

## MANAGEMENT OF AN INDUSTRIAL PARK OF HIGH TECHNOLOGY COMPANIES

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## **ABSTRACT**

The management of an industrial park of high-tech companies is considered an advanced issue before the management and the university sector. The objective of the research was to determine the link between the productive sector and the university sector for the management of a park of high technology companies. The methodology was descriptive, cross-sectional and field, for which a population of 37 managers of small and medium-sized companies of the metalworking productive sector of the Santa Elena Province – Ecuador was selected. For data collection, the survey technique was used with the questionnaire instrument. The statistical results showed that entrepreneurs are interested in the agreements of government agencies to obtain economic resources, with allow financing the projects of an industrial park. On the other hand, they are willing and committed to develop high-tech projects and achieve the progress of companies. The study concluded that the management seeks the means of linking and university technical assistance for companies in the productive sector, in order to achieve progress and optimization in the manufacturing process in exchange for providing a service with financial support to the universities.

**Keywords:** Manager, Pymes, Productive Sector.

## **1. Introduction**

In the context of globalization and the knowledge society, Crespo (2016), maintains that university education institutions before the emergence of a different scenario are in search of alternatives of organization and management. In this sense, formulas have emerged from joint participation with the private sectors, entrepreneurs, graduates, that promote at the same time, training relevant to the development of the country and towards a better quality of the functions of teaching, research and extension.

Similarly, one of the joint participation formulas recognized and carried out according to university models, is the incubator of companies, which is conceived as a space designed to protect and nurture new companies, facilitating business opportunities, support administrative and shared services infrastructure, until they are strengthened and able to grow in competitive markets.

At the Santa Elena Peninsula State University, thought has been given to the business incubator innovation system, which seeks to structure profound changes generated in the institution, the accelerated growth of knowledge and the tendency to its rapid obsolescence. According to Perez (2015), it is sought to integrate internal and external capacities to make education a factor of transformation, where the results of the professionalization are closely linked to the creation of social value knowledge for economic progress.

Thus, the incubator strategy is the emergence of a new modality of knowledge creation, particularly in the regions, have an impact on the current productive structure, on employment, from new professionals, to undertake the activity of business production taking advantage of the transfer of knowledge, multiplying its capacities, competencies and participate in the creation of companies.

Following the same order of ideas, industrial parks are called industrial estates of industrial zones, are defined as a geographically delimited area and speciality designed for the establishment of an industrial plan in adequate conditions location, infrastructure, equipment and services, with an administration permanently for operation. For Drussel (2016), with the installation of an industrial park, the ordering of industrial settlements and the deconcentration of urban and nearby areas, make proper use of the soil, provide ideal conditions for the industry to operate efficiently and stimulate creativity and productivity with in a comfortable environment.

It can be said an industrial park is a territorial area of considerable size that may be built by a number of companies engaged in various activities whose importance lies in providing the services necessary for the member companies to operate efficiently and thus achieve increased productivity, attract foreign investment, generate jobs, make effective use of natural resources and finally guarantee the economic, social and the environment of a given region.

Industrial parks must have abundant raw material, capital, a high technological level, skilled labor, adequate infrastructures and important internal market with an aggressive policy business directed by a management that must be related of linked to the university sector among other government entities that finance high-tech projects.

The objective of the research was to determine the relationship between the productive sector and the university sector for the management of a park of high-tech companies.

## **2. Industrial Park**

Iglesias (2019) cites the Ministry of Economy of the Mexican Government (2015), through the Mexican Official Standard for Industrial Parks, considering it as a geographically delimited surface and specially designed for the settlement of the industrial plant in adequate location conditions, infrastructure, equipment and services, with a permanent administration for its operation, seeking the ordering of industrial settlements and the deconcentration of urban and suburban areas, making adequate use of the land, providing ideal conditions for the industry to operate efficiently and stimulate creativity and productivity in a comfortable environment.

## **3. Agglomeration economies**

Agglomeration economies are the theoretical reference for business concentrations. In the literature that refers to this concept, there are two groups of studies. Those based on explaining the reduction in costs through agglomeration economies and others that provide broader arguments by exposing the benefits that companies can obtain without affecting their costs.

Within the first group are authors such as Weber (1909) who in a first approach considers that production costs are the same everywhere, so the price of the product can only vary depending on transportation costs. He then focuses the importance on labor cost and agglomeration economies. When these factors are not uniform, the savings obtained by locating the plant where they are cheapest can offset the increase in transportation costs. For their part, García and Others (2018) quote Marshal (2005) adding that the concentration of industries in the same sector can generate cost reductions and improvements in productivity by taking advantage of economies of scale, given through three ways: the availability of specialized labor (the interrelation in a given place of companies belonging to the same sector provides the right space for the generation of a qualified and flexible workforce, which is easy to access), the availability of intermediate goods (the concentration of companies favors the concentration of suppliers that increase the availability of inputs and reduce transaction costs) and the ease of exchanging knowledge about products, processes and innovations (formal and informal relationships are created due to the proximity of companies that favor the exchange of information and dissemination of knowledge).

Among the works that provide advantages of agglomeration economies in addition to cost reduction, is that of

Krugman (1991) for whom there are centripetal forces or incentives for the industry to decide to concentrate in a given region. Among these incentives are the advantages related to the specific place of concentration (bays, rivers, central or strategic locations), access to the market, to products and the dissemination of information and technological knowledge.

Likewise, other authors add that advantages are provided such as the creation of networks that configure relationships of trust (Callejon and Costa, 1995), which generate synergies due to the interaction between the employees of the companies and the activities that are carried out (Manrique, 2006). In addition, there are common resources such as innovation platforms, used by the group of companies for technology transfer (Callejon and Costa, 1995, Koh and Tschang, 2005), and distribution channels and infrastructures for the production of knowledge flows, learning and innovation (Huerta, Contreras, Almodóvar and Pedrajas-Rejas, 2012).

#### **4. Types of business agglomerations**

One of the first definitions of PCTs is proposed by the United Kingdom Science Parks Association (UKSPA), which arose as a response to the trend of creating these parks in the 1980s and 1990s in the United Kingdom and Sweden (United King Science Park Association, (2012). This definition describes PCTs as a business support and technology transfer initiative with three fundamental characteristics: the first is to encourage the formation and growth of innovative companies, the second is to provide an environment that allows large corporations to develop relationships with small companies, innovative and thirdly, promote formal and operational links with centers of knowledge creation, such as universities, educational institutes and science and technology parks.

Taking into account the definitions of PCTs proposed by other authors (Monck, 1988, Felsenstein, 1994, Caravaca and Del Valle, 1996, Westhead, 1997, Siegel, Westhead and Wright, 2003 and Koh et al, 2005), it is observed that they present some common aspects for a business concentration to be characterized as a PCT, among which are: acting as an enclave for the transfer of technology, promoting the formation and creation of innovative companies or those arising from another existing entity (sping off), providing a innovative environment that allows the development of innovative products and processes through the formal links that are established with centers of knowledge creation, and increase the wealth of its region and companies through the effects derived from agglomeration, aspects that are collected in the (UKSPA).

For this reason, it is also convenient to know the characteristics of other business concentrations that have contributed to the development and economic growth of the regions. In the first place, there are the industrial districts, conceived by Marshall (2005), cited by García and Others (2018) as the socioeconomic entity constituted by a group of small companies from the same productive sector, where there is competition, but also collaboration between the companies.

Next are the industrial parks, defined as an instrument of the countries' policy to plan the location of industries in a territory. It is based on industrial production, taking advantage of the benefits derived from the provision of infrastructures and common services to carry out its activities (Bredo, 1960). This model is based on the relative abundance of factors (capital, labor, natural resources), physical investment, government support and competition without collaboration between companies (Rodríguez, Troncoso, Gariazzo and Parada, 2014).

Subsequently, an industrial eco-park emerges that is distinguished from other agglomerations by conceiving

the application of ecological principles in industrial activities, combining concepts of industrial ecology, pollution prevention, sustainable development and clean production (Lowe, Moran, Holmes and Martín, 1996). So it becomes an improvement from the environmental point of view to the different negative externalities reported by industrial parks, such as the intensive use of natural resources (raw materials and energy), air pollution due to gas emissions associated with the productive sectors, generation of waste and discharges and the storage of toxic or radioactive waste (Schaper, 2000).

Lastly, the clusters that are production complexes with a network of international companies and institutions in a certain geographical area, where distribution channels and consumers, suppliers of complementary products or services and entities related to knowledge, technologies or services are integrated. Common inputs (universities, professional training institutes and trade associations) (Porter, 2000).

In this concentration there is also cooperation and competition, however this last characteristic is considered fundamental because companies are constantly compared with others that are rivals, that are in the same locality and with which they share general circumstances, affecting them in aspects such as the innovation of its activities and processes to respond to the demands of the competition.

## **5. Management**

For Díaz (2017), management is a process that follows a series of steps well defined, which allow a perfect network between the physical and human resources, working to execute the proposed objectives. It is important to remember that for the management process to be fulfilled there must be continuity in each of the activities to be carried out and they must be delegated the responsibilities so that there is fluidity in the development of certain economic activity.

## **6. Management Development**

According to Dessler (2016), it is any attempt to improve performance current or future managers by imparting knowledge, changing attitudes or improving skills. It is conceived as learning experiences provided by an organization with the purpose of improving the skills and knowledge required in positions current and future. It is intended to improve the managerial effectiveness of managers in their current positions and prepare them to take on more responsibilities when promoted.

The concept of management development emphasizes the improvement of current skills and performance, as well as preparation for the future, all time that it includes an increase in knowledge, a development of attitudes that lead to good administration, acquisition of skills, improvement in administrative performance and the achievement of objectives of the company, competencies needed today when the management of the future must be associated with processes of social and economic transformation.

Consequently, it is necessary that the management and particularly the Ecuadorian know the dynamics of renewal, that is open to accept the change and create their own formulas for success, because each organization has own interests and commitments and in which the manager is involved as a leader of an organization.

## **7. Development of small and medium enterprises**

Both manufacturing and service industry play a central role for the creation of wealth, generation of jobs and growth of an economy. In an era of globalization, increasing integration, intensification of competition and

accelerated technological change, there are new challenges and opportunities for entrepreneurs and policymakers.

Also, changes in the business environment in the new economics have profound implications for the formulation of economic policies, industrial modernization in general, and promotion of small and medium-sized companies in particular. In a knowledge-based economy small and medium enterprises must add dynamism by making a more productive and resource efficient use, provide jobs and stimulate investment and innovation.

For Cervilla (2016), in theory, small and medium enterprises can adapt more rapidly to changing circumstances and are important for the spread of innovation, but its potential contribution to economic growth and job creation depends on the prevailing environment of opportunities of business and a culture of entrepreneurship, the possibility of access to factors of production, in addition to an appropriate regulatory framework and a management support infrastructure.

## **8. Development Structure between the Productive Sector and the University**

According to Correa (2016), among these structures we have:

### **Linking Office**

Generally, the human resources that the universities have, are identified in them for the relationship with the productive sector, then organize this information in a database and advise the university on the legal and marketing aspects related to the company. Likewise, in them the function of the offices is fulfilled, but also detects the needs of companies for the provision of technical expertise.

### **Research Center University – Industry**

They are autonomous centers specially created for the relationship with the productive sector. They usually arise in institutions that do not adapt, through its normal structures, to the University-Company relationship.

### **Structure for the transformation of technologies**

They are complex structures that advise research centers on aspects as diverse as the transformation of basic knowledge into technological development, legal aspects of intellectual property, negotiation of pertinent agreements, marketing of research results, search for partners with the productive sector and funds for problem-oriented research.

### **Incubators**

It constitutes a qualitative leap in relations with companies. Their basic characteristic is that they provide physical space and facilities for production of a technological innovation. It is a structure that evaluates the innovative ideas, gives them administrative, legal, financial support to testing, building prototypes. It provides advisory on the marketing of technological innovation and organizes seminars, courses for specialists. Generally, the institution, one or more researchers put the initial capital, it is the origin of the university companies. They constitute a large physical space where several companies with the advice and participation of the different research centers of the universities.

### **Continuous education for companies**

In general, it is one of the most successful programs in the relationship with the productive sector. The key is to provide "In Situ" the experience acquired in the academic environment (Courses to the company).

### **Information Dissemination Centers**

They are structures created to try in one or several specific companies that the experiences of related research groups be disclosed with the relevant area. They are structures focused on personal contracts.

### **9. Objective of the business plan**

Its objective is to establish, in chronological order, a series of logical actions that outline the comprehensive viability of the project, in order to ensure their long-term survival. The business plan cannot lose of view the reality of the project, and should be approached always taking into account real scenarios about what is going to develop in the future (Drussel, 2016).

In addition, the global viability of the project must always be sought, based on the following pillars: technical, economic, commercial and financial, also, above all, you must observe the following aspects that can be critical to the overall viability of the project:

- Economic possibilities of entrepreneurs: economic resources available and possibility of obtaining them.
- Technical possibilities of the project: permits, licenses, patents, adaptation of land and favorable legislation.
- Knowledge and skills of the promoters: techniques, knowledge of the business, experience, practice, among others.

### **10. Guidelines for the creation of an industrial park of companies**

Pirela (2014) states that among these guidelines are the following:

- A regional and national policy for industrial development and technological, containing innovation, modernization, creation of a new industrial fabric, new entrepreneurs, financing and technical assistance.
- Rescue the technological park of the metalworking sector of small and medium enterprises, under the tutelage and leadership of the universities and Organizations of Scientific Establishments, in coordination with the productive sector of the region, so that the balance between business and academia is restored.
- Develop production processes for the manufacture of parts, pieces and equipment for the metalworking industry.
- Rescue financing for the development of the technological function and innovation.
- Increase business and management training programs.
- Develop technological consultancy and resume training courses for consultants in productivity and quality.
- Stimulate the development of innovative companies with gender criteria, for example: Program for Innovative Women.
- Promote the development of laboratories with quality standards certification.

### **11. Methodology**

This research is characterized as descriptive, because it relates the facts as they happen in the reality of the business sector and university in its relations of agreements. In this regard, Hernandez Sampieri (2014), states that this type of research is one that is oriented to collect information related to the real state of the phenomena, persons, objects or situations, as they present themselves at the time of their recollection.

Sierra (2015) also maintains that the research is applied, because its purpose is to seek the progress of society

and to be able to solve its problems. It is the application of the achievements of exploration. At the same time the study was inserted in the field modality because the information was collected directly from the selected institutions of the small and medium enterprises and the University of the Province of Santa Elena for the study: The small and medium enterprises of a park industrial high technology of the Province of Santa Elena, achieving this way greater reliability.

The technique and instrument used to collect the information was through the survey with a 14-item questionnaire-type instrument with five response alternatives: completely agree (1), agree (2), partially agree (3), disagree, In disagree (4) and Completely disagree (5), which was applied to 37 managers of the productive sector of the industrial park of companies located in the Province of Santa Elena.

## 12. Results

Next are the results.

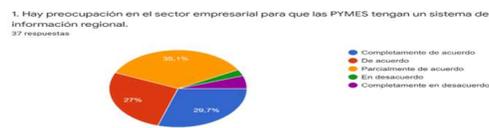


Figura 1. gráfico N° 1.

Of a total sample of 37 people, 29.7% expressed complete agreement that there is concern in the business sector of the Province of Santa Elena for SMEs to have a regional information system, 27% of those surveyed stated that they agreed, while 35.1% believed that they partially agreed and 8.2% of the managers did not respond.

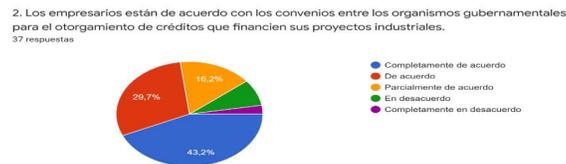


Figura 2. gráfico N° 2.

It is observed that 43.2% of the managers are completely in agreement with the agreements with government agencies for the granting of credits that finance their industrial projects, while 29.7% of the administrators agreed, on 16,2% of the respondents answered that they partially agree and 10.9% of the subjects did not say anything.

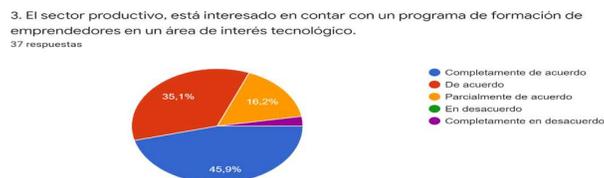


Figura 3. gráfico N° 3.

A majority that represents 45.9% of those surveyed completely agree that the productive sector of the Province of Santa Elena is interested in having an entrepreneur training program in an area of technological interest, on

the other hand, the 35.1% expressed agreement, 16.2% partially agreed, while 2.8% of those interviewed had no opinion.

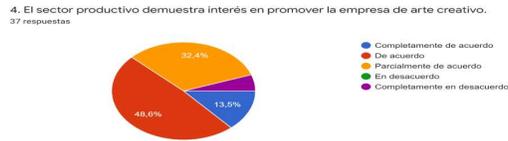


Figura 4. gráfico N° 4.

13.5% completely agree that the productive sector shows interest in promoting the creative art company, supported by 48.6% of the subjects who agreed. 32.4% of the managers stated that they partially agreed and a percentage of 5.5% of the administrators did not answer.

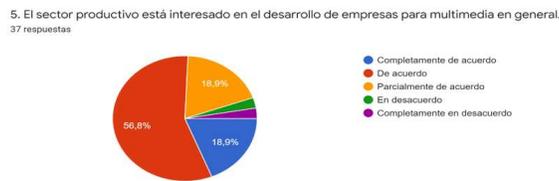


Figura 5. gráfico N° 5.

Figure 5 shows that 18.9% of the managers surveyed fully agree that the productive sector of the Santa Elena Peninsula is interested in the development of companies for multimedia in general, a percentage greater than 56.8 % of the directors interviewed felt that they agreed. 18.9% only partially agree and 5.4% of the subjects did not answer.

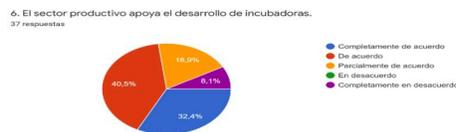


Figura 6. gráfico N° 6.

32.4% of those surveyed answered that they completely agree that the productive sector supports the development of incubators, 40.5% agreed, 18.9% partially agreed, 8.1% managers hinted that they disagree and 0.1% of those interviewed had no opinion.

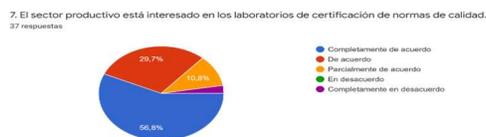


Figura 7. gráfico N° 7.

In figure 7, 56.8% of the managers confirmed that they completely agree that the productive sector is interested in quality standards certification laboratories, 29.7% of the subjects agreed, but 10.8% of those interviewed partially agree and 2.7% of those interviewed did not answer.



Figura 8. gráfico N° 8.

A majority of 59.5% of the interviewees responded that the productive sector is completely in agreement with the activities that allow it to develop technological services for the implementation of standards in the manufacturing processes, 24.3% of the managers said they were in agreement and 16.2% of the subjects surveyed, had no opinion.

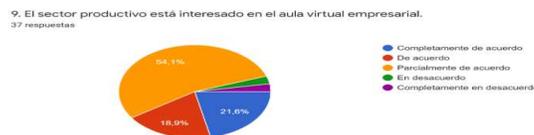


Figura 9. gráfico N° 9.

In figure 9, it can be seen that 21.6% of the managers responded that they completely agree that the productive sector is interested in the business virtual classroom, 18.9% agree, 54% of those interviewed they believed that they partially agreed and 5.4% of the administrators did not respond.

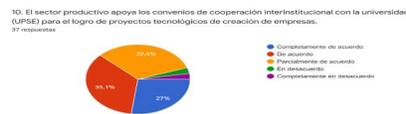


Figura 10. gráfico N° 10.

Respondents answered that they completely agree with 27% that the productive sector supports inter-institutional cooperation agreements with UPSE for the achievement of technological projects for the creation of companies. 35.1% of the managers also agreed, 32.4% of the subjects stated that they partially agreed and 5.5% did not answer.



Figura 11. gráfico N° 11.

In this survey, 27% of the interviewees mentioned that they completely agreed that the research carried out by

UPSE is consistent with the problems of the productive sector of the Santa Elena Peninsula, 18.9% answered that they agreed. 48.6% of the managers stated that they partially agreed and 5.5% of the subjects had no opinion.

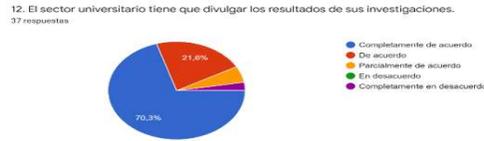


Figura 12. gráfico N° 12.

70.3% of the managers responded that they completely agree that the university sector has to disclose the results of their research, 21.6% of the subjects said they agreed and 8.1% of the interviewees did not answer.

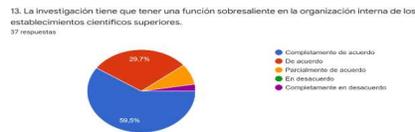


Figura 13. gráfico N° 13.

In figure 13, 59.5% of the administrators completely agree that research has to have an outstanding function in the internal organization of higher scientific establishments, 29.7% of the subjects answered that they agree and the 10.8% of those surveyed did not answer.

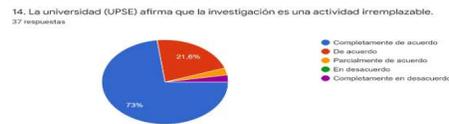


Figura 14. gráfico N° 14.

73% of managers responded that they completely agree that UPSE University states that research is an irreplaceable activity, while 21.6% of those surveyed agree and 5.4% of those interviewed did not state.

### 13. Discussion

- With reference to the analysis of figure 2 and figure 3, the vast majority of the managers stated that the entrepreneurs fully agree that they are interested in the agreements of the government agencies, to obtain resources that allow them to immediately finance their industrial projects, confirming with this what was said by Drussel (2016), who asserts that it is important for the productive sector to have a training program for entrepreneurs in any area of technological interest.
- On the other hand, figures 4, 5 and 6, the managers stated that the productive sector is completely interested and shows interest in promoting the creative art company, the development of companies for multimedia in

general calls their attention and supports the development of incubators, coinciding with Méndez, (2016) who affirms that it is one of the joint participation formulas recognized and carried out by the university.

- For their part, in Figures 7, 8 and 9, the administrators believed that they completely agree, since the productive sector is interested in quality standards certification laboratories, participates in activities that allow it to develop technological services for the implementation of standards in the manufacturing processes and that pay attention to the business virtual classroom, reaffirming what was stated by Drussel (2016).
- Likewise, in Figures 10, 11 and 12, the managers agree that the productive sector supports the inter-institutional cooperation agreements with the Santa Elena Peninsula State University for the achievement of technological projects for the creation of companies, that the research carried out by the university are in agreement with the problem and that the university sector fully agrees that it has to disclose the results of its research according to (Méndez, 2016).
- Finally, in figures 13 and 14, the consulted managers declared that they fully agree that the research carried out by the universities must have an outstanding function in the internal organizations of the scientific establishments of higher education and that in the Peninsula State University of Santa Elena research is an irreplaceable activity, as stated (Méndez, 2016).

#### **14. Conclusions**

The conclusions obtained in this research work have the following:

- The responses of the administrators showed that businessmen have always been interested in agreements with government agencies to obtain resources which allow them to immediately finance the industrial projects of small and medium-sized enterprises in the Province of Santa Elena to achieve their economic progress.
- In relation to short-term projects, the productive sector supports the development of incubators, which is a new type of business creation among the agreements that exist between the productive sector and the university sector for the creation of an industrial business park.
- Most of the managers responded that they agree that the productive sector supports the inter-institutional cooperation agreements with the Santa Elena Peninsula State University for the achievement of technological projects for the creation of companies for the creation of an industrial park for companies.
- Finally, the directors consulted stated that they fully agreed that research must play an outstanding role in the internal organization of higher scientific establishments and that it is an irreplaceable activity, according to the State University of the Peninsula of Santa Elena, in order to achieve the creation of a business industrial park.

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