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## **PUCRS SCIENTIFIC AND TECHNOLOGY PARK - TECNOPUC: SHAPING CITIES**

**WORKSHOP 5 - Innovative business models for STPs in response to city  
challenges**

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## Executive Summary

It is widely known that cities and urban centers represent one of the most significant developments in contemporary society, becoming attractive hubs for entrepreneurs and fostering new ways of managing innovation. The intensive flow of population from the countryside to the city now appears as a rich opportunity for improving people's conditions, making cities richer, more intelligent, more innovative and sustainable. In this context, the Science and Technology Parks (STPs) emerge, establishing true innovation ecosystems and contributing effectively to the growth of urban centers where they are inserted. The experience of the Pontifical Catholic University of Rio Grande do Sul's STP - TECNOPUC - and the implementation of INOVAPUC Innovation Ecosystem over the last 10 years, represent the synthesis of this article, seeking to demonstrate its relevance in the development of the city of Porto Alegre and, in a national context, epitomizing one of the best Brazilian examples for the proposition of sustainable growth based on knowledge and innovation.

## Introduction

The concepts of information society and knowledge society demand a revision of the interaction among companies, universities and the various government levels. Whereas information society is based on technological and scientific advances, the knowledge society comprises more comprehensive social, ethical and political dimensions<sup>1</sup>.

The binomial science-technology has become a central theme in ethical and political debates in the development of modern society, in both economic and social perspectives. In turn, the scientific and technological knowledge form the basis of the innovation process, having at its core the knowledge networks and creativity.

The construction of knowledge, which is characterized by constant and permanent conversion of tacit knowledge into explicit knowledge and better identified and described by the knowledge spiral of Nonaka and Takeuchi<sup>2</sup>, benefits from the cooperation between collaborators of a knowledge network.

In today's society this network is represented by the Government-University-Industry relations in the concept of the Triple-Helix<sup>3</sup>. The relations between these actors are increasingly important in the construction of knowledge, enabling and motivating companies to seek new organizational models based on knowledge management and its practices. In this context, innovation is a response of the economic factors that make up society. The process of innovation and knowledge transfer is complex, dynamic and interactive, allowing new agents to position themselves in this setting, and turning them into vectors for development based on knowledge and innovation. It is in this context that the Science and Technology Parks (STP) and Business Incubators (BI), with the aim of adding value to the businesses, now offer new opportunities for generating employment and income for society. The understanding of these contemporary processes becomes essential to define the structural policies of economic development, research, education and innovation. A society focused on innovation expects that its main actors (Government-University-Industry) create new articulated innovation environments. In a globalized world, these environments play a relevant role in the process of creating, developing and broadening the perspectives of performance of technology-based companies, enabling global actions and leveraging new opportunities for economic success and high performance.

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<sup>1</sup> UNESCO, 2005.

<sup>2</sup> NONAKA, I. TAKEUCHI, H. The knowledge-creating company. Rio de Janeiro. Editora Campus - 14<sup>a</sup> edição, 1997. 358 f.

<sup>3</sup> ETZKOWITZ, H. Hélice Tríplice: Universidade-Indústria-Governo Inovação em Movimento. Porto Alegre: EDIPUCRS, 2009. 207 p.

## Context

Worldwide, there are remarkable experiences related to the implementation of Science and Technology Parks and their relations with the surrounding urban structure, in addition to being recognized as vectors of development based on knowledge and innovation. In this sense, the Stanford Research Park (USA), and Sophia Antipolis (France) are icons of a 1st Generation PCTs Pioneers, born in the 50-60s of the twentieth century, aiming to stimulate development from the synergy between academia and industry. Representing a 2nd Generation, there are STPs followers from the 70-80s, seeking the consolidation of the best trends of success as well as economic revitalization and re-industrialization of abandoned areas. More recently, we have the 90s 3rd Generation of Structuring STPs, based on the Knowledge Society and with differentiated models of management and governance. Among them we see the emergence of several Asian STPs with very bold and innovative initiatives, such as the ones in Singapore, Seoul and Taiwan.

Figure 1 below illustrates the evolution of these generations over the last 60 years.

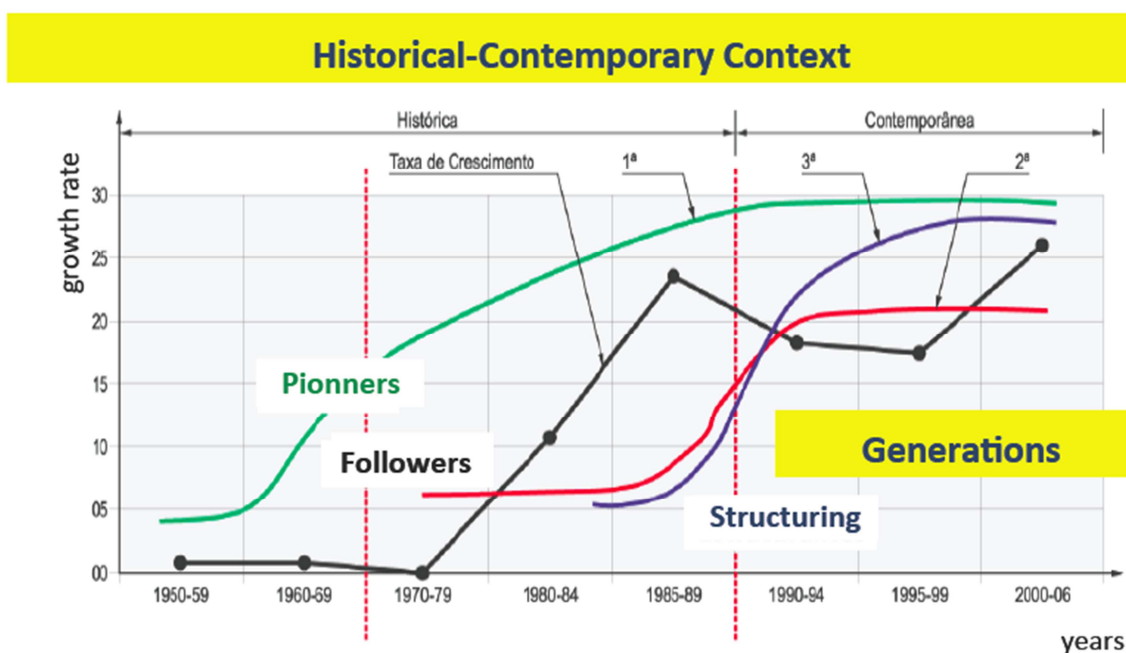


Figure 1: Evolution of the Generations of STP (GIUGLIANI, 2011<sup>4</sup>; ABDI, 2007<sup>5</sup>)

Within the context of this 3rd Generation and today's globalized culture is what was proposed and implemented in one of the best Brazilian experiences to promote technological innovation associated with entrepreneurship and innovation. This strategic action of the Pontifical Catholic University of Rio Grande do Sul (PUCRS)<sup>6</sup>, established the beginning of the activities of the Science and Technology Park - TECNOPUC - in its Campus, located in Porto Alegre, Brazil, in 2003.

After 10 years of a systemic and organic implementation process, it becomes possible to characterize more clearly the scenario for this remarkable Brazilian initiative. On the one hand the conformation of an internal ecosystem of innovation over this period, constantly changing as collateral for its advancement and sustainability. On the other hand, the significant growth of its

<sup>4</sup> GIUGLIANI, Eduardo. Governance Model to STPs in Brazil. 2011. 310 f. Thesis (Doctorate in Engineering and Knowledge Management) - Post-Graduate Program in Engineering and Knowledge Management, Federal University of Santa Catarina, Florianópolis, 2011. Available in: [http://verum.pucrs.br/F/?func=find-b&find\\_code=SYS&request=000433973](http://verum.pucrs.br/F/?func=find-b&find_code=SYS&request=000433973)

<sup>5</sup> ABDI (Brazilian Association of Industrial Development). STPs in Brazil: Study, Analysis and Propositions: Module 1. Estudo sobre alternativas bem sucedidas de Modelos de Parques Tecnológicos e de Programas Apoio no Exterior. Brasília: ABDI-ANPROTEC. 2007. 131 f.

<sup>6</sup> PUCRS, [www.pucrs.br](http://www.pucrs.br)

relevance and its relationship with the city and surroundings focusing on products and services, as well as becoming a reference to the state of Rio Grande do Sul and Brazil.

Domestically, the dynamics of this process is profoundly changing the relationship and the commitment of the University through its actions, inducing changes in its posture and relations with society.

Based initially on the partnership with three global companies - HP, Dell and Microsoft - the exponential growth of TECNOPUC reflected the potential of intellectual capital available in PUCRS and ability to attract new businesses, whether consolidated, spin-offs or start-ups.

In this sense, its ecosystem is currently composed of 81 companies, 28 incubated companies and over 5,500 employees. Its various innovative mechanisms, deployed and permanently adjusted to the stages of growth of TECNOPUC, can be characterized based on two main systems, as shown in Table 1.

<b>Main System</b>	
INOVAPUC Network	PUCRS innovation system composed of Academic and Peripheral Units.
Entrepreneurial Nucleus	Congregation and stimulus for entrepreneurial actions in the academic community.
RAIAR Pre-Incubator	Environment for validation of projects and ideas, including market concepts.
RAIAR Incubator	Beginning of entrepreneurial consolidation, with infrastructure and management support.
Condominium INOVAPUC	Extra support to technology-based companies with innovative drive.
TECNO PUC	PUCRS Scientific and Technology Park.
<b>Complementary System</b>	
Technology Management Agency (AGT)	Management of Projects and Services.
Entrepreneurial Management Agency ( AGE)	Development of economic sustainable strategies for growth.
IDEIA Institute	Hosts projects e ideas from the academic community.
Support to Innovation Management (NAGI)	Elaboration, diagnosis, consultancy and training in innovation.
Technology Transfer Office (ETT)	Intellectual asset management and technology transfer.
R,D&I Centers	PUCRS Research, Development and Innovation Centers.
CriaLab	Creativity Lab, generation of innovative actions.

Table 1: Main System and Complementary System of TECNOPUC

Figure 2 below, indicates the morphology of these two systems, showing the existent synergy as a major factor for the success of this innovation ecosystem.

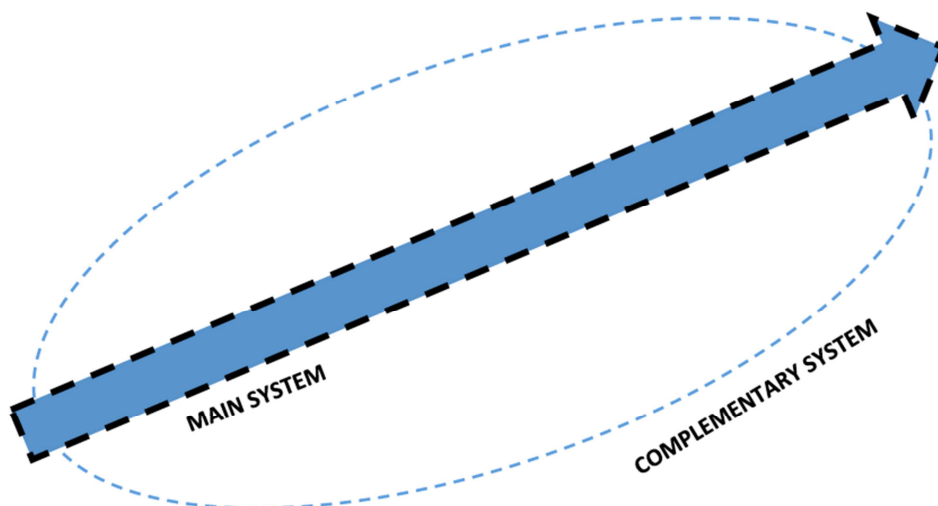


Figure 2: Main System and Complementary System - Proposal Synergy

This platform aims to support the development and deployment of businesses through a support process to innovation management, where there will be the offer of a product or service to society with market demand and affordable competitive prices. This process may occur, in general, in two ways. The first, of an emergence nature, meets several requirements and is based on innovative proposition. The second, and most recommended, is based on a planned process, where we find a continuum between what is considered a project / idea and the expectation of turning this action in an IPO - Initial Public Offer, when the company proposes to open his stocks in the Market capital as a way of raising funds and expanding its corporate base.

Externally, and with the expansion of interdisciplinary activities aimed at technological innovation, there are several actions that are transforming and enhancing the relationship between TECNOPUC, the city and society. Products and services for a global market have been a magnet for other similar entrepreneurial initiatives, both headquartered in TECNOPUC as much as outside it. The establishment of a TECNOPUC office in London - the main world financial center - in 2012, was a pioneering Softlanding action.

Another initiative focuses its actions on the development of innovative urban facilities, modeling people's behaviors and its surroundings in the best sense of the transformations desired by contemporary Smart Cities.

The implementation of the Global TECNOPUC project, scheduled for 2014, will expand these relationships. This new environment will house and provide communities, internal (TECNOPUC and University) and external (society), with new dimensions and synergies to be exploited. An environment conducive to networking, open innovation, creativity and internationalization will be made available in order to add more value to products and services generated, and will also serve as a source of attraction of internal and external interests to foster new partnerships.

The ratification of a management model with high flexibility in decision making, as well as a model of governance with external collaborators supported by best practices of corporate governance<sup>7</sup>, epitomizes an innovative proposal for a new organizational structure for technology parks, associating transparency (disclosure), equity (fairness), accountability (accountability) and corporate responsibility (compliance)<sup>8,9</sup>.

<sup>7</sup> GIUGLIANI, Eduardo; SELIG, Paulo Mauricio; SANTOS, Neri Dos. Governance Model for STP in Brazil. 1a Brasília: Anprotec, 2012. 278 p.

<sup>8</sup> OECD. Principles of Corporate Governance. 2004. 69 p. Available in: <http://www.oecd.org/dataoecd/32/18/31557724.pdf>.

<sup>9</sup> IBGC (Brazilian Institute of Corporate Governance). The Best Practices Code of Corporate Governance. 3a Edição. São Paulo: IBGC, 2004. 48 p. Available in: <http://www.ibgc.org.br/CodigoMelhoresPraticas.aspx>.

This article intends to identify and detail the concrete experiences of TECNOPUC's innovative ecosystem and its mechanisms presenting the methodology of its relations with society. The article will also describe the most relevant and strategic steps for the Park implementation and the strategies that guide its future in a highly competitive environment and recognized social and economic turmoil.

### Innovation Ecosystem INOVAPUCRS

Providing a summary of what is now recognized as one of the most important Brazilian experiences in the field of Brazilian innovation, necessarily requires the identification of its roots and, the main factors that contributed with the shaping of the INOVAPUCRS Innovation Ecosystem. There are two strategic actions, born organically within the Pontifical Catholic University of Rio Grande do Sul:

The first occurred in 1990, when PUCRS set the challenge to reach, in 2000, in its body of teachers and researchers, a minimum of 1000 Masters and Doctors - challenge called "*1000 for 2000 Project*". With strong investment of PUCRS resources and agents of the S&T in Brazil, this goal was achieved in 1999.

Thus, a profound transformation of the intellectual capital of the University began, with consequences that today can be better measured from actions that occurred in the short, medium and long term starting that year. PUCRS implemented the first three elements that would give rise later in the innovation ecosystem to be supported by the INOVAPUCRS Innovation Network, therefore consolidating a first and incipient synergy with the city, society and the market:

- Technology Management Agency (AGT, 1999)
- RAIAR Incubator (RAIAR, 2003)
- Science and Technology Park (TECNOPUC, 2003)

Figure 3 positions these elements, which later would be recognized as the future mechanisms of innovation ecosystem

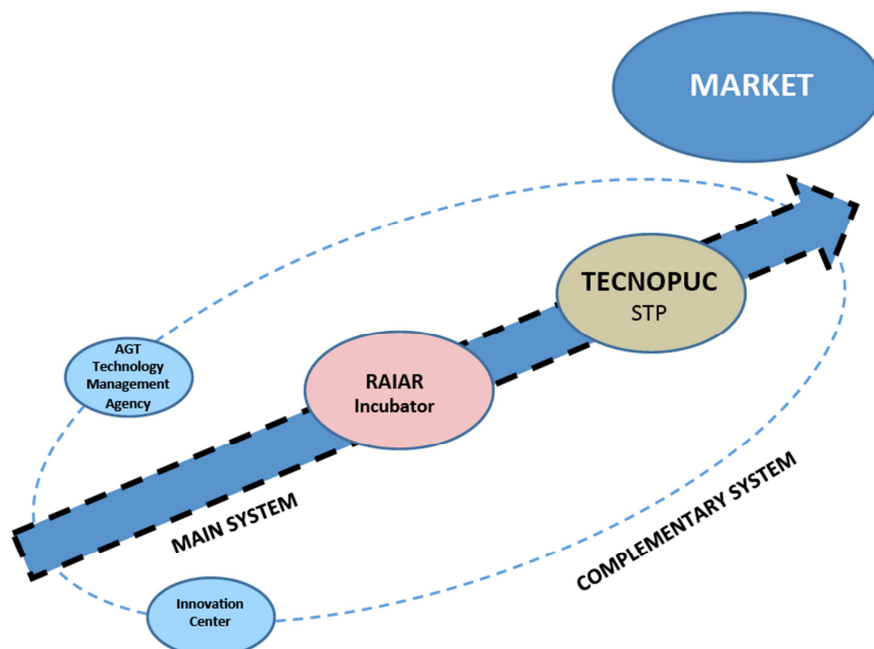


Figure 3: INOVAPUC Innovation Ecosystem - Initial Structure, 2003

The second strategic action occurred in 2004, when PUCRS states that it should be in all its activities, an Entrepreneurial University, starting to redefine its mission and its vision from this new context, as described in Table 2 below:

<b>Mission</b>
Create a community of transdisciplinary research and innovation through collaboration between academia, business and government to increase the competitiveness of its actors and improve the quality of life of their communities.
<b>Vision</b>
In 2015, PUCRS will be a national and international reference for quality of teaching and the relevance of research, with the brand of innovation and sustainable management, promoting the education of students and contributing to the scientific, cultural, social and economic development.

Table 2: Entrepreneurial University - PUCRS Mission and Vision as of 2004

This new scenario helps to strengthen initiatives focusing on innovation, especially those of technological base, making all actions with the potential to involve the TECNOPUC and RAIAR strategic for the University. As of 2005, the following were implanted innovation mechanisms, which are later described in this article:

- Microsoft Innovation Center (CI, 2003)
- Technology Transfer Office (ETT, 2005)
- Entrepreneurial Nucleus (NE, 2007)
- INOVAPUCRS Network (INOVAPUCRS, 2007)
- Research and Development Institute (IDEIA, 2007)
- RAIAR Pre-Incubator (2010)
- Company Condominium INOVAPUCRS (2011)
- Creativity Lab (CriALAB, 2011)
- Enterprise Management Agency (AGE, 2011)
- Innovation Management Nucleus (NAGI, 2012)
- Global TECNOPUC (implementation, 2013)

The INOVAPUC Network is the structure that brings together a group of actors, actions and mechanisms related to the process of innovation and entrepreneurship at PUCRS. Its main objective is to promote the continuous process of innovation, articulating a healthy triple Government-University-Enterprise synergy for the process of social development at local, regional, national and international levels. For PUCRS, the INOVAPUC Network aims to act as a vector with a view to promote a multidisciplinary effort to seek solutions and provide answers to the demands of society in terms of economic, social, environmental and cultural aspects. In this context, the relationship between society and the University occurs in two levels:

- 1º: Identifying problems in society as a starting point for research development;
- 2º: Offering already available knowledge in the University and in its research centers which can be applied to solve existing problems.

The INOVAPUC Network, as part of PUCRS, aims to articulate actors of its Academic Core and Peripheral Units. The Academic Nucleus is composed of all PUCRS Faculties, Institutes and Research Centers. All actions of teaching, research and extension in these units will have as its focus the company and the University itself. The Peripheral Units are institutional mechanisms aimed at interacting with society, specifically with companies and with the different levels of government. This action aims to effectively implement the proposals presented by researchers Burton Clark (UCLA) and Henry Etzkovitz (New Castle and Stanford), based on the consolidation of the Triple-Helix. Figure 4 below illustrates the composition of the network, having as one of its main objectives to promote synergy between the PUCRS and society.

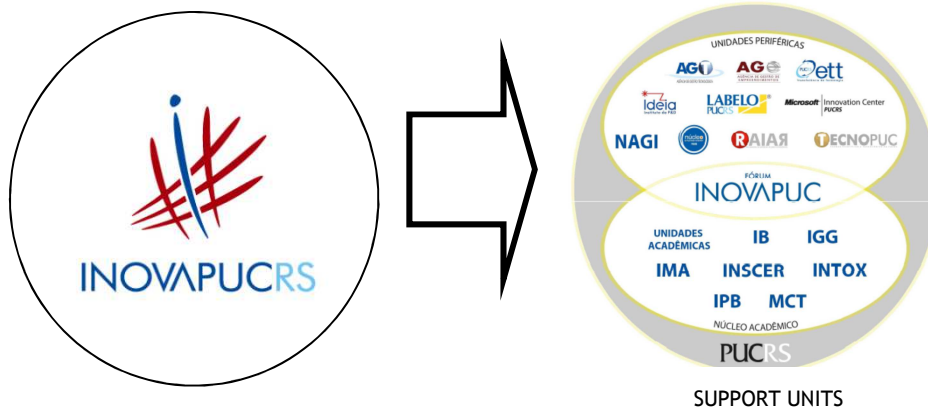


Figure 4: INOVAPUC Network - Innovation System

Due to this strategic vision, the organizational structures above have been developed and implemented in recent years, in order to prepare the University for this new level of performance in society.

From now on, this article goes on to describe the set of these agents that make up the INOVAPUC Network, which is particularly anchored in two main mechanisms, TECNOPUC as an agent of development and innovation, and RAIAR Incubator, as a supporting infrastructure for the stages of pre-incubation and incubation of innovative companies (start-ups and spin-offs).

Figure 5 illustrates the complexity and scope of the INOVAPUC Network today, conforming its Main System of a robust ecosystem facing the formation of innovative companies and their various complementary agents that make up its secondary system, reflecting the close relationship with the University and the wealth of its intellectual capital.

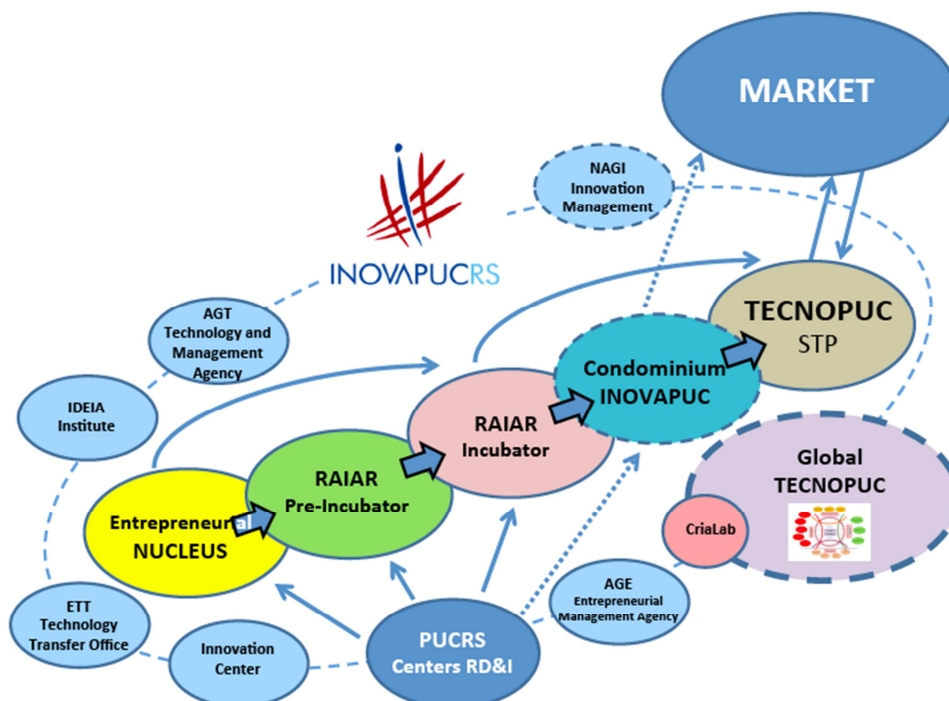


Figure 5: INOVAPUC Ecosystem for the formation of innovative companies - Present Structure

The main system of this ecosystem has five clearly defined steps and the vocation to contribute to the consolidation of an innovative and enterprising environment, as described below.



### Step 1: Entrepreneurial Nucleus → Entrepreneurship



Stimulates entrepreneurship at the University through activities, events and projects, dissemination and promotion of entrepreneurial culture.

### Step 2: Pre-Incubation RAIAR → Pre-Incubation of Companies



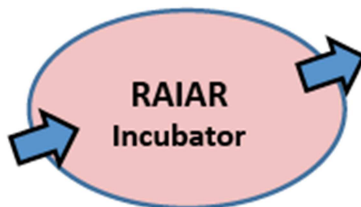
Conceptually, this step in the maturation process of a company, initiated by a project, is defined as an environment where ideas and designs can be tested and validated taking into consideration market and economic viability to formalize the establishment of a company.

One of its objectives is the hosting of ideas and innovative technology-based projects in order to encourage the establishment of enterprises by aligning the business idea with market reality, so that they can establish themselves fully. The target subjects are both projects coming from IDEIA Institute, PUCRS students and teachers, as well as foreign entrepreneurs. The pre-incubation is expected to last six months and should help subjects develop the following activities:

- Elaborating the business plan following RAIAR's model;
- Elaborating the financial viability plan;
- Elaborating the organizational structure;
- Elaborating strategies for Project implementation.

Depending on the performance in the pre-incubation phase, the proposal may guarantee entrance of Project in the RAIAR Incubation Program.

### Step 3: RAIAR Incubator → Enterprise Incubation



This relevant INOVAPUC Network actor initiated its activities in 2002, supporting with TECNOPUC permanent training and preparing companies for the market. In its strategy, aimed at stimulating the entrepreneurial vision of the PUCRS community and society, we turn innovative ideas into competitive businesses through support for infrastructure and business management. Its mission includes being a reference as a multispectral incubator model for technology-based companies,

focusing on the development of entrepreneurial culture and innovation. Its general purpose is to support and provide necessary conditions for business innovators to enter the market in a sustainable and competitive way. Additionally, its specific objectives are:

- Advise technology-based innovative companies generated from PUCRS research projects;
- Encourage PUCRS entrepreneurship community capacity;
- House embryonic enterprises spun off TECNOPUC established companies (spin-offs);
- Encourage the development of business networks (networking);
- Empower young entrepreneurs;
- Promote the generation of knowledge and the adoption of technologies by enterprises;
- Contribute to the reduction of the mortality rate of new firms.

RAIAR target audience is characterized by being internal or external to the University and can be composed of:

- PUCRS Under Graduate and Graduate students;
- PUCRS Teachers and researchers;
- TECNOPUC Spin-off Companies;

- Entrepreneurs from technology-based innovative companies.

RAIAR offers two modes of business incubation: associate and resident.

Associated mode: set to companies wishing to operate in their own physical space, outside the incubator. The associated incubated companies have a contract with RAIAR, remaining incubated for a period of one (1) - renewable - year.

Resident mode: given to companies that occupy the physical space available in the Incubator. These companies have a contract for a period of two - renewable - years.

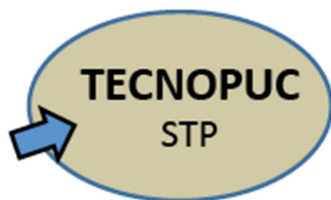
#### Step 4: Condominium of Enterprises INOVAPUC → Condominium of Companies



This stage aims to provide a new organizational structure in the context of the training cycle for companies in the INOVAPUC Ecosystem. This stage provides additional support services and qualification to those companies that have successfully overcome the earlier stages, especially that concerning the incubation phase. With this action, we aim to tackle with determination the issue of mortality of young companies when introduced in the market. This phase aims at the consolidation of the entrepreneurial capacity

from the incubated experience, strengthening their skills and preparing them not only for a competitive market, but primarily for their survival.

#### Step 5: TECNOPUC → Scientific and Technology Park



The Scientific and Technology Park of PUCRS - TECNOPUC is characterized and recognized as a modern and contemporary innovation system, hosting companies from different sizes, entities and actions of the university in the areas of Research, Development and Innovation (RD&I), facilitating technological development of all the actors involved. Within this context, it brings together organizations representing business segments, major companies in the global market, as well as small and medium businesses, including

incubates and spin-offs.

The framework structuring TECNOPUC consists of its mission, vision, governance, objectives and procedures. The Mission of TECNOPUC is to create a community of transdisciplinary research and innovation through collaboration between the University, companies and government, to increase the competitiveness of its actors and improve the quality of life of their communities. TECNOPUC's vision of the future projects it to be a national and international reference for the relevance of innovative research, promoting the technological, economic and social development of the region.

The overall goal of TECNOPUC is to insert PUCRS directly in the process of economic and social development of the region and the country, and their specific goals involve:

- Attract businesses with RD & I projects to work in partnership with the University;
- Promote the creation and development of new technology-based companies;
- Attract RD & I projects in general;
- Stimulate innovation and interaction government-university-industry;
- Generate positive synergy between academia and business;
- To act in a coordinated manner with the spheres of government, both in the county, the state and the federation.

The installation of companies in a Science and Technology Park is maximized when they are knowledge and technology-intensive and have as their object leverage the capabilities and competencies of University researchers and their labs in order to achieve competitive advantages through innovation.

TECNOPUC is a multispectral science and technology park concentrated on four areas:

- Technical and Scientific: Information Technology and Communication Electroeletronics;
- Environment: Renewable Energy;
- Biotechnology: Biological and Health Sciences;
- Creative Industry.

These thematic areas were defined on the basis of competence and academic ability available at PUCRS, involving graduation groups of scientific and technological research associated with society's demands. Other areas of knowledge can be exploited depending on the alignment of the interests of business and government with the powers of the University. TECNOPUC is inserted in the interaction process government-university-industry developed by PUCRS, from its own design, organic and dynamic, which aims to encourage the activities of RD & I, connecting their skills to the demands of business and government and the resources available.

Figure 6 shows the location of the campus, along TECNOPUC and PUCRS are perfectly adherent to the urban structure of the city of Porto Alegre.



Figure 6: Aerial of PUCRS campus highlighting TECNOPUC- Porto Alegre

The pioneer companies in TECNOPUC were Dell Computers, who installed the Global Development Center - GDC, first software development unit for internal company use outside the United States and Hewlett-Packard - HP, which installed two units in the Park, Operation R & D (the largest in Latin America) and operation software.

Today, TECNOPUC has more than one hundred companies and entities participating in its innovation ecosystem. These relations and their synergies developed around TECNOPUC an Innovative ecosystem, dedicated to research and technology, leveraging the intellectual capital of its actors and establishing itself as a major center for high-tech investment in the state and in the country.

The amazing growth of TECNOPUC, from 2003, shows its current potential and its future vision. This trend, supported by both pre-planning and for monitoring dynamic emerging opportunities are described below, with its four phases of implementation of the Park.

#### **PHASE I: 2003 - 2007**

Implementation of the PUCRS Science and Technology Park - TECNOPUC, in 2003.

Offering more than 22 000 m<sup>2</sup> for support services, support and infrastructure to graded and incubated companies with RD & I initiatives in partnership with the university. This phase, even if identified with the first four years of implementation of the park, keeps to the present one continuous occurrence, currently represented by the establishment of the Network INOVAPUC, a tangible aspect of a set of agents internal to the University, including TECNOPUC, companies' partners and collaborators.

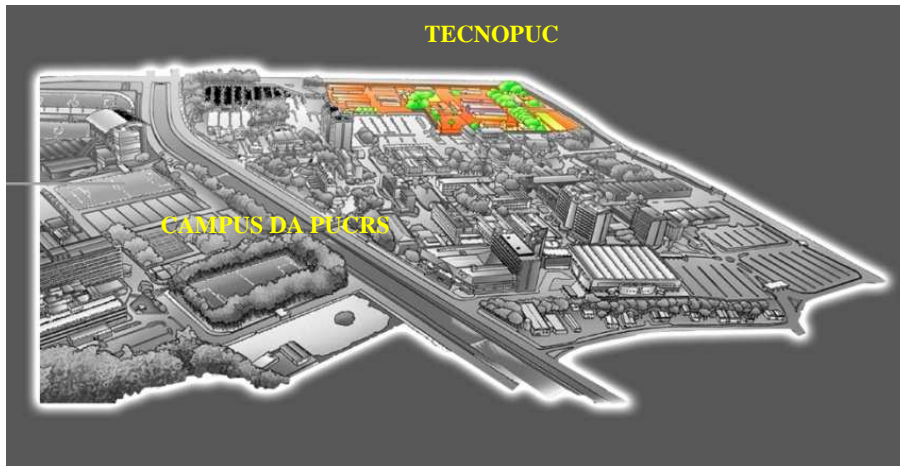


Figure 7: PHASE I: Deployment of TECNOPUC, 2003 - 2007

### PHASE II: 2004 - 2010

As a result of strategic support of the Brazilian Government, it is the expansion phase of the Park with the start of construction of the TECNOPUC Portal (Building 99A), in 2008. This 15- storey high building, with an area of 22 000 m<sup>2</sup>, was inaugurated in December 2010, incorporating a fresh approach for the inclusion of organizations known by being knowledge-intensive. Its focus was aimed at meeting the growing demand from companies and organizations interested in participating in the cluster of high-tech TECNOPUC projects with RD&I from combined synergistic entrepreneurial action with research in a habitat facing innovation to support their teams. It also offered effective possibility of area expansion for resident businesses, scope for attracting new ones, significantly expanding its portfolio of companies and organizations present. The most tangible results can be viewed by more than 80 companies and more than 5,500 jobs. In this context, the focus is to offer new opportunities to attract investments into the country from the increase in the number of research projects, and also capture new opportunities of academic and professional development for students of universities in the region.



Figure 8: PHASE II: Portal TECNOPUC, 2008 - 2010

### Phase III: 2009 - 2015

In March 2004 PUCRS created a new space for the expansion of its operations called TECNOPUC Viamão, located 12 kilometers from central campus on a plot with more than 15 ha. This campus

has a built area of 33,000 m<sup>2</sup> with adequate infrastructure to receive ventures in pleasant surroundings close to nature, ample parking, fully protected by effective security system. Due to its configuration, TECNOPUC Viamão was destined to receive the Phase III expansion of the Park. His spaces are dedicated to the development of various initiatives focusing on innovation and entrepreneurship, catering for the expansion of TECNOPUC and RAIAR Incubator. Primarily, this area is to host the activities constituting RD & I in the Creative Industries segment, with an initial focus on film and video, set by the Technological Center Audio Production and Video of the State of Rio Grande do Sul - Project Tecna.



Figure 9: PHASE III: TECNOPUC Viamão, 2004 - 2015

**PHASE IV: 2011 - 2015**

Implementation of GLOBAL TECNOPUC - Center for Innovation, Creativity and Networking, as a result of innovative proposition as well as for its spatiality interconnected functionality of its multiple activities, characterized by the dimensions provided to co-inhabit the same space to be filled with the future vision of sustainability and support for innovation, creativity and the construction of new networks, as described in Table 03 below:

General Dimension: Innovative and flexible environments, allowing the reconfiguration of spaces and promoting greater interaction and opportunities for new projects
1 <sup>a</sup> Dimension: Co inhabiting
2 <sup>a</sup> Dimension: Networking & Coworking
3 <sup>a</sup> Dimension: <i>Open Innovation</i> - Incubation of projects and ideas
4 <sup>a</sup> Dimension: Internationalization.

Table 03: Dimensions of PHASE IV - GLOBAL TECNOPUC

The Complementary System of this innovation ecosystem, as previously described, comprises a set of innovation mechanisms; the most important links are shown on the next page.

Acts as a facilitator of the process of interaction University - Industry, encouraging and enabling the development of RD&I projects that combine cooperative market needs with existing knowledge in the University.

**ETT - Technology Transfer Office**

Manages intellectual heritage and promotes the transfer of research results in order to strengthen and expand the inclusion of PUCRS in society.

**IDEIA Institute**

IDEIA - PUCRS Research and Development Institute focuses on supporting the Incubation Research Projects of teachers and researchers affiliated to the University. The program aims to create products, processes and services, which make them capable of being transferred to society.

**Innovation Center:**

Partnership between Microsoft and PUCRS. Promotes the skills of professionals and organizations through mechanisms that foster the efficient and innovative use of information technology in products and processes.

**Research Center - Labelo**

Specialized laboratories in electroeletronics, calibration and testing. Operates for more than 20 years in scientific and industrial metrology, accredited by the government. It is an international and national reference.

**AGE - Enterprise Management Agency:**

Operates with a focus on economic sustainability strategy: investor relations, new ventures and specialized services.

**NAGI - Support Center for Innovation Management:**

Acts in making diagnoses of innovation, offering advice and training in innovation management.

The Table 4 records the following key indicators of the INOVAPUC Innovation Ecosystem, confirming the effective growth over the first ten years of its implementation.

Indicator	Mensuration
Companies	81
Incubated companies (Residents e Associated)	28
PUCRS Units	7
Professional entities	8
PUCRS Research centers and Labs	5
Collaborators	+ 5.500
R&D projects	+ 150
Researchers	+ 60
Graduation grants	+ 160
Under graduation grants	+ 300
Trainees in companies	+ 150

Table 4: INOVAPUC Innovation Ecosystem indicators.

These indicators, expressed through measurable and tangible numbers, tend to reflect the value of this initiative and its extreme adherence to the urban context of the city of Porto Alegre. New initiatives have been attracted to the vicinity of the PUCRS Campus and TECNOPUC, like hotels, restaurants and new services, changing the urban context significantly and being a reference in the area of innovation.

## Conclusions

The tangible indicators and evolution of Porto Alegre in the vicinity of TECNOPUC currently represent the best evidence of the positive contribution of INOVAPUC Innovation Ecosystem to the context of the city. The original initiative focusing on ICT, currently extended to four other areas, is the design of a new multidisciplinary and emerging knowledge-based society. Not only due to TECNOPUC, but also influenced by it, the current development axes of Porto Alegre converge to its context. TECNOPUC's new spaces are quickly occupied by both graduated and incubated companies, as well as R&D centers, mainly seeking the existent synergy to promote technological innovation and intellectual capital available.

Processes of internationalization with double flow have positioned TECNOPUC as a new protagonist of the R & D scene at international level. The establishment of a TECNOPUC office in the City of London represents the breaking of a paradigm, confirming the robust presence of a member of the BRICS, emerging now as opposed to a peripheral country of the third world.

The substantial growth in the number of collaborators within the INOVAPUC Ecosystem, with more than 5,500 employees, and a highly evolved service platform, operating continuously, has transformed the life of this community and its surroundings. With domestic and foreign companies operating in the global market, different work habits started to arise, where processes and collaborative knowledge sharing have become the new metric in this valuable yet intangible asset.

It is in this context that the TECNOPUC and INOVAPUC Innovation Ecosystem are inserted. In its first decade of steady growth (2003 - 2013) it has emerged strongly oriented by its strategic planning and its built opportunities. For the next step, it presents a vision of a promising future, to be guided by the advancement of knowledge and the demands of a new market to be set up for a new society.