Órion Technological Park: A Triple Helix for Innovation Development in the Santa Catarina Sierra

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Abstract

Globalization and technological advancement have spurred new ways of thinking and managing. Thus, this study aims to show the importance of establishing Órion Technological Park for the Santa Catarina community considering their regional prospective process. Methodologically, the investigation consists of a field study focusing on the Órion Technological Park in the Santa Catarina Sierra –Santa Catarina, Brazil. The research is qualitative, exploratory and descriptive. Data was collected by bibliographical, documentary and field method, where investigators performed participant observations in the park studied. Results allow concluding that new ways of thinking and managing have a dynamical impact over socio-economical environment. Triple Helix (university-industry-government) propitiates innovation development, generating significant value in the economy, through partnerships in a prospective process, as is the case of Órion Technological Park.

Keywords: Technological Parks. Triple helix. Órion Technological Park.

1. Introduction

Frantic market globalization creates new demands for competitiveness and economic growth. These demands focus on the promotion of the generation and dissemination of knowledge, since in this new market profile knowledge is the main driver for competitive differentials. Among the many mechanisms that promote the knowledge generation and dissemination, there are systems and ways to cooperate that aim to establish productive and lasting relationships between universities and research institutions with the business sector. This allows constant renewal and competitiveness (Zouain, 2003).With market globalization destroying traditional references and demanding a reinterpretation of things and a re-elaboration of the forms of action, the creation of technological parks becomes a new mechanism to stimulate innovation and economic development. Technological Parks are an innovation *habitat*, and as such, they seek to develop and invigorate regional and national economy through knowledge. They progressively become more competitive both in the national and international scenario. The innovative and most successful experience was bringing scientific knowledge and research developed at the Stanford University of California together, as well as the effort to adapt this to the creation of new technologies since the end of the 1940s (Lemos and Diniz, 2001). Furthermore, technological parks are organizations that seek to contribute to the success and development of technical and scientific communities, requiring an innovation culture with a strategic vision of the future for city, region, state and country development. In this context, the objective of this research is to demonstrate the importance of the implementation of the Órion Technological Park for the Santa Catarina Sierra community in the regional prospective process.

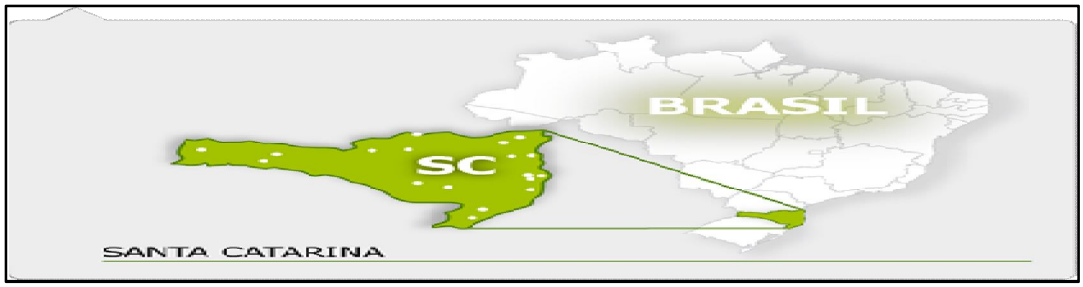
2. Technological Parks

With the opening of markets, globalization and technological progress, companies nowadays are channeled to undertake and innovate. These are the essence for the socioeconomic development worldwide. Traditional enterprises undergo economic, technological and social transition with little chance of development. Management changes emerge focused on "high technology", oriented to research, generating new party possibilities for national and regional development, through the creation of poles of science and technology (Kanitz, 1999). Kanitz (1999) considers it important to reflect on the need for a development policy that integrates regions, enterprises, educational institutions, research and development, which is one of the most discussed and employed in the contemporaneity with regard to the formation of scientific-technological poles. These scientific-technological centers are enterprises created and managed aiming to promote research and technological innovation, stimulate cooperation between research institutions, universities and companies, as well as support the development of knowledge-intensive business activities (IASP, 2002). They are considered Technological Parks when established in the form of urban and real estate projects, focusing on specific areas for the location of companies, research institutions and support services.

According to the International Association of Science Parks - IASP (2002), Technological Park refers to an organization managed by specialized professionals that aim to increase community wealth and wellbeing by promoting innovation culture and venture competitiveness, as well as that of scientific and technical institutions. Technological parks manage and stimulate knowledge and technology flow among universities, R&D institutions, companies and markets; facilitate the creation and growth of technology-based enterprises through incubation and spin-offs; and provides other high added value services coupled with a high quality physical space and support services[1].

Thus, Technological Parks refer to an enterprise inserted in a large public or private area, managed by qualified professionals, having community wealth and wellbeing as its guiding principle. They are in charge of promoting a focus on innovation, culture, collaboration, entrepreneurship and technical and scientific institutions associated with the park, as stated by IASP (2002). This is considered by Sanz (2003) as an opportunity to generate socioeconomic value for the region. Steiner, Cassim and Robazzi (2017) consider the success of a Technological Park will only take place if there is government (municipal, state and federal) involvement, as well as the participation from the business sector, universities and research institutes. This goes in hand with the development of programs and strategic actions in favor of regional and local prosperity, and also, focus on technological segments where the park can act and be competitive. This is the context in which the state of Santa Catarina, located in the southern region of Brazil (Figure 1), finds itself. The region seeks new dynamics of action, and is becoming a reference, both nationally and internationally, as an entrepreneurial and innovative state.

Figure 1. Localization of Santa Catarina state



Source: IFSC (2017)

[1] "uma organização gerenciada por profissionais especializados, cujo objetivo é aumentar a riqueza e o bem estar da sua comunidade, por meio da promoção da cultura da inovação e da competitividade dos empreendimentos e das instituições técnico científicas que lhe são associados. Para viabilizar a consecução desses objetivos, o Parque Tecnológico gerencia e estimula o fluxo de conhecimento e de tecnologia entre universidades, instituições de P&D, empresas e mercados; facilita a criação e o crescimento de empresas de base tecnológica por meio da incubação e de "spin-offs"; e fornece outros serviços de alto valor agregado aliados a um espaço físico e serviços de apoio de alta qualidade"(IASP, 2002).

It stands out as a technological pole, having its mainstay in the technology-based economy in regional development. According to the Catarinense Association of Technology Companies (*Associação Catarinense de Empresas de Tecnologia*- ACATE), in 2016 there was a R$ 2.5 billion turnover in the technological sector and its growth is estimated to be over 15%as stated by Guilherme Bernard, president of the association. In an interview, he affirmed that those who invests in innovation and performance, invests in technology. He added that the city of Florianópolis, state capital, has good training of professionals in the area, but is not yet capable of meeting the demand, having to rely on professionals from abroad. He deems that positive, since "it oxygenates the labor market here" (ACATE, 2016).The Ministry of Science, Technology and Innovation (MCTI) agrees that the state of Santa Catarina has a high entrepreneurial development potential, playing a prominent role in both technological and economic-industrial development in Brazil (MCTI, 2015).

Kanitz (1999) corroborates that Santa Catarina has a significant scientific and technological potential, through universities, which bring together laboratories and renowned courses in engineering, with emphasis on mechanics, automation and computing, and by the existence of research centers and companies in the area of telecommunications and electric energy. Taking this into account, the Government of Santa Catarina plans the creation of 13 Innovation Centers, seeking to contribute socioeconomically to the region in promoting entrepreneurship and support the development of new regional vocations, connecting public power, universities and private enterprise (FAPESC, 2016). These centers are shown in Figure 2.

Figure 2. The 13 Innovation Centers of Santa Catarina

Source**:** DC, 2015.

It can be stated that the Santa Catarina region has its expressiveness in the Brazilian economy by the conception of its technological parks. According to Pereira (1987) technology parks are, in essence, an environment conducive to the creation of new technology-based companies, to carry out research that will be the basis for future economic development and for the establishment of a new industrial organization that meets development needs from each region. This contemporary spirit seeks to spearhead a Triple-Helix (universities, companies and government) type of cooperation. This operates through tailor-made search results negotiations projects, cooperative industrial researches, incubators, innovation centers, venture capital companies, among others.

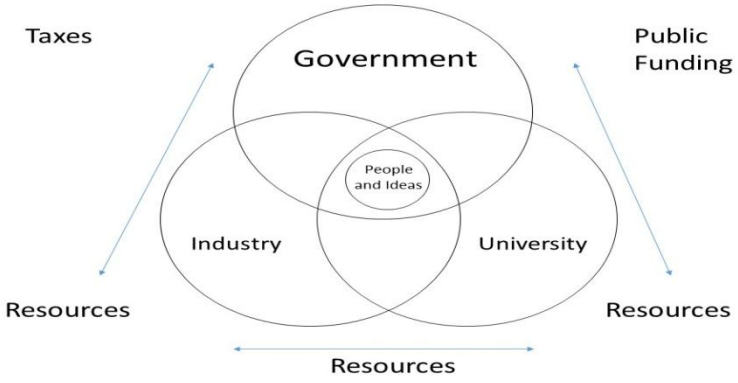
3. Triple Helix

In the mid-1990s, Henry Etzkovitz, a professor at the University of Amsterdam and general adviser at the International Triple Helix Institute (IITH) at LaSalle University in Madrid, Spain, created the term "Triple Helix" to describe the innovation model based on government-university-industry relationship. In Etzkovitz's view, it is only through the interaction of these three actors that a sustainable innovation system can be created in an era of knowledge economy (Valente, 2010).According to Gomes and Pereira (2015), this relationship between university and industry is a valuable component, both in the scientific and industrial context, considering the evolution in people, processes, products and services. These growths favor companies and needs of society, and promote government support.

Amaral (2014) ponders that these relations derive from the influences each helix has on the others, and from the creation of new networks born of these interactions. The Triple Helix Theory arose from the observation of MIT (Massachusetts Institute of Technology) performance and its relationship with high-tech industries, according to Valente (2010). Innovation is seen as the result of a complex and continuous experience process product of the relations between science, technology, research and development in universities, industries and government. This model is currently applied in several countries around the world, even Brazil, stimulating the emergence of incubator nuclei, innovation nuclei, technology transfer offices, new laws and promotion mechanisms, including in Brazil (Valente, 2010).

The Triple Helix Model attempts to capture the dynamics of communication and organization by introducing the notion of an exchange-rate overlap that underpins institutional arrangements. Institutions and their relationships provide fundamental knowledge. Each helix develops internally, but can also interact by means of exchange of products and services, or other functions. Functional and institutional roles can be negotiated outside this knowledge based on expectations, as in the case of the "entrepreneurial university" (Etzkowitz et al., 2000). According to Sbragia et al (2005), the Triple Helix is a spiral model of innovation that takes into account the multiple reciprocal relations at different stages of creation process and dissemination of knowledge. Each helix is an independent institutional sphere, but works in cooperation and interdependence with the other spheres, through knowledge flows among them. Figure 3 shows this relation. As stated by these authors (2005), this innovation model has, in each sphere, functions to be performed as agents for local/regional development. When they are in their axis, their interaction evidences the rate and direction of the innovation process.

Figure 3. Triple Helix model of relations among university-industry-government[2].



Source**:** Sbragia et. al (2005, p. 21).

Paula et al. (2013) show that, in Brazil, the flow of knowledge exchange between universities and companies is still low. Government and the universities must take measures in order to promote an increase in this flow, since each propeller is a knowledge-generating sphere that dynamically works the cooperation and interdependence for innovation. They dynamically activate this practice by stimulating the creation of new products and services, developed in universities and through partnerships with companies. Furthermore, they are successfully inserted in the globally highly competitive market.

4. Methodology

The method used was a field study focused on the Órion Technological Park of the Santa Catarina Sierra - Santa Catarina, Brazil. The research has a qualitative approach, seeking a better understanding of how technological parks impact practices on Órion Technological Park in the state of Santa Catarina. According to Honorato (2004), qualitative research provides better insight and understanding of the issue's context. It is characterized by the psychological analysis of phenomena, causal explanations, and by the impossibility of quantification. Considering research objectives, this investigation is exploratory and descriptive. The exploratory phase of research, serves to gather information about a specific object, thus delimiting a field of work, and mapping the characteristic conditions of the object's manifestation (Severino, 2007).

On the other hand, the investigation is considered descriptive since it describes reality as it is rather than modifying it. Triviños (2008) considers that descriptive studies intend to accurately describe facts and phenomena of a certain reality. The study is characterized as field, documentary and bibliographical, according to sources used. Researchers go to the field to collect the study data. Lakatos and Marconi (2009) state that field research is the one used to obtain information and/or knowledge about a problem for which a response is sought, or a hypothesis that one wants to prove, or discover new phenomena or the relations between them. On the other hand, documentary research refers to the search that takes place recurring mostly to what is called "primary sources". The main source of data collection is restricted to documents, written or not (Marconi and Lakatos, 2007). Finally, its bibliographical character is rendered due to the necessity to turn to bibliographical research for a better understanding of the matter. This consists of the theoretical foundation on the proposed topic. According to Matias-Pereira (2012), this would be the appropriate classification when there is published material, such as books, periodic articles, or even, recently, material made available on online.

Therefore, data collection was carried out by the bibliographical and documentary research for the theoretical framework of this study. And field research was performed through participant observation in the park, to obtain a better understanding of its architecture, aiming to verify the impact on the Santa Catarina Sierra community. Participant observation, according to May (2001), refers to a process in which an investigator establishes a relatively long-term, multilateral relationship with a human association in its natural situation for the purpose of developing a scientific understanding of that group. This methodological procedure was chosen to better integrate the practices and representations experienced by the managers in the technological park, allowing the researchers to perform a more delimited and specific analysis.

Finally, following data collection, the information was organized ant synthesized based on bibliographic research and sustained by the field research, seeking the achievement of the proposed objective.

5. Órion Technological Park

According to VIA (2016), the Government of Santa Catarina through the Secretariat for Sustainable Economic Development (SDS) plans the implementation of 13 Innovation Centers in the State. They would be decentralized and strategically located to meet all of the Santa Catarina state. These centers, according to SDS, are supported by three pillars. The underlying premise is to act as a meeting point between educational institutions, productive sector and public power in an environment that aims to materialize the knowledge of the region in new companies, products or services, acting as disseminator of innovation culture. Namely, (1) activate the innovation ecosystem; (2) become a reference in support of innovative entrepreneurship; and (3) become an engine of innovative culture. The Government of Santa Catarina (2017) establishes there will be a total of 13 innovation centers located throughout the state of Santa Catarina. Their purpose: to promote entrepreneurship, stimulate the creation of high added-value businesses, strengthen investment attraction and public sector, the private sector and educational institutions.

From these 13 promised centers, the first to be contemplated was in the city of Lages, a mountain region, whose unit is named Órion Technological Park, according to FAPESC (2016).In Santa Catarina, centers are planned to have business accelerators, incubators, research laboratories, training and consulting for new businesses, event and exhibition areas, showrooms, auditoriums, training rooms and videoconferencing. Centers will function regionally as support structures for the most diverse initiatives of innovation, education, research and technological development, besides offering training for entrepreneurs, managers and teachers. The initiative is from the State Government, but the buildings will be in the name of municipalities and each center will have a management committee (FAPESC, 2016).The Órion Technological Park structure has 4 thousand square meters, 35 rooms to accommodate companies, and also, common areas, as snack bars or entertainment spaces (FAPESC, 2016). According to VIA (2016), it will be a space open to society for the incubation of new innovative companies, research and development (R&D) laboratories, teamwork, training, events, etc. All this, would be aligned with the specific characteristics of each regions and local ecosystem. Research has shown that the state of Santa Catarina stands out in the national scenario for its productivity. In 2008 it achieved a prominent position in the national ranking of agricultural production in several crops such as garlic (4th place), rice (2nd place), banana (3rd place), onion and apple (1st place), tobacco(2nd place), and wheat (3rd place). The participation of family agriculture in Santa Catarina's production can be assessed by the following numbers: 73% of state bean production, 70% of corn, 67% of rice, 91% of onion, 95% of tobacco, 80% of pigs and poultry, 83% of the milk.

The participation of family farms in the production of honey, potatoes, cassava, tomatoes, bananas and a wide variety of other horticultural products and fruits is also important (IBGE, 2006).The state of Santa Catarina is also a reference in the area of innovation and technology, where Florianópolis has become one of the main poles of innovative technologies in the country. Today, there are 550 companies. Together they generate more taxes for the city than traditional sectors such as construction and tourism (BomDiaBrasil, 2011).Thus, according to ÓrionPark (2017), the goal is to increase community wealth by promoting an innovation culture and the competitiveness of companies and institutions that generate knowledge. An innovation environment is a geographical area where institutions and companies join incubators and startups, creating a region that favors the development of new ideas, products and services.

Órion fulfills the function of a technological park by increasing community wealth while promoting innovation culture and competitiveness among companies and knowledge-generating institutions to support companies committed to the commercial application of high technology with activities. It also supports business, in mechanisms of technology transfer, and stimulates the development of knowledge-based businesses, as well as in the internationalization of companies. Its encouragement of innovation culture, organizational competitiveness, Research & Development, technology transfer and the internationalization of organizations is emphasized (Orion, 2017).According to the State Government (Governo do Estado, 2017), each innovation center will be a community that promotes innovative and entrepreneurial culture, which connects people and empowers innovation agents. In addition, it hosts innovative entrepreneurs, professionals, startups and laboratories, for limited times. During its period in the park, there will be access to advice on development, prototyping, production and marketing. Thus, in general, the park offers physical space, technological infrastructure and a range of shared services for entrepreneurs in order to capacitate, facilitate and accelerate the development of innovative businesses.

It is further explained (*idem*) that the essential mission of these centers is to activate an innovative ecosystem, promote creative and entrepreneurial culture, and enable startups with high growth potential to transform the economy in the region. The following goals are pursued:

- Support the entrepreneur at various levels;
- Capacitate and attract entrepreneurial and innovative talents;
- Lead or intensify innovation in local businesses;
- Support applied research;
- Attract companies and investments to the region;
- Generate massive institutional cooperation;
- Storehouse new businesses;
- Assist agents in the defense of intellectual property;
- Encourage technology transfer;
- Foster social innovation (social affairs, cooperativism, etc.);
- Join government, business and educational institutions for innovation and development.

In this way, Orion (2017) seeks to converge services and equipment of common use of the constituent companies, creating an economy of spaces and human resources. This should enable the management of legal sectors, information technology, park maintenance and asset administration, general park administration; which encompasses common services. This will favor rapid development, directed to the innovation process, having globalized market success as a guiding principle, becoming a generator of competitiveness.

6. Conclusions

This research made it possible to verify the importance of socio-economic impact through the Triple Helix for the development of innovation in a given region, requiring three main actors: the university, the industry and the government, in favor of technological and sustainable development. The movement of the Santa Catarina state to create innovation centers, concentrating investments, financial resources, equipment and training of human resources, in the search to further develop the state is evidenced as generating significant value in Brazilian economy, through the scientific-technological poles, as is the case of Órion Technological Park. The conclusion reached is that the creation of technological centers, in particular Órion Park, brings in its essence the development of the city of Lages and its surroundings.

It promotes actions for the sustainable development of the mountain region, contributes and accelerates innovation, with a prospective process in a mobilized, sensitized, motivated and sensitized way. With the Triple Helix as its main objective, universities, companies and governments work together in synergy for a sustainable development of the park and the region. Government participation and support, both municipal, state and/or federal, should be seen as partner social agents, not as decision makers, and thus consolidate their competitive advantage in a globalized market.

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