The performance of SMEs in Mexico and in the state of Hidalgo shows lacking of development and technological innovation, and the factors used to raise their competitiveness are insufficient to solve the presented problems, showing slow progress in competitiveness and productivity. SMEs are the main support of the economy in a country, they contribute to sustainable economic development, and they generate wealth. According to the importance of technological innovation and its relevance in competitiveness, this paper aims to explore the organizational factors that in technological innovation have the medium enterprises of Hidalgo State to be competitive, to take a competitive advantage based in technological innovation.

---

**Keywords:** Competitiveness, technological innovation

## **Introduction**

Currently, the impact of technological innovation perceived is greater and it sets the future of business development. Technological innovation during the fifties was considered as part of a development and as isolated results in the advancement of research. Currently it is considered as the process for dealing with and resolving problems mainly focused on the market and its various agents, it involves the exchange of tacit and explicit knowledge, which facilitates learning from different approaches (Hidalgo, Vizán and Torres, 2008). According to Camacho (2008) today the business growth requires a factor such as technological innovation that allows the creation and development of production and technological capabilities to look for new products and promote their national and international competitiveness; Also to maintain their levels of business competitiveness, ensure the diversification of trade in their products, to improve their basic infrastructure; it is essential that entrepreneurs constantly innovate their manufacturing and administrative processes as well as the proper use and application of manpower. A key to improve the index factor of business productivity is the technology used in production processes as well as the combination of technology – workforce that is reflected in production volumes which are obtained with better prices to the market.

It is important to note that maintaining the productivity index based on technological modernization of their manufacturing processes must be a constant entrepreneurial attitude. Consumers demand every day better quality of the products they buy and the companies need to improve the technology used to satisfy them. According to Pavón and Hidalgo (1997) the technological innovation is the set of technical, industrial and commercial stages which lead to launch manufactured goods as well as the commercial use of new technical processes. All these aspects are a driving force behind the company towards long-term goals as well as the renewal of industrial structures and the emergence of new sectors of economic activity.

## **Relevance of technological innovation**

Technological innovation during the fifties was considered as a development only as isolated results of research development, currently it is considered as the process for dealing and resolving problems mainly focused on the market and its various agents, it involves the exchange of knowledge tacit and explicit that facilitates learning from different approaches (Hidalgo, Vizán and Torres, 2008). Proper management of technology is one of the keys to success in business today. The technology used by a company can be

generated internally through research or it can be gotten outside. Therefore in order to the company achieve and maintain a technological advantage that allows it to be competitive, it must maintain a position of market dominance from own research and development. The above due to the acquisition of the technology offered in the market is accessible to any competitor and therefore it does not use to provide the company with additional benefits (Pavón and Hidalgo, 1997).

To have innovation according to the Oslo Manual (Cited by Bravo, 2012) you need at least the product, the process, the marketing method or the organizational method to be new, or significantly improved. On the other hand, the essence of the innovation process is continuous in nature, it is the accumulation of knowledge over time, the increase of knowledge is achieved by conducting R & D, although there are other forms associated with different creative mechanisms (Bravo, 2012).

According to Porter (1990) innovation is the key element in explaining competitiveness. The competitiveness of companies represents the ability to operate in global markets, to remain profitable and to compete successfully. And you can add to generate value added and job creation. Therefore companies must grow with the idea of becoming more competitive each day, directing the company to beat the competition which is propitiated by the rising standard of living that is sought by human being. Also competitiveness is defined by productivity as how a country uses its human, economic and natural resources. To understand competitiveness, the starting point is the underlying sources of prosperity that a country possesses. The standard of living of a country is determined by the productivity of its economy, which is measured by the value of goods and services produced per unit of human, economic and natural resources. Productivity depends both on the value of the products and services of a country which is measured by the prices paid for them in free markets and because of the efficiency with which they can be produced. Productivity also depends on the ability of an economy to mobilize their available human resources (Porter, 2005).

### **Factors that have been used to measure competitiveness**

Competitiveness is measured by productivity which allows a nation to support high salaries, a strong currency and attractive capital profitability and thus a high standard of living. The most important is not the property or exports or if companies are domestic or foreign property, but the nature and productivity of economic activities which are developed in a given country. And the local industries contribute to competitiveness because their productivity not only sets the level of salary in each sector, but also has a

significant impact on the cost of living and the cost of doing business in that country. (Porter: 2005).

According to Porter (2005) four factors can be decisive in the competitiveness:

1. The endowment of the country, in terms of quantity and quality of basic production factors (manpower, natural resources, capital and infrastructure) as well as the skills, knowledge and specialized technologies that determine its ability to generate and assimilate innovations.
2. The nature of domestic demand in relation to supply the national production; in particular, the presence of claimants who press bidders with their demands for innovative products and anticipate their needs relevant.
3. The existence of a productive structure formed by companies of different sizes, that are efficient in the world, linked horizontally and vertically, encourage competitiveness through specialized domestic offer of inputs, technologies and skills to support an extensive process of innovation along production channel.
4. The prevailing conditions in the country in terms of creating, organization and management of enterprises and competition, especially if it is encouraged or inhibited by regulations and cultural attitudes towards innovation, profit and risk. (Porter: 1990).

Rubio, A. Aragon, A (2002) identify the factors on which an enterprise (SME) articulate their success. Through an empirical study with a sample of 473 SMEs in the Area of Murcia. To answer a key question: What are the variables of management or direction which propitiate the competitive success of a company.

### **Relevance of competitiveness**

Business competitiveness is key to achieving greater economic and social levels, which allows growing the global channels of production and allows companies to participate in national and international markets.

A company is competitive when it can produce products and services of higher quality and lower costs than its competitors. Competitiveness is synonym of the performance of profitability of a company in the long term and its ability to pay its employees and to generate higher profit for their owners (Padilla, 2006). Determining factors of competitiveness is not easy since it is included the easiness to operate in the domestic and international markets, investment in human capital formation and innovation efforts. Competitiveness has been related to variables such as exchange rate and interest, the budget deficit, availability of cheap and abundant manpower, natural resource endowments.

On the other hand, Drucker (1986) cited by Hidalgo, Vizan & Torres (2008) identifies seven areas focused to seek opportunities for innovation related to competitiveness: The first four are within the company and therefore are visible to people within industry or specific field, these areas are:

- ✓ The unexpected (unexpected success, the unexpected process, surprise).
- ✓ The incongruous (between reality as it is and how it was thought it should be).
- ✓ The need of a process.
- ✓ The collapse (sudden change in industry or market structure).

The second group of opportunity areas for innovation is established by the changes produced outside the enterprise or sector, as:

- ✓ Changes in the population (demographic changes).
- ✓ Changes in perception and culture.
- ✓ The new knowledge (both scientific and non-scientific).

Considering all these aspects and analyzing that planning technological strategy, factors of technological innovation are approached as: innovation in products and services, innovation in manufacturing processes, technological innovation in production processes, the consumer market innovation and technological innovation in the development of organizational capabilities aspects such as: product, service, training, people and technology update, objectives, policies, structure, implementation and evaluation of competitive strategies as priorities for business development are included, this research aims to assess the current situation in which technological innovation is, in order to establish its development in medium enterprises.

## **Problem**

Technological innovation is a fundamental requirement in the creation of wealth of a nation. In developed and competitive economies, there are only three ways in order to people's work produce newsustainably business wealth as:

1. Attracting and retaining customers, increasing market share in a particular activity.
2. Optimize processes, increasing productivity.
3. Developing new products and services to create entirely new activities. In these three fronts, little can be done without innovation (López, A. and Ballesterro, M., 2003).

According to Ramos (2001) it is mentioned that as the competitiveness of enterprises is determined also is identified with nations

and therefore it depends on the ability of its industry to innovate and improve.

Medium enterprises in Hidalgo State fail advantage over the best national and international competitors, the cause of the pressure and the challenge is unknown, and there are several factors involved in the performance of organizations from Hidalgo. They are benefited from having strong domestic competitors, aggressive suppliers in the country and demanding domestic customers. However the desired competitiveness is not achieved by employers. The premise of ECLAC sets four levels for systemic competitiveness, social integration because it is not only important to have political or economic reforms in isolation therefore it is important a transformation project of the society. A structural change in which the participation of the social partners make a commitment in finding joint solutions to the current problems is needed, in which an institutional separation between state, the private sector and intermediary organizations is considered (Meta Level).

In this perspective, the state acting independently and at the same time, groups of public and private social actors have to cooperate with each other and articulate among them is visualized. (Klaus Esser, et.al., 1996). A linking element of systemic management according to Esser, it is the dialogue, it means the ability of social actors to interact and to reach a consensus which is considered important in achieving competitiveness oriented to do a "systemic management covering to society as a whole" (Esser. Op.cit). In this perspective, systemic competitiveness, demands structural changes that impact the legal, political and economic organization that promotes socio-cultural factors and the scale of values. Regarding the macro level, the existence of efficient markets is considered important to the experience of the unstable macroeconomic context impairs growth of the economy, ECLAC establishes the importance of "The government must help to stabilize sufficiently the monetary value, but while avoiding their policies to this end endanger the basis of the national economy and exacerbate social inequalities. "

To achieve this, we require new budget and tax policies to increase economic growth and distribution, which leads to restructure the system of funds and taxes and to raise the efficiency of tax administrations. In this context, this policy should seek to tax consumption more than production, covering all types of taxes and implement progressive taxation, it is important to consider that any budget reform requires structural changes that include policies aimed at economic and social growth. Given the changes which represent a globalized economy, it is important to implement local policies that will solve the problems of organization and management that have prevailed at State level, for that reason, at the mesoeconomic level the

importance of developing an effective institutional structure and promoting the capacity of close interaction between public and private actors are established. (Messner, 1998). Therefore in this research we are interested in identifying the meta level, with analysis of how technological innovation impacts on competitiveness of medium-sized production companies of Hidalgo State in relation to the following dimensions: innovation and expansion of product and services range, innovation and expansion of production processes, technological innovation in the consumer market, technological innovation in the development of organizational capabilities.

### **General Purpose**

The aim of this paper is to analyze the impact of technological innovation of medium sized companies to current needs of competitiveness of the productive sector of Hidalgo State. Considering that the results will be useful to entrepreneurs, researchers, students and anyone who is interested in the topics of technological innovation and competitiveness, enabling them to identify the competitiveness of companies in Hidalgo State.

### **Research Question**

Do medium enterprises in the manufacturing industry of Hidalgo State currently integrate technological innovation to be competitive?

### **Hypothesis of the study**

Based on the problem statement, objectives and research questions, the study hypothesis is:

H<sub>1</sub> There is a statistically significant relationship between the level of technological innovation and the competitiveness of medium-sized companies of Hidalgo State, determined by technological innovation in renovation and the expansion of the products and services range, in renovation and expansion of technological innovation of productive processes, in renovation and expansion of technological innovation in the consumer market, in renovation and expansion of technological innovation in the development of organizational capabilities.

H<sub>0</sub> There is not a statistically significant relationship between the level of technological innovation and competitiveness of medium-sized companies of Hidalgo State, determined by technological innovation in renovation and the expansion of the products and services range, in renovation and expansion of technological innovation of productive processes, in renovation and expansion of technological innovation in the consumer market, in renovation and expansion of technological innovation in the development of organizational capabilities.

## **Method**

The research was designed in two parts, the first technological innovation variables are discussed, considering factors such as companies characteristics, company size, infrastructures that support industrial production and innovation activities in the formation of human capital, and the ability of companies to create, imitate and manage a complex reserve of advanced technological knowledge (Castellaci and Archibugui, 2008).**6.1**

## **Design**

In this paper a non-experimental research, cross-sectional, ex post facto in order to identify the variables associated with the competitive potential of enterprises was designed which is expressed in its ability to generate and hire staff to develop innovations and its organizational purposes. Therefore a questionnaire with the operationalized variables included in the research was integrated.

## **Population and Sample**

The object of this research is a survey of 53 medium-sized companies in Hidalgo State as part of manufacturing, medium-sized enterprises (with 51 or more employees). Companies are located in the municipalities of Acaxochitlán, Actopan Atitalaquia, Atotonilco de Tula, Cuautepec de Hinojosa, Mineral de la Reforma, Pachuca de Soto, Progreso de Obregón, Tepeapulco Tepeji del Rio de Ocampo, Tizayuca, Tlanalapa, Tula de Allende, Tulancingo de Bravo, Zacualtipán de Ángeles y Zapotlán de Juárez. In this paper the partial results of the pilot test at 10 medium companies in Hidalgo are shown.

## **Variables**

**Dependent:** The dependent variable is the potential of technological innovation outlined in the competitiveness of enterprises to perform (products, production or service processes, the consumer market, and human capital formation).

**Independents.** As independent variables company size, age, foreign capital, export share, number of employees, sales, which support industrial production, innovation activities, human capital formation, organizational capabilities in which are included business strategies for the creation, imitation and generation of advanced technological knowledge.

**Measuring instrument.** A questionnaire with a total of 56 questions to mediate the beforementioned variables, each according to their scale of measurement was designed.

## Analysis Procedure

To measure the dependent and independent variable a questionnaire of 56 questions was designed. To these a scale according to the construction of the question were assigned. The dimensions of technological innovation and competitiveness, based on the literature review of the relevant themes are:

- Renovation and expansion of products and services range.
- Renewal and technological innovation of production processes,
- Technological innovation in the consumer market,
- Technological innovation development of organizational capabilities.

## Analysis and interpretation

The analysis and interpretation of the information is started from the results of measuring instruments in the pilot test, then we proceed to capture the questionnaires, for this purpose SPSS See 19 will be used. These results are preliminary to the conclusion of the project.

Statistical analyzes are as follows:

- Descriptive analyzes of the data, using percentages for categorical variables and central measures tendency (mean, median and mode) and dispersion for continuous variables (standard deviation).
- bi-varied statistical analysis. Depending on the scale of measurement of each variable correlations or associations between variables will be made (for example: Pearson correlation coefficient).

## Results

According to Table 1, companies are characterized by having on average 19 years of operation, 5.4% foreign capital, 5.3% of exports. On average companies are integrated by 265 workers and generate average total sales in 2011 of \$ 67'765,145.60 pesos. The average number of jobs generated in the sample was 9.5 and the average number of patents, prototypes and copyrights developed by companies was 0.5.3.

Table 1 Enterprise characteristics of the pilot test (n = 10)

Company size	Age (years)	Foreign capital	Percentage of exports	Number of workers	Sales	Knowledge management (patents, prototypes and copyrights)
Medium	19.0	5.4%	5.3%	265	\$ 67'765,145.60	0.5.3
Total pilot test	19.0	5.4%	5.4%	265	\$ 67'765,145.60	0.5.3

Source: Own elaboration based on survey results.

Moreover, these 10 companies belong to the manufacturing industry, 3 of them to food industry, 3 to 3 the textile and clothing industry, 2 to the automotive industry parts, 2 to the plastic and rubber industries 100.0% of companies surveyed are located in the municipalities of Hidalgo State.

Table 2 Features of the companies surveyed (n = 10)

Company size	Line of business: Food industry		Line of business: textile and clothing industry.		Line of business: automotive industry parts		Line of business: plastic and rubber industries	
	Núm.	%	Núm.	%	Núm.	%	Núm.	%
Medium	3	0.30%	3	0.30%	2	0.20%	2	0.20%
Total pilot test	3	100%	3	100%	2	100%	2	100%

Source: Own elaboration based on survey results.

Of the 10 companies surveyed, 2 make innovations in infrastructure to support industrial production, 3 make process innovations, 3 develop service innovations and 2 made innovation of human capital formation, as it is shown in Table 3.

Table 3 Type of innovations by companies (n = 10)

Company size	Infrastructure innovation		Process innovation		Service innovation		Human capital formation	
	Núm.	%	Núm.	%	Núm.	%	Núm.	%
Medium	2	0.02%	3	0.03%	3	0.03%	2	0.02%
Total pilot test	2	100%	3	100%	3	100%	2	100%

Source: Own elaboration based on survey results.

Product, services, technology, state of the art equipment, communication with customers by Internet, strategic planning, quality, training, continuous improvement, organizational structure and evaluation systems are considered factors which affect the competitiveness of enterprises. The results of the hierarchical regression analyzes performed are presented in Tables 4 and 5. The results obtained with the pilot test of medium sized enterprises are presented in Table 4. In these results a percentage of explained variance of  $R^2 = .37$  ( $p < .01$ ) was identified, a significant association of two main variables was presented: features of the companies in exports ( $\beta = .42$ ;  $p < .01$ ) and in infrastructures specifically in renewal and expansion of products and services. It is important to note that, according to these results, the renovation and expansion of the product range from the presence of an export performance of medium-sized companies are generated. This explains that for medium sized companies of Hidalgo State present a competitive performance in exports; production infrastructure associated with the competitive performance of the company is required.

Table 4 Pilot test: Medium companies (n = 10) / Results of hierarchical regression analyzes  
 Infrastructure/ Renewal and extension of the products and services  
 range

Variable	Company's features	Stage 1	Stage 2	Stage 3	Stage 4
	Age	-.06	.08	.05	.05
	Foreign capital	.06	-.07	-.07	-.09
	Exports percentage		.53**	.40**	.42**
	Númer of workers				
	Sales			-.03	-.02
	Number of patents, prototypes and copyrights				.14
	R	.09	.30**	.30**	.32**
	R <sup>2</sup>	.01	.25**	.25**	.37**
	R <sup>2</sup> Adjusted	.03	.21	.19	.20

\* p < .05      \*\* p < .01

The results presented in Table 5, concerning to the pilot medium enterprises test (n = 10), indicate that there is a significant association between the number of results obtained by the companies in their characteristics in (patents, and models utility) with the formation of human capital, this explains that from the need for companies to train their human capital, innovation in the development of patents, utility models or copyrights are generated ( $\beta = -.50, p < .01$ ). In this analysis a percentage of variance explained of  $R^2 = .38$  ( $p < 0.01$ ) was obtained.

Table 5 Pilot test: Medium companies (n = 10) / Results of hierarchical regression analyzes  
 Variable  
 Formation of human capital

Variable	Company's features	Stage 1	Stage 2	Stage 3	Stage 4
	Age	-.06	.08	.05	.05
	Foreign capital	.06	-.07	-.07	-.09
	Exports percentage	-.01	-.01	.01	-.01
	Númer of workers				
	Sales	-.01		-.01	-.02
	Number of patents, prototypes and copyrights	.49**	.50**	.50**	.50**
	R	.20	.25**	.55**	.52**
	R <sup>2</sup>	.01	.35**	.35**	.38**
	R <sup>2</sup> Adjusted	.03	.22	.29	.23

\* p < .05      \*\* p < .01

In general, in both analyzes, there were not identified significant associations between the variables concerning to the age of companies, their sales volume, which indicates that both innovation in infrastructure and human capital formation are more associated with the results that companies

must generate, in terms of exports and innovations, even when they are medium sized enterprises.

On the other hand the results of competitiveness factors that were measured as the product and services of the competitors, update strategies in production processes, and quality systems in Table 6 are presented. In this table 50% of companies say their products improve and so their competitor's only partially; the same percentages related to services are identified.

Regarding the use and application of technological systems of communication with the client, 40% considered adequate to compete with other companies, 30% considers not being competent with technology and 30% considered to be partially proficient with technology used at other companies.

Table 6 Results of the improvement of competitiveness against other companies

	Do you consider your product improves the ones from competition?		Do you consider your service improves the one from the competition?		Do you think your company has the technology to compete with the market?	
	Núm.	%	Núm.	%	Núm.	%
Yes	5	50%	5	50%	4	40%
No	0	0%	0	0%	3	30%
Partially	5	50%	5	50%	3	30%
Total	10	100%	10	100%	10	100%

Source: Own elaboration based on survey results.

Table 7 identifies that 30% of employers regularly modernize the equipment that their company uses, 40% say no and 30% mentioned that it is partially modernized. Regarding communication by internet 100% of the entrepreneurs mentioned that they maintain communication in this way. Regarding the strategic planning applied to their company 60% of employers performed it and 40% perform it partially.

Table 7 Identification of strategies for updating production processes.

	Do you regularly modernize the equipment that your company uses?		Do you maintain communication with your clients by internet?		Do you perform strategic planning in your productive processes?	
	Núm.	%	Núm.	%	Núm.	%
Yes	3	30%	10	100%	6	60%
No	4	40%	0	0%	0	0%
Partially	3	30%	0	0%	4	40%
Total	10	100%	10	100%	10	100%

Source: Own elaboration based on survey results.

Regarding information identified in Table 8, 60% companies have a quality program, 10% do not have this program, and 30% have partially the

quality program. Regarding training programs 40% of companies have this program, 20% do not have and 40% have partially this program. Referring to the continuous improvement of equipment and institution is found that 50% apply, 30% did not apply and 30% apply partially.

Table 8 Results of quality programs used by companies

	Does your company have a quality program?		Does your company have a training program?		Does your company apply continuous improvement of equipment and institution?	
	Núm.	%	Núm.	%	Núm.	%
Yes	6	60%	4	40%	5	50%
No	1	10%	2	20%	3	30%
Partially	3	30%	4	40%	2	20%
Total	10	100%	10	100%	10	100%

Source: Own elaboration based on survey results.

The variables of strategic planning aimed at competitive companies are identified in Table 8 as follows. Related to the mission, vision, objectives, policies and results 60% have them determined; the remaining 40% have them partially determined.

Table 9 Results of implementation of strategic business planning.

	Mission		Vision		Values		Objectives		Políticas		Results	
	Núm.	%	Núm.	%	Núm.	%	Núm.	%	Núm.	%	Núm.	%
Yes	6	60%	6	60%	6	60%	6	60%	6	60%	6	60%
No	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Partially	4	40%	4	40%	4	40%	4	40%	4	40%	4	40%
Total	10	100%	10	100%	10	100%	10	100%	10	100%	10	100%

Source: Own elaboration based on survey results.

Table 10 identifies that 100% of companies have organizational structure

Table 10 Results of using organizational structure.

	Does your company have organizational structure?	
	Núm.	%
Yes	10	100%
No	0	0%
Partially	0	0%
Total	10	100%

Source: Own elaboration based on survey results.

Table 11 identifies that 100% of the companies have an organization chart. 50% have a manual of functions and the remaining 50% have partially this manual, and the same situation is presented with the manual of processes.

Table 11 The company has written and updated with

	Organization chart		Manual of functions		Manual of processes	
	Núm.	%	Núm.	%	Núm.	%
yes	10	100%	5	50%	5	50%
No	0	0%	0	0%	0	0%
Partially	0	0%	5	50%	5	50%
Total	10	100%	10	100%	10	100%

Source: Own elaboration based on survey results.

## Conclusion

Technological innovation and competitiveness have been considered as one of the most important aspects for various economic entities of a country, as they are elements of development on the lines of income and employment. On the other hand, they are considered as one of the main paradigms for the development applied to companies in order to strengthen their productive capacity and consequently their competitiveness.

Competitiveness is considered as principal axis of a country to produce goods and services that pass the tests of national and international markets, while it is keeping the long-term real incomes of its people (Abdel, 2001).

Business competitiveness is of great relevance today in terms that the various economic entities of a country are strengthened. It is considered as one of the main paradigms for development applied to companies with the aim of strengthen their productive capacity, profitability and consequently their competitiveness.

Competitiveness is considered as principal axis of a country to produce goods and services that pass the tests of national and international markets, while it is keeping the long-term real incomes of its people (Abdel, 2001).

The results of the pilot test give relevant aspects of the variables that are integrated to determine the business competitiveness these variables are: Product, services, technology, updated equipment, communication with customers by Internet, strategic planning, quality, training, continuous improvement and organizational structure.

Determining the use of variables within companies, enables identify that every day, medium sized companies of Hidalgo State perform actions that lead them to join to the demands of competitiveness, identifying that currently there are companies that incorporate partially competitive variables, it worth noting that it is identified a smaller percentage of companies that do not have updated their technology and do not perform continuous improvement actions.

This research aims to identify the scope of technological innovation for a company to be competitive, which will allow to the conclusion of the

project to bring forward strategies, which lead medium sized companies of Hidalgo State to maintain themselves competitive in the regional, national and international market.

The results of this pilot test show very important aspects to analyze, first the relationship of the characteristics of the companies, the infrastructure of development activities related to innovation in production processes and situations involved in this activity.

On the other hand the characteristics of the company with the intellectual capital and knowledge generation result in the creation of brands and patents that make companies succeed with their innovations, improve its market position, establishing a significant relationship, every aspect is key to accelerate the impact on competitiveness issues.

This research aims to identify the scope of technological innovation for a company to be competitive, finally strategies that lead to medium sized companies of Hidalgo State to remain competitive in the regional, national and international market will be proposed from the integration and implementation of them.

### **References:**

- Abdel, G y Romo, M.D. (2005). Sobre el concepto de competitividad. *Revista Comercio Exterior*, 55(3).
- Alic. J (1987). *Evaluating industrial at the office of technology in society*. New York. Basic Book Inc
- Bravo, G.M. (2012). Globalización e innovación tecnológica y pobreza. Aproximaciones a las nuevas conceptualizaciones en Latinoamérica. *Espacio abierto, Journal Venezolano de Sociología*, Vol. 21 No. 3 (julio septiembre) pp.543 – 556.
- Bruckley, P.J., Pass, C.L. & P rescott, K. 1988. Measures of international Competitiveness: A Critical Survey, *Journal of Marketing Management*, 4 (2): 175-200.
- Camacho, C. A. (2008). Impacto de la gestión tecnológica en la competitividad de las Pymes. *Revista Entramado. Área de Administración*. Artículo de reflexión, pag 9-14.
- Cabrera, A & López, P. & Ramírez, C. (2011) *La competitividad empresarial: un marco conceptual para su estudio*. *Revista Competitividad Universidad Central*. Bogotá Colombia.
- Camisón, C. (2007). Bases organizativas de la internacionalización y la competitividad de la empresa española: dinámica en las dos últimas décadas nuevos productos. Nuevos mercados y nuevas formas de internacionalización. *Revista Administración* Septiembre - octubre 2007. N° 838 ICE.

- Castellanos, J. y Castellanos C. (2010) Concepciones Teóricas referentes a la definición de competitividad. Revista Contribuciones a la Economía. ISSN 1696-8360. Extraído el 12 de junio del 2012 desde <http://www.eumed.net/ce/2010a/cccm3.htm>
- Consejo de Política de Competitividad de los Estados Unidos (1992) Primer Informe al Presidente al Congreso. Estados Unidos.
- Castellaci, F. Archibugi, D. (2008). “The technology clubs: The distribution of knowledge across nations” Journal, Research Policy, Num. 37, pp. 1659-1673.
- Drucker, P. (1986). La Innovación y el Empresario Innovador. La práctica y los principios. ed. Barcelona. pp. 274-289.
- Foro Económico Mundial. (1996) Informe de Competitividad Mundial. WEF Oxford University Press.
- Grupo Consultivo sobre la Competitividad (1995) La mejora de la competitividad europea. Primer informe al Presidente de la Comisión Europea, Los Primeros Ministros, y los Jefes de Estado.
- Hidalgo N., Vizán I. y Torres M. (2008). Los factores clave de la innovación tecnológica: claves de la competitividad empresarial. Dirección y Organización, Journal núm. 36, (Octubre) .pp. 132-175.
- IESE Business School. Michael Porter. Centro Anselmo Rubiralta de Globalización y Estrategia. Universidad de Navarra España Enero-Abril 2005 <http://www.iese.edu/es/IESE/AboutIESE/aboutIESE.asp>, extraído el 1 de diciembre del 2011.
- International Institute for Management Development. (2003) Anuario de Competitividad Mundial. IMD. Suiza.
- Informe de la Comisión Especial de la Cámara de los Lores sobre comercio Internacional (1985).
- Juma, C. (2001). “Global governance of technology: meeting the needs of developing countries”, International, Journal of Technology Management, Num. 22 (7-8), pp. 629-655.
- Kruman, P. (1997) El Internacionalismo moderno, la economía internacional y las mentiras de la competitividad. Barcelona: Critica Grijalbo Mondadori.
- Laplane, M. (1996). Estudio sobre competitividad de la industria brasileña. En: Productividad, competitividad e internacionalización de la economía. Bogotá: DANE.
- Malaver, F. (1999) Lecturas sobre competitividad, empresa y educación gerencial, Bogotá: Centro ed. Javeriano.
- Organización para el Crecimiento económico y el Desarrollo. (1996) Benchmarking Business Environments in the Global Economy. OCDE
- Padilla, R. (2006). Conceptos de competitividad e instrumentos para medirla. Comisión Económica para América Latina y el Caribe (CEPAL). Panamá. pp. 356-390.

- Pavón, J. e Hidalgo A (1997). La Gestión de la innovación tecnológica en las organizaciones. Ed. Pirámide. México, pp 279-290.
- President`s Commission on Industrial Competitiveness (1985) Estados Unidos de Norteamérica.
- Porter, M. (1980). Estrategia competitiva: técnicas para el análisis de sectores industriales y la competencia. México: CECSA.
- Porter, M. E(1985). Ventaja Competitiva. México: ed. CECSA.
- Porter, M. E. (1990). The Competitive Advantage of Nations, Macmillan, London.
- Porter, M. E(1990) The Competitive Advantage of Nations. Free Press, Nueva York, 1990.
- Porter, M.E(1993) La ventaja competitiva de las Naciones,ed. Javier Vergara. Buenos Aires.
- Porter, M.E. (2005) Competitiveness in a globalised world: Michael Porter on the microeconomic foundations of the competitiveness of nations, regions, and firms. Journal of International Business Studies (2006) 37, 163–175
- Ramos, R.R. (2001). Modelos de evaluación de la Competitividad Internacional: Una aplicación empírica al caso de las Islas Canarias. Universidad las Palmas de Gran Canaria. Tesis para obtener el grado de Doctor en Ciencias Económicas.
- Reinel, J.y Bermeo, E. (2005) Las directrices del costo como fuentes de ventajas competitivas. Revista Estudios Gerenciales.
- Ricossa, S.(1990). Diccionario de Economía. ed. Siglo XXI. México.
- Rubio, A y Aragón A. (2002) factores explicativos del éxito competitivo. Un estudio empírico en la pyme. Cuadernos de Gestión. Vol. 2 No. 1
- Saavedra, M. (2010). Hacia la determinación de la competitividad de la PYME Latinoamericana. XII Asamblea general de ALAFEC, Lima-Perú, 9-12 de noviembre.
- Warner, A. (2007). Definición y evaluación de la competitividad: Consenso sobre su definición y medición de su impacto. National Bureau of Economic Research, Cambridge, Massachusetts y Center for Global Development.