



## Entrepreneurship Ecosystems and the Stimulus to the Creation of Innovative Business: A Case in the App Industry in Brazil

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### Abstract

This article aims at analyzing how entrepreneurship ecosystems influence the development of business with innovative potential. To do so, the model proposed by Isenberg (2011; 2013) is used as a reference, which covers six areas: policy, finance, culture, supports, human resources and markets. The exploratory research was conducted through the case study method. Data collection occurred through observation, analysis of documents and interviews with entrepreneurs established at Porto Digital, in Recife-PE. For processing and analysis of data, the content analysis technique was selected. It was found that Porto Digital offers the necessary conditions for new businesses to develop their innovative potential, characterized by unique value proposals, offering solutions based on everyday problems and co-created with end users.

**Keywords:** Ecosystems; Entrepreneurship; App Industry; Startups.

### 1. Introduction

Entrepreneurship and innovation are the engines of development. The combination of both can lead to unprecedented products, services or business models, as well as the creation of entirely new sectors or segments (Hult, Snow, & Kandemir, 2003; Hnyilicza, 2008; Araya, & Peters, 2010). However, for new businesses to be created and innovation actually happen, a set of appropriate structural conditions to the needs of enterprises should be available to entrepreneurs in the initial stage. This set of conditions is called "entrepreneurship ecosystem".

Entrepreneurship ecosystems seek to provide the ideal conditions for entrepreneurship to triumph and remain sustainable. When well developed, these environments stimulate the growth of new companies and are crucial to the creation and development of innovative enterprises (Autio et al., 2014). At the same time, the entrepreneurship ecosystem approach emphasizes the entrepreneur's relationship with the environment. Entrepreneurs, then, are the central element of the ecosystem.

Currently, one of the fastest growing segments is the industry of applications for mobile devices (apps). This segment is also part of the creative industry. The figures in this industry also prove to be relevant. According to the Brazilian Association of Software Companies (ABES, 2015), the apps segment earned approximately US\$ 400.1 million in 2014.

In the Brazilian context, Recife, capital of the Pernambuco state, has invested in promoting the developments of information technology and the creative economy as a differential to generate prosperity and development for the region.

This article aims at understanding how the conditions offered by the Porto Digital entrepreneurship ecosystem influence the creation and development of business with innovative potential. To achieve these objectives, we selected two technology *startups* belonging to the mobile applications industry, both installed in Porto Digital.

## 2. Literature Review

### 2.1 Entrepreneurship and Innovation

The actions of entrepreneurs are a key element of the entrepreneurial process (Acs, Autio & Sczerb, 2014), as they often result in innovation (Bird, Schjoedt, & Baum, 2012). It is necessary, however, to distinguish between invention and innovation. While the inventive process is basically synonymous with having good ideas, innovation goes further: it is the process of making these ideas evolve to the point of having practical use (Tidd, & Bessant, 2013), provide for market needs (Freeman, 1974; Rothwell, 1992) and being profitable (Crawford, & Di Benedetto, p. 17). Thus, Rothwell (1992) expresses that a new use given to a new product or process may also be characterized as innovation.

Schumpeter (1942) underscores the importance of creative destruction, given the evolutionary nature of capitalism, expressing that it is through the emergence of new products, new production methods, new organizational forms and new markets through the "destruction" of old business models, that an economy thrives. However, technological innovation does not stem only from radical changes, but also smaller technological advances (Rothwell, 1992). Most of the time, the innovations occur incrementally and represent a substantial improvement on any product/service or existing process. In addition to that, activities that support the commercialization of a new technology (Rothwell, 1992) are also part of the innovation process. Thus, in addition to technological innovation (products and processes), there are also non-technological ones, represented, according to the Oslo Manual, by organizational and marketing innovations (OECD, 2005).

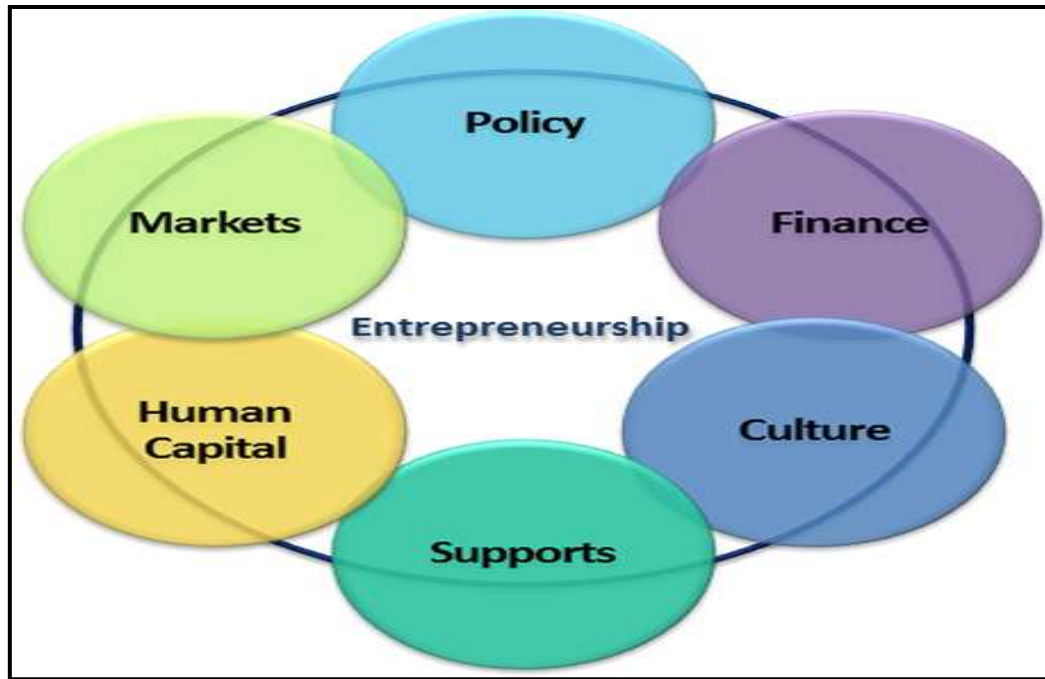
The characterization as incremental innovation, argue Tidd and Bessant (2013) will depend on the perceived novelty level in relation to what is being evaluated, but unlike radical innovation, which usually involves products that are "new to the world", that will focus on optimization processes and new products at company level mainly. Still, according to the authors, "innovation is not only the opening of new markets - it can also mean new ways to serve markets already established and mature" (Tidd, & Bessant, 2013, p. 4).

However, Teece (2010) points out that without a well-developed business model, many innovators will fail to deliver and capture value. The discussion about the business model emerged predominantly in the last decade due to the rapid growth of technology startups, defined in this work as temporary organizations for a repeatable and scalable business model and whose products/services are mostly based on *software* (Blank, 2013; Compass, 2015). The business model shows the organizational and financial structure of a business. At the same time, it describes how the organization captures and delivers value to their customers by converting the payments received into profit. Thus, a good business model produces attractive value propositions to customers and reflects cost and risk structures that are advantageous to the company (Teece, 2010).

To overcome the challenges of increasingly complex and uncertain environments, the trend is that companies are directed towards the paradigm of open innovation (Chesbrough, 2003). According to Chesbrough (2003), open innovation means that valuable ideas can come from inside or outside a company and can go to market from within or outside the company. Entrepreneurship ecosystems are environments that foster open innovation and therefore should be encouraged.

### 2.2 Entrepreneurship Ecosystems

Innovation usually happens through the action of entrepreneurs. But for entrepreneurial activity to be carried out, a set of interacting elements should be available to entrepreneurs. These elements stimulate the creation and development of new companies (Neck *et al.*, 2004; Stam, 2015) and are called "entrepreneurship ecosystem." The entrepreneurial ecosystems are geographically limited environments (Isenberg, 2010), that are also complex and evolving, holistic and dynamic. An entrepreneurship ecosystem, therefore, is the result of interaction between the actors, which evolve together and reinforce each other (Isenberg, 2011). The main study model on entrepreneurship ecosystems is the model proposed by Isenberg (2011; 2013), which features six interrelated areas, namely: policy, finance, culture, supports, human capital and market. Figure 1 below shows these six domains (Isenberg, 2011; 2013).



**Figure 1: Entrepreneurship Ecosystem Domains**

Source: Isenberg (2011)

With regard to policies, the role of the government to remove obstacles and provide the ideal preconditions for development of entrepreneurship must be emphasized (Isenberg, 2011; Mason, & Brown, 2014). These preconditions are linked to reforms in the legal, bureaucratic and regulatory frameworks (Cohen, 2006; Isenberg, 2010). The actions to meet these objectives include the simplification and organization of tax collection, decriminalization of bankruptcy, protection of shareholders before creditors, creation and liberalization of capital markets and simplification of terminations of employment contracts - plus support for the unemployed (Isenberg, 2010; 2011; Autio et al, 2014.).

Access to finance, in turn, is considered by the entrepreneurs one of the three main aspects of entrepreneurship ecosystems - the others are markets and human capital (WEF, 2013). Financial resources, public or private, should be available, visible and accessible to all segments and sectors of the ecosystem (Stam, 2015). A well-developed financial market reduces the cost of acquisition of capital by companies and facilitates the flow of money, allowing companies to develop more quickly (Kshetri, 2014).

Culture also has an important contribution to the evolution of the ecosystem. This domain refers to the strengthening of informal institutions for entrepreneurs to feel less insecure when undertaking. For this, fault tolerance is critical. Entrepreneurs who succeed are often those who have failed one or more times before being successful (Isenberg, 2010; 2013). But for that cultural change to happen and society faces the failure as something potentially beneficial, entrepreneurship should be communicated as a high social priority.

The supports, in turn, are divided into three main groups: infrastructure, non-governmental organizations and support professions. To the infrastructure group belong the science parks, telecommunication conditions, transport, logistics and energy (Isenberg, 2011). Non-governmental organizations include accelerators, hubs and incubators (Arruda *et al.*, 2015). Supporting professions include services like support for legalization of the business, lawyers specialized in ventures, accountants, consultants, suppliers and funding agencies (Isenberg, 2011).

The fifth area is human capital. Companies that want to succeed need skilled workers. On the one hand, entrepreneurship education can provide the necessary support to human capital training (Isenberg, 2013). On the other, the most enterprising regions are those which have a supply of talented and skilled professionals (Zahra, Wright, & Abdelgawad, 2014).

The final area relates to markets. Two elements contribute substantially to the *startups* ability to access the opportunities that the market offers. One of them is the big companies that provide resources, space and commercial opportunities - first contracts or initial customers, for example - for startups. The other element is networks. They encourage the creation of new businesses from knowledge spillovers and are a key source of information, resources and access to domestic and international markets (Zahra, Wright, & Abdelgawad, 2014).

Finally, it should be noted that the approach of entrepreneurship ecosystems therefore not only sees entrepreneurship as a result of the ecosystem, but also sees the importance of entrepreneurs as key players (leaders) in the creation of the ecosystem and keeping it healthy (Stam, 2015).

### 3. Method

The research method used in this article was case study. Based on the objective of the study, we chose to interview two entrepreneurs with different profiles, whose businesses are established at Porto Digital. The city of Recife-PE is one of the locations in Brazil has more thoroughly sought to enhance the entrepreneurial culture and provide the necessary conditions for entrepreneurs to develop business with innovative potential. A specific area of town called Porto Digital, is where these efforts are concentrated and, thus, the ideal setting for conducting this study.

Data collection occurred through observation, analysis of documents and interviews with entrepreneurs in the creative industry of mobile applications (apps). The script of the interview was based on six areas of entrepreneurship ecosystems (Isenberg, 2011; 2013). Interviews with entrepreneurs and managers of Porto Digital were recorded and transcribed. The visits were also recorded with photos and notes by the researchers. For processing and analysis of data, the content analysis technique was selected.

### 4. Recife and Porto Digital

In Recife, Porto Digital is an open science park, which is situated in the neighborhood called "Recife Antigo" (Old Recife). Porto Digital is defined as the Productive Arrangement of Information and Communication Technology and Creative Economy and brings together organizations, companies, universities and governments in an effort to stimulate innovation and entrepreneurship. Currently, this environment is already recognized as a center of human capital, entrepreneurship and innovation. In 2010, 200 companies anchored in Porto Digital totaled together a turnover of BRL 1 billion (Porto Digital, 2016). In the Porto Digital environment, the Centro de Estudos e Sistemas Avançados do Recife (Recife Study and Advanced System Center) (CESAR), a private innovation center that provides information and communication technology solutions. Created in 1996, CESAR has been recognized by several innovation awards nationwide. It won, among them, the Finep Award for the Most Innovative Research Institution in Brazil in 2004 and 2010 (CESAR, 2016).

### 5. Analysis and Discussion of the Results

Interviewee from Startup 1 is a serial entrepreneur who started his first business in 1994 - a computer tutoring company that still operates. Currently, the entrepreneur is dedicated to leading two startups, both located in Porto Digital and belonging to the application industry. The second interviewee (Startup 2) may be characterized as an intrapreneur. His startup can be called a spinoff of another information technology company located in Porto Digital.

Both entrepreneurs reported being undertaking due to a career choice. Interviewee 1 reports that he always imagined having his own business. However, his entrepreneurial career began out of necessity. Still young, he found on entrepreneurship a source for livelihood because he belonged to low-income family and could not count on the financial support of his parents. With a very different path, the second respondent started working in a family business. It was when he discovered his vocation for entrepreneurship. Currently, he is already owner of a business itself. However, he has not dedicated to it due to his commitment to the afore mentioned spinoff.

One of the businesses controlled by the respondent 1 is an application which aims at facilitating user access to medicines. Through it, consumers can compare prices between drug stores, buy, pay and schedule the delivery of products. The other startup of this entrepreneur, in turn, is described as a "social network for dogs." In this app, the user can register a dog and meet other dogs to play, breed and travel. Also, there is the option of adopting animals and having access to the location of pet shops, veterinary clinics and hospitals. Given the nature and purpose of the projects, one linked to medicine and other animals, it can be deduced that the graduation of the entrepreneur in veterinary medicine possibly influenced the opportunity to identify and the decision to undertake in both businesses.

As for the startup/spinoff coordinated by respondent #2, it is intended to provide immersion and interactivity to soccer viewers through an app in which they can follow in real time the matches of their favorite teams and also see the plays. The project is an evolution of a previously designed solution whose initial idea was just to offer the narration of matches.

To characterize each *startup* and identify the innovations that each presents, some factors were analyzed. These factors are: value proposition; type of innovation; presence of open innovation; and most important dimensions of entrepreneurship ecosystem for each startup, according to its developers. Table 1, below, shows these factors.

All projects focus their value proposition in the end user. However, the way to raise revenue differs in each of the businesses. While the medicine purchase app focuses on an agreement with the credit card companies to earn

revenue by charging them a small percentage of each transaction performed, the app for the pet segment still does not have a clear strategy of how to profit. Startup 3, in turn, wants to bet on a freemium model, in which users have access to the basic version and pay for additional features and partnerships with companies linked to football, as the clubs themselves, for example.

The three business promote research and testing with their respective target audiences, further incorporating users' suggestions. While in the case of startups 1 and 2 tests are done mainly at fairs, startup 3 typically invites users to the company and makes controlled tests with them. The entrepreneur responsible for this project relates a situation in which 50 to 60 people were placed in a room and monitored while watching a football game and used the app. Feedback from participants was later recorded and the entire process videotaped. This served to drive improvements in service and the app business model.

Description	Startup 1	Startup 2	Startup 3
Business (app)	Virtual platform for purchasing medicine	Virtual platform that brings together services for dog owners	Virtual platform for viewing soccer match plays in real-time
Project's start year	2015	2015	2010
Financing	Mixed (own capital + private investment)	Own Capital	Mixed (public funding + own capital)
Internship	Preincubation	Incubation	Incubation
Value Proposal	Ease of price comparison and purchase of medicines	Social network for dogs	Different view of a football match
Innovation Type	Service	Service	Service
Scope of Innovation	Industry	World	Industry
Open innovation	Yes	Yes	Yes
Main dimension(s) of the ecosystem	Markets/Human Capital/Supports	Markets/Human Capital/Supports	Markets/Culture/Supports

Openness to co-creation corroborates the finding that open innovation is no longer just a differential but a necessity for companies to survive, to adapt to the market and to become successful. Especially in the early stages of developing a new solution and in sectors/segments as or more uncertain than those related to information technology; validation with users at each stage has proven to be essential to the strategy of startups. This prevents them from wasting resources on something that users do not want and enables the correction of any flaws during the development process.

One of the main contributions of Porto Digital in this process is the access to networks. Entrepreneurs mainly emphasized the benefits of *networking* that can be built in Porto Digital. However, none of them made clear the importance of the ecosystem to assist in closing deals, that is, to make the connection between buyer and seller. This is an opportunity that can be further exploited by entrepreneurs and more stimulated within the Porto Digital entrepreneurship ecosystem.

The two entrepreneurs stressed the importance of support for the development of these innovative businesses. While for startups 1 and 2 the most relevant is the use of mentoring and consulting services provided by the incubator where they are installed, the proper incubation process is central to the strategy of startup 3. Since the latter is still in the testing phase and has not set a concrete way of raising revenue, it is essential that its activities continue to receive qualified professional knowledge contribution and has relatively low fixed costs, which is only possible due to the facilitation of the incubator.

In Porto Digital, the importance of the culture domain is also clear. Both interviewed entrepreneurs stressed that the "atmosphere" of Porto Digital favors the emergence of new ideas and, consequently, entrepreneurship and innovation. On the other hand, the initial entrepreneurs are not highly valued by the culture of the society outside Porto Digital. Thus, while the term "entrepreneur" is used as an almost derogatory connotation for newly established entrepreneurs, the most experienced and successful entrepreneurs who have already achieved are called "business persons". These, from the moment they start making money and showing off their assets, such as cars and real estate, for example, acquire high status in society and are viewed with admiration.

For respondent 1, however, the dimension of human capital is even more important. According to him, the main difficulty was to find a qualified and committed programmer to work on their projects. In this sense, Porto Digital can enhance this dimension, through training and incentives to behavioral training of these professionals. At the same time, being incubated in Porto Digital has helped the entrepreneur to overcome the difficulty of hiring qualified people. The main benefit was access to the network of contacts of people linked to Porto Digital, which indicated trusted professionals to the entrepreneur.

## 6. Conclusion

Startups object of this research, belonging to the Porto Digital app industry, resulted from the identification of opportunities by their respective entrepreneurs. The three companies are designed to meet latent demands and offer solutions with innovative potential.

Evidence indicates that the Porto Digital entrepreneurship ecosystem plays an important role in fostering new enterprises and stimulating innovation. It was observed that all six dimensions influence the development of startups. Among them, the most important influence can be attributed to the field of "markets", mainly due to networking and contact networks established among entrepreneurs. It should also be highlighted the support of institutions, which, in addition to incubating the enterprises also contributed to mentoring, training and business development tools.

The other dimensions are also relevant for startups to develop and meet an innovative business model. Despite occasional difficulties in relation to labor, it would probably have been even more difficult to hire qualified personnel, have motivation to undertake and find investors if the dimensions "human capital", "culture" and "finance", respectively, were not well developed in Porto Digital. Similarly, it is likely that these conditions for the support to entrepreneurship and innovation do not exist without public policies to encourage startups - especially those of the creative economy.

As a limitation of this study, it was not possible to collect data with actors from each of the ecosystem areas. Therefore, further studies could include a larger number of respondents. Based on these exploratory findings, a study of confirmatory nature is suggested.

## References

- [1] ABES (Associação Brasileira das Empresas de Software). (2015). Mercado Brasileiro de Software: panorama e tendência. São Paulo: ABES.
- [2] Acs, Z. J., Autio, E., & Szerb, L. (2014). National Systems of Entrepreneurship: Measurement issues and policy implications. *Research Policy*, 43, 476-494. DOI: 10.1016/j.respol.2013.08.016.
- [3] Araya, D., & Peters, M. A. (2010). *Education in a creative economy: Knowledge and learning in the age of innovation*. New York, NY: Peter Lang.
- [4] Arruda, C., Nogueira, V. S., Cozzi, A., & Costa, V. (2015). An Analysis of Entrepreneurship Determinants in Brazil and Perceptions around the Brazilian Regulatory Framework. In: R.L. LA ROVERE et al. (eds.). *Entrepreneurship in BRICS*, 9-26. DOI: 10.1007/978-3-319-11412-5\_2.
- [5] Autio, E., Kenney, M., Mustar, P., Siegel, D., & Wright, M. (2014). Entrepreneurial innovation: The importance of context. *Research Policy*, 43(7), 1097-1108. DOI: 10.1016/j.respol.2014.01.015.
- [6] Bird, B.; Schjoedt, L.; Baum, J. R. (2012) Editor's Introduction. *Entrepreneurs' Behavior: Elucidation and Measurement. Entrepreneurship Theory and Practice*, 36 (5), 889-913. DOI: 10.1111/j.1540-6520.2012.00535.x.
- [7] Blank, S. (2013) Why the Lean Startup Changes Everything. *Harvard Business Review*. Available in: <<https://hbr.org/2013/05/why-the-lean-start-up-changes-everything>> Access in: August 1, 2016.
- [8] CESAR (2016). Quem. Available in: <<http://www.cesar.org.br/quem>> Accessed on June 20, 2016.
- [9] COMPASS. The Global Startup Ecosystem Ranking 2015. Available in: <<https://startup-ecosystem.compass.co/ser2015/>> Accessed on June 20, 2016.
- [10] Chesbrough, H. (2003). *Open Innovation: the new imperative for creating and profiting from technology*. Harvard Business School Publishing Corporation.
- [11] Cohen, B. (2006). Sustainable Valley Entrepreneurial Ecosystem. *Business Strategy and the Environment*, 15(1), 1-14. DOI: 10.1002/bse.428.

- [12] Crawford, C. M., & Di Benedetto, A. (2010). *New Products Management*. 10<sup>a</sup> ed. Irwin/McGraw-Hill.
- [13] Feijoo, C., Barroso, J.-L., Aguado, J.-M., & Ramos, S. (2012). Mobile gaming: industry challenges and policy implications. *Telecommunications Policy*, 36, 212-221. DOI: 10.1016/j.telpol.2011.12.004.
- [14] Freeman, C. (1974). *The Economics of Industrial Innovation*. Penguin Modern Economics Texts.
- [15] Hnyilicza, E. (2008). Competitiveness and Entrepreneurship in Latin America. *Journal of Centrum Cathedra*, 1(1), 34-46.
- [16] Hult, G. T. M., Snow, C. C., & Kandemir, D. (2003). The Role of Entrepreneurship in Building Cultural Competitiveness in Different Organizational Types. *Journal of Management*, 29(3), 401-426. DOI: 10.1016/S0149-2063(03)00017-5
- [17] Isenberg, D. J. (2010). How to start an entrepreneurial revolution. *Harvard Business Review*, 88(6), 40-50.
- [18] Isenberg, D. J. (2011). *The Entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurship*. Dublin: Institute of International European Affairs.
- [19] Isenberg, D. J. (2013). *Worthless, Impossible and Stupid: How Contrarian Entrepreneurs Create and Capture Extraordinary Value*. Harvard Review Business Press.
- [20] Kshetri, N. (2014). Developing successful entrepreneurial ecosystems: Lessons from a comparison of an Asian tiger and a Baltic tiger. *Baltic Journal of Management*, 9(3), 330-356. DOI: 10.1108/BJM-09-2013-0146\_
- [21] Neck, H. M., Meyer, G. D., Cohen, B., & Corbett, A. C. (2004). An entrepreneurial system view of new venture creation. *Journal of Small Business Management*, 42(2), 190-208. DOI: 10.1111/j.1540-627X.2004.00105.x
- [22] OECD (2005). *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd Edition. DOI: 10.1787/9789264013100-en
- [23] PORTO DIGITAL (2016). O que é o Porto Digital. Available in: <<http://www.portodigital.org/parque/o-que-e-o-porto-digital>> Accessed on June 20, 2016.
- [24] Rothwell, R. (1992) Successful industrial innovation: critical factors for the 1990s. *R&D Management*, 22 (3), 221-239. DOI: 10.1111/j.1467-9310.1992.tb00812.x
- [25] Schumpeter, J. A. (1961). *Capitalismo, Socialismo e Democracia*. Rio de Janeiro, Fundo de Cultura.
- [26] Stam, E. (2015). Entrepreneurial Ecosystems and Regional Policy: A Sympathetic Critique. *European Planning Studies*, 23(9), 1759-1769.
- [27] Teece, D. (2010). Business Models, Business Strategy and Innovation. *Long Range Planning*, 43, 172-194. DOI: 10.1016/j.lrp.2009.07.003
- [28] Tidd, J., & Bessant, J. (2013). *Gestão da Inovação*. Porto Alegre: Bookman.
- [29] WEF (WORLD ECONOMIC FORUM). (2013). Entrepreneurial ecosystems around the globe and early-stage company growth dynamics: the Entrepreneur's Perspective. Available in: <[http://www3.weforum.org/docs/WEF\\_EntrepreneurialEcosystems\\_Report\\_2013.pdf](http://www3.weforum.org/docs/WEF_EntrepreneurialEcosystems_Report_2013.pdf)> Accessed on February 16, 2016.
- [30] Zahra, S., Wright, M., & Abdelgawad, S. G. (2014). Contextualization and the advancement of entrepreneurship research. *International Small Business Journal*, 32(5), 479-500. DOI: 0.1177/0266242613519807