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Startup Garage: Business Modeling in a Science and Technology Park

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Science parks and their businesses: new models, new opportunities

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Startup Garage: Business Modeling in a Science and Technology Park

Executive Summary

A business incubator and a university can bring interesting challenges in an ecosystem of innovation and entrepreneurship within a science and technology park, especially regarding the formation of entrepreneurial profile in the ecosystem.

Having a business modeling program in this ecosystem is an opportunity for students, professors and researchers to work on their business ideas and thus validate the market viability of these. For businessman and entrepreneurs already stablished in the technology park is an opportunity to meet new ones and sharing their experience and knowledge providing a great mutual learning environment.

For this reason, in this paper we describe the Startup Garage Program, an innovative business modeling program planned and executed by Raiar, a technology-based incubator located in Porto Alegre at TECNOPUC, the Science and Technology Park of PUCRS University. The program is focused on the improvement of business modeling skills for the students and researchers at PUCRS and the TECNOPUC ecosystem.

1. Introduction

It is known that entrepreneurship is one of the major economic players of a country, generating new business and hence new jobs. Reynolds et al say that "the lesson of history is clear: businesses likely to drive the U.S. economy 25 years from now will come not from large established companies, but from the efforts of nascent entrepreneurs starting companies today[1]."

It is not difficult to imagine that Brazil follows the same path and that it has universities and science and technology parks as big players of this ecosystem to be providers of knowledge and skilled labor. Seeing a technology park as a simple condo for companies can be a strategic mistake regarding what it is expected by society. Many parks in Brazil are associated with universities and there is an interest by the University to see the knowledge generated through their researches transformed into business and these new companies get established in the areas inside the tech parks. In addition, it is understood that a modern University has a range of entrepreneurial formation leading to the discovery and development of entrepreneurial among his students.

In this way, we have the Innovative University. Audy et al understand that on incorporating the term 'innovation', we are emphasizing three fundamental aspects: interaction with society (in order to identify the demands), companies (since this is the type of organization in which innovation occurs) and the government (as a facilitator of the process[2]).

Developing an ecosystem of innovation and entrepreneurship in a science and technology park is not a trivial activity. On one hand, there are the needs of companies that are using the space of the park and on the other there is the union with the ecosystem of the University that seeks an outlet for their creations. Furthermore, we know that currently students are graduated very prone to entrepreneurship.

A recent survey by Endeavor[3] indicated that around 58% of students plan to open their own business in the coming years and that one in four students are already entrepreneurs. Another important point in this survey shows that books and the Internet are the main sources used by students when they need information regarding to entrepreneurship.

Many people have ideas, but only a few of them can become business. There are several reasons to make it happen but a major risk is the lack of preparation of the entrepreneur. Currently in Brazil, there are various ecosystems of innovation and entrepreneurship being created, typically around technology parks and incubators. One well known benchmarking for such ecosystem is TECNOPUC, located at the PUCRS University Campus, in the south of Brazil.

TECNOPUC is a science and technology park focused on four main areas: Information Technology and Communication; Energy and the Environment; Life Sciences (e.g. Biotechnology, Medicine) and the Creative Industry. These areas were defined based on the academic competence of the university, involving science and technology research groups and graduate programs (master's and doctorate), associated to the existence of society's demand (www.pucrs.br/tecnopuc/), and also based on and the expertise of the companies located within the park. The park was inaugurated in 2003 and is part of INOVAPUCRS, the PUCRS' network of innovation and entrepreneurship.

1. REYNOLDS, P. D.; CARTER, N. M.; GARTNER, W. B.; GREEN, P. G.; COX, L. W. The entrepreneur next door: characteristics of individuals starting companies in America. Kansas City: The Ewing Marion Kauffman Foundation, 2002.
2. AUDY, JORGE L.N.; MOROSINI, MARILIA C. Innovation, University and Relationship with society. Porto Alegre: EDIPUCRS, 2009
3. ENDEAVOR; Entrepreneurship in Brazilian Universities. Endeavor do Brasil, 2014

The Raiar incubator operates in the park since 2003 and is always looking for opportunities for stimulating students and professors at the University to transfer its technology into businesses opportunities. Its mission is encouraging entrepreneurial vision of PUCRS community and society, transforming innovative ideas into competitive businesses, by supporting infrastructure and business management.

Both the Science and Technology Park TECNOPUC and the Raiar incubator are part of the INOVAPUCRS network. This is a University network that brings together a set of actors, actions and mechanisms for promoting innovation and entrepreneurship process. Therefore, seeks to articulate all those involved in the triad : teaching, research and extension. The focus of the work of the University, through INOVAPUCRS, is the promotion of multidisciplinary efforts on finding solutions of the demands of society in terms of economic, social, environmental and cultural development.

However, validating ideas that can turn into promising businesses is one of the greatest challenges of innovation and entrepreneurial ecosystems mainly when related to the community of students and professors/ researchers at a given university. Ries[4] indicate that the fundamental activity os a startup is to turn ideas into products, measure how customers respond, and then learn whether to pivot or persevere. Besides knowing the proper tools for these validations, adjacent concepts to the entrepreneur are needed to have successful cases. Thus, a focused entrepreneurial work has been more effective when one analyzes the existing successful startups.

In this context, this paper describes Startup Garage, an innovative program planned and executed at Raiar incubator. The program is focused on the improvement of business modeling skills for the students and researchers at PUCRS. In this program, the future entrepreneur receives assistance with tools, mentoring and networking opportunities. The program helps people who have ideas and do not have the knowledge of the tools needed to validate their hypotheses and turn them into sustainable businesses. We work important pillars for any endeavor: the entrepreneur skills, understanding the problem and the customer, the value proposition and the business model itself. In addition, the program also covers issues related to law, accounting and intellectual property protections.

The first instance of the Startup Garage Program has been executed and has received positive feedback from its participants. More than 100 candidates have applied and we selected 45 attendants who were distributed in 20 projects. They were divided into two groups: one with morning meetings and the other one with afternoon meetings. During these sessions, they had the opportunity to receive guidance from qualified professionals and experienced entrepreneurs divided in three stages, as explained in detail in the next session.

2. The Startup Garage Program

The Startup Garage Program (SG) is divided in three stages: the first is related to selfknowledge and definition of the problem, the second is focused on structuring the business model and the third one works with important operational issues of any business.

2.1.SG – Stage One: Self-Knowledge and Business/Customer Validating

In the first stage, the entrepreneur performs self-knowledge activities guided by professionals who make him/

4. RIES, ERIC; The Lean Startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. New York: Crown Business, 2011

her understand better about himself/herself, essentially predicting certain behaviors and identifying strengths and weaknesses.

There are several attempts in the literature to characterize the entrepreneur in relation to his/her behavior and characteristics, including culture, kind of family involvement, life history, achievements, skills, beliefs, style, motivations, values, future vision, life purposes and the way they lead the decision making process regarding his/her career and particularly his/her psychological profile.

Although we can not completely answer all questions related to the entrepreneur, once the definition of what is an entrepreneur contemplates different opinions, it seemed important to carry out a research that raised the psychological profile of the entrepreneurs who manage companies expanding in different regions of the country, making use of a dedicated tool in the scientific community to survey the psychological typology.

The current instruments that can define the psychological profile according to the approach proposed by Carl Gustav Jung are: the Gray-Wheelwright, the MBTI (Myers Briggs Type Indicator), and the QUATI (Typological Assessment Questionnaire), which are used as resources for evaluation psychological aspects of personality in clinical, educational and organizational areas[5].

In this program, an entrepreneur profile analysis is based on the MBTI with activities that allow the participants to get to know and promote themselves better and mainly connect with others so that it can bring advantage for the enterprise. Highly qualified experienced professionals work these aspects with this young, student and entrepreneur audience.

More than that, experienced entrepreneurs help the newbies using tools like the experiment board (www.javelin.com/experiment-board.html) guiding them to figure out what the problem(s) they are trying to solve in their projects.

One of the most difficult stages for a startup is when it comes to validating the business model in the real world and finding that everything thought by the participant has to be changed in order to adapt into something that works. This time can be very costly and often leads to the beginning of an entrepreneur demotivation process.

In order to solve this issue, we use a tool that assists with the identification and validation of the problem and the customer mapping the solution to be proposed. The purpose of this tool is to provide a framework on which the entrepreneur can make decisions and manage the assumptions life cycle of the startup and its changes.

The Experiment Board – Figure 1 - consists of two main areas: the area of brainstorm (left) and the execution area (right).

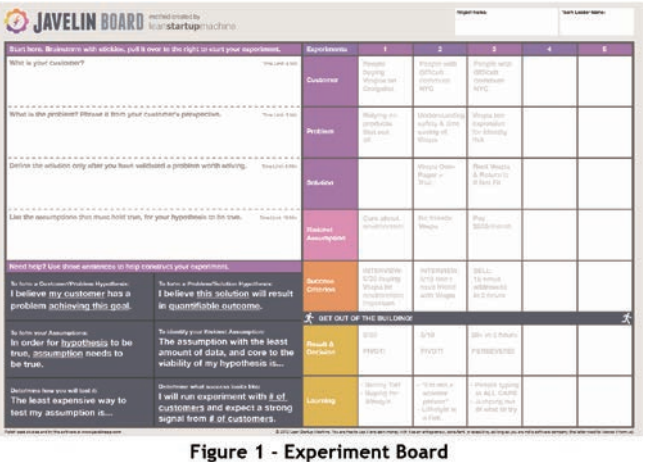

Figure 1 - Experiment Board

5. BRZOZOWSKI, RICARDO P. Psychological type of the individual entrepreneur: A study of the predominant psychological type in entrepreneurs, according to the
MBTI. Campo Limpo Paulista: FACCAMP, 2011

During the process, the team will raise possible hypotheses for customers, problems, solutions and assumptions. These hypotheses should be placed on the left side of the board in the corresponding sections.

Each experiment begins with the formation of a hypothesis. They describe situations that the entrepreneur considers facts and must be validated in the market with customers.

Each hypothesis has a set of assumptions considered true but not a fact yet. Assumptions are actions and behaviors that the client must present. It is considered the premise of increased risk one that has less information and is vital for the business. If it is false, the hypothesis will also be.

The criterion of success is the minimum validation that they need to invest more resources, time and effort to persist in the project. It is usually represented as a fraction (or percentage).

When the time comes to define an experiment, the team will select the corresponding items of brainstorm area and will place them in the execution area, where the experiment will be supplemented by further information: method, success criteria, and lessons learning.

After defining the experiments along with the team and mentors, teams should find their target customers and get information to validate these hypotheses. As Steve Blank[6] said “it is the time to get out of the building”.

When they return, the information collected is analyzed and success criteria is checked on. We do not expect a decision based only on numbers but on the experience that entrepreneurs have during their contact with the market. Each group reports their experience to the others and there is mutual learning.

If the success criterion has not been met, the hypothesis has been invalidated and the project should be pivoted, i.e., some changes should be done and a new experiment will be created and there is a new interaction with the market looking for new information.

If the success criterion is reached the team must persevere with the hypothesis and also work on a new experiment in search of a bill consolidation. In the end , the lessons learned are recorded in the board for future reference.

2.2SG – Stage Two – Business Model

In the second stage, the mentors work in the designing of the business model, emphasizing the clear definition of added value to customers as well as those required to establish the business. In order to do so, they use the business model canvas proposed by Ostewalder and Pigneur.

This tool allows the construction of the business model in a visual way and its fundamental basis to split the organization into nine key components that demonstrate how it generates or want to generate value. These key components are inserted into four main areas of the company: customers, supply, infrastructure and financial viability. This means that the entrepreneur no longer needs to go through page after page of a document to understand strategies defined for the business. Another great aspect is that the business model enables entrepreneurs to view the "strategic fit" that exists between different areas. Documents that are based only on text do not allow this type of analysis.

6. BLANK, STEVE; DORF, BOB. The Startup Owner’s Manual: the step-by-step guide for building a great company.California: K&S Ranch, Inc. 2012

In the model of Business Model Canvas with every building block, there are key questions to be answered in order to fulfill the building block that can be seen from the Table 1.

Building Block	Original BMC Key Question
Value Proposition	What value do we deliver to the customer? Which one of our customer's problems are we helping to solve? What bundles of products and services are we offering to each Customer Segment? Which customer needs are we satisfying?
Customer Segments	For whom are we creating value? Who are our most important customers?
Customer Relationships	What type of relationship does each of our Customer Segments expect us to establish and maintain with them? Which ones have we established? How are they integrated with the rest of our business model? How costly are they?
Channels	Through which Channels do our Customer Segments want to be reached? How are we reaching them now? How are our Channels integrated? Which ones work best? Which ones are most cost-efficient? How are we integrating them with customer routines?
Key Partners	Who are our Key Partners? Who are our key suppliers? Which Key Resources are we acquiring from partners? Which activities do partners perform?
Key Activities	What Key Activities do our Value Proposition require? Our Distribution Channels? Customer Relationships? Revenue streams?
Key Resources	What Key Resources do our Value Proposition require? Our distribution Channels? Customer relationships? Revenue Streams?
Cost Structure	What are the most important costs inherent in our business model? Which Key Resources are most expensive? Which Key Activities are most expensive?
Revenue Streams	For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying? How would they prefer to pay? How much does each Revenue Streams contribute to overall revenues?

Table 1 - Business Model Canvas -Building Blocks7

Many discussions among the entrepreneurs are about the value proposition so our mentor tries to emphasize that "value" in this case means "benefit". Therefore, it is crucial that entrepreneurs know to explain which benefits their products (or services) deliver to their customers.

Another very important item is the definition of the customer segments. We must point out two important aspects that justify the importance of this point: i) the word "segment" has implied that it is the choice of a slice of the market. In other words, you need to define a niche of customers. Selling quote "who sells to everyone, does not sell to anyone" is taken seriously in developing a business model. ii) A business should be developed from the customer's perspective. There is no point of having a good idea if you cannot see through the eyes of those who will pay for the product / service you will deliver.

Using the business model canvas (Figure 2) and with the help of mentors participants Startup Garage participants can at this stage build their business models and, most importantly, map out the MVP (Minimum Viable Product).

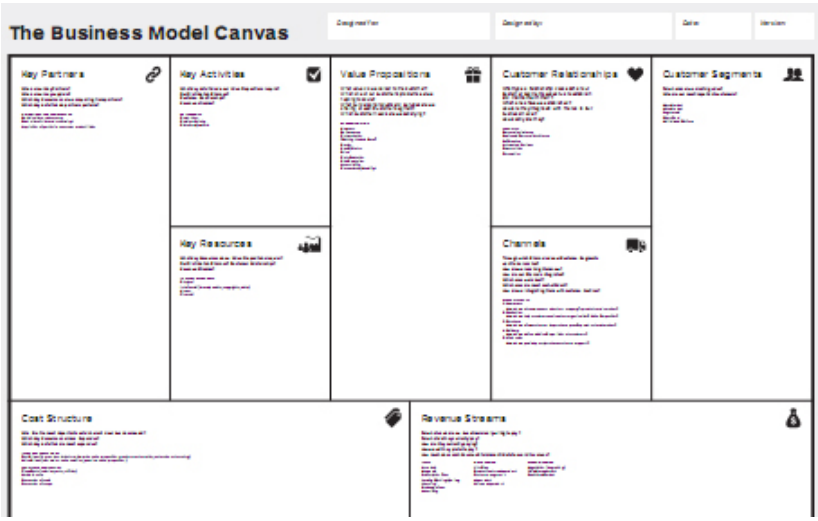

Figure 2 - Business Model Canvas[7]

2.3SG – Stage Three – Operational Issues

In the last stage, partners address several important issues for new businesses. A law firm presents discussion of legal issues, addressing issues such as social contracts, contracts between companies and Brazilian civil rights framework for the Internet. Media professionals work with the positioning of the company and the entrepreneur in the social medias presenting the main concerns about image and how they can manage it.

The University's technology transfer office (TTO) offers all its expertise to advise the different types of businesses that are brought up to the Startup Garage program regarding intellectual protection and patent. Moreover, an accountant shows the participants how the company should be analyzed through numbers and its importance for a well succeed business.

7. OSTERWALDER, ALEXANDRE; PIGNEUR, YVES; Business Model Generation: A handbook for visionaries, game changers, and challengers. New Jersey: John Wiley & Sons, Inc. 2010.

In the end of the project, an event called Pitch Day is held with the presence of the entrepreneurial community, including accelerators, investment fund managers, angel investors and activists of local entrepreneurship. On this day each group performs a 2-minute pitch and the 3 best pitches will be rewarded.

Figure 3 - Pitch Day

Evaluation of groups takes place in three different times during the program. The pitch is judged throughout all the process though. During the first stage, learning and validations of the problem are considered, and in the last two steps, issues related to the business model such as target market, competitors, cost vs. revenue, partners, etc., and existing business innovation close the final score of the project. Mentors, professionals involved in the Raiar incubator and people engaged in the entrepreneurship ecosystem in the city perform such analysis.

After all that has been shown throughout the paper, it is important to emphasize that the creation of a program within a science technology park that helps new entrepreneurs to know themselves as entrepreneurs providing them with the tools that they need to validate their hypotheses is a seed action for the creation of ventures that in the near future will be absorbed by the park and will benefit from its ecosystem.

3.Conclusions and Final Recommendations

In this paper we presented the Startup Garage, a business modeling program that was created within the ecosystem of TECNOPUC, involving the park, the PUCRS University, the Raiar incubator and the INOVAPUCRS network. The experiment conducted in the first edition brought some important lessons:

a)It is important to focus on the entrepreneur; bringing mechanisms that allow the entrepreneur himself/herself develop self-knowledge and create a personal development plan. By doing this, entrepreneur is strengthening the personal bases and promote an entrepreneurial career.

b)The use of the Experiment Board early in the process was a valid decision mainly because the participants start the Startup Garage with a simple idea and through the use of this tool they were able to make an early discovery on their project and they could enable a fast change (fail fast concept).

c)The act of inviting and bringing businessman that work in the TECNOPUC ecosystem to talk to the participants (new entrepreneurs) was extremely worthy and was widely welcomed by them. Discussion of good management practices, sharing their success stories and failure, first steps of their companies were some themes presented by the executives.