VENTURE CLIENT: ANALYSIS OF THE MINING LAB PROGRAM

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ABSTRACT

The world is marked by great cycles of evolution and development. The industrial revolution that has significantly transformed people's lives in the last century is now giving way to the era of the industrial internet. In fact, the internet has shortened distances and revolutionized access to information and the way people relate. Increasingly the internet has been used to integrate intelligent machines, connect professionals and generate profound changes capable of bringing more operational efficiency in different sectors. To adapt to the new context, traditional companies have increasingly sought to adopt innovative practices, but face many difficulties for change. One of the initiatives fostered by companies is to conduct open innovation programs for interaction with startups, as these startups companies are an interesting way to gain learning, inspiration, ideas and new business opportunities. Through interaction with startups, large companies can quickly and efficiently absorb new practices, technologies and solutions that allow real gains in short term and with less investment for the corporation. Startups, on the other hand, can use the knowledge and network from the company to insert their solution in the market in a more assertive and agile way. The present study aims to analyze the open innovation program of Nexa Resources, called Mining Lab, by identifying the main strategies, parameters, difficulties faced, and results achieved. The experiences lived by the program managers and participating startups are explored through semi-structured interviews and are a rich source of information. The unit-case choice was based on the following criteria: the first startups program in the world focused on supplier development, also known as Venture Client program, for the mining sector; program focusing on solutions for the reuse of waste and new energy matrices; program already executed and with initial verified results; the industry has reliable data source and program managers are responsible for the information. The main indicators analyzed were: program structure, team involved, forms of integration, investment

made and initial results. Finally, a discussion about the Venture Client program in question is made, highlighting the lessons learned and comparing the initial results with the literature, emphasizing the main differences and benefits to other relationship programs of large corporations with startups. Because of the research, it will be possible to have a view of the gain perceived by the industry and the supported startups, as well as a comparison with other open innovation initiatives with startups. Finally, this article promotes knowledge and allows discussions about a form of innovation management still little explored in the literature: The Venture Client phenomenon.

Key words: Venture Client, Startups, Industry, Innovation, Mining Lab

INTRODUCTION

The development and use of innovative technologies have transformed the industry in a way and at a speed previously unseen. This revolution, known as the fourth one, is causing profound changes in both industry and society, in the way of relating, producing, choosing products and services, innovating, among others. The challenges of this new industrial revolution are fostering the development of multi-stakeholder solutions, and the breadth and depth of changes indicate the transformation of entire production, management, and governance systems (Schwab, 2016).

The origin of this new era is related to the emergence of the internet in the early 21st century, which allowed the development of increasingly sophisticated and accessible software and hardware, as well as the ability of machines to learn and relate, to create a vast network of communication and collaboration, also called Internet of Things (IoT). This transformation, characterized by the interaction of physical, digital and biological systems, was conceptualized as Industry 4.0 during the Hannover Industrial Fair in Germany in 2011 (Dreher, 2016).

In fact, the internet has shortened distances and revolutionized access to information and the way people relate, and increasingly it has been used to integrate intelligent machines, connect professionals, and generate profound changes that can bring greater operational efficiency in different sectors. To adapt to the new context, traditional companies have increasingly sought to adopt innovative practices associated with the new revolution, but they face many difficulties related to the changes especially due to the rigid and bureaucratic organizational structure that does not keep pace with the required speed of change.

One of the initiatives fostered by companies to minimize this difficulty is to conduct open innovation programs for interaction with startups, as they are an interesting way of learning, inspiration, ideas and new business opportunities. Through interaction with startups, large companies can quickly and efficiently absorb new practices, technologies and solutions that enable real gains for the corporation in the short term and with less investment. Startups, in turn, can use the knowledge, resources and network of the company to insert their solution in the market in a more assertive and agile way (Varrichio, 2016).

If, on the one hand, the studies of the relationship between startups and large companies are incipient, which makes it a fertile field for research, on the other hand, the potential gains are expressive. Recent research shows that large companies lose at least $ 1.5 trillion in growth opportunities because they do not partner with startups to scale and develop new digital business models (Accenture, 2015).

Despite the apparent benefits of the relationship and the fact that many companies are already interacting with startups, efforts in developing countries such as Brazil and in more traditional sectors such as mining are still incipient, reinforcing the relevance of this paper.

In this context, the main objective of the article is to analyze Nexa Resources' open innovation program, called Mining Lab, identifying the main strategies, parameters, difficulties faced, and results achieved, both from the perspective of the program managers and from the view of the participating startups, being a rich source of information to support the discussions of the work.

Therefore, this is the article structure: the first section introduces the mining sector and startups, and presents theoretical concepts related to the topic of open innovation, emphasizing corporate venturing and client venture as distinct mechanisms for the industry to innovate in this new era. Then, the research methodology is presented, and the case of the Mining Lab Program is described and analyzed. Finally, the article presents the main conclusions and opportunities of studies in the area.

THEORETICAL BACKGROUND

The mining industry and the startups

Mining can be considered one of the oldest activities of civilization, and although a long history may suggest archaic traditions, an ancient industry does not mean rudimentary methods. For many, the mining industry may not seem innovative, and to reinforce this view, R&D spending is lower when compared to investments in other industries such as biotechnology and telecommunications. But the reality is different. Mining has always been a source of innovation, seeking efficiency, safety, social and environmental balance in very adverse circumstances (Minalliance, 2012).

In recent years there has been an even greater improvement in the sector. Mining companies are changing their strategies, adopting new business and operating models. Several factors have motivated these changes, such as: market volatility, global demand change, prospecting of new reserves, focus on assets with longer life cycles, commitment to operational excellence, and political aspects, among others. To take advantage of opportunities, mining companies must use digital tools and capabilities to achieve new levels of productivity throughout their value chain (Accenture, 2016).

In this context, the recent report by PricewaterhouseCoopers (PwC), entitled “We need to talk about the future of mining”, states that mining companies need to be aware of the significant role they play in the economic, social and technological ecosystem, which is becoming increasingly complex through the emergence of disruptive forces. Some questions are raised and lead to some reflections: how will innovative technologies (robotics, blockchain, Internet of Things, etc.) change jobs in mining? How will social media affect the supply and consumption of minerals? How to benefit from technological advances rather than becoming victims of them? What are companies doing today to stay competitive in the future? (PwC, 2017).

It should be noted that there are around 200 startups in the world operating in mining-related activities, offering innovative services and products in different areas such as information technology (37%), operations (26%), environment (10%), finance (10%), infrastructure (9%) and human resources (8%). These startups are located near the world's largest mining centers, with the largest

concentrations in the US, Australia and in the city of Santiago, Chile, with the largest number of mining startups in the world. Despite the existence of startups with solutions applied to the industry and the need for miners to innovate in an increasingly complex and competitive scenario, the startup-industry connection is not yet effective, and many leaders try to reinvent themselves even though there are already established startups operating in the market (Sirinanda, 2017).

In this context, Nexa Resources, when creating the open innovation program, Mining Lab Program, breaks paradigms in the sector and opens the company's doors to innovative solutions capable of impacting the mining value chain. Through the program, detailed in the case study, startups that have solutions applicable to the challenges of the company can demonstrate their value and become suppliers and business partners.

Open Innovation

Chesbrough (2003) coined the term open innovation, proposing it as a determinant for companies wishing to create and profit from the use of technologies. According to the author “open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively”.

This model of innovation was the opposite of closed innovation, in which companies generate their own ideas of innovation and then develop, build, market and distribute on their own (Chesbrough, 2003).

Despite the evolution incorporated by Chesbrough, open innovation, in its basic concepts, had already been practiced for a long time, that is, both the search for external knowledge to improve internal processes and the external search for new businesses were not entirely new practices (Huizingh, 2011). Reinforcing this idea, Mowery (2009) suggests that closed innovation may have been the exception in a history characterized primarily by open innovation practices.

Another rich source of open innovation background has been the amount of work that addresses the importance of external technology for improving the company's internal processes. Some of these studies address the need to invest in internal research, to adapt to external technology (absorption capacity), and others to model the company's strategic decision to use innovative technologies from outside the company. (Chesbrough; Crowther, 2006).

Huizingh (2011) further emphasizes that most open innovation initiatives are restricted to large companies wishing to launch new products and challenges for the future. These companies, according to the author, are more willing to address the uncertainties associated with open innovation, such as objectives, risks, levels of interaction and roles.

From these concepts, some authors, such as Nambisan and Sawhney (2007), list several ways in which companies can openly innovate, such as codesign projects, collaborative innovation, joint ventures, open source models, spin-offs and intellectual property licensing, among others.

One of the open innovation mechanisms that has been gaining more prominence in recent years is Corporate Venturing, which represents the movement of large companies in search of disruptive innovation in a more agile and more economical way. Under the thought that involves corporate venturing, new business can come from ideas generated both inside and outside the company, and

can be integrated or separated from the core business. In this sense, such risky investments should be an important way for a company to leverage its business growth (Chesbrough, 2003).

According to Chesbrough (2003), Corporate Venturing differs from other types of risky investments since large companies have two objectives: (i) strategic, aiming to increase the sales and results of the organization's own businesses, identifying and using the synergies between the parent company and the new business, and (ii) financial, seeking to produce positive results, using the company's knowledge of the markets and resources needed. So, while an average investor wants to just value the startup for sale, the big business benefits more strategically as a partner, customer, or business partner.

Another concept recently launched by the German company Bayerische Motoren Werke (BMW) is the Venture Client. In its open innovation program, called BMW Startup Garage, the company seeks to integrate startups into its processes in a differentiated way. BMW becomes a startup customer at a time when the risk still exists, such as if the product has not yet been released. The company allows startups to understand their needs to propose innovative solutions. After selecting the best startups, BMW verifies which departments of the company should be involved as customers and builds a cooperation term for developing the solutions together. The project lasts a maximum of four months and the implementation of the solutions is paid, so that startups become suppliers of the company. In this way, the company's main objective is to quickly integrate the innovations of the startups (Tisher, 2017).

Inspired by the Venture Client concept, the following chapters demonstrate how Nexa Resources modeled its open innovation program and what were the main difficulties and results achieved.

RESEARCH DESIGN AND METHOD

Data collection and its analysis

This case study was structured from information available and collected on the Internet, in scientific articles and in semi-structured interviews. The interviews were segmented on two fronts: (i) with specialists responsible for the execution of the Mining Lab Program and (ii) with representatives of three projects selected at the end of the program and that are in the final stages of implementation of their solutions in the company. The variables analyzed include: (i) for the specialists: motivation to create the program, structure of the program, staff allocated, investments made, initial results and lessons learned and (ii) for finalist startups: motivation to participate in the program, main difficulties faced, main perceived benefits and other lessons learned. Each interview lasted approximately 40 minutes, was transcribed and validated before the analysis.

Startups interviewed

In addition to meetings with the experts responsible for the implementation of the Mining Lab Program, interviews were conducted with three startups from the program. For confidentiality reasons, we will use fictitious names to refer to the startups in this article. The first startup interviewed was Alpha, which has a rapid biomass pyrolysis technology to obtain bio-oil for transformation into Liquid Standardized Biomass. The second, called Beta, proposed the generation

of energy by means of energy recovery of waste or biomass. The third startup, named Gama, presented a solution for the removal of metallic ions for transformation into products, with the aid of a magnet and without the need to add other chemical reagents to the process.

RESULTS

This topic presents the characterization of the Mining Lab Program and its specificities from the perspective of the program's executors and three finalist startups, allowing a rich discussion about it.

The Mining Lab Program

Mining Lab Program is the open innovation program of Nexa Resources, a large family company, respected and recognized in the segment it operates, focusing on value creation, environmental and social, in the mining-metallurgical industry.

The program was motivated from the strategic planning of the company, with the main objectives: to increase the competitiveness of Nexa Resources plants; reduce time and costs of research and development; exposing employees to startup culture; and identify new opportunities in research and development to fuel the management of innovation in the company.

A team was defined with five company employees to support the execution of the program, including a manager and a project coordinator and legal, human resources and communication professionals. In addition to this team, five professionals, called sponsors, were allocated to support nanotechnology projects and three to renewable energy projects. In addition, the company hired professional startups to support them throughout the program.

Mining Lab Program was structured in four macro steps:

i. *Setup:* stage in which the challenges are prioritized, being defined the structure of the program, participation rules, visual identity, site and dissemination plan;

ii. *Dissemination, sensitization and selection:* it consists of the online and offline dissemination of the challenges; in lectures to raise awareness of the company's staff to demonstrate the importance of the program and align expectations regarding it; in the planning of the bootcamp and in the selection of projects with greater potential;

iii. *Bootcamp:* stage in which the startups interact with the company and with the outsourced support team, aiming the refinement of the proposal of work together with the company. During the bootcamp, technical and business mentoring takes place, as well as training for business case construction and preparation of the presentations for demoday, event that marks the last day of the bootcamp, in which company executives decide which startups will be supported and will have their implanted solutions;

iv. *Implementation:* development of the solution according to the implementation plan described in the business case.

Setup

In the first cycle of the program, initiated in October 2016, solutions were prioritized in two areas from megatrends: nanotechnology and renewable energies applied to the mining-metallurgical sector.

The main criteria for startups selection were: alignment of the solution with the proposed challenges; ability of the project to strengthen the company image; potential monetary impact (reduction of costs and/or increase in productivity); investment needed for proof of concept; degree of solution innovation and competitive analysis; technological and market potential; team and business skills; possibility of implantation within 12 months after the selection.

It was also defined that the company's objective was to support startups in the development or improvement of their solutions for Nexa Resources, that is, to support future beginning suppliers in proof of concept of the viability of their solutions, offering economic and financial counterparts in exchange of the support to the development of innovative solutions capable of increasing the competitiveness of the company.

To create a more competitive and efficient selection process, it was established that for each prioritized area, up to ten startups would be selected for participation in the bootcamp. Thus, the company could more accurately monitor and evaluate the best startups to be supported.

Dissemination, sensitization and selection

The first edition of the program had national scope, so that all the campaigns and actions were carried out in the Brazilian territory. Considering the characteristics of the program, the target audience for dissemination consisted of: universities, incubators, accelerators, research center and startups events. An online advertising plan was defined, in the main channels related to the target audience, besides actions in the field in the places with greater density of projects and startups aligned to the areas of interest of the company.

A website was created for the program, with an online platform for submission of offers. After about two months of publication, 115 entries were counted, of which 92 were related to renewable energy and 23 were nanotechnology. Before submitting the offers for the evaluation of the specialists of each area, a first filter was made by the project team, in a way that advanced the 29 most promising offers in energy and 16 of nanotechnology. At the end of the experts' evaluation, 11 energy startups and 9 nanotechnologies for the bootcamp were selected, of which 17 confirmed participation in the step.

Bootcamp

Bootcamp occurred at the headquarters of the company contracted by Nexa Resources, which is a startups accelerator. Over the course of two weeks, startups went through an intense period of technical and business mentoring, deepening their knowledge of Nexa Resources' processes related to both areas and building a business case. Training was offered on important topics such as strategic planning, financial planning, technology roadmap, market intelligence, legal and regulatory aspects, pitch, among others.

During this step, essential materials were created for the company to decide which startups it would support. Among the materials generated, the following stand out: business plan, detailing a physical-financial schedule for the implementation of solutions; executive summaries, containing the main aspects of the business in a one-page document; presentations in pitches, refining the discourse of entrepreneurs to convince the managers of the company about the potential of their project. It should be noted that one startup has given up participating in the bootcamp by identifying the likely unfeasibility of its solution to the company.

Bootcamp ended with the presentation of the startups for the executives of Nexa Resources in the morning, followed by a startups fair and a demoday with presentation of finalist projects in the afternoon. Of the 16 startups that finalized the bootcamp, 8 were judged finalists and 5 of them closed contracts with the company to implement the solutions, being 3 of renewable energies and 2 of nanotechnology. It should be noted that the negotiation was customized for each startup and involved issues such as necessary investment, intellectual property, non-competition clauses, among other aspects relevant to the business.

Implementation

After the negotiation process and the decision to invest in the 5 startups, the company began to implement the solutions. For each startup a sponsor was assigned, who was responsible for managing the project within Nexa Resources and for guiding the entrepreneurs according to the business plan defined in the bootcamp. During the implementation of the solutions the importance of working together with the sponsors and the potential return of startup solutions to the company was observed. Although the projects have not yet completed their implementation, the future financial return calculated up to November 2017 represents 4.7 times the amount invested, stimulating the second edition of the program, with an expected launch for January 2018. The main parameters of the Venture Client program are summarized in Table 1.

Table 1 - Mining Lab Program Main parameters. Source: the authors

Stage	**Setup**	**Dissemination, sensitization and selection**	**Bootcamp**	**Implementation**
Duration	2 months	2 months	1 month	Up to 18 months
Main Objectives	Define which challenges to solve by startups and what are the rules of the program.	Prospect with high precision and select the best startups.	Connect more assertively startups with the company.	Implement the most promising solutions and monitor the gains and difficulties.
Number of startups	-	115, 45 being prioritized at first.	20, of which 17 participated in the stage and 8 were judged finalists.	5 startups.
Critical points	Prioritization of challenges and alignment of expectations.	Definition of communication strategies, brand positioning and selection of startups.	Logistics and transfer of cost help to startups and availability to meet the demands.	Contractual negotiation, hiring of startups and project management.
Main departments involved	Program management and legal.	Program management and communication.	Program management and technical team related to the challenges.	Program management, legal, supplies and technical team related to the challenges.
Support offered	-	-	Cost support, infrastructure, mentoring, training and networking.	Infrastructure, inputs, financial resources, skilled labor.

Startup Alpha

Alpha is an academic spin off that emerged from a doctoral research project at Universidade Estadual de Campinas. The company's mission is to provide innovative solutions to transform biomass and other wastes into cheaper renewable fuels and renewable inputs with respect to their equivalents of fossil origin, with social and environmental responsibility.

According to the entrepreneur, the participation in the Mining Lab Program was motivated to build a case with a large player to open the consumer market for products derived from the technology developed, since the inexistence and suitability of the market for insertion of products with innovative technologies is a big bottleneck.

The solution presented to Nexa Resources consists of the rapid pyrolysis of biomass to obtain bio-oil, as well as the procedures to transform the bio-oil into a standard liquid, called Liquid Standardized Biomass (BPL). In this way the company would be incorporating renewable fuels in its production chain with a lower cost than those of fossil origin currently used, such as heavy oils, natural gas, petroleum coke and mineral coal. It should be noted that the startup is already a manufacturer of equipment with experience in the construction of pyrolysis units up to 20 tons per day of GLP, with a potential cost reduction of up to 20% for Nexa Resources, in addition to environmental and social gains.

The main difficulty relates to the need for capital to set up the industrial plant, since the startup does not have real guarantees or billing that justifies the high investment and that Nexa Resources does not have funds provisioned to invest in the project. Although the company has issued a letter of intent to purchase the solution, investors and banks still do not see the document as collateral that minimizes payment risk. On the other hand, the entrepreneur reports as positive aspects of the program: the knowledge of the internal procedures of the company; access to tools to reach the target market; and the relationship with the executives and employees of the company.

Regarding the lessons learned, the entrepreneur points out that it is not enough to have a good technology or a revolutionary idea to be successful. It is necessary to improve the mechanisms and tools to demonstrate to potential clients and investors that your project is feasible and that it has the potential to be big business.

Startup Beta

Startup Beta is a Solid Waste and Renewable Energy Management company. It promotes decentralization and adequate final disposal of waste with lower costs and still generates creative solutions for circular economy, sustainability projects and power generation. Startup has developed a technology called Flash Dissociation System (FDS™), considered the evolution of a pyrolysis system that promotes self-generation or distributed generation of energy, through energy recovery of waste or biomass.

The solution under implementation allows the substitution of fossil fuel for non-fossil fuel, reducing the emission of greenhouse gases and allowing the economy to circulate in the company. The potential gains are related to a cost reduction of about 23% in the price of steam currently used by the company, in addition to carbon credits. After the first results in partnership with Nexa

Resources, the startup aims to launch in 2018 three projects, with investments of around R$ 100 million, from new investors who have already shown interest in the business.

Regarding the lessons learned with Mining Lab Program, the entrepreneur highlights the need for a dedicated and committed representative during the bootcamp and the proactivity of requesting information and feedback related to the business plan. It is also worth mentioning the need to effectively communicate the value proposition of startups and to relate to the participants. Whether or not the startup is a winner or not, the entrepreneur emphasizes the importance of using the startup program to take the next steps toward growth.

Startup Gama

The startup Gama is an academic spin-off and came up with the proposal to develop and produce functionalized nanoparticles on a large scale. The technology consists of nanoparticles of metal oxides functionalized with organic molecules on their surface, which may have specific functions, such as compatibility with organic, aqueous or polymer matrices, temperature response, pH and other factors.

The solution presented and developed in the Mining Lab Program consists of a nanoparticle consisting of a superparamagnetic core and an organic surface that absorbs metallic cations, the focus being on magnesium (Mg2+) cation. The process involves the capture of the cations by the nanoparticles that are attracted by a magnetic field, separating the cations from the solution, after separation the nanoparticles return to the capture process. The solution aims at the development of nanoparticles and the pilot application in samples of the effluents of the Três Marias plant, with the capture of magnesium cations.

This solution may help reduce the amount of metals discarded in effluents, and can also be used to capture other ions of great commercial value, such as gallium, cadmium, tantalum and others.

The main difficulty is to make the process feasible in the technological and economical aspect, due to the large volume of nanoparticles required that will require the construction of a specific plant for its production.

The main lesson learned by the startup is that small improvements in the processes of Nexa Resources represents a great monetary impact, given the proportions of the business. In this way, the innovation must start from the gradual optimization of processes, since an instant disruptive innovation is something difficult to be reached and applied in the dimensions of the company.

DISCUSSION

The first issue of Mining Lab Program was a fertile field of learning for both the management team and startups. Some of the key lessons learned that should be considered in future similar programs include:

i. The client venture, which foresees the development and investment in suppliers with no counterpart of stock, makes the program attractive;

ii. The dissemination strategy in the field, in the places with greater density of startups in line with the challenges, is very effective for prospecting good projects;

iii. The live bootcamp allows a more assertive assessment of startups in a brief period;

iv. The participation of different departments of the company, such as human resources, legal, communication and supplies, is essential for the success of the program;

v. The company's mentors are essential to support the entrepreneurs both in technical matters and in the internal procedures of the organization, facilitating the progress of the project;

vi. Negotiating terms of partnership, such as exclusivity, intellectual property and investment aspects, case by case and when necessary is better than embedding rules during disclosure;

vii. More mature startups allow short-term return with lower R&D risk, so you should combine this project profile with those with a medium- and long-term perspective;

viii. One should not be too specific in the areas of the program, since more general challenges with some predefined areas allow you to identify solutions not initially imagined.

In addition, some improvement opportunities have also been identified that should also be considered by managers:

i. It is important to align the project team and key departments of the company regarding the program, expectations and work dynamics along with startups;

ii. A single channel should be created for receiving and evaluating proposals, without relying on multiple tools, making the process less time consuming for many proposals received;

iii. Approve in advance possible benefits and cost help for selected startups, in addition to the form of money transfer;

iv. Include a visit to some plant of the company for the startup to better understand the processes and the size of the project;

v. Watch for the period between the release of the selected startups and the start of the bootcamp, to have enough time to organize the necessary logistics;

vi. Develop templates of all materials needed for the bootcamp, being the main ones: business case, executive summary, term of adhesion to the program and Non-Disclosure Agreement (NDA).

vii. Anticipate closure event invitations for key partners, investors, internal company staff, and other stakeholders.

Based on the first edition of Mining Lab Program and Lessons Learned, a generic optimized stream was built to inspire new Venture Client programs, comprising the key milestones, deliverables, and duration, as shown in Figure 1.

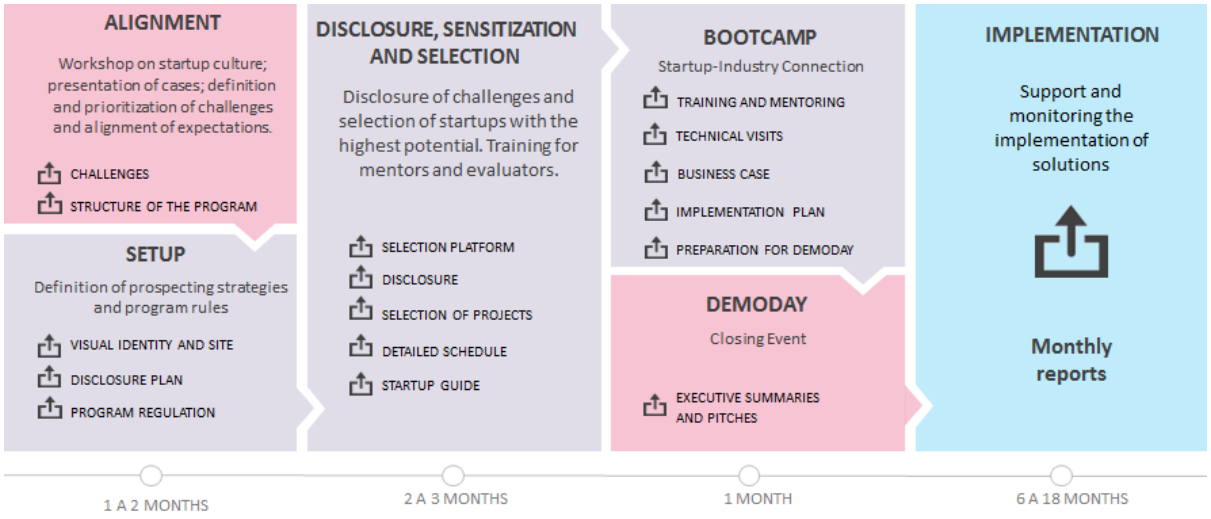

Figure 1 - Generic optimized flow for Venture Client programs. Source: the authors

Through these six steps it is possible to align the expectations of different departments of the company in relation to the program; prioritize the challenges to be solved and the rules involved; carry out program setup including visual identity, site, regulation and dissemination plan; prospect and select the most potential startups; connect the startups with the industry through an intensive Bootcamp; present the refined proposals to the company and support and monitor the implementation of the solutions. The complete duration of the program can vary from 10 to 24 months, depending on the speed of the company in the execution of the first 5 steps and especially the complexity of the projects to be implemented a posteriori. It is hoped that this generic model can inspire similar programs around the world and that it be constantly improved, enriching the discussions on the subject.

CONCLUSIONS

The main objective of this study was to describe and make a first analysis of a Venture Client program, including its structure, potential gains for the company and startups, and main challenges to design and manage it.

It became clear that the main purpose of a Venture Client program is to quickly integrate startup innovations into the company processes, validating their solutions without compromising participation in the startup social capital and without making them less flexible. In this way, the model allows to increase the startup value without diluting the participation of the partners, making the initiative attractive for the entrepreneurs.

It can also be inferred that the classic venture capital and venture client approaches are complementary. While the Venture Client is best suited for early stage startups who need to test the solution with a real client, other venture capitalists, including the venture itself - if applicable, can invest in a subsequent step, in which the risks tend to be smaller.

In fact, the Mining Lab Program proved to be very attractive to startups. The collected testimonies show that the more detailed knowledge of the problems and procedures of the company, aligned

with the theoretical and practical basis of the bootcamp, are essential for the construction of a more assertive partnership proposal (for development and commercialization of the solution). In this way it is possible to demonstrate to potential clients and investors that your project is viable and that it has the potential to be a great business. Thus, the program represents a unique opportunity for entrepreneurs to take the next steps towards growth in partnership with a large player.

The program proved to be equally attractive to Nexa Resources. By opening the company's doors to innovative solutions available in the market, initially in two areas of interest (nanotechnology and renewable energies), and creating an interactive selective process through the bootcamp, it was possible to select in a more assertive way the startups that would become suppliers from the company. As partial results of the program, despite all the difficulties and opportunities for improvement highlighted, the future financial return verified until November 2017, which represents 4.7 times the amount invested in the program, besides the image gain of the company, which stimulated the launch of the second edition of the Mining Lab Program scheduled for 2018.

The limitations of the research are related to the fact that the phenomenon Venture Client is still incipient, and it was not possible to identify in the literature articles that could support the discussion about the case and the results achieved. Additionally, this research had only 3 interviews with entrepreneurs of the startups, in addition to those conducted with the management team, and confidentiality issues imposed some limitations on the data collected, which may lead to a certain incompleteness in the study in question.

Finally, in describing and offering a first analysis of the Mining Lab Program and proposing a generic flow for the management of Client Venture programs, the present work contributes to broadening the discussion about the theme, serving as an inspiration for futures works in open innovation.

ACKNOWLEDGMENTS

We thank the Board of Innovation and Technology of Nexa Resources (formerly Votorantim Metais) for providing the data and support in the structuring of this article.

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