
**30th IASP World Conference on Science and Technology Parks**

**Recife, Brazil, 2013**

# New models for Science and Technology Parks in response to the growing role of the cities as *Innovation Habitats*: perspectives from South America

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

## A 62 co-authored paper

## Brazil, Argentina, Colombia, and Paraguay

---

To cite this article from the Proceedings of the 30th IASP World Conference on Science and Technology Parks, please indicate:

SPOLIDORO, R. et al. (a sixty-two co-authored paper) *New models for Science and Technology Parks in response to the growing role of the cities as Innovation Habitats: perspectives from South America,* Proceedings of the 30th World Conference on Science and Technology Parks, International Association of Science Parks and Areas of Innovation - IASP, Recife, Brazil, 2013.

# New models for Science and Technology Parks in response to the growing role of the cities as *Innovation Habitats*: perspectives from South America

**Authors**

- SPOLIDORO, Roberto; researcher on *Innovation Habitats*, former adviser to Brazilian Ministry of Science, Technology and Innovation; former researcher of Centro de Pesquisa e Desenvolvimento CPqD – Campinas, CEO of NEOLOG Consulting Ltd.; Brasília, Brazil; robertospolidoro@uol.com.br
- ABELÉM, Antônio; Professor, Federal University of Pará, President of Fundação de Ciência e Tecnologia Guamá; Guamá Science and Technology Park; Belém, PA, Brazil: www.pctguama.org.br
- ACOSTA, Jaime Puertas; Researcher on innovative regional and national development; Bogotá, Colombia
- ALVES, Alexandre F.; Professor, Universidade Estadual de Maringá, Maringá, PR, Brazil: www.pce.uem.br
- ARANHA, José A. S.; Director of Genesis Institute; adviser to Rio de Janeiro Pontifical Catholic University Science and Technology Smart Region; Rio de Janeiro, RJ, Brazil: www.puc-rio.br
- ARAÚJO FILHO, Guajarino; Coordenador, Núcleo de Estudos e Pesquisas em Inovação, Fundação Centro de Análise, Pesquisa e Inovação Tecnológica – FUCAPI; Manaus, AM, Brazil: www.fucapi.br
- AUDY, Jorge L. N.; Professor and Vice-Rector, Pontifical Catholic University of Rio Grande do Sul - PUCRS, former Director of TECNOPUC (PUCRS Science and Technology Park); Porto Alegre, RS, Brazil: www.pucrs.br
- BARON, Rosane; Physician, consultant on innovative development processes, NEOLOG Consulting Ltda.; Brasília, Brazil
- BELACIANO, Mourad; Physician, Professor, University of Brasília, coordinator of the Science and Technology Park on Health project; Brasília, DF, Brazil
- BERMÚDEZ, Luís A.; Professor and Pro-Rector of Planning, Universidade de Brasília; former Director of CDT- Center for Development of Technology, former Director of University of Brasília Science and Technology Park; Brasilia, DF, Brazil: www.unb.br
- BORBA, Marcelo L.; Director, Parque de Inovação Tecnológica Joinville e Região, Inovaparq (Joinville Regional Park for Technology Innovation); Joinville, SC, Brazil: www.inovaparq.com.br
- BORDEAUX-REGO, Antonio C.; Director of Innovation, Centro de Pesquisa e Desenvolvimento – CPqD; Polis de Tecnologia (CPqD Research Park); Campinas, SP, Brazil: www.polisdetecnologia.com.br
- BUENO, Carmem S. C; Researcher, Project Manager, Center for Strategic Studies and Management in Science, Technology and Innovation (CGEE); Brasília, DF, Brazil: www.cgee.org.br
- CASAGRANDE, Marcos A.; Vice-President, Sindicato das Empresas de Informática do Rio Grande do Sul – SEPRORGS; Porto Alegre and Caxias do Sul, RS, Brazil: www.seprorgs.org.br
- COLLERE, Vanessa de O.; Director, Parque Inovação Tecnológica Joinville e Região - Inovaparq (Joinville Regional Park for Technology Innovation); Joinville, SC, Brazil: www.inovaparq.com.br
- CORDEIRO, Heraldo; Physician, researcher, technical coordinator of the Science and Technology Park on Health project; Brasília, DF, Brazil
- DE GREGORI, Diogo; Executive Superintendent, Agência de Desenvolvimento de Santa Maria – ADESM; Santa Maria, RS, Brazil: www.adesm.org.br
- ENRIQUEZ, V. Gonzalo; Professor, Director of Innovation Unity, Federal University of Pará - UFPA; Belém, PA, Brazil: www.universitec.ufpa.br
- FARIA, Reginério S.; Researcher, Minas Gerais Agriculture Research Company - EPAMIG, Professor, Uberaba University; Adviser to Uberaba Technology Park; Uberaba, MG, Brazil: www.epamig.br
- FELIX, Júlio C.; Director-President, Instituto de Tecnologia do Paraná; Curitiba, PR, Brazil, http://portal.tecpar.br

- FERREIRA, Olivério M.; Professor, Universidade FEEVALE (Vale do Sinos Community University), President of VALETEC Park (Parque Tecnológico do Vale do Sinos); Campo Bom, Novo Hamburgo and other municipalities, RS, Brazil: www.valetec.org.br
- FREITAS, Sebastião; consultant on innovative development processes; Maringá, PR, Brazil.
- FURLAN, Sandra A.; Professor and Rector, Joinville Region Community University - Univille; Joinville and other municipalities, SC, Brazil: www.univille.edu.br
- GALIAN, Carlos E.; Professor, Universidad Nacional de Misiones; Director, Misiones Technology Park Foundation, Parque Tecnológico Misiones; Deputy Secretary of Science, Technology, and Productive Innovation of Misiones Province; Posadas, Argentina: www.ptmi.org.ar
- GÁMBARO, Edgardo; President of the Federación Argentina de Parques Industriales, associated to Argentinean Chamber for Middle Size Companies; President of the Unión Industrial del Oeste; Director del Ente de Promoción Industrial Buenos Aires – Morón (promotor del Parque Industrial La Cantábrica); Moron, Provincia de Buenos Aires, Argentina: http://redcame.org.ar/home
- GODINHO, Marco J. de F.; Adviser to Espirito Santo Science and Technology Park; Vitória, ES, Brazil: www.cdvitoria.com.br
- GUARITÁ NETO, Luiz; former elected mayor of Uberaba (1993-1996), one the founders of the Uberaba Technology Park in 1993; President of the Centro Operacional de Desenvolvimento e Saneamento de Uberaba – CODAU: http://serv1.codau.com.br
- HAMERA, André A.; Adviser to Pato Branco Technology Park, to Pato Branco Technopolis, and to Argentina-Brazil Binational Technology Park Posadas/Misiones - Pato Branco/Paraná; Pato Branco, PR, Brazil: www.pbtec.org.br
- HAUSER, Ghissia; Deputy Secretary of Science, Technology and Innovation of Rio Grande do Sul State; Porto Alegre, RS, Brazil: www.sct.rs.gov.br
- KALLÁS, Elias; Professor, Instituto Nacional de Telecomunicações - INATEL; adviser to Santa Rita do Sapucaí Technology Pole; Santa Rita do Sapucaí, MG, Brazil: www.inatel.br
- LAHORGUE, Maria Alice; Professor, Economy Sciences Department, Federal University of Rio Grande do Sul; Porto Alegre, RS, Brazil: www.ufrgs.br
- LATTMANN, Júlio C. H.; President of Pato Branco Technopolis Association, Pato Branco Technology Park; Pato Branco, PR, Brazil: www.pbtec.org.br
- LICHOWSKI, Luis E.; Professor and Rector, Universidad Gastón Dachary; Posadas, Misiones, Argentina: www.dachary.edu.ar
- LOBÃO, Marcos W. N.; President, Sergipe Technology Park, Aracaju, SE, Brazil: www.sergipetec.org.br
- LOTUFO, Roberto A.; Coordinator, Universidade de Campinas (UNICAMP) Innovation Unity; Campinas, SP, Brazil: www.inova.unicamp.br
- MARQUES, Maria Angélica J.; Manager of the Science, Technology and Innovation Unity, Parque Tecnológico Itaipu – Brasil; Foz do Iguaçu, PR, Brazil: www.pti.org.br
- MALETZ, Edison A., Executive Director, IT Pole of Caxias do Sul (Trino Polo); Caxias do Sul, RS, Brazil: www.trinopolo.com.br
- MATTIA, Monica B.; Professor, UCS - Caxias do Sul Region Community University, Adviser to TecnoUCS (UCS Science, Technology and Innovation Park); Caxias do Sul and other municipalities, RS, Brazil: www.ucs.br
- MAZAROLLO, Claynor F.; Executive Director, Instituto Brasília de Tecnologia e Inovação – IBTI; Brasília, DF, Brazil: www.ibti.net.br
- MOSCHETTA, Roberto A.; Director of TECNOPUC – Pontifical Catholic University of Rio Grande do Sul Science and Technology Park; Porto Alegre, RS, Brazil: www.pucrs.br
- NICHELE, Marcelo; Professor, Universidade de Caxias do Sul - UCS (Caxias do Sul Region Community University); Manager of TecnoUCS – UCS Science, Technology and Innovation Park; Caxias do Sul and other municipalities, RS, Brazil: www.ucs.br
- NUNES, Ortência, L. G. S.; Researcher of CNPq; Technical Director, FUNDETEC (Foundation for Scientific and Technological Development); Cascavel, PR, Brazil: www.fundetec.org.br
- NUNES, Renato de A. F.; Professor, Universidade Federal de Itajubá; Coordinator of development, Itajubá Science and Technology Park; Itajubá, MG, Brazil: www.unifei.edu.br
- OCAMPOS, Diego A.; Manager, Universidad Nacional de Asunción Science and Technology Park, and Business Incubator and Entrepreneurship Program – INCUNA; Asunción, Paraguay: www.incuna.una.py
- OLIVEIRA, Patrícia C.; Professor, Universidade Federal do Oeste do Pará - UFOPA (Federal University of the West of Pará State), Director of Tapajós Science and Technology Park; Santarém and other municipalities, PA, Brazil: www.ufopa.edu.br

- PAIXÃO CÔRTES, Zulema M.; Architect, researcher on *Innovation Habitats* and innovative regional development processes; Professor, Universidade de Uberaba; Uberaba, MG, Brazil: www.uniube.br
- PASSOS, Carlos A. S.; Coordinator, Centro de Tecnologia da Informação Renato Archer Science and Technology Park (CTI-Tec); Campinas, SP, Brazil: www.cti.gov.br
- PEDRO, Eduardo A.; Consultor Executivo, and former Executive Director, Centro de Incubação e Desenvolvimento Empresarial – CIDE; Manaus, AM, Brazil: www.cide.org.br
- PETEFFI, Alexandre; Executive Director, VALETEC Park (Parque Tecnológico do Vale do Sinos); Campo Bom, Novo Hamburgo and other municipalities, RS, Brazil: www.valetec.org.br
- PIAU, Paulo; Researcher of Minas Gerais Agriculture Research Company – EPAMIG; one of the founders of Uberaba Technology Park Uberaba in 1993, when was Uberaba Secretary for Industry, Commerce and Services; elected to Minas Gerais House of Representatives (1995 – 2007), and to Brazilian House of Representatives (2008 -2014). He is the elected mayor of Uberaba for the term 2013-2016; Uberaba, MG: www.uberaba.mg.gov.br
- SALDANHA, Gustavo S.; Technical Coordinator, Agência de Desenvolvimento de Santa Maria - ADESM; Santa Maria, RS, Brazil: www.adesm.org.br
- SALVI, Eloni J.; Professor, Director of Tecnovates (UNIVATES Science and Technology Park), Centro Universitário UNIVATES, Lajeado and other municipalities, RS, Brazil, www.univates.br
- SANT'ANNA, Tadeu P.; Pro-Rector, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo - IFES; member of the governance of Espirito Santo Science and Technology Park; Vitória and other municipalities, ES, Brazil: www.ifes.edu.br
- SERRO, Vilson M.; Director-President, Agência de Desenvolvimento de Santa Maria - ADESM; Santa Maria, RS, Brazil: www.adesm.org.br
- SEIXAS LOURENÇO, José, Rector, Universidade Federal do Oeste do Pará (Federal University of the West of Pará State – UFOPA), General Coordinator of the Tapajós Science and Technology Park; Santarém and other municipalities, Brazil: www.ufopa.br
- SILVA, Carlos R. B.; Executive Manager, Incubadora Tecnológica de Caxias do Sul – ITEC; Caxias do Sul, RS, Brazil: www.itec.org.br
- SILVA, Eduardo; Technology Manager, Oficina de Vinculación Tecnológica, Parque Tecnológico Misiones (Misiones Technology Park); Posadas and other municipalities, Misiones, Argentina: www.ptmi.org.ar
- STANCK, Fernando J.; Manager, TecnoUnisc (Santa Cruz do Sul Region Community University Science and Technology Park), Universidade de Santa Cruz do Sul – UNISC; Santa Cruz do Sul and other municipalities, RS, Brazil: www.unisc.br/tecnounisc
- STÜLP, Simone; Science Sector Manager, Tecnovates (UNIVATES Science and Technology Park), Centro Universitário UNIVATES, Lajeado and other municipalities, RS, Brazil, www.univates.br
- TONHOLO, Josealdo; Professor, Federal University of Alagoas, Maceio, AL, Brazil: www.ufal.br
- VIOLA, Itamir; Executive Director of Pato Branco Technopolis Association, and Pato Branco Technology Park; Pato Branco, PR, Brazil: www.pbtec.org.br
- VIOLATO, Cláudio A.; Superintendent, Centro de Pesquisa e Desenvolvimento – CPqD; CPqD Research Park; Campinas, SP, Brazil: www.polisdetecnologia.com.br
- ZAMPIERI, Nilza L. V.; Professor, Santa Maria Federal University – UFSM; Coordinator of UFSM's Business Incubator; adviser to Santa Maria Technology Park; Santa Maria and other municipalities, RS, Brazil: www.itsm.ufsm.br
- ZORZI, Isidoro; Rector, Universidade de Caxias do Sul – UCS (Caxias do Sul Regional Community University); General Coordinator, TecnoUCS (UCS Science, Technology and Innovation Park); Caxias do Sul and other municipalities, RS, Brazil: www.ucs.br

# New models for Science and Technology Parks in response to the growing role of the cities as *Innovation Habitats*: perspectives from South America


## Executive Summary

The paper presents the main outcomes from a *virtual workshop* regarding new models for Science and Technology Parks – STPs, in special in South America, in response to challenges stemming from trends such as the integration of STPs to the urban tissue and the fact that cities and regions are becoming relevant *Innovation Habitats* by their own.

This *virtual workshop*, based on Internet, gathered professionals involved with the development of STPs and other *Innovation Habitats* in South America, and sought to answer questions proposed by the 30th IASP World Conference on STPs' agenda.

The topics presented in paper are: (a) Conceptual framework for *Innovation Habitats*; (b) Evolution of STPs in response to the above mentioned challenges; and (c) Strategies regarding the development of STPs, in special in South America.


## I. Introduction

This article is a synthetic report of a *virtual workshop* (based on Internet) carried out by professionals involved in the development of Science and Technology Parks - STPs and other *Innovation Habitats* in South America.

The objective of the workshop was to elaborate, in a cooperative way, answers to questions proposed by the 30th IASP World Conference agenda regarding the evolution of STPs in response to challenges stemming from trends such as the integration of STPs to the urban tissue and the fact that cities are becoming relevant *Innovation Habitats* by their own.

Similar virtual workshops were held in the past focusing on themes proposed by international conferences on *Innovation Habitats* and regional development.[1]

## II. A conceptual framework for *Innovation Habitats*

It is acknowledged that STPs do not follow a single model or a consensual definition, and that they are embodied through a wide range of models, objectives, and strategies.[2]

The *Science Park* definition adopted by IASP in 2002,[3] and used till recently, encompassed a wide spectrum of initiatives, ranging from a *Business Incubator* to a huge regional venture, such as a *Technopolis*, which are obviously very different entities.

This comprehensiveness, accompanied by the lack of an adequate conceptual framework for *Innovation Habitats*, raises a number of problems, particularly regarding public policies to support STPs.

---

[1] See:
- SPOLIDORO, R. et al. *New horizons for Science and Technology Parks: a Brazilian-Argentinean perspective*. Proceedings 27th World Conference on Science Parks, IASP, Daedeok, 2010
- _____ *Science and Technology Parks and sustainable solutions for global challenges: perspectives from a South American School of Thought on Development*. Proceedings 28th World Conference Science Parks, IASP, Copenhagen, 2011.
- _____ *Innovation Habitats and Regional Development driven by the Triple Helix: perspectives from a South American School of Thought and Action*. Proceedings 9th Triple Helix International Conference, Stanford University, 2011.

[2] See:
- TOWNSEND, A. et al. *The Next Twenty Years of Technology-Led Economic Development*. Institute for Future, 2009: www.iftf.org/files/deliverables/SR-1236%20Future%20Knowledge%20Ecosystems.pdf
- US National Research Council: *Understanding Research, Science and Technology Parks: Report of a Symposium*, 2009: www.nap.edu/catalog/12546.html

[3] www.iasp.ws, access in December 2002

In Brazil, for example, some state policies designed to support STPs require the park to own or to be legally responsible for a glebe with a minimum of several hectares.[4]

This kind of exigency would eliminate *Porto Digital* – the host of the 30th IASP World Conference - of the Brazilian STPs since its physical basis is formed by buildings, mostly owned by third parties relatively to the Governance, spread in the urban tissue, similarly to other STPs in the world, as the *Chicago Technology Park*, *Kista Science City* and *Lyon Biopôle Gerland*.[5]

The lack of an adequate conceptual framework for *Innovation Habitats* may hinder the transformation of the urban tissue in ambiences that are more innovation prone. In fact, initiatives such as *Porto Digital* and *Medellín Innovation District*[6] do not obey traditional STPs' canons, based on isolated areas at town outskirts and exclusive for high-tech companies.

Furthermore, new formats of *Innovation Habitats* are constantly appearing, such as *Innovation Hubs* and *Living Labs*. This reinforces the perception that *Innovation Habitats* forms a living ecosystem with species whose number and diversity don't cease to grow.

Seeking ways to address these trends, IASP sought the STP community to propose courses of action. Some of the results are:

- In 2012, the association became the *International Association of Science Parks and Areas of Innovation*, acknowledging that STPs are not isolated species but rather a manifestation of a far more complex phenomenon, encompassing a whole bunch of *Innovation Habitats* (or *Areas of Innovation, or Communities of Innovation);*
- In its website, instead of a definition for STPs, IASP states:[7]

  "Areas of Innovation, of which STPs are a highly specialized type, play a key role in the economic development of their environment. Through a dynamic and innovative mix of policies, programs, quality space and facilities and high value-added services, they:

  - Stimulate and manage the flow of knowledge and technology between universities and companies.
  - Facilitate the communication between companies, entrepreneurs and technicians.
  - Provide environments that enhance a culture of innovation, creativity and quality.
  - Focus on companies and research institutions as well as on people: the entrepreneurs and 'knowledge workers'.
  - Facilitate the creation of new businesses via incubation and spin-off mechanisms, and accelerate the growth of small and medium size companies.
  - Work in a global network that gathers many thousands of innovative companies and research institutions throughout the world, facilitating the internationalization of their resident companies."

Within this context, the 30th IASP World Conference offers a singular opportunity for debating the evolution of STPs in response to challenges brought by recent trends related to *Innovation Habitats*.

To pave the way for fruitful debates, the participants of the virtual workshop advocate that an adequate conceptual framework for the *Innovation Habitats* is urgently needed. A proposition on this subject follows.

---

[4] See:
- Programa Gaúcho de Parques Científicos e Tecnológicos: Decreto nº 46.840/2009: www.legislacao.sefaz.rs.gov.br/Site/Document.aspx?inpKey=169386&inpCodDispositive=&inpDsKeywords=46840
- Sistema Paulista de Parques Tecnológicos: www.desenvolvimento.sp.gov.br/cti/parques

[5] www.portodigital.org; www.techpark.com; www.kista.com, www.techlyongerland.prd.fr

[6] See:
- www.portodigital.org;
- www.rutanmedellin.org/actualidad/Paginas/un_distrito_tecnologico_para_la_ciudad_del_conocimiento_2_150113.aspx

[7] www.iasp.ws/web/guest/the-role-of-stps-and-innovation-areas;jsessionid=50f9dbab292600a5ec0251b97bbe

## III. *Innovation Habitat* concept

It is assumed that:

a) Innovation processes can occur in all fields of human activities, and can impact the society as a whole, involving its political, cultural and economic fields.
b) In the case of technology-based sectors, the innovation process starts with the generation of knowledge and intellectual capital at local level, continues through their amalgamation with homologous ones generated elsewhere in order to engender products and ventures oriented (ideally) to improve the population's welfare and quality of life, and culminates with their success in the market (ideally respecting socially responsible approaches).
c) An *Innovation Habitat* is an environment and circumstances that favor innovation processes and whose main attributes are indicated in Table 1.

**Table 1.** Main attributes of an *Innovation Habitat*

| | |
|---|---|
| **Objectives** | ▪ Generate sustainable local and regional capacity for innovation in all areas;<br>▪ Contribute to:<br>❑ Built a sustainable, socially responsible and globally competitive local and regional development process;[8]<br>❑ Overcome global critical challenges, in special through Global Partnership for Development, one of the *UN Millennium Project Goals*.[9] |
| **Physical Basis** | The geographic space in which the participants develop their activities. |
| **Participants** | Actors of innovation, in especial Government, Academia, Business, and Civil Society Organizations,[10] that complement and reinforce each other's actions. |
| **Governance** | A structure of governance is in place and is active.[11] |
| **Services** | The Governance provides to participants (or offers through third parties) services such as:<br>▪ Mechanisms that promote synergy and networking of participants between themselves and with counterparts elsewhere and with the market;<br>▪ Access to cooperative R&D projects, R&D advanced laboratories, technologies and expertise made available by innovation actors;<br>▪ Access to plots of land, built areas, and infrastructure of quality;<br>▪ Support on matters such as technical, managerial, juridical, financial and commercial aspects. |
| **Creation and development of enterprises.** | The Governance promotes, within the Physical Basis:<br>▪ Development of the entrepreneurship culture;<br>▪ Creation and development of knowledge-based companies, primarily from technology and intellectual capital provided by regional innovation actors;<br>▪ Attraction, installation and development of R&D centers, universities, technical schools, and high-tech production lines from other regions or countries;<br>▪ The development and attraction of venture capitalists. |
| **General conditions.** | The Governance promotes the general requirements for the success of *Innovation Habitats*, such as high level of education, outstanding scientific and technology capacity, excellence of services, high quality of life, liberty of expression, adequate legal substrate and business ambiance, easy and fruitful dialog government-academy-enterprises, and commitment to the destiny of the *Innovation Habitat* and of the country.[12] |

[8] This means, among other aspects, the creation of working posts in all levels, especially in knowledge-based sectors.
[9] www.unmillenniumproject.org
[10] World Bank: Civil Society Organizations include Non-Governmental Organizations, trade unions, faith-based organizations, indigenous peoples movements, foundations and many other: www.worldbank.org
[11] PORTER, M. *Cluster and the New Economics of Competitions*, Harvard Business Review, Nov. – Dec. 1998
[12] See:
- ACEMOGLU, D., et al. *Why Nations Fail*. New York: Crown Publishing Group, Randon House, 2012
- SENOR, D.; et al. *Start-up Nation: The Story of Israel's Economic Miracle*. New York: Hachette Book, 2009
- SPOLIDORO, R. et al. *Parque Científico e Tecnológico da Pontifícia Universidade Católica do Rio Grande do Sul - TECNOPUC*. Porto Alegre: EDIPUCRS, 2008

## III. Main categories and subsets of *Innovation Habitats*

It is assumed that, nowadays, the main categories and subsets of *Innovation Habitats*, hierarchized in function of the complexity of the Governance, are those shown in Table 2 and in Figure 1.

**Table 2. *Innovation Habitat* Categories and Subsets**

| Category | Peculiar attributes | Main Subsets | Examples |
|---|---|---|---|
| **Technopolis** | ▪ Participants: innovation actors located in the Physical Base regardless the existence of a contract with the Governance.<br>▪ Physical Base: a town or a Metropolitan Region.<br>▪ Governance: an entity,[13] or a joint effort of community organizations.[14] | **Innovation Region** | ▪ Rennes Technopole<br>▪ Rhein-Neckar Metropolitan Region<br>▪ Pato Branco Tecnópole<br>▪ Silicon Valley[15] |
| | | **Science City Smart City[16]** | ▪ Birmingham Science City<br>▪ Lyon Smart City [17] |
| **Sector Cluster, or Pole** | ▪ Participants: interconnected companies with close supply links, service providers, and related industries and institutions located in the Physical Base, regardless contracts with the Governance.[18]<br>▪ Physical Base: may transcend towns or a Metropolitan Regions. | **Supra-regional Pole** | ▪ French Pôles de Compétitivité<br>▪ Polo Genética Bovina de Minas Gerais[19] |
| | | **Regional Pole** | ▪ BioRN — Biotech Pole Rhein-Neckar<br>▪ IT Caxias do Sul Pole<br>▪ IT Buenos Aires Pole Association<br>▪ Santa Rita Sapucai Technology Polo, Brazil<br>▪ Polo Tecnologico Rosario, Argentina[20] |
| | | **Local Pole** | ▪ French Pôles d'Excellence[21] |
| **Innovation Networks** | ▪ Participants: professionals and groups in institutions located in the Physical Base, acting under contract with the Network Governance.<br>▪ Physical Base: may have global dimensions.<br>▪ The participants remain in their home institution, and use the Web and other means aiming to collaborate.[22] | **Network of Competence** | ▪ Brazilian Institutes of Science and Technology Program<br>▪ European Business & Innovation Centre Network<br>▪ European Network of Open Living Labs (Figure 1)[23] |
| | | **Virtual Innovation Incubator or Park** | ▪ Paraná Virtual Innovation Park[24]<br>▪ CONNECT Bogotá - Región[25] |

[13] www.rennes-atalante.fr; www.pbtec.org.br
[14] As in Silicon Valley and Greater Boston: [STURGEON, T. J., 2000]
[15] www.rennes-atalante.fr; www.m-r-n.com/en/home.html; www.pbtec.org.br; www.jointventure.org
[16] A Science City or a Smart City becomes a Technopolis when its Physical Basis encompasses the whole town: www.eu-smartcities.eu
[17] www.birminghamsciencecity.co.uk; www.business.greaterlyon.com/lyon-smart-city-france-europe.346.0.html?&L=1
[18] PORTER, M. Cluster and the New Economics of Competitions, Harvard Business Review, Nov. – Dec. 1998
[19] www.competitivite.gouv.fr; http://excelenciagenetica.simi.org.br
[20] www.biorn.org/biorn-cluster; www.poloitbuenosaires.org.ar; www.trinopolo.com.br; www.valetronica.com.br; www.polotecnologico.net/index.cgi
[21] http://echogeo.revues.org/11798
[22] http://en.wikipedia.org/wiki/Collaborative_innovation_network;
[23] http://estatico.cnpq.br/portal/programas/inct/_apresentacao/docs/livro.pdf; http://eit.europa.eu/kics; www.ebn.be; www.openlivinglabs.eu
[24] www.aen.pr.gov.br/modules/noticias/article.php?storyid=71954&tit=Workshop-valida-conceito-do-Parque-Tecnologico-Virtual
[25] www.connectbogota.org

| | | | |
|---|---|---|---|
| **Technology Parks** | ▪ Participants: enterprises and other innovation actors located in built up areas physically near to each other, within the Physical Base, acting under contract with the Governance.<br>▪ Physical Base: may take many formats: an exclusive tract of land, buildings scattered in the urban tissue, and several areas disseminated in the territory. | **Park of Science and Technology, Innovation Park, Innovation Districts, Smart Cities**[26] | ▪ Sophia Antipolis, France<br>▪ Research Triangle Park, US<br>▪ Parque Tecnológico São José dos Campos, Brazil<br>▪ Parque Tecnologico Misiones, Argentina<br>▪ Zonamerica, Uruguay<br>▪ Porto Digital, Recife, Brazil<br>▪ Kista Science City, Sweden[27] |
| | | **Industrial Innovation Parks**[28] | ▪ Plankstadt Industrial Park, Germany<br>▪ Parque Industrial Cántabrica, Argentina<br>▪ Techno Park Campinas, Brazil[29] |
| **University - driven Research Parks** | ▪ Participants: enterprises and other innovation actors located in built up areas, physically near to each other, within the Physical Base, under contract with the Governance.<br>▪ Physical Base: may take many formats (see above) and generally is owned by a university or research institution.<br>▪ Priority for admission: start-ups and spin-offs stemming from academic activities, and participants of cooperative R&D projects congregating the university or the R&D institution.[30] | **Research Parks owned and run by a university or a public R&D institution** | ▪ Tecnopuc, Brazil<br>▪ Purdue Research Park, US<br>▪ Universidad Nacional de Colombia Research Park[31] |
| **Innovation Ateliers**[32] | ▪ Participants: researchers from different institutions that temporarily join an R&D cooperative project focusing on strategic subjects.<br>▪ Projects: have well defined goals and deadlines; though temporary, may engender an institution.[33]<br>▪ Physical Base: existing facilities or refurbished buildings in a town. | **Innovation Hubs** | ▪ Philadelphia Energy Innovation Hub, US[34] (Figure 2)<br>▪ Norbbic Subsea Index, Vitoria, Brazil[35] |
| | | **Innovation Communities** | ▪ Knowledge and Innovation Communities, European Institute of Innovation and Technology[36] |
| | | **LivingLabs** | ▪ MIT Living Labs, US[37] |

[26] A Smart City or a Science City is a STP when its Physical Basis is within a part of a town: inspired on www.eu-smartcities.eu
[27] www.sophia-antipolis.org; www.rtp.org; www.pqtec.org.br; www.ptmi.org.ar; http://web.zonamerica.com; www.portodigital.org; www.kista.com
[28] Industrial districts that increasingly host knowledge-based companies with R&D activities along with manufacturing ones.
[29] www.biorn.org/servicesactivities/biorn-real-estate/plankstadt-industrial-park.html; www.moron.gov.ar/pde/proyectos/cantabrica; www.technopark.com.br
[30] SPOLIDORO, R. et al. *Parque Cientifico e Tecnológico da Pontifícia Universidade Católica do Rio Grande do Sul - TECNOPUC*. Porto Alegre: EDIPUCRS, 2008
[31] www.pucrs.br; www.ucs.br; http://purdueresearchpark.com; www.unal.edu.co/extensionbog/adjuntos/presentaciones/16.pdf; www.austral.edu.ar
[32] See: www.technologyreview.in/energy/41556/; www.energy.gov/hubs
[33] Berkeley Lab's Solar Energy Research Center, Joint Center for Artificial Photosynthesis, US DOE Energy Innovation Hub for Fuels from Sunlight: http://newscenter.lbl.gov/news-releases/2012/10/19/berkeley-lab-breaks-ground-on-new-solar-energy-research-facility
[34] http://energy.gov/articles/energy-innovation-hub-report-shows-philadelphia-area-building-retrofits-could-support-23500
[35] Innovation Hub to develop the Subsea Index, Norway-Brazil Business and Innovation Agreement: www.ifes.edu.br/noticias/3875-ministro-da-educacao-recebe-demanda-de-polo-de-inovacao-no-ifes
[36] http://eit.europa.eu/kics
[37] http://livinglabs.mit.edu

| | | | |
|---|---|---|---|
| **Innovative Business Support Centers** | ▪ Participants: knowledge-based startups and spin-offs, and people and companies interested in developing new products or business, acting under contract with the Governance. | **Business and Innovation Centers** | ▪ European Business and Innovation Centers<br>▪ HABITAT - Biominas[38] |
| | | **Incubators, Accelerators** | ▪ Start You Up Vitória, ES, Brazil<br>▪ Incubadora de Empresas - Universidad Nacional de Asunción, Paraguay[39] |

Fig.1. The *European Network of Open Living Labs* has a Physical Basis that encompasses the planet.[40]

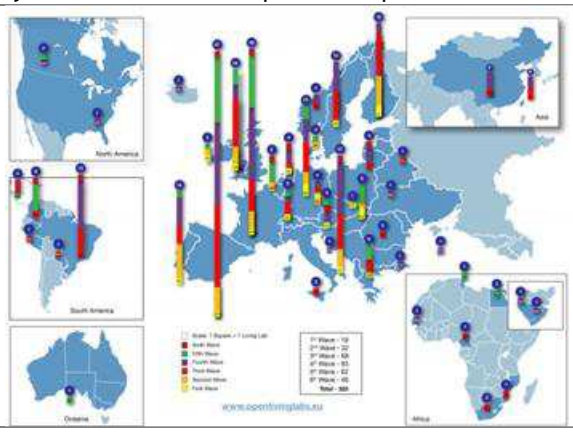
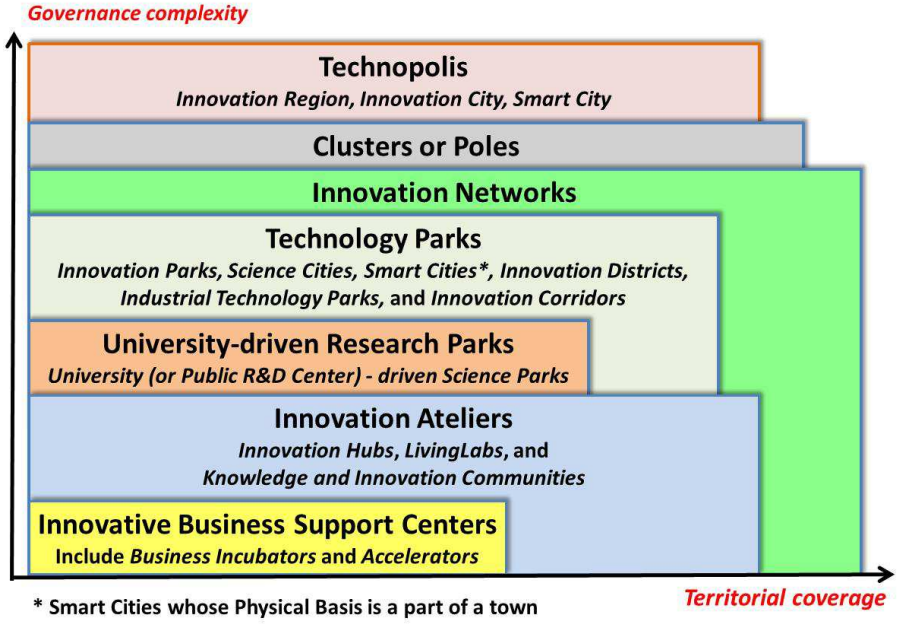


Fig. 2. The *Energy Efficiency Buildings Innovation Hub* uses buildings of the Philadelphia Navy Yard, a 1,200 acre (nearly 5 km$^2$) area which was an important naval shipyard for over a century.[41]

The information content of Table 1 allows the graphic representation shown in Figure 3.

**Figure 3**

***Innovation Habitats*: main categories and hierarchy**




[38] www.incubadorahabitat.org.br
[39] www.startyouup.com.br; www.incuna.una.py
[40] www.openlivinglabs.eu
[41] http://energy.gov/articles/energy-innovation-hub-report-shows-philadelphia-area-building-retrofits-could-support-23500; www.navyyard.org/

## IV. Main findings

Based on the proposed conceptual framework, the participants of the *virtual workshop* analyzed the evolution of STPs in South America in response to challenges brought on by the mentioned new trends and scenarios. The main findings are summarized below.

### IV.1. Private Developers

Private developers are increasingly providing real estate and added-value services for STPs tenants (Figures 4 to 7). Traditional launchers of STPs in South America (universities, research institutions, government, and industry associations) hereinafter may focus on setting strategies and overseeing the initiative development rather than on providing real state and services for tenants. Their effort will therefore be concentrated on actions such as:

- Improving public-private partnerships (as the strategy of *Labège Innopole* in the 1980's);[42]
- Encouraging, in the region, the development of an *Innovation Habitat Ensemble*, ideally counting on the whole spectrum of these habitats;
- Preventing oversimplifications of the philosophy underlying STPs, especially regarding their unique role on promoting the daily synergy of regional innovation actors based on multi-sectorial, trans-disciplinary, and multi-institutional approaches;
- Perfectioning the Governance structure of STPs through approaches as hiring private companies to carry out executive tasks (as *Cambridge Science Park* since the 1970's);[43]
- Fostering the amelioration of the business environment and the entrepreneurial culture;
- Networking regional innovation actors to counterparts in other regions and countries.

Fig. 4. *The Cambridge Innovation Center*[44]

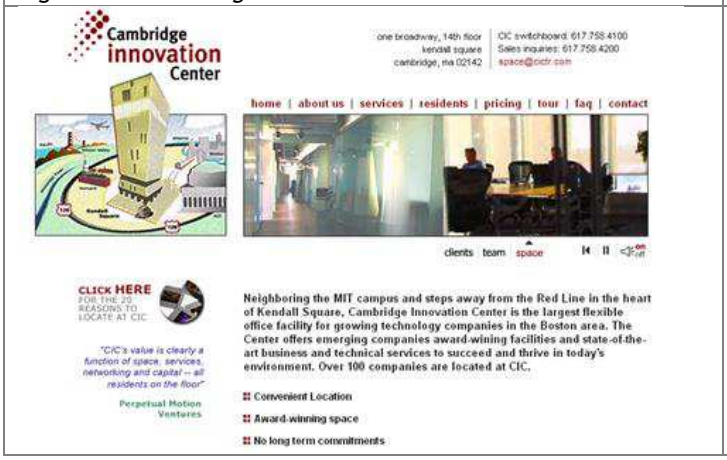



Fig. 5. Cummings Properties[45]


[42] www.sicoval.fr
[43] www.cambridgesciencepark.co.uk
[44] www.cictr.com
[45] www.cummings.com

Fig. 6. STPs developed by private companies: *Johns Hopkins*, US[46] (left photo); *Zonamerica Innovation Park*, Uruguay[47] (center), and *Parque Tecnológico Acate*, Brazil [48] (right).



Fig. 7. *Parque Eco Tecnológico Dahma*, Brazil, developed by a private company.[49]


## IV.2. Boundaries fade away

Boundaries between categories of *Innovation Habitats* fade away, allowing an increasing overlap of functions:

- Besides private developers, *some Innovation Habitat* categories, local governments, and even spontaneous movements are increasingly offering real-state and value added services to knowledge-based companies and to R&D institution, as illustrated by *Eurogarden Park, Heidelberg Bahnstadt, Quartier de l'Innovation Montréal, Boston's Innovation District,* and *Bogotá Urban Technology Park*.[50] Since the provision of the mentioned items was a hallmark of *Technology Parks*, possibly these initiatives, in the near future, will have to be reinvented.
- Some *Innovation Ateliers* began to perform as *Technology Parks* or *Research Parks*, as exemplified by *Manaus Innovation Center* - CIDE (Brazil),[51] and *Philadelphia Energy Efficient Buildings Hub* (US).[52]
- On the other hand, some *University-driven Research Parks* may coalesce as *Innovation Ateliers* amalgamated to *Innovative Business Support Centers* due to factors such as the limited area available to expand those parks, combined with the need to support startups that are continuously stemming from the academic activities. This trend seems to be a hallmark of the *3rd Generation of University - driven Research Parks*.[53]

[46] www.forestcityscience.net/
[47] http://web.zonamerica.com/
[48] http://tisc.com.br/entidades/florianopolis-ganha-novo-parque-tecnologico/
[49] www.damha.com.br; www.parqueecotecnologico.com.br
[50] www.gazetamaringa.com.br/online/conteudo.phtml?tl=1&id=1247305&tit=Projeto-para-construcao-do-Centro-Civico-preve- urbanizacao-do-aeroporto-antigo; http://heidelberg-bahnstadt.de; http://quartierinnovationmontreal.com/en/discover-qi/; www.innovationdistrict.org
[51] www.cide.org.br
[52] http://energy.gov/articles/energy-efficient-buildings-hub
[53] See: ALLEN, J. *Third Generation Science Parks*. Manchester Science Park, 2007: www.mdew.co.uk; and CONDOM, P. *Parques científicos y biotecnología*. In *Estado de la Biotecnología, Biomedicina y Tecnologías Médicas en Cataluña*, Barcelona: Biocat, 2011: www.biocat.cat

## IV.3. STPs in the urban tissue

It is well known that STPs are no longer limited to traditional models (based on a campus-like area, at the town periphery and exclusive for high-tech enterprises and R&D centers), and that STPs are increasingly being integrated to the urban tissue aiming to fully enjoy the amenities of the city and its innovation prone ambience.

Many of these manifestations, based on refurbishing deactivated buildings in abandoned or degraded urban areas, are attracting knowledge-based companies and R&D centers,[54] especially in sectors as Information and Communication Technology, and Creative Industries (Figures 8 to 22).

Fig. 8. *Heidelberg Bahnstadt*,[55] Germany (left), and *Eurogarden Park*,[56] Maringá, Brazil, are *Urban Innovation Parks*. Both will have R&D centers, *Innovation Ateliers*, knowledge-based industries, hotels, residential and recreational areas, shopping center, restaurants, and theatres. Both count on the participation of private developers.



Fig. 9. *Porto Digital*, Recife, Brazil, initially bounded to the island where the town was founded, is being expanded to the continent.[57]

Fig. 10. *Porto Maravilha*, Rio de Janeiro, transforms old docks area in an *Urban Innovation Park*. A 19th century deactivated industry building hosts an innovation center of a worldwide renowned software company (right photo).[58]

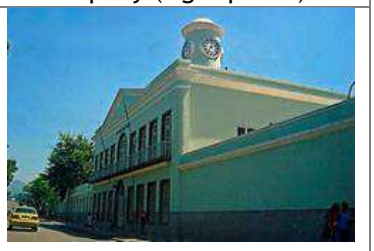



Fig. 11. *22 @ Barcelona*, Barcelona, Spain[59]

Fig. 12. *Technopôle Lyon-Gerland*, France[60]

Fig. 13. *Chicago Technology Park*, US[61]

[54] www.webdig.com.br/16037/microsoft-centro-inovacao-brasil/#ixzz2EWOOunoS
[55] http://heidelberg-bahnstadt.de
[56] www.gazetamaringa.com.br/online/conteudo.phtml?tl=1&id=1247305&tit=Projeto-para-construcao-do-Centro-Civico-preve-urbanizacao-do-aeroporto-antigo
[57] www.portodigital.org
[58] http://portomaravilha.com.br; www.webdig.com.br/16037/microsoft-centro-inovacao-brasil/#ixzz2EWOOunoS
[59] www.22barcelona.com
[60] www.techlyongerland.prd.fr
[61] www.techpark.com

Fig. 14. *Area Tecnologica NODO*, Rosario, Argentina, transforms a quarter in an *Urban Innovation Park*. [62]

Fig. 15. *Innobo -Tec*, Bogotá, Colombia, intends to transform an axis of the city in an *Urban Innovation Park*.[63]


Fig. 16. Buenos Aires, Argentina, develops *Urban Innovation Parks* scattered in the tissue of the town, often based on refurbished deactivated industry plants.[64] The *Centro Metropolitano de Diseño*, in the *Distrito de las Artes*, uses a renovated manufacturing plant (right photo).[65]

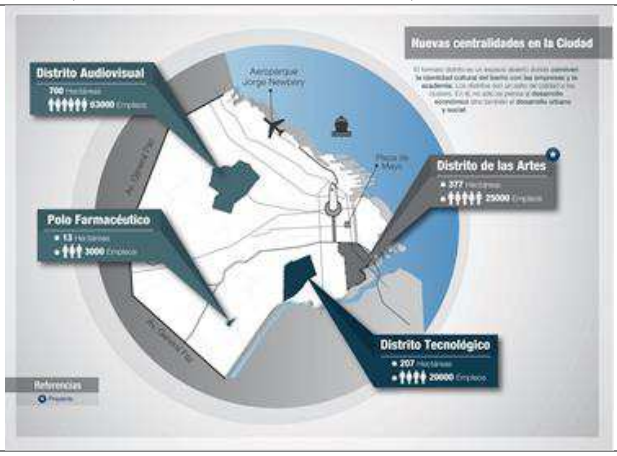



Fig. 17. Montreal, Canada, sets up an *Urban Innovation Park* at the heart of the city.[66]

*Fig. 18. Boston Innovation District*, in US, intends to invigorate the industrial South Boston Waterfront.[67]


[62] www.atnros.com.ar
[63] ACOSTA. J. *Ciudades de América Latina en la Sociedad del Conocimiento.* Bogotá: Colciencias, 2009; www.jaimeacostapuertas.blogspot.com
[64] www.buenosaires.gob.ar
[65] http://estatico.buenosaires.gov.ar/areas/produccion/promocion_inversiones/distrito_tecnologico/graficos/zonigr.jpg
[66] http://quartierinnovationmontreal.com/en/discover-qi/
[67] www.innovationdistrict.org

Fig. 19. *Praça das Artes*, São Paulo, Brazil, intends to transform the heart of the city in an *Urban Innovation Park* focusing on Creative Industries.[68]


Fig. 20. Santiago, Chile, sets up an *Urban Innovation Park* in the urban tissue. A deactivated industry building will host a center of performing arts.[69]

Fig. 21. *London's Tech City* began with IT companies scattered in the urban tissue. Now, it encompasses a meandering 7-mile section of the town.[70]


Fig. 22. *Curitiba Tecnoparque*, Brazil. It was planned as a STP scattered in the urban tissue (grey in the map); nowadays the Park encompasses the whole town.[71]


## IV.4. *Local Segments* scattered in the territory

Besides spreading in the urban tissue, STPs are also being formed through the combination of areas scattered in the territory, hereinafter called *Local Segments*. Each *Local Segment* often encompasses a concentration of innovation assets (Figures 23 to 31).

This approach requires a strong articulation between Government, Academy, Business, and Civil Society Organizations aiming to define a territorial zoning conducive to a fruitful synergy of the innovation actors, as well as to offer better conditions for the creation, attraction, installation and development of knowledge-based companies and R&D centers.

[68] Folha de São Paulo, 4 dezembro 2012, pagina E4
[69] www.mibarrioitalia.cl
[70] www.bostonglobe.com/business/2013/02/06/london-growing-tech-hub-looks-kendall-square-capture-mit-magic/...
[71] www.agencia.curitiba.pr.gov.br; www.gazetadopovo.com.br/economia/conteudo.phtml?id=1274741&tit=Curitiba-vira-Tecnoparque

This articulation is particularly requested in regions where there are knowledge-based and innovative companies scattered in the territory, created before the inception of the STP and that have their R&D divisions adjacent to the production lines. Interviews conducted by the authors with founders and CEOs of those companies suggest that:

- Many of the companies are not prone to send off their R&D divisions to a STP that has been created nearby since the move is expansive and could break a tradition of complementarity between corporative R&D and manufacturing activities.

- Some of the companies may set up R&D laboratories related to emerging sectors in a *University-driven Research Park* provided there is a perspective of a fruitful synergy between the involved institutions.

- Emergent high-tech companies, in which there is a strong interaction between R&D and production activities, may move to a *Technology Park* or a *University-driven Research Park* to fully benefice from the possible synergy between the enterprise, academy and interrelated companies.

*Fig. 23. Manchester Science Park*, UK, has several *Local Segments*.[72]

|  |  |  |  |
|---|---|---|---|
| Science Park | Technopark | Central Park | Innovation Park |

Fig. 24. *VALETEC Park*,[73] Brazil, has *Local Segments* scaterred in the Sinos Valley, Rio Grande do Sul state:

- Segment 1 (left photo), with 100 hectares, hosts the Central Building and some knwoledge-based companies;
- Segment 2 (center) encompasses a corredor with innovative companies established before the inception of the Park, with R&D divisions along with their production lines;
- Segment 3 (right) in the urban tissue of Novo Hamburgo town; hosts mostly IT companies.

(Photos: R. Spolidoro, VALETEC, jornalpolegar.blogspot)[74]



[72] www.manchestersciencepark.co.uk
[73] www.valetec.org.br
[74] http://jornalpolegar.blogspot.com.br/2011/11/hamburgtec-e-nova-referencia-em.html

Fig. 25. *Technologiepark Heidelberg*, Germany, has three *Local Segments*.[75]

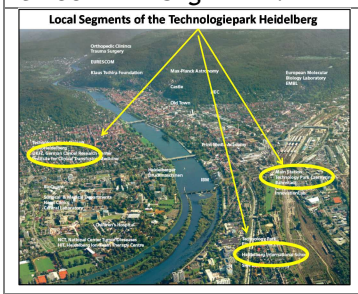


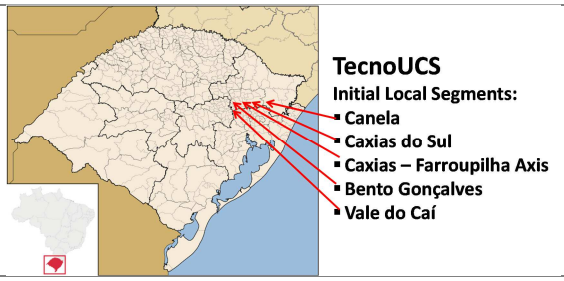

Fig. 26. *Purdue Research Park*, US, has four *Local Segments*. [76]


Fig. 27. *Technology Park of Rennes Technopole*, France, has several *Local Segments*.[77]


Fig. 28. *TecnoUCS*: Caxias do Sul Region Community University *Science, Technology and Innovation Park*, Brazil.[78]

- The Physical Base is formed by *Local Segments* scattered in a 20,000 km² region, centered on UCS' campuses and near knowlwedge-based and innovative industries.
- Many of these industries were created in the region in the second half of the 20th century, have their R&D unities along with manufacturing lines, and conquered global presence.
- TecnoUCS, counting on science and technology competences of UCS and other education and research actors, helps regional companies to improve their products and to accelerate their entry into emerging advanced knowledge-based sectors.

This case reinforces the importance of adequate strategies to design and develop *Innovation Habitats* adeherents to the needs and potentialities of each region.




Some knowledge-based and innovative companies created and located in Caxias do Sul region.
Photos: Fras-le, Randon, Marcopolo[79]

[75] www.technologiepark-heidelberg.de
[76] http://purdueresearchpark.com
[77] www.rennes-atalante.fr/pole-mer-bretagne.html
[78] www.ucs.br
[79] www.randon.com.br/a/companies/empresas-randon/fras-le; www.randon.com.br; www.marcopolo.com.br

Fig. 29. *Uberaba Technology Park*, Uberaba, MG, Brazil.[80] Local Segment 1 (left photo) is close to downtown and encompasses areas of government agricultural research corporations.[81] Segment 2 (center and right) encompasses a corridor called *Bio Rota* which hosts several innovative companies related to bovine genetics that need plots of land with relative large dimensions.
(Photos: Prefeitura Uberaba, Alta Genetics, Geneal)

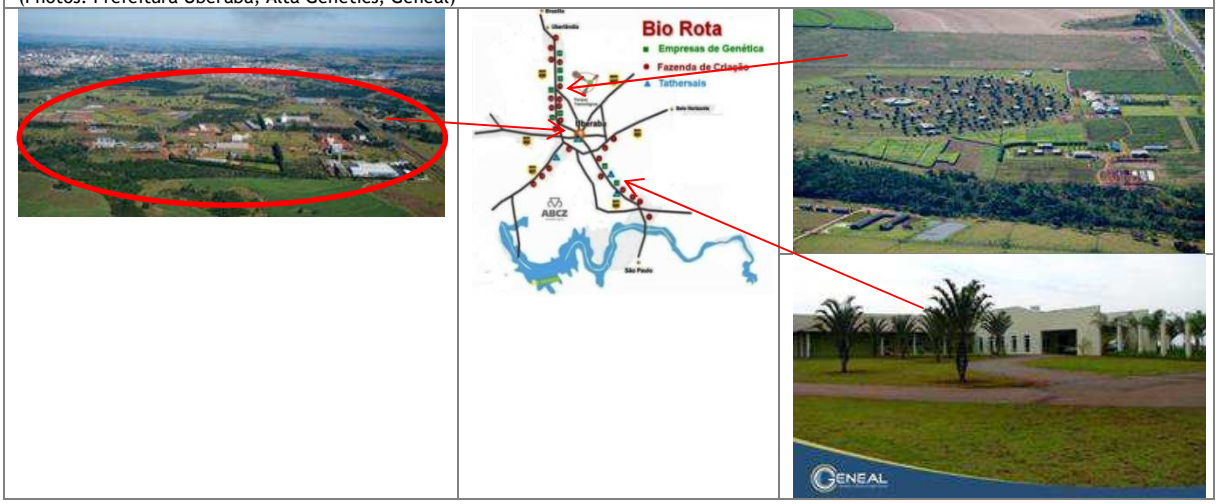



Fig. 30. Pato Branco is a 75,000 inhabitants town in Brazilian inland. *Pato Branco Tecnology Park* has several *Local Segments* (left photo). *Segment CETIC* (beneath photo) and *Segment FAZTIC* (center) are adjacent to Paraná Federal Technology University at Pato branco. The *Urban Segment* (right photo) hosts several knowledge-based companies.[82]

Photo UFTPR 2007

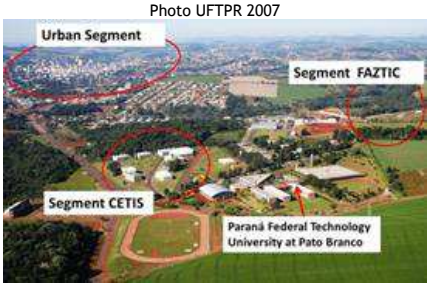


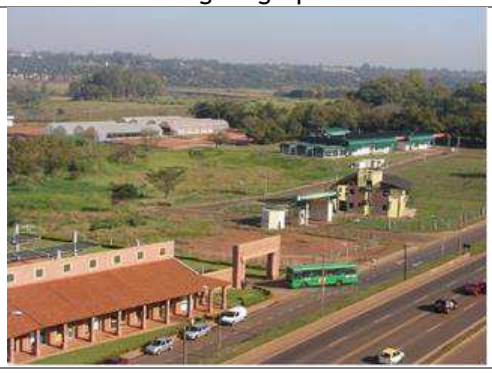

Photo Adriano Oltramari, 2012

Photo: R. Spolidoro


Local Segment CETIS. Photo: R. Spolidoro

[80] SPOLIDORO, R. et al. *Ambientes de inovação e empreendedorismo no Agronegócio: o caso do Parque Tecnológico Uberaba*. Anais XX Seminário Nacional ANPROTEC, Campo Grande, 2010
[81] EMBRAPA: Brazilian Agricultural Research Corporation: www.embrapa.br/english; and EPAMIG: Minas Gerais Agriculture Research Company www.epamig.br
[82] www.pbtec.org.br

Fig. 31. *Misiones Technology Park*, Argentina, has three *Local Segments* in Misiones Province, encompassing the main campi of the Misiones National University - UNaM. *Posadas Segment* (right photo) encompasses areas of UNaM and of Instituto Nacional de Tecnología Agropecuaria - INTA. [83]

## IV.5. *Industrial Districts* are becoming *Technology Parks*

*Industrial Districts* and *Industrial Parks* increasingly host knowledge-based companies, many of whom have R&D activities along with their manufacturing lines. This trend reinforces the fading away of boundaries between *Technology Parks* and former *Industrial Districts*.

Knowledge-based companies stemming from academic activities and located in *University-driven Research Parks* may be asked to leave the site due to limitations of physical area in the university campus or adjacent to it. A possible new location for the companies is a nearby *Industrial District* offering attractive conditions, such as affordable refurbished industry buildings. This trend is illustrated *mutatis mutandis* by the initiatives in Figures 32 and 33, as well as by *Plankstadt Industrial Park*, Germany.[84]

**Fig. 32.** *Parque Industrial la Cantábrica*, Buenos Aires Province, Argentina,[85] began as a metallurgical industry in 1902. It was closed down in 1992. From 1994 on, the premises were refurbished and began to host small and medium sized companies, many of them focusing on knowledge-based sectors and having their R&D unities along with their production lines.

Metallurgical industry Cantábrica, first half of 20th centrury.[86]

*Parque Industrial la Cantábrica* nowadays.[87]

[83] www.ptmi.org.ar; inta.gob.ar
[84] www.biorn.org/servicesactivities/biorn-real-estate/plankstadt-industrial-park.html
[85] www.moron.gov.ar/pde/proyectos/cantabrica
[86] www.goodfood.com.ar/plantaindustrial_br.html
[87] See:
- www.moron.gov.ar/pde/proyectos/cantabrica
- STUPENENGO, S. *La Cantabrica: De Industria Testigo a Parque Pyme*, Buenos Aires: Epica, 2009

Fig. 33. *Distrito Industrial Cachoeirinha*, Porto Alegre Metropolitan Region, Brazil, hosts several knowledge-based companies that have their R&D unities along with their production lines,[88] as well as companies in low-tech sectors that are adding science, technology, and innovation to their products and processes.[89]



### IV.6. Conventional STP model

In South America, traditional model of Technology Parks are also being implemented, counting on partnerships of government, academia, business, and civil society organizations, as illustrated by *Sapiens Park*, and *Sorocaba Technology Park* (Brazil), *Guatiguará Technology Park*, Bucaramanga (Colombia), and *Parque Tecnológico del Litoral Centro*, Santa Fé, Argentina.[90]

### IV.7. Research Parks driven by universities

South American universities - mainly the public, the community ones,[91] and the Catholic universities[92] - are increasingly developing *University-driven Research Parks* as part of the institution strategy to become an *entrepreneurial university*,[93] that is to say, an institution with a great capacity to innovate in all domains, able to respond to the challenges of the Knowledge-based Society and to contribute significantly for a sustained, socially responsible and globally competitive regional development process.

Each of these *Research Parks* may transit to become a *Technology Park with Local Segments scattered in the territory*.[94] This transition may allow bringing together a larger number of innovation actors and overcome physical area limitations that may hamper the performance of the *University-driven Research Parks*.

Many of the South American *University-driven Research Parks*, such as *Tecnopuc*, and *Rio de Janeiro Technology Park* (Brazil), *Austral University Science and Technology Park* (Argentina), and *Umbría Science and Technology Park* (Colombia),[95] illustrated in Figures 34 to 38, have characteristics similar to worldwide homologous initiatives.

[88] www.parks.com.br/site/pt/empresa-historico.php
[89] www.fallgatter.com.br/empresas/metalmecanica
[90] www.sapiensparque.com.br; www.empts.com.br; http://gtechpark.com/who.htm; www.ptlc.org.ar
[91] A *Regional Community university* is a private university run by a civil society organization that represents the people and relevant institutions of the respective region. There are several of these universities in Brazilian Southern states: www.comunitarias.org.br and http://portal.mec.gov.br/dmdocuments/comung_acafe.pdf
[92] A *Catholic university* is a private university run by the Catholic Church or by Catholic institutes. Those with closer ties to the Holy See are called *pontifical universities*: http://en.wikipedia.org/wiki/Catholic_university
[93] AUDY, J. N. et al. *Innovation and Entrepreneurialism in University*. Porto Alegre: EDIPUCRS, 2006.
[94] ALLEN, J. *Third Generation Science Parks*. Manchester Science Park, 2007: www.mdew.co.uk
[95] www.pucrs.br; www.parquedorio.ufrj.br; www.usbcali.edu.co; www.parqueaustral.org

Fig. 34. *Austral University Science and Technology Park*, Argentina.[96]

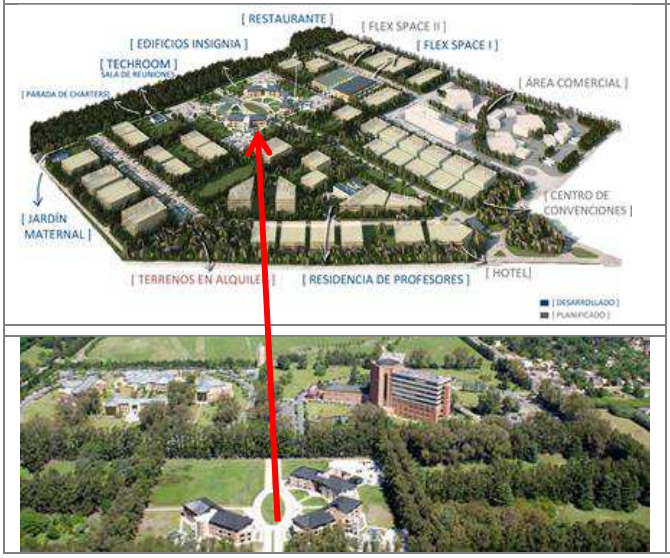



Fig. 35. *Rio de Janeiro Federal University Science and Technology Park* (Parque Tecnológico do Rio de Janeiro), Brazil. [97]

Fig.36. *Rio Grande do Sul Pontifical Catholic University Science and Technology Park*, Tecnopuc, Porto Alegre, Brazil[98] (Photo: R. Spolidoro)

Fig. 37. *Parque Tecnologico de la Umbría - Universidad de San Buenaventura*, Cali, Colombia[99]


Fig. 38. *Polis de Tecnologia*, Campinas, SP, Brazil, is an *R&D Center - driven Research Park* [100] owned and run by a private foundation. The center was created in the 1970's by the Brazilian Government's Telecommunication Holding Company, which was privatized in the 1990's.
(Photos: CPqD, R Spolidoro)

[96] www.parqueaustral.org
[97] www.parquedorio.ufrj.br; and http://ambipetro.com.br/investimentos-realizados-no-parque-tecnologico-do-rj-chegam-a-r-1-bi/
[98] www.pucrs.br
[99] www.usbcali.edu.co
[100] www.cpqd.com.br; www.desenvolvimento.sp.gov.br/noticias/?ID=1527

Additionally, one observes remarkable new models of *University – driven Research Parks* in South America, such as the *Amazonas Federal University Science and Technology Park*,[101] and the *Tapajós Science and Technology Park* (related to Western Pará Federal University - UFOPA), Brazil.[102]

The *Amazonas Federal University Science and Technology Park*, for example, has *Local Segments* in villages of South-American indigenous population in the Amazon Basin.

- Each Segment, among other objectives, seeks to promote a better identification of traditional knowledge kept alive for millennia by the tribes, and to help indigenous entrepreneurs transforming that knowledge (amalgamated with modern technologies) in socially responsible endeavors: cooperatives, companies, goods and services. The *Science and Technology Park*'s work is done with a deep respect toward the culture of the tribes and their admirable ability to live in communion with nature, and aims to provide conditions to raise the quality of life of the whole population in each region.

- One of the activities supported by *Local Segments* is the improvement of the education of the indigenous population within formats that amalgamates local culture and traditions to modern technologies (Figure 39).

Fig. 39. School Pamáali, part of *Amazonas Federal University Research Park*, São Gabriel da Cachoeira Segment, Brazil.[103]


## IV.8. Social inclusion

South American STPs in general promote social inclusion initiatives in surrounding areas, such as programs conducted by *Porto Digital*, *Itaipu Technology Park*, *VALETEC Park*, *Rio de Janeiro Technology Park*, *Guamá Research Park*, and many others.[104] These programs reflect the conscience that STPs are in debt toward the people that ultimately pay the bill and that a STP will not succeed unless it contributes in all possible ways to open opportunities for the socially excluded population and to upgrade their living condition.

## IV.9. Regional Projects for the Future

STPs and other Innovation Habitats in South America, tuned to their attributes (Table 1), are increasingly promoting the respective '*Regional Project for the Future*'. Each of these projects is a proposition that calls for innovative approaches in all domains aiming to build a sustained, socially responsible, and globally competitive regional development process. This action is in line with homologous ones conducted worldwide by Innovation Habitats (Table 3).

[101] www.protec.ufam.edu.br/component/content/article/21-pctis/361-parque-tecnologico; http://protec.ufam.edu.br/ultimas-noticias/243-sustentabilidade-dos-povos-amazonidas-em-debate;
[102] http://www.ufopa.edu.br/multicampi
[103] www.artebaniwa.org.br/baniwa2.html; http://iilp.wordpress.com/2011/06/21/unesco-aprova-projeto-da-ufam-para-discussao-de-uma-universidade-indigena-no-alto-rio-negro; http://rbaniwa.wordpress.com/category/escola-pamaali/
[104] www.portodigital.org; www.pti.org.br; www.valetc.org.br; www.parquedorio.ufrj.br; www.pctguama.org.br

**Table 3**

| Region | Innovation Habitats | Regional Development Program |
|---|---|---|
| Boston Area, US | Several initiatives | MetroFuture[105] |
| Coventry, Solihull, and Warwickshire, UK | University of Warwick Science Park | Coventry, Solihull and Warwickshire Technology Corridor[106] |
| Huntsville, US | Cummings Research Park | Regional Economic Growth Initiative[107] |
| Misiones, Argentina | Misiones Technology Park | Misiones Project for the Future[108] |
| Santa Maria, Brazil | Santa Maria Federal University Incubator and Santa Maria STP | Santa Maria Development Program[109] |
| SICOVAL Commonwealth of Municipalities, France | Labège Innopole | SICOVAL *Agenda for the Future* [110] |
| *Silicon Valley*, US | Stanford Research Park | Joint Venture: Silicon Valley Network[111] |
| Sinos Valley, Brazil | VALETEC Park | Sinos Valley Project for the Future[112] |
| Triangle Region, US | Research Triangle Park | Competitiveness Plan for the Research Triangle Region[113] |

## V. Conclusions

The success of the pioneering STPs, in 1950 and 1960 decades, paved the way for the nowadays worldwide galaxy of *Innovation Habitats*, with tens of thousands of individual cases grouped in species whose number and diversity do not cease to grow.

This multiplication of species, however, brings forth significant challenges regarding the planning and development of STPs and other *Innovation Habitats* in regions, as those in South America, where STPs are younger and less numerous than similar initiatives in North America and Europe. Among those challenges, one may point out:

- Overcoming legislations that were inspired on traditional STP models, once these laws hamper – and even impede - initiatives as *Urban Innovation Parks* and *Technology Parks* disseminated in the urban tissue or formed by *Local Segments* scattered in the territory;
- Implementing regional and national policies that are tuned to needs and opportunities related to innovation in all domains, such as *Innovation Laws* and *Municipal Science and Technology Funds*.

In spite of difficulties, the implementation of STPs in South America has been, in many regions of the subcontinent, a paramount experience toward a better understanding of the conditions required to set up successful *Innovation Habitats* and to promote sustained, socially responsible, and competitive development processes.

Among relevant lessons from the experience, one may point out:

1. An adequate *Innovation Habitat* conceptual framework is critical to guide public policies related to these initiatives and their development.

[105] http://www.mapc.org
[106] www.uwsp.bit10.net/information/conference_papers/documents/UWSPCaseStudy.pdf
[107] www.huntsvillealabamausa.com
[108] www.ptmi.org.ar
[109] http://adesm.org.br
[110] www.sicoval.fr/documents/SyntheseDevDurablesept04.pdf
[111] www.jointventure.org
[112] SPOLIDORO, R. et al. *VALETEC Park (Brazil): An innovative STP enhancing a traditional industrial cluster to leap forward the knowledge-based economy*. Proceedings IASP World Conference, Johannesburg, 2008.
[113] www.rtp.org

2. The *Innovation Habitat Ensemble*, in each region, is not a patchwork. Instead, it is built up by a continuous spectrum of species which add up and complement each other, and whose success depends on a broad set of conditions, as described in the literature.[114]

3. Regarding innovative business models for STPs in response to city challenges - one of the themes of the IASP World Conference, it is acknowledged that traditional models for STPs (based on a campus-like area exclusive for high-tech companies and R&D centers, at the outskirts of towns) increasingly face the competition of new models of STPs and new categories of *Innovation Habitats*.

   The competing species that traditional STPs have to face, besides STPs integrated to the urban tissue[115] or scattered in the territory, include the emerging *Innovation Ateliers*, about which one observes:

   - The European Union is increasingly implementing *Knowledge and Innovation Communities*, and the United States augmenting the support to *Innovation Hubs*;

   - These *Innovation Ateliers*, if they meet their missions, may become new R&D institutions which, counting on the help of *Incubators and Accelerators*, may engender a new model for *Research Parks* (the *4th Generation of Research Parks*?).

4. Be under the traditional model or under new clothes, STPs are no longer alone as privileged *Innovation Habitats*. Therefore, before starting the design of a STP, it is critical to set clearly what are its objectives, customers, formats, and development strategies.

   In this context, it is advisable to begin the design of a STP by answering questions stemming from the proposed conceptual framework, such as, for example:

   a) In the case of a *Technology Park*:

      - The Physical Basis will be formed by a campus-like area outside the city, exclusive for enterprises and R&D centers? Or will be disseminated in the urban tissue? Or will be scattered in the territory through *Local Segments*? Or, yet, will combine all these possibilities?
      - The Park will accept manufacturing lines of knowledge-based companies or only their R&D unities?
      - Is it possible to start the Park based on an existing *Industrial District* that increasingly hosts knowledge-based companies with R&D divisions along with their manufacturing lines and may have affordable buildings and infrastructure to offer?

   b) In the case of a *University-driven Research Park*:

      - Is the university prepared to provide the required conditions for the success of the Park, such as, for example: a) An efficient and intense synergy between professors, undergraduate and graduate students, and the tenants' knowledge workers? b) An obsessive quest for innovation and entrepreneurship without renouncing to academic excellence? c) A well-structured system leading to cooperative R&D and educational projects congregating academy, business and government?
      - Is it possible to start immediately some *Innovation Ateliers* that may gradually engender the desired *Research Park*?

[114] For example:
- ACEMOGLU, D., et al. Why Nations Fail. New York: Randon House, 2012
- SENOR, D.; et al. Start-up Nation: The Story of Israel's Economic Miracle. New York: Hachette Book, 2009
- SPOLIDORO, R. et al. Parque Científico e Tecnológico da Pontifícia Universidade Católica do Rio Grande do Sul - TECNOPUC. Porto Alegre: EDIPUCRS, 2008

[115] ENGARDIO, P. *Research Parks for the Knowledge Economy*, BusinessWeek June 1, 2009: www.businessweek.com/innovate/content/jun2009/id2009061_849934.htm

- Will the *Research Park* stay limited to the area available in the university campus or nearby? Or will it be expanded through *Local Segments* scattered in the territory?
- Is there already an area reserved for the *Research Park* in the university campus or its vicinity? (A sound advice is preserving available areas even if the university does not have yet a *Research Park* project).
- Will the *Research Park* remain part of the university's strategy to become an *entrepreneurial institution*? Or the *University-driven Research Park* will progressively become a *Technology Park*? In this case, will the university keep the leadership or will renounce to it in order to enable a political engineering to support the initiative?

5. Since an *Innovation Habitat* is not equal to another one,[116] each community has the right – and the duty - to develop the regional *Innovation Habitat Ensemble* that better answers to their needs. Therefore, good practices and models from a successful STP in a certain context may be valuable to inspire a STP design, but should not be mandatory.

6. The cities will increasingly behave as *Innovation Habitats*, thus strengthening – or recovering - a major role that they have played since the dawn of civilization.[117] It is not surprising therefore that *Innovation Habitats* are becoming more and more urban.

7. The *Innovation Habitat Ensemble* in each region - due to its singular characteristics, commented bellow - is a major promoter of the '*Regional Project for the Future'*, understood as a program based on innovation applied to all domains and conducive to a regional development process that is sustained, socially responsible, and globally competitive.

   Among the singular characteristics displayed by an *Innovation Habitat Ensemble* are approaches that are multi-sectorial, trans-disciplinary, and multi-institutional, as well as a daily contact with the future in innovative and pragmatic ways. These characteristics are increasingly necessary to overcome the growing and complex challenges that threaten our local, regional and global community.

8. Summarizing, it seems that the actors that implement *Innovation Habitats* in South American regions have basically five major challenges:

   - Internalizing that the *Innovation Habitat Ensemble*, in each region, is not a patchwork; rather, it constitutes a continuous spectrum of categories and subsets which add up and complement each other and whose number and diversity do not cease to grow.
   - Promoting the conditions required for the success of STPs and other *Innovation Habitats.*
   - Behaving under the aegis of the new paradigm – the *Knowledge-based Society*, and not under the framework of the exhausted paradigm - the *Industrial Society*.[118]

     An example of a behavior tuned to the new paradigm is a welcoming attitude regarding business incubation. Selection committees with experts anchored in exhausted paradigms may refuse amazingly innovative proposals, as reminded by the personal computer, in the 1970's, which was considered, by respected professionals, a product without future.[119]

[116] US National Research Council: *Understanding Research, Science and Technology Parks: Report of a Symposium*, 2009: www.nap.edu/catalog/12546.html

[117] See:
- RIBEIRO, D. *O processo civilizatório*. São Paulo: Companhia Letras, 1998
- WATSON, P. *Ideas: a history of thought and invention*. New York: Harper Collins, 2005

[118] SPOLIDORO, R. *The Paradigm Transition Theory*. In FORMICA, P.; TAYLOR, D. (Eds): *Delivering Innovation*, Malaga: IASP, 1998

[119] See:
- DRUCKER P. *Peter Drucker on the profession of Management*. Boston: Harvard Business Review, 1998
- www.apqc.org/blog/drucker-s-five-deadly-sins-business

- Handling successfully different perspectives for STPs, conceding that traditional models will increasingly compete with a variety of new models, in special STPs integrated with the city and enjoying better conditions to attract educated, creative and talented people, as well as the emerging *Innovation Ateliers*.
- Taking on effectively the role of promoters and leaders, in the territory, of the respective *Regional Project for the Future*.

Finally, in view of the potential of the *Innovation Habitat Ensembles*, the authors suggest a future IASP World Conference around the setup of a worldwide Innovation Habitat's partnerships aiming a cooperative effort toward sustained, socially responsible and competitive development processes for all regions and countries – even if this objective sounds utopic.