Engagement of Science and Technology Park of Cornélio Procópio, PR, Brazil in triple helix model

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ABSTRACT

The objective of this article is to compare recommendations of the literature on management of technology parks with the implementation actions of Science and Technology Park (STP) of the Federal Technological University of Paraná, Cornélio Procópio Campus (UTFPR-CP), Brazil. Thus, a lifting was carried out in the literature on the origins of technological parks and their respective trajectories. The main points identified in this study were compared with the event records that are guiding the execution actions for the STP implementation project. The results show that implementation process follows the recommendations of literature, including with establishment of regional strategic partnerships, according to Triple Helix model. In addition, the importance of political support at the municipal, state and federal levels was evident, as well as the private initiative and the Academy, essential in enabling the donation of the land and the beginning of STP physical construction, following the pattern of fourth generation of technology parks.

Keywords: Science and technology park; Incubation environments; Regional development; Triple helix.

1. INTRODUCTION

The Science and Technology Park (STP) of Cornélio Procópio city started being conceived from the Entrepreneurship and Innovation Program (PROEM) developed at the Federal Technological University of Paraná, Cornélio Procópio Campus (UTFPR-CP), since 2002. It is, therefore, a long-term project and built by many hands through partnerships among different institutions, as recommended by Vedovello, Judice, and Maculan (2006).

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UTFPR-CP was inaugurated on April 17, 1993, with the objective of training qualified professionals for society, offering education with high added value, in addition to contributing to the socioeconomic development of the Northern region of Paraná. Throughout its trajectory, the University has been consolidating this objective and expanding its performance as a promoter of this development together with other entities.

In 1999, still as Federal Center of Technological of Paraná (Cefet-PR), the institution started to operate with an emphasis on technological higher education, due to federal government regulations, and in 2005, it was transformed into a Technological University, the first in the country. Currently, UTFPR has 13 campuses operating in Paraná. The Cornélio Procópio campus has more than 3 thousand students enrolled, coming from different regions of the country, approximately 30% of whom are from Paraná. It occupies 65,100 m^2, with a built area of approximately 22,500 m^2, covering administrative, teaching, research, extension and sports areas.

Due to its distinctive characteristic in relation to other Brazilian universities, since it operates predominantly in the technological area, it offers courses aimed at the insertion of highly qualified professionals in the world of work, able to also undertake and innovate to boost the country's socioeconomic development. This contribution to regional development has been very effective, as, in addition to training highly qualified professionals, it improves the trading and the service sector in the region. In that vein, the Institution is protagonist in the process of implementing of the STP, involving several actors in the region (Löfsten & Lindelöf, 2002).

Thus, the objective of this article is to compare Cornélio Procópio's STP implementation project with the recommendations of the literature on management and development of similar undertakings. In addition, the article seeks to identify the stage of development and in which generation the STP fits.

2. LITERATURE REVIEW

2.1. SCIENCE TECHNOLOGY PARK: AN EVOLUTION

In emerging economies, STPs are treated in common sense and better known as Technology Parks, which basically help and present themselves as inducers of local development policies, by encouraging the formation of high-tech companies (Bigliardi, Dormio, Nosella, & Petroni, 2006).

The Silicon Valley, in Massachusetts, USA, was the starting point for the creation of the Technology Park concept. Stanford Research Park, from Stanford University, in the United

States, created in the 1950s, is considered the first park in the world, which houses several companies of information technology, computing, among others, of global proportions and insertion. Influenced by the American success, in the 1960s and 1970s, Sophia Antipolis appeared in France, and Cambridge, British, the first European parks, to contribute decisively to the evolution of this concept (Amirahmadi & Saff, 1993; Zouain, 2003). In Japan, the Tsukuba Science City, in the 1960s, represented the first initiative to create a technology park in Asia (Phan, Siegel, & Wright, 2005). In this experience, the concept of Park was expanded and incorporated into the city (technopoles), just as it happened in France (Santos & Parejo, 2005).

There are several park models that bring together different motivations, expectations and interests that guide the involvement and interaction of different institutional actors in this type of enterprise (Vedovello et al., 2006). However, the main motivation is in the innovative company and in the intensity of cooperation and interaction among these companies and the Academy. Thus, according to Spolidoro (1997, p. 22), "a technology park is an initiative based on a physical area, with a plot or a set of buildings, designed to receive innovative or knowledge-intensive companies, in order to promote their interaction with teaching and research institutions".

For Vedovello et al. (2006), the objectives of technology parks are obvious: generation of jobs and income, creation and strengthening of technology-based startups, diffusion of entrepreneurial culture, as well as the incentive to transfer information, knowledge and technology among the actors involved in the process innovation, thus broadening interactions between universities and companies installed in these environments. The evolution of the number of technology parks since the 1960s, to the present day, shows gradual improvements in their structure, goals and form, as shown in Table 1.

Table 1
Evolution of Technology Parks in Europe

Period	Structure and Location	Mission	Actors
1960 - 1970	Establishment close to university campuses	Industrial innovation through interaction between academics and industrial partners	Department of universities and R&D laboratories. Researchers only.
1970 - 1980	Establishment within abandoned industries and incubators	Establishment within abandoned industries and incubators Reindustrialization of abandoned areas	Local government organizations and universities

After the 1990s	Establishment close to universities, abandoned areas or any location	Development of innovation within factories within particular areas	Universities and local government, central government

Source. Adapted from Bigliardi et al. (2006, p. 491).

The offer of innovative technologies combined with entrepreneurship and the interaction of different actors, has given notoriety to technology parks (Löfsten, & Lindelöf, 2002; Hansson, 2007; Lu and Bunchapattanasaakda, 2020). However, there is no consensus that they have the full capacity to increase the transfer of knowledge and technology to companies, generating articles and debates. Still, Stanford's successful experiences motivated the strategy of installing Technology Parks close to universities and research centers, as one of the mechanisms used by many countries for the development of high-tech companies (Yang, Motohashi, & Chen, 2009). In this sense, a Technology Park is considered as the center of the ecosystem in which it operates, that is, the central axis of Triple Helix, as it establishes bridges between the actors of the cooperation network so that there is success in the integration and transfer of knowledge and technology (Yang, Wong, Xu, & Stewart, 2009). Vedovello et al. (2006) highlight as essential factors for the success of a technology park, the available infrastructure, the proximity to universities and research centers, the agglomeration of innovative companies, the promotion of entrepreneurship, the facilitation of access to financial resources and the opportunity for investors.

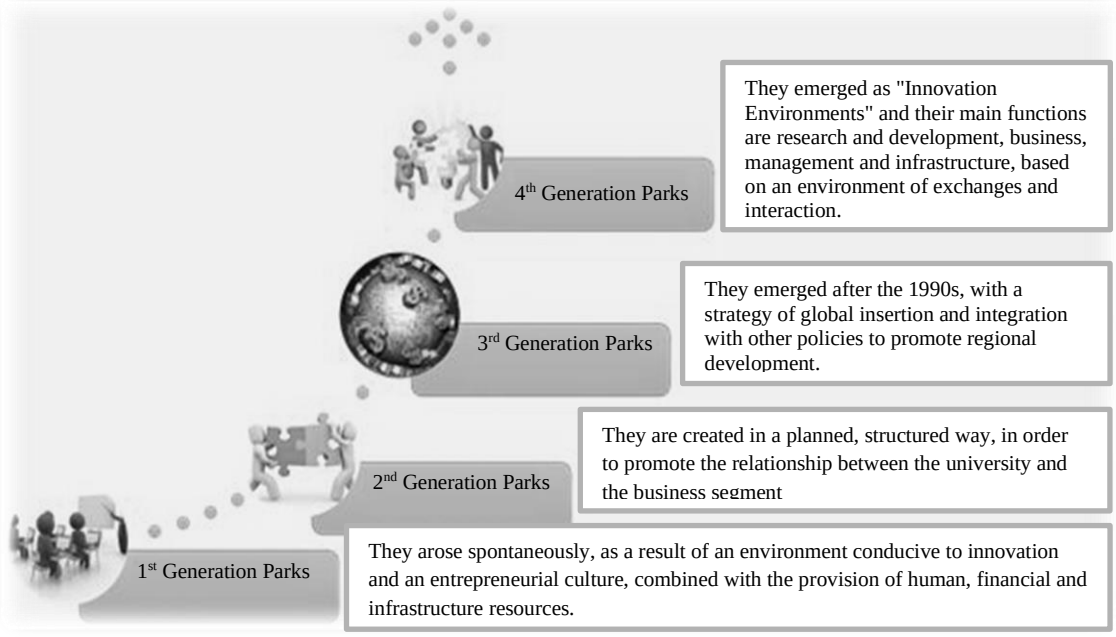
It is widely recognized, after all, that science and technology parks are effective vehicles for the promotion of new technology companies, facilitating the commercialization of scientific research and the revitalization of regional economies (Colombo & Delmastro 2002; Hall, Link, & Scott, 2003). This path must lead to technologies and so-called “cutting-edge sciences”, which are becoming increasingly important for regional competitiveness and economic growth. Helping in interactions between producers and consumers of knowledge is also revealed as a central issue for the development of regional innovation policies and strategies that aim to increase the absorption and application capacity of scientific research, through the promotion of closer links between university and industry, the Park main goal (Cooke, 2002; Etzkowitz, 2008). The growth and development of science and technology parks has been the subject of public policies in recent years and it is necessary to assess the evolution of the concept and its purposes over time, as well as what changes have occurred since its origins and its efficiency and effectiveness as a tool for transferring knowledge and technology, with innovation, in a cooperation network between university-company-government. In the park, we will have this network formed and according to Rau, Salviati, and Nascimento (2019) the performance of

universities, in this partnership with companies and government is fundamental and beneficial to society, because "higher education is considered vital for national economic growth, as well as for global competitiveness, through the production of research, inventions and innovations".

The Figure 1 shows how this evolution has classified STPs into generations and is linked to the time of their creation, which until the 2000s, basically, takes place in three distinct moments, that is, three generations of parks with common initial characteristics (Gyurkovics & Lukovics, 2014), but evolving over time. Currently a new generation of parks is being considered, the so-called “Innovation Environments”.

According to IASP (2020), science and technology parks are the perfect habitat for businesses and institutions that belong to the global knowledge economy. Technology parks are the promoters of economic and competitive development in regions and cities through: (1) creating new business opportunities and adding value for mature organizations; (2) promoting entrepreneurship and the incubation of new companies; (3) creation of knowledge-based jobs; (4) building attractive environments for those emerging from knowledge; and (5) increased synergy between universities and companies.

Figure 1
Generation of Science and Technology Parks



Source. Adapted from Gyurkovics; Lukovics (2014, pp. 197-199), Allen (2007), and IASP (2020).

This IASP vision is related to the new concept associated with the fourth generation of parks, providing for the exchange and interaction among the actors participating in this knowledge ecosystem. In this study, and in general, the parks are located close to universities

and their laboratories and research centers, aimed at developing new knowledge and innovations, as well as serving the society of highly qualified and experienced human resources in the business world. This almost symbiotic proximity creates opportunities and new formats for transferring knowledge and technology. These opportunities generate new research and new researchers are faced with the challenge of transforming their investigation into products and services that add value to the unlimited needs of consumers and that are made available to the market in the form of innovative products.

In the Figure 1, the concept of 'science and technology park' emerged in the first generation, in the USA, around 1960, spontaneously by geographic agglomeration. (Anprotec, 2020; Gyurkovics & Lukovics, 2014; Spolidoro & Audy, 2008). This concept migrated to Europe, with emphasis on the implantation of the French (as Sophia-Antipolis) and British (Cambridge) pioneer parks, in the early 1970s (Anprotec, 2020; Gyurkovics & Lukovics, 2014; Spolidoro & Audy, 2008). In this generation, one can classify parks, technological business incubators and the services provided as an extension of the university, to put into practice the technologies arising from university research, with a thinking more focused on the success of scientific results.

In summary, Moré, Andrade, Moré, & Hoffmann (2019) highlights that innovation habitats can help create connections among different institutions and people, being able to transform isolated economies into an interconnected network, bringing benefits to all. In the second generation of science and technology parks, innovation stands out through the creation and development of companies that seek university knowledge and technology to innovate in products and services. The parks are created in a more planned and structured way, still as an extension of the universities, to bridge the gap between the university and the companies, thinking, above all, in the final format of innovation.

In the third generation, there is an evolution of concepts and the parks, after the 1990s', take the form of institutions geared to global insertion and integration with other regional development policies, being managed by specialist professionals. There is no loss of identity from previous generations, such as the link to the university and its research and innovation, but the strategy becomes more comprehensive and includes participation in the process of increasing wealth in the region in which the park is inserted, with the effective creation of the university-company-government cooperation and interaction network (Etzkowitz & Leydesdorff, 1999).

One aspect to highlight in relation to science and technology parks is that there has been an evolution over the years through their own experiences and the exchange of knowledge and

technologies among them, helped mainly by the evolution of National and World Associations, with strong purpose of helping this ecosystem.

According to Rowe (2003), STPs begin their early years planning actions and creating infrastructure and buildings. This prioritization was not surprising as they sought to establish efficient environments for the high-tech sector and therefore significant capital was needed for what was seen as a highly speculative and risky activity. In the 1990s, it was necessary to move forward and take more seriously how a Park could leverage the transfer of technology between its associated universities and the productive sector, enabling the development of high-tech startups. Formica (2009) notes that innovative STPs, with an emphasis on business creation, have become increasingly interesting in this decade, due to the significant role they have shown in economic development in Europe.

There is no linear system, much less a model ready to be implemented in this university-company-government relationship. Each park has its adaptation to its region, government, university, and its resources. The names adopted may vary: business park, science parks, technology parks, technopoles, research parks, innovation centers, and innovation environments; but the general concept of bridge and central axis in this network is consensus, as well as the need to adapt to each reality. In the next section, we describe the case of Cornélio Procópio's STP, situating it with the concepts presented so far.

For Dabrowska (2017), the literature casts considerable doubts on the success of STPs, since most of the methodologies used to assess these ventures have focused on evaluating the performance of the STPs' companies, rather than evaluating their own activities and actions of the STPs. As STPs mature, the need to achieve financially sustainable business status is questioned (Allen, 2007).

Measuring the progress of an STP over time is not an easy task (Nosratabadi, Pourdarab, & Abbasian, 2011; Vila & Pages, 2008) and objectives may vary depending on park owners who have schedules and different expectations (Luger & Goldstein, 1991). Furthermore, according to Dabrowska (2017, p. 8), "unique features that distinguish STPs from typical property management organizations make their performance measurement even more complex". Allen (2007) demonstrates that mature STPs or so-called third-generation STPs have characteristics common to Knowledge-Intensive Organizations (KIOs). This observation led the researcher to review the literature and look for other evidence to argue that STPs should be considered KIOs.

Yami, Chagchun, and Han (2018), while reviewing the literature on the main dimensions that affect STPs, identified: 1) Government innovation policies to support the innovation system

so that it can evolve (Liu & Guan, 2016); 2) Quality human resources adapted to the regional innovation strategy in which companies provide greater job growth in university STPs (Wright, Liu, Buck, & Filatotchev, 2008); 3) Cooperation networks that increase global innovation (Rycroft, 2007) and this relationship increases infrastructure innovation and promotes the network itself (Vasquez-Urriago, Barge-Gil, & Rico, 2016) to spread knowledge on a reciprocal basis; 4) STP's operating market becomes a bridge between innovation strategy and market value, where marketing, sales growth and profitability are more related to STP than to companies outside the park (Löfsten & Lindelöf , 2002); and, 5) Knowledge activities promoted via research and development (R&D), research and technology (R&T), in which the commercialization of research results (Chun, Chung, & Bang, 2015) increases the positive impact of regional collaboration in R&D , patents and innovation factors (Minguillo & Thelwall, 2015).

Dabrowska's thesis (2017) seeks to develop a better understanding of what a successful STP means for public, private, university owners and for client companies, that is, what they consider success factors for STPs and how to measure the progress. The result of the work was an initial performance measurement system (PMS) that was tested in Manchester Science Park, completed and validated. In addition, the survey results demonstrate that there is a significant discrepancy between what STPs already measure and what they think is important to measure. The case study of Yami et al. (2018) developed a research model to assess the competitiveness of STPs by analyzing the impact of subjective externalities of innovation based on the Global Innovation Index[6] and the eco-innovation key indicator approach. This evaluation model was adopted and tested by two different fuzzy analyzes and examined the survey forms and questionnaires that were filled out by some experts from the STP. All evidence was gathered and analyzed at Caohejing Hi-Tech Park in Shanghai, China; and the results evaluated the competitive advantage through innovation policies and performances and the classification index of some main innovation dimensions, key indicators and eco-innovation development and diffusion factors. According to authors:

> The final conclusion as the general overview of the literature associated some interesting results that the main benefit of an eco-STP system is to ecological ideas and Culture of Innovation, the stable social benefits (job creation), internationalization, industry cluster effect and finally to share the strong knowledge-based economy and latest technologies (eco-innovation diffusion). It was also understanding that the eco-innovation as a new competitive advantage for the located hi-tech enterprises is effective (Yami et al., 2018, p. 197).

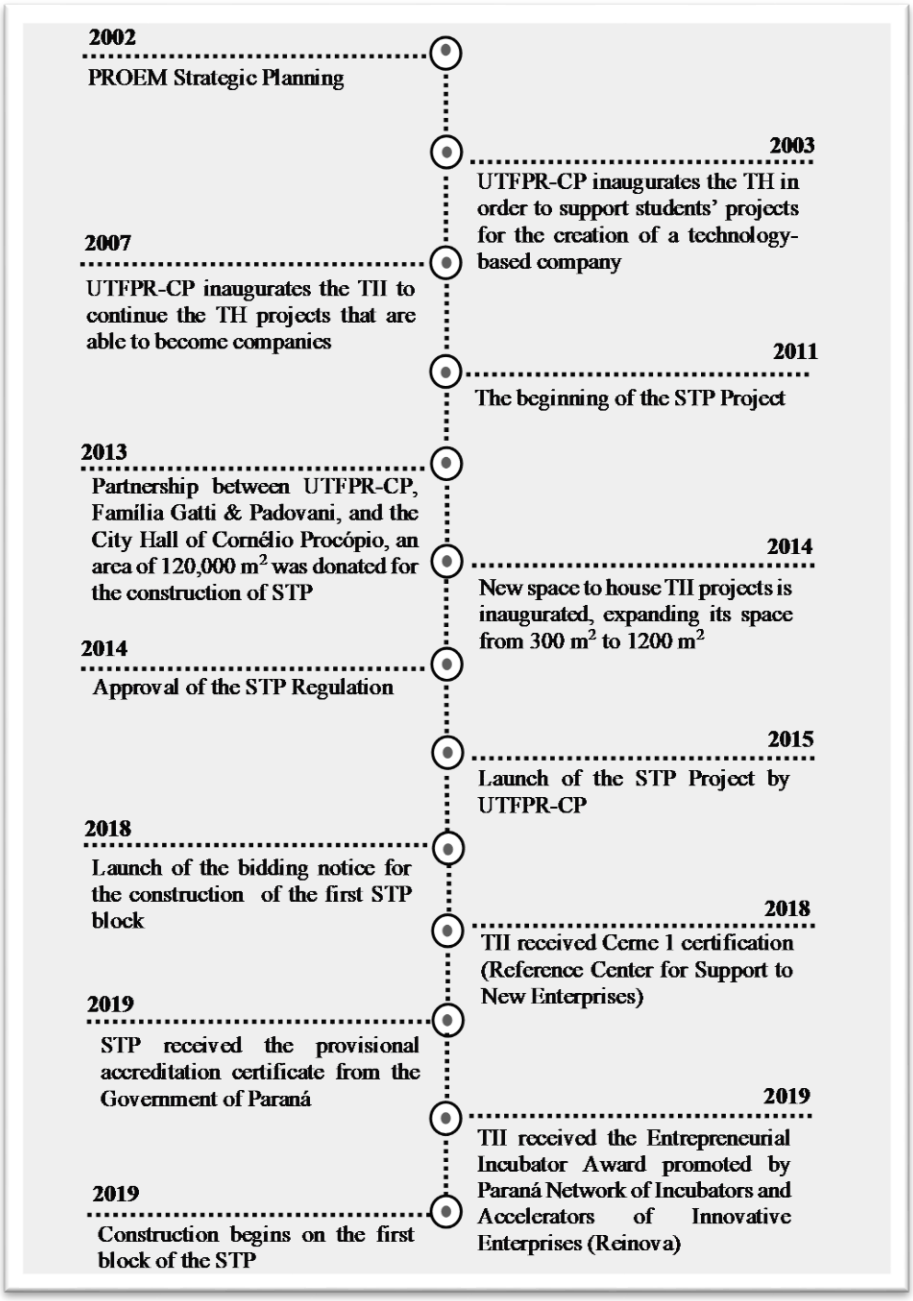
[6] The 2020 edition of the Global Innovation Index (GII) presents the latest global innovation trends and the annual innovation ranking of 131 economies.

Drabowska's empirical research (2017) provided evidence that technology parks employ highly qualified professionals with a strong management knowledge base, that is, in a knowledge input perspective that engages in the knowledge production process and its dissemination (knowledge output). Thus, he emphasis of the knowledge-based economy is contemplated.

3. METHODOLOGY

This research is characterized as qualitative that uses the single case study strategy, as recommended by Stake (2009). The applied research techniques were document research to describe the trajectory of the STP and the participant observation of the managers involved with its implementation. The initiative of the STP of Cornélio Procópio is being led by UTFPR-CP, as can be seen in the timeline illustrated in Figure 2.

Figure 2
PROEM Timeline



Source. Developed by authors.

According to Kawulich (2005), participant observation has been used in a variety of disciplines as a tool for collecting data about people, processes, and cultures in qualitative research. The definition of participant observation takes in account, the history of its use, the purposes for which it is used, the stances of the observer, and when, what, and how to observe. The main technique resides in the collection of observation notes on the studied phenomenon to allow a consistent analysis over time.

Participant observation allows researchers to check definitions of terms and facts that participants narrate in interviews, observe situations that informants may be unable or unwilling to share when doing so would be embarrass, and observe situations informants have described

in conversations, thereby making them aware of distortions or inaccuracies in description provided by those informants (Marshall & Rossman, 1995).

In this research, the participant observation technique has been applied in a systematic way, since the planning of the implementation of the Entrepreneurship and Innovation Program at the University, in 2002. The five authors of this work are engaged in the realization of this important project of regional socioeconomic development and have assumed relevant strategic positions over time, whether in the management of PROEM, STP or the UTFPR-CP itself.

3.1. THE CASE ITSELF

PROEM's general objective is to enable UTFPR students, employees and alumni, as well as the external community, to have access to entrepreneurship and innovation programs, events and actions, acting in the dissemination of entrepreneurial culture, contributing to the development of innovative enterprises based on technological.

To achieve this objective, PROEM already has some mechanisms and institutional structures, such as the Technological Hotel (TH), the Technological Innovations Incubator (TII) and the Junior Companies Program, existing in four undergraduate courses at the University. Other innovation habitats are still foreseen, such as the Business Accelerator (BA) and the STP, in the process of gradual implementation. UTFPR-CP maintains PROEM and its institutional mechanisms and structures, providing, within legal limits, the resources necessary for its operation.

TH, opened in 2003, is characterized as a pre-incubator and aims to support the development of projects by students, graduates, servers and entrepreneurial researchers from the academic and external community, supporting them in their first steps, with the following priorities: business training; encourage an entrepreneurial attitude; encourage the creation of companies with innovative technology-based products/services and bring the academic environment closer to the market.

In this space, entrepreneurs develop the foundations of their venture without having the company legally open. For a period of up to two years, these teams receive support for structuring and validating the business model. The selection of projects for the TH is carried out according to the rules established in the specific pre-incubation notices, available in the selection process. The pre-incubation period is 12 months, which can be extended for an equal period.

The TII inaugurated in 2007, it is another PROEM support mechanism that gives continuity to the work developed in the pre-incubation, also welcoming companies from the

external community, contemplating areas of action of the 13 UTFPR campuses, spread in Paraná. The photos of the TII and TH entrance can be seen in Figure 3.

The Incubator's mission is to house companies whose products, processes or services are generated from the results of applied research, in which technology represents high added value. The general objective is to consolidate the process of creating micro and small companies (startups) increasing their chances of survival in the market, generating employment and income, in order to promote sustainable regional development.

Figure 3
Frontages of the TII and TH

Source. Provided by authors.

The incubator's great differential is that it is located within an entity that promotes and creates technology, with its own solid infrastructure, being able to add researchers to its service bank. The TII operates in the sector according to regional singularities, focused on areas of notorious knowledge of the University and of specific development, such as: Mechanics, Software, Electrical, Automation, Biotechnology and others.

In 2017, TII was ranked among the 10 best incubators in the State of Paraná, according to data from UBI Global (2019). In 2018, the Incubator received the Cerne 1 certification granted by the Chirstiano Becker Institute for Studies on Development, Entrepreneurship and Innovation.

The incubation process takes place through two modalities: Resident and non-resident. In the non-resident modality, the company does not have a physical space at the TII, but can use other benefits, such as qualifications, advice and consultancy. The selection of projects is carried out in accordance with rules established in specific Incubation notices, made available in the selection process. The incubation period is up to one year, which can be extended for up to 60 months.

The STP, in turn, is intended to promote the scientific and technological development of the Cornélio Procópio region, in Northern Paraná, Brazil, by attracting companies that carry out research, development and innovation, invest in their innovative products and processes, valuing sustainable development and present a cooperation plan with the UTFPR campuses.

By definition, the STP is an organizational complex of a scientific and technological nature, which will house the administrative headquarters, the Technology-Based Companies Accelerator, the Innovation and Technology Center, Research and Innovation Centers, as well as transfer spaces for anchor companies. in a Business Condominium focused on Science, Technology and Innovation (S&T&I), being an agent promoting the culture of innovation, industrial competitiveness, business training and transfer of knowledge and technology among the participants of the Procopense Innovation Ecosystem. Located in an area of 120,000 m2, on the banks of the BR-369 road, at the exit to the State of São Paulo, in front of the Rural Society Exhibition Park, the STP will house, in addition to the environments, a living center, amphitheater for holding events, restaurant, and sports area.

All this is the result of the actions of PROEM which has supported and disseminated technological innovation projects and programs, acting in partnership with entrepreneurs and representative bodies society and public authorities, seeking to encourage regional development, collaborating to create jobs, increase the level of income (through the high added value of products and services) and social inclusion.

PROEM operates in the development of the corporate culture and provides conditions for stimulating the projects of technological and innovative companies through the TII and the TH (UTFPR-CP, 2022). A video about the incubation environments can be seen at UTFPR-CP (2015a).

4. RESULTS AND DISCUSSION

The origin of the STP's project, as recommended by Vedovello et al. (2006) is in the connection of UTFPR-CP with several local partner entities willing to collaborate. In August 2011, this group formed the Entrepreneurship and Innovation Committee, initially constituted by UTFPR-CP, State University of Northern Paraná (UENP), Federation of Industries of the State of Paraná (FIEP), Commercial and Business Association of Cornélio Procópio (ACECP) and the Brazilian Micro and Small Business Support Service (SEBRAE), with the objective of developing joint actions for the founding of the STP.

In 2014, the UTFPR University Council approved the STP installation regulation and, in 2015, UTFPR-CP officially presented the architectural project to the regional community and the search for financial resources. On the occasion, authorities, and representatives of institutions, followed the presentation and highlighted the importance of the STP for local and sustainable regional development, boosting local economic activity, with the formation and growth of companies based on knowledge and innovation.

In 2018, when the city of Cornélio Procópio celebrated its 80th anniversary, the first stage of the STP's project was launched, in the amount of R$ 3,9 million, related to parliamentary amendment for the construction of the administrative block of the enterprise. For the completion of this stage, more 5 million reais will still be needed, which should also be contributed through parliamentary amendment. UTFPR-CP also counts on the support of the Cornélio Procópio City Hall for the execution of earthmoving and urbanization works in the area where the STP is located, providing the necessary machinery, since all projects have been approved by competent authorities.

It is important to note that this action was only possible after the donation of the 120 thousand m^2 of land by the Gatti family for the enterprise. In 2019, UTFPR-CP requested the Superintendence of Science, Technology and Higher Education of the Government of Paraná (SETI), support for the continuity of the STP implementation, which should involve around R$ 86,2 million for over 25 years, as shown in the Figure 4.

The Government of Paraná is implementing a support policy for Technological Parks in the State, through the creation of the Paranaense Technological Parks System (Separtec), which is part of the Innovation System. The initiative will effectively contribute to the development of the entire Northern region of the state.

Figure 4
Overview of the STP's Project

Note. Project's video can be accessed at UTFPR-CP (2015b).
Source. Provided by authors.

The complete STP's project includes the implementation of the following infrastructures: main guardhouse and access, administration, entrance square, accelerator for innovative companies, convention center, parking, research center, accommodation, walking trail, helipad, cycle path, central maintenance, business lots for anchors and community center. The Table 2 presents an estimative of the investments.

Table 2
Budget Estimate for Investments in STP

Resources	Values – R$ (BRL)*
Projects	1,795,500.00
Infrastructure	3,435,000.00
Constructions	75,000,000.00
Equipments and Furnitures[a]	5,000,000.00
Outsourced Services[b]	1,000,000.00
Total	86,230,500.00

Notes. [a] Equipments of computer and electronics, tables, chairs, counters and cabinets.
[b] Estimate of surveillance/cleaning service hires for the first two years.
* Exchange rate quote on March 10, 2015: 1.00U$ = R$3.1299 (BACEN, 2015).
Source. STP Global Project Data (2015).

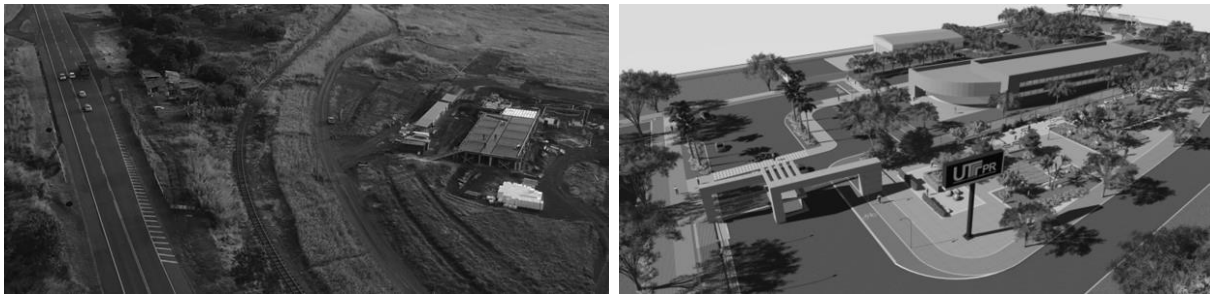
STP's project has gradually attracted new partners and the regional community realizes that there is great potential to leverage sustainable and long-term socioeconomic development in the region. For Savitz & Weber (2007, p. 3) "sustainability is business management in order to promote growth and generate profit, recognizing and facilitating the realization of the economic and non-economic aspirations of the people on whom the company depends, inside

and outside organization". This definition fits and adapts to the STP project and the dream of many begins to become a reality, as shown in the Figure 5.

The STP's management model is based, therefore, on the proposal of Triple Helix by Etzkowitz (2008), since it involves the spheres: government, business and academic. Nature is public, managed by UTFPR-CP, through partnerships with the private sector and, Currently, the main challenge is to overcome the lack of financial resources to carry out the project. Thus, this research has shown the finding of Dambrowska (2017, pp. 265-266), that is:

> The ownership structure of SPs has evolved, and although the public sector still has a predominant place in Science Parks ownership composition, the private sector presence in the ownership structure is growing and is more visible. There is the potential for further research in these areas.

Figure 5
Aerial View of the Construction and Project of the STP Administrative Block



Source. Provided by authors.

5. CONCLUSION

Finally, we can highlight that the empirical data collected on the implementation process of Cornélio Procópio's STP fit the concept adopted by IASP (2020) on innovation environments, as it has a proposal to become a habitat for businesses among institutions that belong to the global knowledge economy, in order to promote the socioeconomic and competitive development of the region where it is located, in accordance with the fourth generation of technology parks immersed in an innovation ecosystem.

According to Lu and Bunchapattanasaakda (2020), entrepreneurs must play a role of "builders of relationship bridges" in different sectors or fields of the market when consolidating the various chains of relationship, pointing to a more correct direction and with less risk when participating in the park's ecosystem and its network. There is a clear intention that entrepreneurs can intensify their strengths and potential through the connections that will be established, in relevance and in heterogeneity of the networks formed in the park, allowing

everyone in the network to communicate and interact more closely, which could help residents in the transfer of technology in order to improve the level of innovation of their companies.

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Engagement of Science and Technology Park of Cornélio Procópio, PR, Brazil in triple helix model

Engajamento do Parque Científico e Tecnológico de Cornélio Procópio, PR, Brasil no modelo da hélice tripla

RESUMO

O objetivo deste artigo é comparar as recomendações da literatura sobre gestão de parques tecnológicos com as ações de implantação do Parque Científico e Tecnológico (PCT) da Universidade Tecnológica Federal do Paraná, Campus Cornélio Procópio (UTFPR-CP), Brasil. Para tanto, foi realizado um levantamento na literatura sobre as origens de parques tecnológicos e suas respectivas trajetórias. Os principais pontos identificados no estudo foram confrontados com os registros de eventos que estão norteando as ações de execução do projeto de implantação do PCT. Os resultados mostraram que o processo de implementação segue as recomendações da literatura, inclusive com estabelecimento de parcerias estratégicas regionais, segundo o modelo da Hélice Tripla. Além disso, ficou evidente a importância do apoio político nas esferas municipal, estadual e federal, da iniciativa privada e da Academia, essenciais para viabilizar a doação do terreno e o início da construção da infraestrutura física do PCT, seguindo o padrão da quarta geração de parques tecnológicos.

Palavras-chave: Parque científico e tecnológico; Ambientes de incubação; Desenvolvimento regional; Hélice tripla.

Compromiso del Parque Científico y Tecnológico de Cornélio Procópio, PR, Brasil en el modelo de triple hélice

RESUMEN

El objetivo de este artículo es comparar las recomendaciones de la literatura sobre gestión de parques tecnológicos con las acciones de implementación del Parque Científico y Tecnológico (PCT) de la Universidad Tecnológica Federal de Paraná, Campus Cornélio Procópio (UTFPR-CP), Brasil. Para ello, se realizó un relevamiento en la literatura sobre los orígenes de los parques tecnológicos y sus respectivas trayectorias. Los principales puntos identificados en el estudio fueron confrontados con los registros de eventos que están orientando las acciones de ejecución del proyecto de implantación del PCT. Los resultados mostraron que el proceso de implementación sigue las recomendaciones de la literatura, incluyendo el establecimiento de alianzas estratégicas regionales, según el modelo Triple Helix. Asimismo, se evidenció la importancia del apoyo político a nivel municipal, estatal y federal, la iniciativa privada y la Academia, indispensable para viabilizar la donación del terreno y el inicio de la construcción de la infraestructura física del PCT, luego del patrón de la cuarta generación de parques tecnológicos.

Palabras clave: Parque científico y tecnológico; Ambientes de incubación; Desarrollo regional; Triple hélice.