STARTUPS CONTRIBUTING TO SOLVE CITIES' PROBLEMS: THE CASE OF PORTO DIGITAL

PARALLEL SESSION 8
STPs and cities

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EXECUTIVE SUMMARY
Porto Digital outstands as an Urban Technology Park in the third most densely populated city of Brazil, Recife, Pernambuco. The main difference of Porto Digital's sustainability strategy is that it not only raises socio environmental awareness of entrepreneurs and society but it also promotes and supports the conditions for the creation and development of ICT startups to solve some of the contemporary urban problems throughout open challenges and more directly by incubating solutions-oriented products/services. This paper presents the details of 03 startup competitions, their results, the benefits they have provided for the environment and the society in general, and the prospects for the years to come in Porto Digital's sustainability area (ITgreen - Innovation and Sustainability).

1. URBAN SPRAWL THE GROWTH OF URBAN CITIES AND THE IMPACTS CAUSED

In 2013 the world population reached 7.2 billion people with more than half of this number living in urban areas[1]. This phenomenon is known as urbanization. It is "the demographic transition from rural to urban,
associated with shifts from an agriculture-based economy to mass industry, technology, and service"[2].

Still according to GHO (2013), about 20 years ago (1990s) less than 40% of the global population lived in a city, but as of 2010, more than half of all people live in an urban area . By 2030, this number should rise to 60%, and by 2050, the percentage will increase to 70%.

The rapid and unplanned growth of urban cities causes high impact on both the physical and built environments, as well as on citizens. Urban sprawl increases the monetary and environmental costs associated with infrastructure, waste disposal, the use of natural resources and energy consumption. The results are: biodiversity and natural resource reduction, urban space occupation, climate change, pollution (air, water, land, food), congestion and so on.

The complexity of solving such urban problems requires the involvement of local actors, civil society and the active participation of government at many levels[3]. That's why "cities offer a unique environment to innovate, develop and scale up new ideas and processes... They have become laboratories for action on problems solving where learning and experience induces further innovation and falling cost in new technologies"[4].

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[1] United Nations Population Division (UNPD, 2013)
[2] Global Health Observatory (GHO)
[3] LEITE, C. Implementing Urban Change, LSECITIES, December, 2008. Accessed on May 11th, 2014. Available on <http://lsecities.net/media/objects/articles/implementing-urban-change/en-gb>
[4] RODE, P.; STERN, N.;, ZENGHELIS, D. Global Problems: City Solutions. LSECITIES, December 2012. Accessed on May 15th, 2014. Available on <http://lsecities.net/media/objects/articles/global-problems-city-solutions/en-gb/#cite_note-4>

Technology on the other hand is directly associated to urbanization meaning it is part of the reasons for the rural to urban transition but it also plays an important role as development catalyst. And can do even more. It can help improve the urban experience, connect people, and make cities more fun, fair, vibrant, and develop more sustainable places. Technologies are available to improve urban transport, the construction of buildings, and the development of urban energy, water, and waste systems in such a way that they reduce resource and energy consumption[5].

Cities and technology then when integrated to a technology park make a perfect arrangement to produce constructive results in an innovative and integrated form. According to the definition of the International Association of Science Parks[6], Technological Science Park is an organization whose main objective is to increase the wealth of the community by promoting the culture of innovation and competitiveness and knowledge-based institutions associated with him. To achieve these goals, a Science and Technology Park stimulates and manages the flow of knowledge and technology between universities, research institutions and development - R & D, companies and markets; facilitates the creation and growth of enterprises based on innovation through incubation and spin-off processes, and provides other value-added services and support high quality services.

This paper therefore aims to propose, in the context of technology parks, a methodology to support innovative projects that seek to address the cities' problems having the case of Porto Digital as a reference.

2 CITY OF RECIFE, PERNAMBUCO, BRAZIL

Porto Digital is located in Recife, the capital of Pernambuco State, with a population of 1.599.513, a territorial area of 218.435 Km2 and a demographic density of 7.039,64.It's the 9th most populated city of Brazil, and the fourth highest density.[7]

Pernambuco is the state of Brazil that has had the highest economic growth in the Northeast. The revenue of the state has grown 5,1 percent in the last three years due to an unprecedented investment of both the federal and state government. The construction of the Industrial Complex of Suape (the main Port of the Northeast) was definitely the biggest asset to the State attracting the establishment of a wide variety of companies, in special the Refinery Abreu e Lima and the Atlântico Sul Shipyard.

All this sudden and unplanned growth however caused serious impacts to the state, especially to the capital (Recife). To start with the construction of the complex caused the dispossession of lands of many families as well as the grounding of an island. On top of that, the state had to hire professionals from other states and even countries to work on the construction.

Recife then started facing all the problems that big cities (usually without an urban planning) do: real estate speculation, sewage treatment, waste management, traffic (urban immobility), pollution, violence, water distribution, energy and so on. They can be endless.

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[5] UNEP, 2011.

[6] IASP, 2014. Accessed on May 15th, 2014 Available on http://www.iasp.ws/home

[7] IBGE, 2013. Accessed on May 15th, 2014. Available on
<http://cidades.ibge.gov.br/xtras/perfil.php?lang=&codmun=261160&search=pernambuco|recife>.

The development of the state also contributed to raise society's awareness and to get them to go to the streets and to step up to their demands and to their dissatisfactions. More than ever they feel they must be heard. They can be heard.

About one year ago (July 2013), a group of people decided they had to do something to change things they considered were affecting the life quality of the citizens of Recife. They created a fanpage on Facebook, Direitos Urbanos (Urban Rights). In less then one year they have already got about 15.550 members. The objective of the group is to discuss public policy and to incentivate people to fight for their rights and to assume their positions of citizens.

The number of members on the group is a reflection of the intensity of the civil society willingness to be more participative in the decisions of the city, in the city's present and future.

With the help of technology, it is becoming easier to connect society and governors. Society is being invited to contribute to the solution of some of the city's problems. It is done in various ways: citizens are asked to monitor the city via apps specially developed.

3 PORTO DIGITAL

Being a technology park a relevant asset in the production of ICT, able to promote innovation and stimulate the competitiveness of enterprises, this is characterized as a potential agent to contribute to the socio-economic development of a region.

The Porto Digital Technology Park is the main ICT sector component of Pernambuco State, located in Recife, Northeast of Brazil. Its goal is to implement public policies for economic development of the State, urban regeneration, social inclusion, strengthening the ICT hub and other clusters through the use of these technologies.

In 13 years of existence, Porto Digital (PD) has become a leading technology hub in the country. It has already generated for the state 7,055 jobs, attracted 536 entrepreneurs and 240 institutions including universities, governmental agencies, research and development centers and national and international technology companies. Just recently it started to integrate in its scope the creative economy as the second market.

PD started gaining recognition in 2005 (only five years after its operation), when it was elected by AT Kearney[8] , one of the largest consulting companies in the world, as the largest technology park in the country in number of companies and sales[9]. It went on being reconized by its work and untill today it is a reference of success of a technology park implemeting public policies and delivering results to the society. To mention a few of these recognitions: (i) in 2007 PD was recognized as the Best Technology Park and Habitat for Innovation in Brazil by the National Association of Entities Promoting Innovative

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[8] AT KEARNEY. Desenvolvimento de uma Agenda Estratégica para o Setor de "IT Off-shore Outsourcing". Brasília, 2005.
[9] SAMPAIO, J.; GOUVEIA, C.; CAVALCANTI, B.; ANDRADE LIMA, H.; SABOYA, F. ITgreen: The Experience of Porto Digital Technology Park in order to Contribute to a Sustainable Innovation Habitat. IASP, Tallin, 2012.

Enterprises, ANPROTEC[10] , which represents the interests of business incubators, technology parks and innovative enterprises in Brazil; (ii) in 2008, Porto Digital was the only Brazilian technological park to join the first edition of Learning by Sharing from IASP (International Association of the Science Parks) that featured four parks around the world; (iv) in 2009, the Business Week, the largest business magazine in the world, noted PD as one of the places where the future was being created; (v) in 2009 PD was mentioned as a case of success of the Triple Helix, by Henry Etzkowitz; (vi) in 2013 won the prize by the National Association of Entities Promoting Innovative Ventures as the best incubator for local and sectoral development in Brazil.

PD is the result of an innovation environment in Pernambuco which was consolidated in recent decades along with the coordinated effort of the university, the productive sector and the government, in order to insert the industry of ICT in the economic matrix of the State. Sector of high growth potential, ICT is also the basis for increasing the competitiveness of a region.[11]

Figure 1: The scenario in which the Porto Digital was created

Source: The Authors

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[10] ASSOCIAÇÃO NACIONAL DE ENTIDADES PROMOTORAS DE EMPREENDIMENTOS INOVADORES. Panorama de Incubadora de Empresas e Parques Tecnológicos 2006. Brasília, ANPROTEC, 2005. Available at: <http://www.anprotec.org.br/ArquivosDin/Panorama_2005_pdf_11.pdf> Access on May 15th, 2011.
[11] SAMPAIO, J.; GOUVEIA, C.; CAVALCANTI, B.; ANDRADE LIMA, H.; SABOYA, F. ITgreen: The Experience of Porto Digital Technology Park in order to Contribute to a Sustainable Innovation Habitat. IASP, Tallin, 2012.

Created in 2001, the Núcleo de Gestão do Porto Digital (NGPD), organization responsible for the management of Porto Digital Technology Park, has the mission of promoting competitive conditions for the creation, attraction and strengthening of innovative enterprises from the Information and Communications Technology (ICT) and Creative Economy (CE) in Porto Digital.

In order to promote the emergence of innovative entrepreneurship in ICT and CE in the region, the NGPD restarted in 2010 its strategy of fostering innovative startups through incubation services: CAIS do Porto (July 2010) focused on ICT startups and Portomídia (February 2013) for Creative Economy startups. CAIS do Porto objective is to support startups aimed at developing ICT solutions to real problems of the productive sectors of the state of Pernambuco, Brazil.

Porto Digital has also established a CSR Policy (Corporate Social Responsibility) and implemented a sustainability area in order to incentivize companies to adopt a sustainable
strategy integrated to their business model adding up to increase their competitive potential. The area created in 2010 is called ITgreen – Innovation and Sustainability.

3.1 ITGREEN

ITgreen is then the area of Porto Digital responsible for promoting the use of information technologies for environmental development. It was created (as an specific area) in 2010 as an understanding of the board of directors that an IT Park with more than 200 companies, about 6500 employees at the time, should be playing an important role not only in the economy of the state but also in the society and in the environment. But much earlier than that PD had already invested on the qualification of youngsters in vulnerable situation.

The first oficial project to be implemented as ITgreen was focused on the waste of electrical and electronical equipments (WEEE). The concept of the project was to understand the life cycle of ICT equipments, the impacts caused by an inadequate disposition and what was being done in the world to tackle the problem the waste generated from the discard of old or downdated equipments. Since then Porto Digital has been one of the few institutions with know-how on the subject and a reference in Brazil. It organizes an annual international event, SIREE (International Seminar on WEEE), the main event of the subject in Brazil.

Parallel to that the CSR Policy started being better designed with the park's representants and so identified the main subjects to be adopted in the policy . At that moment three subjects were stablished as starting point: (i) WEEE; (ii) digital accessibility; and (iii) qualification of youngsters for the market and urban mobility.

On the digital accessibility subject, the park provided workshops to introduce the concept of digital accessibility and to teach IT and design professionals how to develop more inclusive products, considering the various physical limitations that made technology almost unreachable for people with special disabilities. A digital accessibility manual was developed and sent to all companies.

The last area is being worked by

During these four years of operation, ITgreen has delivered:
04 editions of SIREE

01 Best Practices on ICT Guide
01 Digital Accessibility Manual
01 Photo Exhibition

3.2 ENTREPRENEURSHIP SUPPORT AT PORTO DIGITAL

As part of its strategy to encourage the emergence of startups in Technology Park, NGPD decided in 2010 to resume Incubator Cais do Porto focused on supporting ICT ventures.

The CAIS do Porto aims to support emerging ventures aimed at developing ICT solutions to real problems in the productive sectors of the state of Pernambuco, located within or in the capital. During the 18 months of incubation, the enterprises receiving consulting and training in Business Management, Business Law, Accounting & Finance, Sales & Marketing, Software Development and Personal Development, and have access to a shared workspace.

The Cais do Porto, since 2010, has supported 31 projects, benefiting 141 people, 97 of them entrepreneurs. These developments have raised R $ 2.9 million in public and private resources and received 16 local, regional and nacionais awards.Five of these projects were approved in acceleration programs in Brazil and overseas. In Outubro/2013, CAIS do Porto Incubator was awarded by the National Association of Entities Promoting Innovative Ventures as the best incubator for local and sectoral development in Brazil.

The CAIS do Porto lies to start the third class and from the beginning provides spaces related to solving economic and social problems projects. In 2012 edict, this support was even more direct, having been provided three (3) spaces related to solving problems relating to social and environmental sustainability of cities projects, including digital and physical accessibility, sustainable management of electronic equipment and optimization of urban services .

Currently, the strategy to support the creation of innovative enterprises in the Porto Digital, involves actions divided into 3 main areas: (i) Fostering Entrepreneurship, responsible for raising awareness and encouraging entrepreneurship among students and professionals in the market by conducting and supporting events, competitions and lectures; (ii) Incubation Projects, offering training, consultancy and infrastructure for ICT developments springs (CAIS do Porto Incubator) and Creative Economy (Incubator of Portomídia); and (iii) acceleration of developments, which include the start of the operation of a business accelerator in technological park in partnership with the Talento Brasil Instituto (Jump Brazil) and the implementation of a program of international acceleration in Silicon Valley.

5. STARTUPS SOLVING CITIES' PROBLEMS: PORTO DIGITAL STARTUP CHALLENGES

In 2012, due to concerns about the sustainability of cities, Porto Digital through a joint effort between the sustainability (ITgreen) and entrepreneurship areas (incubators), intensified its incentive for ICT projects that aim at solving urban problems. This was done by: (i) allocating 03 vacancies for sustainability projects in the CAIS do Porto Call for Proposals; and (ii) launching two startup challenges: 1- Desafio Porto Digital para Sustentabilidade das Cidades (Porto Digital Challenge for the Sustainability of Cities), and 2 - Desafio Cidades Ecointeligentes (Ecointelligent Cities Challenge). The challenges

were conducted in partnership with Greenpeace and the State Departments of Science and Technology, and Environment and Sustainability, respectively. In both challenges it was proposed that the project should fit into at least one of the eight strategic themes defined: Digital and Physical Accessibility, Electronic Surveillance, Conservation of Urban Equity, Sustainable Management of Waste Electrical and Electronic Equipment (WEEE); Efficient Use of Water; Management of Urban Services; Efficient and Renewable Energy, and Land Use and Occupation.

Figure 2: Porto Digital Actions to Support Startups to Solve Cities' Problems
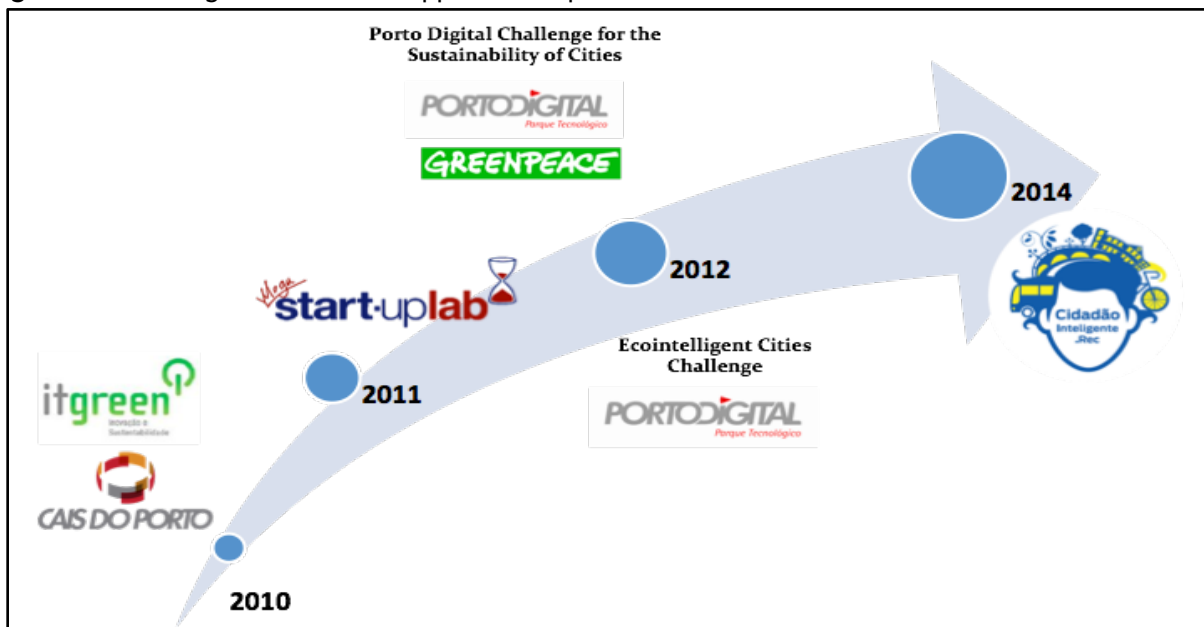
Source: The Authors

5.1 - Porto Digital Challenge for the Sustainability of Cities[12] (Desafio Porto Digital para Sustentabilidade das Cidades):

PORT DIGITAL CHALLENGE FOR SUSTAINABLE CITIES, sponsored by Porto Digital in partnership with Greenpeace, aims to recognize and promote innovative experiences in any area, developed in the state of Pernambuco and supported by information technologies that impact positively on the sustainability of cities (PORTO DIGITAL, 2012)

Figure 3: Greenpeace Ship Rainbow Warrior docked at the Port of Recife

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[12] PORTO DIGITAL, 2012. Desafio Porto Digital para Sustentabilidade das Cidades. Acessed on 21 of May 2014. Available on http://www2.portodigital.org/portodigital/ARQUIVOS_ANEXO/EDITAL_DESAFIO_PD_SUSTENTABILIDADE _CIDADES.pdf
12

Project Areas: Digital and Physical Accessibility, Electronic Surveillance, Conservation of Urban Equity, Sustainable Management of Waste Electrical and Electronic Equipment (WEEE); Efficient Use of Water; Management of Urban Services; Efficient and Renewable Energy, and Land Use and Occupation.

Awards: Incubation at CAIS do Porto, Diploma, Trophy.

Numbers: 16 projects submitted.

Winners: Ecomanager

5.2 - Ecointelligent Cities Challenge[13] (Desafio Cidades Ecointeligentes):

THE CHALLENGE ECO SMART CITIES sponsored by the Department of Environment and Sustainability (SEMAS), in partnership with the Department of Science and Technology (Sectec) and Core Management of Porto Digital (NGPD), aims to encourage the emergence of information technology ventures focused to develop models of Smart and Ecological Cities. For this, there will be awards and dissemination of innovative trial designs and entrepreneurial skills, supported by Information and Communication Technology (ICT) involving the participation of society through activities in collaborative networks and impacting positively on the sustainability of cities.

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[13] PORTO DIGITAL, 2012. EDITAL – Cidades Ecointeligentes – Soluções em Rede para os desafios do
[13]desenvolvimento sustentável das cidades. Acessed on 21 of May 2014. Available on http://www2.portodigital.org/portodigital/ARQUIVOS_ANEXO/Edital_Desafio_Cidades_Ecointeligentes.pdf
[13]

Figure 4: Award ceremony of the Challenge Eco Smart Cities 1st Place - Economize Industrial

Project Areas: Management, reverse logistics and recycling of waste (garbage); Reduction of waste water; Decentralized generation and use of electricity Sharing vehicles to improve urban mobility; Protection of natural resources; Management of urban services with artificial intelligence; Monitoring the state of conservation of urban goods and biodiversity monitoring environmental risk; Balanced urban planning and solutions to reduce displacements in the city; Alerts for effects of climate change; Mapping of land use, facilitating systematic planning of the occupation of the city; Accessibility solutions for people with special needs, among others.

Awards: R$ 21.000,00 (around US$ 10.000,00) +Incubation at CAIS do Porto for the winner

Numbers: 29 projects submitted. 04 Incubated projects: Bidcorp, Carona Sustentável, Economize e Selletiva.

Winners: 1st Place - Economize Industrial; 2nd Place - Carona Sustentável; 3rd Place - Economize Residencial; 4th Place - E-Lixo Sustentável (Selletiva), e 5th Place - Bidcorp

5.3 - Intelligent Citizen[14] (Cidadão Inteligente)

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[14] CIDADÃO INTELIGENTE, 2013. Cidadão Inteligente.Rec. Accessed on 21 of May 2014. Available on http://cidadaointeligente.rec.br/index.php

In 2013 Porto Digital was invited to partner up with the City Hall in a project called "Intelligent Citizenship". The objective of the project is to provide open data of the city of Recife to program developers so they can present an idea or an app that will contribute to a better and sustainable city.

Figure 5: Award ceremony of the Intelligent Citizen

Project Areas: mobility, sustainability, tourism, security, education, healthy and solid waste.

**Awards: R$** 33.000,00 (around US$ 15.000,00)

Winners : 1st Place - Cidadão Recifense; 2nd Place - Doe Recife; 3rd Place - PeerSquare Recife; 4th Place - VacinaREC and 5th Place - Participe Recife

6. CONCLUSIONS

The rapid growth of cities has generated a number of structural problems that impact on people's lives. In this context, startups operate in solving societal problems through the creation and launch of innovative products and services.

Technology centers as agents that bring together different sectors are particularly important to channel innovation to solving the problems of the cities. The Porto Digital, technology park located in

Recife, Pernambuco, Brazil, in 2010 resumed its strategy to support innovative entrepreneurship in the area of Information Technology and Communications (and later Creative Economy) while that initiated its policy of corporate social responsibility (CSR).

In order to encourage the role of startups as solvers real problems of society, Porto Digital has been conducting since 2010, several actions through the connection between their areas of entrepreneurship and CSR, among which we can highlight: allocation of specific notices of vacancies in incubators for startups that solve social and economic problems; launching competitions startups to solve problems of cities and support other initiatives in this area.

Demonstrating the importance of the topic for the Porto Digital, most recently in 2013, the park hosted the international meeting of the IASP with the theme "Technology Parks formatting new towns" and attracted to Recife, Northeast office of Artemisia[15] , nonprofit organization, pioneer in the dissemination and promotion of business social impact in Brazil.

This article addressed specifically competitions held at Porto Digital startups together with partners to encourage the creation and development of startups that solve problems in cities. Step-by-step instructions for conducting the competitions:

1) Preparation: Identify areas of interest and seek partnerships. It is important to look not only institutional partners, but partners that can provide awards and assist in the dissemination of competi'ção.
2) DISCLOSURE: Wide dissemination of the notice together with startups, Universities, Innovation and existing businesses. Disclosure is important to build a network that can be activated in future opportunities.
3) SELECTION: Selection Banking consists of experts in the field of business and projects submitted.
4) RESULT: It is important to publicize the results in order to contribute to the continuity of the proposed project.

In conducting of 3 competitions in the period 2012-2014 , we obtained some learnings :

1) PARTNERSHIPS : Importance of partnerships to enable awards , wide distribution of applications and especially the implementation of the projects . It is vital to attract partners who can add to the project not only institutional support .
2) PROJECTS IN INITIAL PHASE : Many projects were still quite early and were created exclusively for competitions and after the award ceased to operate. The ideal is to seek projects that are already in operation.
3) TRAINING: projects participating in general are quite early and often only focused on the social aspect and the business aspect bit . It is interesting to conduct classroom or online training for improvement of projects and their presentations . The training can also be performed after the awards to the finalists . The purpose of the training is to assist entrepreneurs in the design and validation of its business model ,
4) HOW GOVERNMENT CLIENT: the government (municipal, state and federal) is usually the main customer / beneficiary for this type of solution . It is important to be a commitment by the

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[15] ARTEMÍSA. Quem somos. Accessed on May 21th, 2014. Available on
http://artemisia.org.br/conteudo/artemisia/quem-somos.aspx

Government to use the tools implemented as a pilot customer . One important way is to find business models that do not rely solely on government

5) MATCHING incubators : in order to support the continuity of projects , Porto Digital has awarded the winners of 2 of the 3 competitions with vacancies in their incubators . For this to happen productively is important that the selection criteria and timing are aligned with partner incubators of competition.

Startups are important mechanisms for the generation of wealth and change in society, therefore, technological Parks, Innovation and Business incubators should act as catalysts of innovation for solving the problems of the cities. In this context it is important the participation of all: Government, Academia, Market and Civil Organizations nonprofit network working to support startups.