IASP International Association of Science Parks and Areas of Innovation

33rd IASP World Conference on
Science Parks and Areas os Innovation 2016

Russia, Moscow

An international Cooperation scheme for STPs and AIs: The framework of Creative Economy Promotion Program

Parallel session

The role of SPTs and AOIs in inter-regional cooperation

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An International Cooperation Scheme for STPs and AIs: The Framework for a Creative Economy Promotion Program

Executive Summary

The creation of Small and Medium Enterprises (SMEs) has undergone unprecedented growth during the past couple of decades. Knowledge-Intensive Entrepreneurship became vitally important for contemporaneous economic health, strongly contributing to job generation and nations' gross domestic product. The literature recognizes that the systematic development of innovative SMEs can help boost emerging economies. In this context, the collaboration of SMEs with Global Value Chains (GVC) and specialized Innovation Networks can turn into a valuable resource tool to strengthen the nesting infrastructure and innovation conditions for SMEs business development. This paper presents a case study focusing on the framework and preliminary results of the "Brazil-Korea Creative Economy Program", an international collaborative approach for Areas of Innovation (AIs), to foster knowledge-intensive SMEs through collaboration with Global Value Chains and Innovation Networks.

Keywords: Creative Economy; Start-ups; Global Value Chains; Innovation Networks; Science and Technology Parks; Areas of Innovation; Brazil; Korea.

I. Introduction

In April 2015, the Brazilian Association of Science Parks and Business Incubators (Anprotec), the Brazilian subsidiary of Samsung Electronics and the Korean Daegu Center for Creative Economy & Innovation (CCEI) signed a Memorandum of Understanding, aiming to disseminate the entrepreneurial Korean Creative Economy model in Brazil [13], based on the Daegu CCEI's accumulated experience and know-how, organized as a collective set of knowledge-intensive entrepreneurial resources, including methodologies, technologies, practices and culture, to develop an Acceleration Program to provide seed capital to startups. This Acceleration Program is called "Startup Creative Economy" and was implemented to foster innovation and entrepreneurial activity through direct investments in the creation and development of knowledge-intensive Small and Medium Enterprises (SMEs) in Brazil. This agreement embraced a wide range of activities, including, but not limited to, entrepreneurial education, research & development, knowledge and methodology transfer, capacity building, investment and venturing. Its primary objective was to implement a pilot plan, which consisted of the first approach to the Acceleration Program inspired by the South Korean experience. This pilot plan was promoted by the Brazilian Government, the private sector and the codified and tacit knowledge transfer from South Korea to Brazil. The secondary objectives are listed as follows: 1) To develop Brazilian Innovative Enterprises through projects focused on the priority thematic areas: Digital Education, Digital Health, Information Security and Digital Mobility; 2) To customize the Acceleration Program, from the South Korean Creative Economy framework, regarding Brazil's social, technological and economic scenario; 3) To exercise collaborative networking between firms and innovation initiatives to develop organizations and maximize the benefits of "open innovation" [8][9]; and 4) To contribute to the mechanisms of Technological Upgrading, namely the improvement of regional innovation activities through the interaction between SMEs and Global Value Chains [1][2] and young innovative startups. The Startup Creative Economy can be quoted as "an experimental Startup Acceleration Program which derives from the experiences of the South Korean Creative Economy Model, having the ambition to contribute with the National Innovation System (SNI) in Brazil". This paper is a case study introducing the framework and preliminary results of the Startup Creative Economy Program, and is organized as follows: Section II presents the framework of the program, its main agents and processes. Section III introduces the theoretical framework and a bibliographic review. Section IV discusses the methodology utilized in this work. Section V displays the preliminary results from the case study. Section VI discusses those preliminary results and provides an analytical diagnosis. Section VII includes final considerations and alternatives for future papers and research projects. Finally, Section VIII acknowledges the main institutional contributors.

II. The Startup Creative Economy program

The Startup Creative Economy Program requires six key players to materialize: a) Regulator: The Ministry of Science, Technology and Innovation (MCTI), in accordance with the Brazilian Law of Information Technology; b) Sponsor: SAMSUNG BRAZIL is the sponsor representing the GVC and provides the financial resources from the Brazilian Law of Information Technology; c) Manager: The Brazilian Association of Science Parks and Business Incubators (ANPROTEC) is the executor of the Program in Brazil through its wide network of associates; d) Licensor: The Center for Creative and Innovation Economy (CCEI); e) Beneficiaries: The young independent technology-based companies called Startups and Incubator(s), affiliated with ANPROTEC and accredited by the MCTI to manage the financial resources from the Brazilian Law of Information Technology. The projects supported are represented by young knowledge-intensive startups, defined by SCHMITZ & STRAMBACH [14] as "Knowledge-Intensive Business Services" (KIBS), and their interactions with GVCs are through annual investment cycles. This interaction involves the transfer of codified and tacit knowledge, and interactive learning is expected among firms from different sources "learning by doing, using and interacting" (DUI) [15]. The acceleration framework follows the program methodology, which derives from the adapted practices of the Korean Creative Economy Model [13] and it is funded by the Brazilian Law of Information Technology** regarding the provisioned budget of five million dollars. The customization process for the development of the Startup Creative Economy Program was carried out pursuant to Brazil's social, technological and economic scenario and was also based on Brazil's incubation methodology, called CERNE [36]. The Reference Center for Business Incubation – CERNE aims to promote significant improvement in the results of incubators in different areas, both quantitatively and qualitatively, through the creation of an operating standard and model to increase their capacity and generate systematically successful innovative companies. From the Korean model of Creative Economy and proposed technical review by CERNE's criteria, the Startups Creative Economy was designed as an acceleration program that aims to develop startups at the seed capital stage. The model provides a framework of a startup acceleration process, to be carried out in 6 months and organized into 7 stages, namely: 1-Incorporation; 2-Boot camp; 3-Work Plan; 4-Creative Networking Day (CNDAY); 5-

Mentorship & Solutions Ad hoc; 6-Pitch Day; and 7-Showcase & Graduation. For each cycle of acceleration, the term "batch" is given to a set of startups taking part in the program. This article in particular addresses the framework of the first batch of the Startup Creative Economy Program.

Stage 1: Incorporation - The first stage begins with the incorporation process of startups and incubators. The incorporation is based on two requirements: a) a minimum maturity level by the sponsor; and b) startup suitability, i.e. mandatory registration and the participation of enterprises with a minimum age of 6 months.

Stage 2: Boot Camp - The boot camp is the first event dedicated to the preparation of startups and incubators, including: a) Introduction and training of key program themes; and b) access to SAMSUNG's mentorship and technologies. The meaning of "boot camp" comes from the military context, which offers intensive and technical training for new recruits. For two days, the sponsor and the coordinator meet the beneficiaries in person, training them on key issues, such as: a) Design Thinking methods; b) Relationship with Media Guidelines; c) Technologies and Samsung; and d) Pitching for Investors. In addition to these training activities, the startups received the first official SAMSUNG mentoring, aimed at delivering initial guidance to startups in compliance with the work plan for each startup.

Stage 3: Work Plan - The work plan is a document that details the product vision, defined by both Samsung and the startup, until the end of the program. This document is developed and led by the technical team sponsor and contains the expected results to be monthly achieved by each startup.

Stage 4: Creative Networking Day (CNDAY) - The CNDAY is a virtual event that focuses on knowledge transfer and spontaneous generation of networking. Its main objective is to promote virtual meetings among market professionals, incubators and startups in the six key areas of the sponsors' areas of expertise. By the end of the program, 16 virtual lectures will be held.

Stage 5: Mentorship & Solutions Ad hoc - Regarding the Work Plan, developed in the third stage of the program, the mentoring activities are available monthly for the selected startups to reach the expected results. The Ad Hoc solutions are understood as complementary measures to mentoring efforts, providing opportunities, for example, for startups to access specialized professionals and special sponsor tools in order to solve emergency technical problems.

Stage 6: Pitch Day - The Pitch Day is a working event to monitor preliminary results, held at the end of each month. The main objective is to present the startups' progress through a virtual Pitch Session, to measure their results.

Stage 7: Showcase & Graduation - The seventh stage officially ends the program and has two objectives: a) to present the latest version of the product in compliance with the Work Plan; and b) to host the graduation ceremony, certifying the progress made by the companies and the completion of the first batch.

III. The Theoretical Framework

The significance of knowledge for society and the economic order has been debated for a long time in the literature [31]. In accordance with Kuznets, the distinctive characteristic of modern industrialized societies is the systematic application of knowledge to the economic context. Many authors argue that the economic activity shifted away from big industrial plants towards the exploration of knowledge [32]. As a result, the economies of scale that gave machine- and labor-based activities their competitive advantage in the past were no longer important and separated the economy from its physical resources. As stated by Stam & Garnsey, the fuel of today's economy is knowledge and, while former scholars from the 20th century emphasized the economic importance of large firms, a shift from the managed economy to the study of entrepreneurial economy in OECD countries has been recently identified [33]. Still according to Stam & Garnsey, knowledge-based firms have the potential to demonstrate the economic value of new knowledge, and economies equipped with a high number of knowledge-based firms are building the expertise necessary for the future, when emerging technologies will diffuse into other parts of the economy, which is when knowledge-intensive entrepreneurial activity becomes critical. A basic definition of Knowledge-Intensive Enterprises (KIEs) is given in terms of four basic characteristics: "KIEs are new firms that are innovative, have significant knowledge intensity in their activity, and develop innovative opportunities in diverse sectors" [34]. Since Schumpeter isolated the entrepreneurial function existing in the economic system [10], entrepreneurship became a crucial engine through which opportunities and inefficiencies in an economy are discovered and mitigated [11]; however, undertaking the development of entrepreneurs and venturing is neither obvious, nor a trivial occupation. There are several paths and possibilities; thus, determining the appropriate tools to collaborate with entrepreneurial systems is crucial to increase the chances of success in venturing business projects. This work instantiates the economic entrepreneurial function through SMEs and focuses on the analysis of knowledge-based SMEs' interactions with Global Value

Chains (GVC) [1][2] and Innovation Networks (IN) [8][9], creating collaborative arrangements to mitigate venturing risks of early-stage startups and strengthening the nesting infrastructure and conditions for SMEs business development. SMEs are recognized as engines for "open innovation," and high-growth SMEs are generally shown to have characteristics of innovation, market linkages, and networks focused on encouraging SME growth [30]. Humprey & Schmitz [2] define GVCs as one of the possible approaches to condense in a single idea the principle that a chain of activities distributed across different locations and organizations involves design, production and commercialization of products. The authors analyzed the pressures on existing firms, particularly on firms based on developing countries, and suggested that *Upgrading* is a tool to develop local innovation activities of SNIs, given the following main definitions of an SNI in the literature: "*the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies*" (Freeman, 1987), or "*[...] the elements and relationships which interact in the production, diffusion and use of new, and economically useful, knowledge [...] and are either located within or rooted inside the borders of a nation state*." (Lundvall, 1992), or finally *"[...] a set of institutions whose interactions determine the innovative performance [...] of national firms*" (Nelson, 1993), increasing production efficiency or adding value to products, and allowing firms to assume new functions in the value chain. Presumably, it has relevant implications for firms from developing countries to interact with GVCs led by multinational enterprises (MNEs) as commercial partners or suppliers, enabling them to access innovation *Upgrading* mechanisms [12]. Still according to the literature, not only GVCs, but also interrelationships between SMEs and specialized INs are potential catalysts to strengthen SME's abilities and accelerate business expansion, especially towards internationalization [6][7][8][9]. Therefore, the connections between SMEs, GVCs and INs are a relevant subject of research. Identifying what are the characteristics of those symbiotic interactions can directly contribute to the improvement of knowledge-based entrepreneurial activity in emerging economies [3][4][5].

IV. The Methodology

This section presents the methodology and procedures for the development of the study. The work structure is divided in three main steps: i) bibliographic research; ii) context observation and diagnosis, in which the roles of Global Value Chains and Innovation Networks are explored through the case study; and iii) evaluation of preliminary results, discussion and diagnosis. *Prospecting* and *Prioritizing* were adopted as supporting tools to address the problem of identifying emerging technologies and selecting projects to develop knowledge-intensive SMEs. The bibliographic research presents and critically discusses the existing literature, which includes different methods of prospecting and prioritizing projects. Our starting point for observation and diagnosis is the context of the "Startup Creative Economy" program. It is worth mentioning the direct engagement of the authors in this project's institutional context during process, proposition and execution, contributing to a better understanding of the context studied. Considering that the project horizon is for five years, from July 2015 to June 2020, it was estimated that the outcomes from the project would arrive in the street market between 2017 and 2021, at a flat rate of 10 new SMEs every year. Then, the formulation of the problem was organized in two parts. Firstly, the elaboration of a *Prospection Plan* to address the identification of emerging technologies in 4 domains of interest: 1) Digital Education, 2) Digital Health, 3) Information Security and 4) Digital Mobility, and contribute as a decision-making support tool to prioritize direct investment decisions in specific projects. Secondly, the elaboration of a *Prioritization Plan* to select potential Incubators and candidate SMEs. Rotolo [16] generated controversial debates when trying to define the meaning of the empirical term "emerging technologies". To prevent controversy, this paper adopted Rotolo's definition as a "*radically new technology, characterized by relative fast growth, with some degree of persistent coherence through the time, and potential to create impact in the social-economic context, which is observed in terms of composition of actors, institutions and patterns in their interactions, associated with processes of knowledge production*". The program focuses on startups capable of driving the development of emerging technologies in collaboration with an enterprise organization and an associated innovation network. In conclusion, the problem addressed in this paper is a matter of *Prospection* and *Prioritization*.

A. Prospection Methodology

Jantsch [17] reminds us of the historical gap between Forecasting and Research and Development activities. Jantsch´s arguments lean towards the systematic search and evaluation of information as input for the dynamics of future studies, especially in the context of Technology Forecasting. Technology Forecasting techniques and methods emphasized the determination, with the best possible precision, of the future of technological development and new technologies. This perspective was gradually replaced by another trend emphasizing the "construction of the future", through a mechanism of empowering present decision-making processes with the input of robust information and knowledge gathering. The term Technology Foresight, or simply Foresight, coined by Georghiou et al. [18], designates this new approach. In

addition, Saritas&Aylen [19] discusses the plurality of methods to approach the future in a broad spectrum from general qualitative methods or "*opinion-driven*", to purely quantitative or "*data-driven*" methods. Saritas&Aylen suggests that the combination of different methods with different sources of information contributes to significantly increase the precision of the estimates. Complementing this view, Georghiou presents a possible categorization of prospection methods, organized by types of knowledge divided into four main axes as the Foresight Diamond: 1) creativity, 2) expertise, 3) interactions and 4) evidences; at the same time providing a general overview on the emphasis of each prospection method regarding its characteristics in terms of qualitative, quantitative and semi-quantitative approaches. On the qualitative axis, tools such as Delphi [20] contribute to converge opinions among participants. Other tools described by Saritas & Smith [21], including scenarios, trends, wildcards and weak signals can be classified as opinion-driven and contribute to build possibilities of future. Still under opinion-driven methods, it is worth mentioning Horizon Scan, as discussed by Miles & Saritas [22]. It provides a systematic analysis of potential threats, opportunities and probable outcomes, including but not limited to the current mindset and actual plans. We should also mention Technology Roadmap [23] as a technique to plan the realization of objectives, especially those related to product and technology. Expert Panels [24] is yet another opinion-driven method frequently used to collect relevant inputs from expert communities. Regarding quantitative methods, there is a wide range of options, from exhaustive methods, including bibliometric and patent analysis [25][26], to more complex methods of computational modeling and data mining [27][28][29]. Daim et al. [26] argues that prospecting emerging technologies presents challenges such as the inexistence of historical data and suggests that the use of bibliometric and patent analysis may provide complementary data for the decision-making process. For this case study, we identified that the program under study is predominantly exploratory, not normative, and that this feature, combined with the unavailability of historical data, indicates the use of the Foresight Diamond as a reference and the prioritization the axis of qualitative or opinion-driven methods. The following methods were prioritized: a) Literature Reviews; b) Horizon Scanning; and c) Experts Panel, which are eventually complemented by patent analyses for each thematic area chosen by the program as a domain of interest: 1) Digital Education, 2) Digital Health, 3) Information Security and 4) Digital Mobility. The following future scenarios for each domain are listed in table IV.1.

#	Area	Future Scenario
1	Digital Education	Includes but is not limited to: (i) Authoring platforms for advanced educational content, including interactivity and augmented reality; (ii) Advanced educational content for training and technical and vocational recycling; (iii) Platforms for school and classroom management; and (iv) Educational content (k12, EJA, undergraduate or technical programs introducing components of gamification, interactivity and/or automatic assessment).
2	Digital Health	Includes but is not limited to: (i)Monitoring of vital signs; (ii) Monitoring of physical activities (e.g. mobility, physical, accidents, emergencies); (iii) Monitoring of mood and behavior; (iv) Monitoring of engagement in medical treatment (e.g. Medication, diet food); (v) Monitoring of environmental conditions (e.g. light, temperature, humidity, noise); (vi) Communication and medical cooperation, patient care team; and (vii) Alarms, warnings and recommendations based on the analysis of monitoring data.
3	Information Security	Includes but is not limited to: (i) Protection against leakage of sensitive information; (ii) Toughening of platforms; (iii) Password-less authentication; (iv) Parental control, child protection services and filtering of inappropriate content; and (v) Mobile phones as a personal security tool in the Internet of things context.
4	Mobility	Includes but is not limited to (i) Convergence of wearable technology, smartphones, tablets and TVs; (ii) Digital TV converging content; (iii) Battery management and resource optimization; (iv) Storage management; and (v) Wifi seamless call.

Table IV.1– Selected future scenarios for Year1/2017

B. Prioritization Methodology

Quantitative methods are frequently mentioned in the literature concerning project selection and resource allocation [27][28]. Comparative models such as Q-Sort, Analytical Hierarchic Process (AHP), punctuate models, economic models, group techniques, dynamic programming, stochastic models, fuzzy logic, simulation, heuristics and even cognitive models constitute the array of possibilities, but qualitative methods also have their space in the context of prioritization. Peer-review, for example, is largely used to evaluate the quality of academic research, and expert panels are a common tool for prioritization. In this case study, we noticed the intensive use of multi-criteria analysis to prioritize projects, as discussed by many different authors, such as Zopounidis & Doumpos in 2002 and Mavrotas et al. in 2003, allowing a combined qualitative and quantitative approach. Given the particularities of this case study, the multi-criteria analysis was combined with ADHOC qualitative analysis, considering that there were many other tacit and strategic interests involved in investment decision-making processes. As a result, the prioritization was carried out in three steps, after the realization of the open call to gather candidate proposals: 1) MCDA – Multi Criteria Decision Analysis. Evaluators from the sponsoring organization's business and research and development areas, together with evaluators from the selected Incubators, evaluated the candidate proposals individually, based on the criteria described in table IV.2, each ranging from 0-minimum to 2-maximum,

balanced by weights from 5 to 10%. A group of 20 evaluators was appointed to execute this step. Based on the consolidated results, the evaluators filtered the more than one hundred candidate proposals and recommended finalist candidate projects to move ahead to the next stage. 2) ADHOC Qualitative Workshop – this phase selected the top projects by means of a workshop to carry out an in-depth qualitative analysis of these project proposals. The evaluators ranked the project proposals in this phase. 3) ADHOC Executive Decision – this stage was held by the sponsoring organization's executive committee, who selected the winner proposals to be further developed by the direct investments of the Acceleration Program.

#	Criteria	h%	Definition
1	Market opportun.	10	0 - No clear market can be identified 1 - Solution will compete in existing market 2 - Solution has potential to create a new market
	Market size	10	0 - Solution impacts regional market(municipal/state level) 1 - Solution impacts domestic market (national level) 2 - Solution impacts international market (global export)
	Market Regulation	10	0 - Market regulation is extremely tied 1 - Market regulation is weak 2 - There is no market regulation at all
2	Contribution to the R&D chain	5	0 – There is no potential contribution to the R&D chain 1 - Potential as a mid/long-term technology partner 2 - Explicit contribution to optimize time or specific R&D costs
	Contribution to Product &Services portfolio	10	0 - There is no potential contribution to Samsung sales opportunities 1 - Potential to contribute to mid/long-term sales B2B/B2C/B2G 2 - Potential to contribute to short-term sales in B2B/B2C/B2G
	Adherence to Areas of Interest	5	0 - No adherence to the areas of interest 1 - Somehow connected with the areas of interest 2 - Fully adheres to the areas of interest
3	Degree of innovation	10	0 - No innovation: saturated market and technology 1 - Incremental Innovation : addresses existing market 2 - Radical Innovation : creates/destroy market
	Intellectual Property	5	0 – Competitors hold similar solution or patent 1 - No similar solution or patent filing detected 2 - Proponent has ownership of patent (filed)
	Business Shielding	5	0 - Solution or Business Model easy to replicate 1 - Solution or Business Model hard to replicate, 2 - Solution or Business Model, complementary assets
4	Leadership competence	5	0 - Leaderless team without cohesion 1 - Regular team with average leadership 2 -Strong leadership, entrepreneurial spirit, motivated
	Research competence	5	0 - Proponent Partners without formal academic degree 1 - Proponent Partners with formal undergraduate degree 2 - Proponent Partners with formal Master's or PhD level
	Experience competence	5	0 - Team experience unrelated to the Business 1 - Team has some experience in the field of the Business 2 - Team has extensive experience in the field of the Business
5	Consistency	5	0 - No technical / financial / market consistency 1 - It has technical and financial coherence but lacks market 2 - It has technical/financial/market consistency
	Minimum Viable Product/Prototype	5	0 - No MVP available 1 - Low fidelity MVP available 2 - High fidelity MVP available
	Investment Readiness	5	0 - MVP not validated with the market 1 - MVP already validated with the market 2 - Revenue scaling started with evidence of traction

Table IV.2 – MCDA parameters for Prioritization

V. Preliminary Results

As a result of the execution of the Prospection and the Prioritization Plans, more than 300 Incubators were invited to participate in the process, 20 of which submitted their proposals. Sixteen incubators were qualified and five were effectively selected for the pilot plan in 2016.The five incubators selected are located in the following regions and respective states of Brazil: North (Amazonas), Northeast (Paraíba), Midwest (Goiás), Southeast (São Paulo) and South (Porto Alegre). There were approximately 2000 interested startups in the application round, 106 of which submitted their project proposals. After running the prioritization process, eight projects were selected for the Startup Creative Economy Program. These eight startups belong to the Digital Education, Digital Health, Mobility, and Information Security sectors and were incubated in early 2016 in the following regions: Northeast (Paraíba), Midwest (Goiás), Southeast (São Paulo) and South (Porto Alegre). Unfortunately, negative results came from the North region. A new application round will be required to perform this regional goal for the Western Amazon region. More than 20 evaluators were invited to join the prioritization exercise and evaluate these projects. The prioritization was considered satisfactory by all stakeholders. The main results of this stage are: 1) the realization of a new application round for the North region in order to select local projects, and 2) the development of a work plan by the sponsoring organization and the selected startups. These startups initiated their incubation process in January 2016, and should achieve market product maturity in the first quarter of 2017. From January to April 2016, Anprotec followed the evolution of the incubators and the results of the startups, such as:

A. **Incorporation:** full compliance with the acceleration program conditions: eight partnership agreements were signed between: SAMSUNG, Startups and the Incubators.

B. Boot Camp: the official opening of the Startup Creative Economy Program, it is a three-day event that offers intensive entrepreneurial training for 22 professionals from incubators and startups in the following areas: 1 Design Thinking; 2 Relationship with Media Guidelines; 3 Samsung Technologies; and 4 Pitching for Investors. The event was closed with eight startup pitches and 40 mentorship sessions.

C. Creative Networking Day (CNDAY): Five virtual training events were carried out by connecting four Brazilian areas: Northeast (Paraíba), Midwest (Goiás), Southeast (São Paulo) and South (Porto Alegre). The CNDAY trained 8 startups and more than 30 invited guests every week. The entrepreneurs were trained on: 1- The Brazilian Law of Information Technology and accountability;

2 The new approach to Pitches; 3- Digital Education; 4 Accounting Procedures and 5 Public Funding Opportunities

D. Pitch Day: The first Pitch Day was marked by an in-person and virtual event, managed by the incubator from the Midwest region. The event brought together 15 professionals to evaluate eight pitches and monitor the general results.

The first evaluation of the Ministry of Science, Technology and Innovation (MCTI) emphasized the importance of the Brazilian Law of Information Technology to the country's competitiveness. In accordance with the MCTI, the Startup Creative Economy Program became a benchmark in using this funding model for open innovation and entrepreneurial support in Brazil, an important tool for innovation and interaction between government, incubators, multinationals and SMEs. The program became an example for other companies intending to use the Brazilian Law of Information Technology funding model. In line with the MCTI, Anprotec is directly linked to the development of business incubators and technological parks and the execution of the Startup Creative Economy Program in different regions of Brazil has begun to smoothly spread the Korean Creative Economy Culture. The successful implementation of this model to support innovation involves transferring knowledge to AIs and STPs and strengthening the industry based on intensive knowledge of SMEs. The Daegu-CIEE aims at promoting the creative industry, by identifying innovative startups in the Brazilian market. Finally, by the end of July 2016, more than three hundred and eighty thousand dollars (US$380,000.00) will be invested in areas of innovation (AIs); and four business incubators and eight startup companies will be entirely supported by the Startup Creative Economy Program. Until the end of 2020, the program will invest five million dollars (US$5,000,000.00) and more than 30 Brazilian startup companies will benefit from business incubators certified by ANPROTEC and accredited by the Brazilian government to manage financial resources from the Brazilian Law of Information Technology to be invested in Research, Development and Innovation (R&D&I).

VI. Discussion

From the findings in the preliminary results section, we have identified an incongruity in the implementation of a broad national strategy, as well as a unique and general approach to the implementation of the Startup Creative Economy framework in five different regions: North (Amazonas), Northeast (Paraíba), Midwest (Goiás), Southeast (São Paulo) and South (Porto Alegre). The economic and legal asymmetry in Brazil causes the need for different strategies splitting the country in two great areas: the Western Amazon region and the other Brazilian states. Regarding the negative result in the North region, we recommend the following adjustments: 1) a new application round; and 2) a specific acceleration model to support entrepreneurs in that region, working with embryonic prototypes and achieving medium-term results. The adjustment strategy for the North region would ensure the originality of the regional projects, thus avoiding crossover incubation between the Western Amazon startups and other startups from different areas and vice-versa. Another reason that justifies revising the strategy for the North region is the existence of a local legislation defining specificities for incubation in the Western Amazon region. The Ministry of Development, Industry and Foreign Trade (MDIC) is in charge of the Western Amazon region, while the Ministry of Science, Technology and Innovation (MCTI) regulates the rest of Brazil. These two Ministries have similar legislations, with particularities for different contexts. After analyzing these results and the critical success factors for the implementation of a national strategy, we concluded that there are regional distinctions in Brazil, confirming the need to revise the selection model and acceleration of entrepreneurs and startups in future editions of the Startup Creative Economy Program.

VII. Final Considerations and Future work

In light of the Program, it is essential to reconsider the Brazilian territory and re-evaluate the economic and legal impacts on two major areas. In this sense, we will pursue continuous improvement, building references and global guidelines, taking into consideration local customizations required by the market, the economy and the Brazilian legislation. It is also necessary to continue this work through the Evaluation Plan of Results and Impact Assessment (R & I), considering the specific objectives of this program, the great heterogeneity and different interests of the agents involved and the random behavior characterized by the thematic diversity of the supported projects. WEISS [37] defines evaluation as an activity that aims to assess the operations or results of a program or policy, based on a comparison or set of patterns that can be pre-defined, explicit or implicit, and that contribute to improvement. The author lists five key components of evaluations: the first is the nature of research; the second and the third refer to the focus of the evaluations, i.e., if they focus on the analysis of operations (such as the program being conducted) or on program results (outcomes and impacts for beneficiaries); the fourth is the definition of criteria for comparison of the objectives to be achieved; and the fifth relates to the purpose of the evaluation and its contribution to the improvement of the programs.

VIII. Acknowledgments

We would like to give special thanks to the Brazilian Subsidiary of Samsung Electronics, as the approach proposed in this paper for prospecting and prioritizing emerging technologies and startups was obtained from

research activities sponsored by Samsung Eletrônica da Amazônia Ltda. under the terms of Brazilian Federal Law 8248/1991. We would also like to thank the Daegu Center for Creative Economy and Innovation for licensing the South Korean Creative Economy model, which is a reference for the development of the Startup Creative Economy Program. We should also extend our thanks to Anprotec for seeking new innovative solutions to support Business Incubators and Technology Parks. We also thank the incubators and startups, the protagonists of this first batch of the Acceleration Program. Finally, we want to express our gratitude to the Brazilian and Korean Ministries of Science and Technology for their institutional support, unleashing the possibilities of collaboration for innovation between Brazil and Korea.

References

[1] GEREFFI, G. (1994) – "The organization of buyer-driven global commodity chains: How U.S. retailers shape overseas production networks". In G. Gereffi and M. Korzeniewicz "Commodity Chains and Global Capitalism". Chapter 5, Westport, CT, 1994;

[2] HUMPHREY, J. & SCHMITZ, H. (2000) – "Governance and Upgrading: Linking Industrial Cluster and Global Value Chain Research", Working Paper 120, Brighton: IDS, 2000;

[3] KUNDU, Sumit & RENKO, Maija (2005) – "Explaining Export Performance: A Comparative Study Of International New Ventures In Finnish And Indian Software Industry". In: KATZ J.A. and SHEPHERD D. International Entrepreneurship, Advances In Entrepreneurship, Firm Emergence and Growth Volume 8, p 43-84, A. Leeds School of Business, University of Colorado, Boulder, USA, ELSEVIER, 2005;.

[4] ZAHRA, SHAKER A. ; NECK HEIDI M. ; KELLE DONNA J. (2004) - "International Corporate Entrepreneurship And The Evolution Of Organizational Competence: A Knowledge-Based Perspective" In: KATZ J.A. and SHEPHERD D. Corporate Entrepreneurship, Advances In Entrepreneurship, Firm Emergence and Growth Volume 7, p.145-172 A. Leeds School of Business, University of Colorado, Boulder, USA, ELSEVIER, 2004;

[5] OECD & WORLDBANK (2015) – "Inclusive Global Value Chains Policy options in trade and complementary areas for GVC Integration by small and medium enterprises and low-income developing countries" . OECD and World Bank Group - Report prepared for submission to G20 Trade Ministers Meeting Istanbul, Turkey, 6 October 2015.

[6] COVIELLO, N. E. & MUNRO, H.J. (1995) – "Growing the entrepreneurial firm networking for international market development". European Journal of Marketing, Vol. 29 No. 7, 1995, pp. 49-61. © MCBUniversity Press, 0309-0566.;

[7] FREEMAN, S.; EDWARDS, R.; SCHRODER, B. (2006) – "How Smaller Born-Global Firms Use Networks and Alliances to Overcome Constraints to Rapid Internationalization". Journal of International Marketing © 2006, American Marketing Association Vol. 14, No. 3, 2006, pp. 33–63 ISSN 1069-031X (print) 1547-7215 (electronic).

[8] TOLSTOY D. (2010) – "International Entrepreneurship in Networks The Impact of Network Knowledge Combination on SMEs' Business Creation in Foreign Markets". Dissertation for the Degree of Doctor of Philosophy, Stockholm School of Economics 2010;

[9] VONORTAS, N. & McPHERSON, M. (2012) - "Networks and Strategic Options for Innovative performance in Knowledge-Intensive Enterprises", George Washington University, April 2012;

[10] SHANE S. & VENKATARAMAN S. (2000) – "The Promise of Entrepreneurship As A Field Of Research ". The Academy of Management Review, Vol. 25, No. 1, pp. 217-22, 2000;

[11] KIRZNER, I. (1997) – "Entrepreneurial discovery and the competitive market process - An Austrian approach". Journal of Economic Literature, 35: 60-85, 1997;

[12] WORLDBANK (2014) – "Latin American Entrepreneurs - Many Firms but Little Innovation" - ISBN (paper): 978-1-4648-0012-2, ISBN (electronic): 978-1-4648-0013-9. DOI: 10.1596/978-1-4648-0012-2

[13] SMART KOREA (2014) – "Smart Korea Creative Economy". World Economic Forum, Annual Meeting, South Korea Ministry of Science, ICT & Future Planning, January, 2014. http://www.korea.net/NewsFocus/Policies/view?articleId=121727;

[14] SCHMITZ, H. & STRAMBACH, S. (2009), "The organisational decomposition of innovation and global distribution of innovative activities: insights and research agenda". Int. J. Technological Learning, Innovation and Development, Vol. 2, No. 4, 2009 p231-249

[15] LUNDVALL, B.A, et al (2009), "Innovation system research and developing countries" in LUNDVALL,A.B., Joseph, K.J., CHAMINADE, C. and VANG, J. (eds.) Handboook of Innovation Systems and Developing Countries. Building Domestic Capabilities in a Global Setting. Edward Elgar, Cheltenham, UK and Northhampton, MA, USA.

[16] ROTOLO D. ;HICKS D. ; MARTIN B. (2015) – "What Is An Emerging Technology". Research Policy , Elsevier V.44 (2015) pp. 1827-1843

[17] JANTSCH, E. (1967) - "Technological Forecasting in Perspective: A Framework for Technological Forecasting, its Techniques and Organisation". OCDE, 401p;

[18] GEORGHIOU, L., HARPER, J. C., KEENAN, M., MILES, I., POPPER, R. (2009) – "The Handbook of Technology Foresight". Cheltenham: Edward Elgar Publishing;

[19] SARITAS, O.; AYLEN, J. (2010) –"Using scenarios for roadmapping: The case of clean production". Technological Forecasting & Social Change;

[20] GARY, J.E.; GRACHT, H.A. (2015). "The future of foresight professionals: Results from a global Delphi study". Futures, 71. p. 132–145

[21] SARITAS, O.; SMITH, J.E. (2011). The Big Picture – trends, drivers, wild cards, discontinuities and weak signals. Futures, 43. p. 292–312;

[22] MILES I.; SARITAS O., (2012) - "The depth of the horizon: searching, scanning and widening horizons", Foresight, Vol. 14 Iss 6;

[23] PHAAL R.; FARRUKH C.; PROBERT D., (2004) –"Technology Roadmapping – A planning framework for evolution and revolution". Science Direct, Technological Forecasting and Social Change Vol 71;

[24] LOVERIDGE, D. (2002) – "Experts and Foresight: review and experience". PREST, Discussion papers series;

[25] CHANG, SB (2012) - "Using patent analysis to establish technological position: Two different strategic approaches". Technological Forecasting and Social Change. Volume 79, Issue 1, January 2012, Pages 3–15;

[26] DAIM, T.U.; RUEDA, G.; MARTIN, H.; GERDSRI, P. (2006) – "Forecasting emerging technologies: Use of bibliometrics and patent analysis". Technological Forecasting & Social Change, 73. p. 981–1012

[27] HEDGEBETH, D. (2007). "Data-driven decision making for the enterprise: an overview of business intelligence applications", VINE, 37(4). p. 414 – 420;

[28] MINER, G. (2012). "Practical Text Mining and Statistical Analysis for Non-structured Text Data Apps". Science Direct. Cap 1. http://www.sciencedirect.com/science/book/9780123869791 ;

[29] PALOMINO, M.A. et al. (2012). "Web-based horizon scanning: concepts and practice", Foresight, 14(5). p. 355 – 373;

[30] VONORTAS, N. & McPHERSON, M. (2012) - "Networks and Strategic Options for Innovative performance in Knowledge-Intensive Enterprises", George Washington University, April 2012;

[31] KUZNETS, Simon (1966) - "Modern Economic Growth". Yale University Press. New Haven, Conn, Chap 1, 1966;

[32] BIRCH, D. L., HAGGERTY, A., & PARSONS, W. (1993). Who's creating jobs?. Boston: Cognetics Inc. Birch, D. L., Haggerty, A., & Parsons, W. (1995). Who's creating jobs?. Boston: Cognetics Inc

[33] AUDRETSCH, D & THURIK, A. (2001) - "What's New about the New Economy? Sources of Growth in the Managed and Entrepreneurial Economies". Industrial and Corporate Change vol. 10(1) pp:267-315, 2001

[34] MALERBA, F. (2010) – "Knowledge-intensive entrepreneurship and innovation systems. Evidence from Europe". Franco Malerba (ed.) London & New York: Routledge, 2010. ISBN 9780415557917 (Hardback). 352 pp

[35] MCT, Setor de tecnologias da informação: resultados da Lei 8.248/91, http://www.mct.gov.br, 1999;

[36] BIZZOTTO, C. E. N; GARCIA, F. P.; PIRES, S. O. e CHIERIGHINI, T. Reference Center for Business Incubation**:** a proposal for a new model of operation. In. IASP Annual Conference. Beijing: 2015.

[37] WEISS, C (1998) – "Evaluation: Methods for Studying Programs and Policies, 2nd Edition" ; ISBN-13: 978-0133097252