



THE CAUSES OF UNSUCCESS OF ENTREPRENEURIAL
PRACTICES FROM TECHNOLOGICAL START-UPS

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Introduction

This study approaches two very trendy subjects, meaning, technology and entrepreneurship but also how can they, combined, impact a country/region with economic development, competitive advantage, increase in the employment rate, knowledge growth, which all combined can gift a particular country/region with a very interesting skill-set.

Despite all the skills that “technopreneurship” can bring, theory has been written regarding how technological start-ups may thrive in the market, the main purpose of this work is to test that same theory to some practical cases in Portugal and to analyze the outcomes of the surveys made, to check if theory applies to practice and to find some guidelines for future technological entrepreneurs to consider while developing their businesses.

Sumário

O objetivo deste estudo é analisar as principais características de start-ups tecnológicas bem sucedidas, permitindo validar se a teoria que nesta dissertação é levantada se aplica à realidade, definindo, desta forma, algumas linhas de orientação que permitam ao empreendedor perceber que variáveis contribuem para que atinja o sucesso ou o fracasso.

O âmbito da presente dissertação evoca duas temáticas muito em voga nos dias de hoje: empreendedorismo e tecnologia. Ambas contribuem visivelmente para a evolução do país em que se enquadram e respetiva vantagem competitiva, auxiliando no desenvolvimento da economia, criação de emprego, aumento do conhecimento e competências.

A metodologia utilizada consistiu num inquérito realizado a um grupo de empreendedores do setor tecnológico, distinguindo os casos de sucesso dos de insucesso. Esta abordagem permitiu identificar algumas correlações que parecem importantes em ambos os casos.

As principais conclusões que advieram desta dissertação identificam que os empreendedores de sucesso têm maior experiência, bons conhecimentos de gestão e conhecimento do mercado no qual entram. Por outro lado, os empreendedores entrevistados que não foram bem sucedidos aparentam falta de proatividade e de planeamento detalhado nos seus negócios, sendo que a maior dificuldade para este grupo está relacionada com o tempo que demora a entrar no mercado desejado.

Este estudo pretende ajudar os empreendedores do setor tecnológico a compreender alguns dos requisitos necessários para começar/adaptar o seu negócio à melhor forma de atingir o sucesso do mesmo.

Palavras-chave: Tecnologia; Start-ups; Gestão

Abstract

The purpose of this research is to study the main features of successful technological start-ups, to validate if the theory that is shown in this paper applies to reality, defining some guidelines that allow entrepreneurs to better understand what variables contribute to achieve success or failure.

The scope of this research is focused on two very trending areas nowadays: entrepreneurship and technology. Both contribute a great deal to the country's evolution in which they are operating and it's respective competitive advantage, they also help developing the economy, job creation and to increase knowledge and skills of their workforce.

The methodology consisted on a survey performed to a group of technological entrepreneurs, distinguishing the successful experiences from the unsuccessful ones. This approach allows one to identify some important correlations on both cases.

The main conclusions that came from the survey were that successful entrepreneurs have bigger experience, with good management skills and market sensitivity. On the other hand, the unsuccessful entrepreneurs that were studied seemed to lack proactivity and overall accurate planning, with their biggest constraint being the time-to-market.

In the end, this study is intended to help technological entrepreneurs to understand some of the requirements needed to start/adapt their business in the best way to achieve the success of their venture.

Keywords: Technology; Start-ups; Management

Executive Summary

The purpose of this research was to evaluate the characteristics of successful technological start-ups, to verify if all the theory mentioned on the literature review applies, in practice, to the testimonials of 33 tech start-ups.

The main conclusions that came from the survey were that successful entrepreneurs have bigger experience, with good management skills and market sensitivity; this is mainly given by age, entrepreneurial experience and, of course, the agility to adapt to unforeseen events, not giving up.

On the other hand, the unsuccessful entrepreneurs that were studied lacked proactivity and overall accurate planning, this group didn't have an adjustable and solid business plan and also lacked mentoring from more experienced people that they would find at incubators or technological parks, instead, from these organizations they mainly took advantage from the logistic support. Despite the major constraint being the time-to-market, when they effectively start running the business, the unsuccessful group spent more time in operational activities rather than marketing the business or developing a solid network.

The aim is to help new technological entrepreneurs to achieve success in a constantly changing market, providing some highlights to what are the most important details he/she should pay attention to, before starting their endeavor.

1- Literature Review

1.1 - Entrepreneurship: Definition; Context and Importance

If we want to analyze the phenomenon of entrepreneurship thoroughly, one must consider the many definitions of this concept made by several authors, since the eighteenth century by Richard Cantillon, where he stated that entrepreneurship was the process of bearing the risk of buying at certain prices and selling at uncertain ones (Spellman, 2011), assuming therefore the risk of maintaining, or not, the assets at stake (Sarkar, 2010).

Two centuries later, in 1921, Frank Knight, defined that entrepreneurs attempt to predict and act upon change within markets taking the role in bearing the uncertainty of market dynamics, performing managerial functions (Spellman, 2011), bearing the risks of that same uncertainty, differentiating entrepreneurs from all other market players (Sarkar, 2010).

Schumpeter in 1934, made his statement linking entrepreneurship to innovation, defining that the entrepreneur is the innovator who implements change within markets through carrying out of new combinations. The role of entrepreneurship is to assemble and deploy resources in new combinations that disrupt the otherwise static nature of the market (Spellman, 2011). Innovation, therefore, is more than growth or a market share, is to create new products or arranging new shapes and outcome of products and/or services that already exist in the market (Sarkar, 2010).

Schumpeter in Venkataraman (2003) states that this disruption is responsible for frequent improvements in the economy and the subsequent recessions are for restoring the balance affected by the outcome of the new products and methods, obtained by the process of entrepreneurship.

In 1985, Peter Drucker confirmed this linkage by stating that entrepreneurs innovate. Innovation is the specific instrument of entrepreneurship; it is the act that endows resources with a new capacity to create wealth and, therefore, a powerful resource. (Spellman, 2011). However, not all endeavors are entrepreneurial ones if there's no risk and no innovation attached to it (Sarkar, 2010).

In the mid-twentieth century the concept of entrepreneurship became perpetually related to innovation (the act of bringing something new and relevant to the table) and newness. Being so the greatest challenge to the entrepreneur, because it matters not only to create something new but also to understand all the forces that are involved in the process (Hisrich & Ramadani, 2017).

However, according to the actual conjecture, a more accurate definition may be the one made by the Entrepreneurship Center at the Miami University of Ohio and it will be the one adopted for this thesis, that entrepreneurship may be considered a function that is focused on spotting market opportunities, arranging inputs and resources, in order to answer to those opportunities and needs (Spellman, 2011).

All the definitions above have parallel notions of entrepreneurship: newness; creating wealth; risk taking; creativity; however, according to Hisrich & Ramadani (2017), entrepreneurship isn't delimited to a certain group of people, because innovators can be found in all jobs, from education to government stations, passing through medicine and architecture. Entrepreneurship is, therefore, the process to make something inexistent yet with value, dedicating the necessary time and effort, being responsible for the social, psychic and financial endeavors and enjoying the outcomes, profits and personal satisfaction.

Although it is a wide concept, and regarding the work of Howard Stevenson (2000), one must also consider, in this field of study, the dimensions of entrepreneurship and according to the author mentioned, there are six of them: Strategic Orientation (to adapt to the constant development of products/services); Commitment to Opportunity (to consider all the risks, short decision timings, and all stakeholders; and compromising towards consensus); Commitment of Resources (taking into consideration the lack of predictability of resources; social needs and international demands); Control of Resources (to specialize ones resources; to consider the risk of obsolescence of those same resources, which may spread to the final product/service itself; which leads to the fact that entrepreneurship must be a flexible activity) ; Management Structure (to take into consideration all shareholders requirements and their future professional necessities); and Reward Philosophy (rewarding all stakeholders: the organization; the employees; investors and society itself). Stevenson also concludes that the behavioral theory of entrepreneurship is a process that is more

closely related to an individuals' personal traits than from an economic function (Stevenson, 2000).

These traits, attitudes and aspirations are influenced by the individuals' environment, the society where he/she is included and all its' aspects (e.g.: economic; political) (GEM, 2014). In the end, is the group of attitudes and behaviors that allow an entrepreneur to easily spot opportunities and maximize them, transforming them into wealth and growth (Trigo, 2012).

Due to the fact that sometimes the economy is not so healthy, and also to the development of this field of study, where new concepts have been included, one must also consider, apart from all the innovative process, the context where this activity will take place:

Starting with the geographic context, the GEM 2013 Global Report states that there are 3 different types of economies by geographic region and economic development level, which give different purposes to the range of the entrepreneurial activity:

First: Factor-Driven Economies, which include some countries of the Sub-Saharan region, Middle East and North Africa, characterized by unskilled labor and by having natural resources, with the main goal of constructing enough basic requirements/services (GEM, 2014).

Second: Efficiency-Driven Economies, constituted by countries from Latin America and Eastern Europe, that have the main purpose of improving already existing basic requirements, making them more efficient (GEM, 2014). These economies tend to create more companies than the following one, which is characterized by an higher income (Sarkar, 2010).

Although some entrepreneurs seek to fulfill a gap in necessity, others seek to provide socially responsible solutions to their country and society, other entrepreneurs tend to *born global* and address a more international market with their solutions (Roper, 2012).

Third: Innovation-Driven Economies, such as countries from Western Europe and North America, with the feature of having more qualified knowledge and labor force, their aim is to create something new, yet inexistent, which therefore tells us that these economies

must have a good balance of the previous two: Good basic requirements and enough efficiency enhancers (GEM, 2014).

Cultural context, in the meantime tends to produce a certain type of endeavors, meaning, that in a culture where certain stereotypes are seen as successful would tend to not embrace, with the same support, different ideas from their successful cases. Therefore in such cultures, that upkeep mainly traditional investments (e.g.: real estate), the Schumpeterian concept of entrepreneurship, where disruptive innovation happens, does not meet its' purpose, are considered bold ideas (Venkataraman, 2003).

Entrepreneurship is, therefore, a process that is considerably impacted by local factors, culturally speaking, with inputs from the economy where it is established as well as legal and regulatory environments and also from the persons who develop it (Roper, 2012).

Followed by the economic context, societies that are influenced by deep economic crisis, face a duality in the entrepreneurial activity: Maybe entrepreneurs wanted to start a business, however due to the lack of funds, derived from the crisis, this intention needs to be postponed; There are other situations, that also derive from the crisis, in which the entrepreneur sees an opportunity (“Opportunistic Entrepreneur”) that the main purpose is to retrieve as much profit as possible during the time the original situation lasts (Camboa, 2012).

Other scenario is the “Necessity-Driven Entrepreneur”, that doesn't have a viable alternative other than starting his/hers own business, because there are no other options available in the job market (GEM, 2014). According to Venkataraman (2003) these are the wrong kind of entrepreneurs: although misfortune may be a good trigger for entrepreneurship, usually, in these situations, what tends to happen are copied ventures of other business, bringing, therefore, no qualified enterprises.

The OECD's Entrepreneurial Framework evaluates the positive consequences of entrepreneurship on society and economy and how a country could benefit from a performance measurement of entrepreneurial activity, meaning the creation of jobs, increase in wealth, R&D and technological enablement, if a government fosters the culture, empowering legislation, access to funding and good market conditions (Stokes *et al.*, 2010).

The cultural and economic contexts are the key factors for a brain-drain of entrepreneurs, or even for better opportunities of living. They shock against what is called, by Venkataraman (2003), the *Virtuous Circle* (an aggregation of people, governments, organizations, etc. that has set as role models of idealistic talent and success). Countries are losing great minds due to this migration of talent, unless there's a change in corporate and tax laws, financial markets and systems, enabling entrepreneurs to be one of the causes of deep economic and social changes.

Regarding the personal context, which has become a novelty in recent years, and investigators have given due importance analyzing the entrepreneur's attitudes, activities and aspirations: soft-skills; know-how; networking (Barroca, 2012) as well as the aspirations of the entrepreneur; they can be of growth (job creation and constant expenditure of their business); innovation (which is positively correlated with the economic development of the country where the business is inserted); and/or international orientation, to use the most recent tools to attract international attention and gain access to foreign markets (GEM, 2014); and how all these factors can influence the outcome of the entrepreneurial activity.

Related with the fields of entrepreneurship there also exists other divisions such as necessity, ethical, capital electronics, family, societal, state, local, retirement and young entrepreneurship (Bruin & Dupuis in Sarkar, 2010).

Therefore, with so many aspects to pay attention to, it is extremely difficult for investigators and academics to find a common definition for entrepreneurship (Barroca, 2012), because it is always related to the context where the activity is developed and to the people who do it.

The importance of the entrepreneurial activity is, mainly, the creation of economic activity, income, cash flows, job creation at times of bigger unemployment rates, but it also promotes a countries' development, making its economy more competitive (Barroca, 2012), as well as entrepreneurs have a higher well-being rate compared to people that are not in the process of creating and own-managing a new business (GEM, 2014). So, the crucial standpoint of entrepreneurship, the creation of new companies, has not only a good consequence in employment but also in innovation, outcomes and economic cycles (Sarkar, 2010).

1.2 - The success factors of an entrepreneur

According to Virgínia Trigo (2012), entrepreneurship is the only economic resource that can't be easily transferred, due to the fact that it has a major competitive advantage and it isn't easily copied. The effort of the entrepreneur, in any area, is divided in specific stages, which must be learned, understood and adjusted if needed.

Trigo mentions, in her paper "Twelve months of entrepreneurship", ten universal stages, that every entrepreneur should follow religiously adapting accordingly to each business flow. These ten stages are also related to the europe process of entrepreneurship, with its' five landmarks, (*"Spirit; Resources; Opportunities; Business Plan; Execution"*), defended by Sarkar (2010).

Firstly, one should identify an opportunity to start a business, a gap in a determined situation that needs a solution. Since nowadays we live in constant change, gaining the routine to spot opportunities, must become an habit for every entrepreneur, asking themselves if there is another more efficient process to do something; what is missing in a determined service or product and who uses it; why isn't there this product/service; who will need what and when? (Trigo, 2012).

These opportunities shouldn't be limited to a local range, which is a mistake that many entrepreneurs commit. The broader the scope, more opportunities shall flow. If one needs help to spot an opportunity there are some sources where he/she may find the needed information, such as: *"personal experience; university projects and idea contests; employees; suppliers; companies; clients or markets"* (Sarkar, 2010).

According to Blank & Dorf (2012), this is called the concept and seed stage where the entrepreneurs, also known as founders turn their passion and ideas into a business plan wondering: *What is the product/service concept? What are the products' features and benefits? Can it be built? Is further technical research needed? Who will the customers be and where will they be found?*

In second place, an entrepreneur must create a good business idea, meaning, an idea that answers best to the opportunity/gap that has been perceived; Then, one should be sure if there is, in fact, a business opportunity and if there are consumers to that opportunity. There should be enough customers and cash flow to support the business for, at least,

one year. If there isn't certainty, the entrepreneur should make adjustments and ask him/herself these questions again (Trigo, 2012).

Sarkar (2010) gives us seven questions that every entrepreneur should ask themselves when assessing their opportunity: *For how long is my opportunity available before competitors grab it?; Do we have a differentiation feature that will allow us to gain more time before competitors spot our idea?; What is the difference between the real value and the perceived value of this opportunity?; What are the size and origin of the risks involved?; What are the origin and size of the expected returns? Does the project match with the know-how and goals of the entrepreneur? What is our competitive advantage towards the market we are about to enter?*

The entrepreneur should therefore consider what is called industry wide competencies, meaning to be aware of the business implementation process and to manage the business growth; to look for a gap to ameliorate existing products and services, identifying a new niche market and their needs, developing a consistent business plan that accommodates daily operations, uncertainty and probable losses (Huan, 2016).

An interesting thought is the mainstream of innovation, meaning, that entrepreneurs should not only consider the skills needed to develop the product but also the market demand. Entrepreneurs can develop a product/service that might have no interest for the society, so they must adapt and still be innovative while meeting market demands. Or in opposite, the entrepreneur should do a little *leapfrogging*, this is to think about a market gap before consumers even realizing it (Fowosire *et al.*, 2017).

Fourthly, there should be a concrete identification of all the resources an entrepreneur needs to start and develop the business and also, how to get them (e.g.: renting; buying; leasing; borrowing; creating alliances) (Trigo, 2012). Not forgetting about investing in the new ventures' human resources (including him/herself) (Sarkar, 2010). Although some authors state that being an entrepreneur is a lonely activity, a lonesome entrepreneur tends to achieve nothing: one needs to think about the persons that will help in the early stages of the nascent business and during the growing process (Trigo, 2012).

At this point comes an extremely important task to consider in order to be successful: the customer development model. All stages of the business model and product

development must include potential customer feedback in order to test all hypotheses. The customer development model will help on building the company because there are no facts inside the new venture, so the entrepreneur must step outside and to make continuous developments, alterations and prototypes is not considered as a failure in the startups' world (Blank & Dorf , 2012).

This customer relationship management may include a customer loyalty program; studies according to the demographics of the clients; direct marketing plans; if possible, use a Search Engine Optimization (SEO), to follow-up and work on the clients' demand changes, therefore working regularly according to the customer satisfaction level in order to ultimately become a love-brand (Huan, 2016).

New business should also start working on the Minimum Viable Product (MVP), this means to release a product/service with the minimum features in order to guarantee that the next upgrade would be made according to customer feedback: usability tests, customer usage and testing of the product/service and interviews. This will help the entrepreneur to make an upgrade based on what the customer wants/needs instead of develop something that may not even have any utility to the client (Selig, 2014).

Afterwards, it is time to choose a brand and to register it. A brand is the most powerful communication tool a company might have; it is the basis for the company's identification, a collective personality, as one could say. This decision should not be taken lightly because it will also affect the entire business model (Trigo, 2012). To register a brand and to patent it, also brings competitive advantage towards the nascent endeavor (Teece, 2010).

In sixth place, the entrepreneur should make its financial forecast, in order to be sure of the business profitability, analyzing the cash flow management. In this process one should take into consideration all cash inflows and outflows, never forgetting if there is a need for funding (Trigo, 2012). It is advisable that this financial forecast is accompanied by a strict cost control system, in order to evaluate all the costs and profitability of what you are selling; and also to have the main goal of not running out of capital (Selig, 2014).

Then, the business plan should be written, in order not to become a mere idea in one's head. This will become an opportunity for the entrepreneur to reflect on his/hers

decisions, to be the business guidelines and should take into consideration all stakeholders: potential investors, customers, employees and business partners (Trigo, 2012), this will help the entrepreneur(s) to understand if the business is viable; it will come as a powerful tool of organization and determine if the time comes to ask for financial aid and it will help to spot where efficiency can be optimized (Sarkar, 2010).

In order to achieve competitiveness, this business plan should be efficient: using the balanced relationship between resources aiming to achieve a structured and stable routine in order to produce larger quantities with the minimum cost, however, in service delivery this feature alone will not be enough; The business plan should also consider adaptability: this trait is intimately related with innovation due to the fact that it is of greater importance to be constantly looking for a better idea/method, meaning that the initial plan can change completely in order to achieve the demands of the current market conjecture; and flexibility to allow the company to adapt to changes and emergencies while maintaining their routine (Fowosire, *et al.*, 2017).

Last but not least the business plan should also define the design and architecture of the process of creating value towards clients, through data analysis and how the entrepreneurs will deliver it and the mechanisms needed to do so. The business plan must become the architectural blueprint of the business, considering, not only, the business model, income statements and cash flow projections, client assumptions, forecast of profits and expenses, try to predict the market needs and gaps and how will the competition respond to such changes. (Teece, 2010).

The next step is to start the process: to start looking for employees/partners; funding; a place to set the company; to know all the stages one needs to go through to open your own business and also to establish the corporative culture of the firm (Trigo, 2012).

According to Blank & Dorf (2012), after all the market research there should be made a market requirements document which considers a product development waterfall model that would take, according to the authors 1 / 2 years: First establish the requirements; then design the product/service; thirdly implement it; then verify it and finally maintain it.

The entrepreneur should manage its own business, especially when all the nascent processes have passed, because if all the initial excitement of starting your own business

has passed, as a business manager, the entrepreneur will need a whole new range of soft-skills to keep the company alive and stable: Never ceasing to have ideas; keeping a close eye on the market; not disregarding the business culture. If one is able to do this, as stated by Trigo, there will be an intricate genetic code on the business that will help to assure the future of the company (Trigo, 2012).

This genetic code must be accompanied by the willingness of the entrepreneur to take action, based on knowledge, creativity, soft-skills, intelligence, patience, persistence and team-work. The entrepreneurs should invest in knowing what calculated risks to take, to have self-confidence, honesty and connections (Sutevski, 2010).

At last, one should always be aware of timings, if there is a starting point for every stage; there should also be an ending one. Being aware of this fact, making things not last when opportunities have passed, will make the entrepreneur one step ahead of the market (Trigo, 2012).

According to Teece (2010), a business model that empower startups must change and be replaced by others as time passes by, due to technological and organizational improvements the tailor made business model is rarely decided at the beginning of the entrepreneurial process. Managers, that have a *good but not perfect business model* that may be improved and adjusted, *are the ones most likely to succeed*.

Following these stages will help during the nascent process: dividing the route in steps, adjusting accordingly to each situation will help to prevent and anticipate errors before it is too late. All entrepreneurs will do some wrongdoing at some point, however, making mistakes and learning how to avoid them is the best learning tool and process becoming the best ally of the entrepreneur, making him/her understand his/hers goals and do better in the future of the nascent company (Trigo, 2012).

However, one can consider seven aspects that may be at the source of an enterprise failure, such as lack of management skills; poor strategical management and lack of funds; no market and opportunity comprehension; poor product design; lack of soft-skills; product obsolescence (Zacharakis, Meyer, & DeCastro, 1999)

1.3 - The differences of technology-based enterprises

Technological services/products are gaining market share due to trust and popularity issues, because, nowadays, Generation Y and technological aware segments tend to focus their personal needs being answered in the most innovative way. Today, technological start-ups, to succeed, must focus on the needs of these audiences and cater them (Capgemini, 2016).

The actual conjecture tends to make society think that traditional companies have a slower response rate to customer expectations, the fact technological development one can see nowadays, through more modern channels (especially mobile) makes this gap even greater. Such gap is being more and more addressed by technological companies that take advantage of that said gap and deliver better value propositions, staying ahead of traditional providers and creating a new, more personal and convenient standards (Capgemini *et al.*, 2016).

Nowadays, the trend on technological development is positively correlated to an increase in opportunities and challenges on a country's economic development: If one pays attention to the daily achievements in the technological field, for better strategies and structures, it is clear to see that there will be a promising worldwide market, with endless opportunities to create and add value in order to achieve the said economic development and sustainability (Fowosire *et al.*, 2017).

As stated before, entrepreneurship is important to develop employment and according to João Barroca (2012), to develop the creation of companies in Portugal may be a crucial tool and strategy for economic growth, especially if those companies are centered in creativity and innovation, adding value to determined markets, especially in emerging economies: considering the CEO's of those companies focus on international partnerships, for funding and to export their products and services.

Stated by Venkataraman (2003), nowadays one can see more than ever the importance of *technopreneurship*, where areas such as computing, healthcare, biotechnology, fintech are leading the world towards the next step. Today, one can say that these are the areas to invest and the ones that will bring growth and development towards the society they're inserted in.

According to Fowosire *et al.* (2017), the goal for technopreneurship is to commercialize innovation that are developed by academic-based scientists through patenting, licensing, start-ups and other academic related alliances.

Tecnology-Based Entreprises (TBE's) are at the core of companies that work with creativity and innovation, and, therefore, they may be one of the key-points to push economies further. Liao and Welsch have centered their work on the question "Do Tecnology-Based Entrepreneurs and Non-TBE's differ in their venture creation process in terms of the number of start-up activities engaged, gestation duration, association and sequencing patterns of start-up activities?"(Liao & Welsch, 2003)

Technopreneurship is a way of developing a person, an organization, a country and the world itself through a new process related with the innovation associated to technology. TBE's and technopreneurship intend to present an innovative hi-tech product/service, or use hi-tech do deliver a new product/service in a new and different way using specialized manpower and capital as resourdes and quick growth and outstanding risk management as milestones for decision making (Fowosire *et al.*, 2017).

Nowadays one is able to share resources, to have access to market information, technological development and to communicate much faster, which is not only a powerful tool of enhancement but a weakness to be easily spotted by the competition, so one must innovate continuously in order to obtain success, without being restrained to regional markets (Sarkar, 2010).

For current companies it is also a huge opportunity to invest on because it will help to improve the business processes, in a new borderless world. It also means a great match to big companies, that use the new venture's products/services, in order to achieve economic development and, therefore, empower their nation as a whole (Fowosire *et al.*, 2017).

Capgemini *et al.* (2016) state that now is an age for B2C and not B2B, leading to a disruptive impact on existing markets using their own big data to study their own customers, and in an era where data is the new oil this is of the outmost intelligence and priority.

Liao & Welsch (2003) conclude that TBE's spend more time planning, establishing legitimacy and searching for resources than Non-TBE's: The second group of

entrepreneurs only spends more time on marketing their products/services than TBE's. Basically, both groups of entrepreneurs spend about the same time in core activities, they only differ in peripheral ones.

However, studies show that software companies that spend more time/resources in R&D, in order to become more innovative, tend to improve their outcome, sales and also to outwit their competitors (European Commission, IRI, 2015), because knowledge is a crucial standpoint for innovation, competition and economic growth (Sarkar, 2010).

All companies, regardless of their area of performance, start with their gestation process. Liao and Welsch, mention several authors on this topic:

Katz and Gartner *in* Liao & Welsch (2003) state that a company is in the process of coming into existence if it fulfills four requisites: Intentionality; Boundary Definition; Resource Acquisition and Exchange.

Van de Ven (1989) suggests that if one is looking for business creation processes, he/she should explore how the business idea evolves over time; when and how functional requirements and solutions are developed; when and how the solutions stated on the previous point are adjusted to other situations; and finally, how all these efforts are influenced or constrained by all the market and industry contexts (Liao & Welsch, 2003).

In technology-based enterprises (TBEs), Liao and Welsch also state several authors that differentiate their gestation process from Non-Technology-Based Enterprises: Firstly, Gartner supports that TBE's should develop prototypes hire new employees; look for funding methods; do some market research. However, this process is not a linear one, because, not all these activities will be initiated, timing will be different for each process and for each company. Every situation should be adjusted to the needs of every company and to the industry and market where the enterprise is inserted (Gartner, 1985).

On the differentiation of the activities for the gestation period of TBEs and other branches of activities for start-ups, Liao and Welsch also mention the theory of Delmar and Shane (2002), which state that there are two types of startup activities:

Operating Activities, which can be divided into legitimacy building activities (events that state the physical and legal boundaries, as the firm is registered and created); resource transformation activities (actions that relate human, physical, financial and technological resources) and market related activities (marketing and customer relationships); and planning activities that are actions that coordinate different events that happen in the early stage of the gestation process, related to the business creation (Delmar & Shane, 2002).

Every industry is different; therefore the model presented previously is not linear. Technological innovation leads to a faster obsolescence of products and services, maybe if an entrepreneur wishes to develop a certain product/service, when it comes the time to transform ideas into actions, the whole idea could not updated to the whole market. If one wants to start an enterprise in the technological field, there must be a constant assessment of advantages and market opportunities, because timing is very important if one wants to create something technologically innovative (Liao & Welsch, 2003).

There should also be a “technological legitimacy” establishment because one of the bigger constraints in this market is the newness and smallness liabilities. If a company is not legitimate or is too small for the industry, this will probably affect the concretization of sales and gaining market share from competitors (Liao & Welsch, 2003). However, this perspective may be contradictory because, being a small company means that you may not be the center of attention of the international competition and, therefore, will not be immediately crushed by it (Sarkar, 2010).

Regarding the companies that might form partnerships with technological start-ups, they may also face some obstacles that might impact this alliance with the tech-entrepreneurs: Culture (some cultures in the world are not fond of innovation); budgetary constraints (which become an effort that is too big to pursue, that executives tend to disregard in order to pay attention to business-as-usual routines); and philosophical ones (because all the industry must change in order to accept technological advance) (Capgemini *et al.*, 2016).

A TBE must have resources to survive, more tangible than intangible, at first, compared to other industry areas. However, the acquisition of intangible resources for TBEs is more important and is key for the survival of the company, making it what makes the

difference between technology company A from technology company B, and which one will thrive and which will fail (Liao & Welsch, 2003).

The importance of intangible assets for the survival of a TBE, also known as a knowledge intensive service, relies on “*technological know-how; product design; marketing; understanding of customers; personal creativity and innovation*” (Van de Ven, 2005). However, it is a common knowledge that technopreneurship is characterized by plenty of technical know-how and a gap on necessary managerial skills (Fowosire *et al.*, 2017).

Basically, from the whole theory defended by Liao and Welsch, what differentiates TBEs is the fact that they should analyze more thoroughly the external environment of the company: business opportunities; organizational boundaries; resource requirements and also have a more constant activity with internal and external stakeholders (Liao & Welsch, 2003).

The venture creation process is always characterized by uncertainty and this is more critical for TBE’s, mainly because of the speed of the products and services are available in the market, if the idea doesn’t come to life quickly enough it may become obsolete. The venture creation process is the result of association (occurrence of event x, because event y happened before) and sequencing patterns (sequences of closely associated events). For TBE’s the whole process happens much faster because all events are closely connected and the events that happen in the planning stage (business plans and arranging teams) are far more critical for non-TBE’s because of the timing and quickness necessity. Despite the feature of quickness and agility for TBE’s their venture creation process is made from trials-and-errors, that should be studied in their business plans, planning activities and resource acquisitions, making their gestation period longer than non-TBE’s (Liao & Welsch, 2003).

1.4 - Business Development Requirements for Technological Based Start-Ups

There are several theories about what should a start-up do when it comes to develop its own business, one of them focuses on a resource-based view, mentioned by Serra *et al.* that state that on the process of innovation, companies not only make their resources more efficient, as they also build new strategic resources, competences and strategic

capabilities; Mainly because the basis for the growth and success of companies is the management of control and effective use of heterogenic and unique resources (Ribeiro Serra et al., 2008).

Entrepreneurship is a resource by itself, because it is considered to be one of the resources that can't be easily transferred, as such, it gifts the recent business with a powerful tool that other companies can't share (Trigo, 2012).

Resources can make a company have a better competitive advantage towards the market, as long as they are, according to the authors, valuable, meaning they should make a difference inside the company, rare so they can't be common, because if everyone could have access to them, they wouldn't make a difference, can't be copied and are irreplaceable, because if a company has a product/service that is easily copied or has a substitute, it will not have the aimed competitive advantage (Ribeiro Serra, Ferreira, de Moraes, & Fiates, 2008).

According to Silva and Soares (2012), there should be a "requirements engineering" in the business planning of technological-based start-ups, mainly because these companies deal with the constraint of time to market as stated before and as such a well-planned business with full acknowledgment of its necessities is of due importance.

Effective entrepreneurial management should also be considered as one of the most important business development requirements, due to the fact that this course and mentality identifies the opportunities and successfully grasps them, sustaining, therefore, the competitiveness of the company. Adding effectiveness to the company's culture is to support innovative ideas: fostering the right resources/expertise and embodying innovation and constant adjustment to the venture's profile (Hisrich & Ramadani, 2017).

This effective entrepreneurial management comes, according to Hisrich & Ramadani (2017), in four phases:

- 1 – Identifying and evaluating the opportunity (where one can assess, create, analyze the value and the risks of this gap in the market);

2 – Develop the business plan (ponder about the opportunity; where it fits the industry; write the technology, marketing, financial, production, organizational and operational plan);

3 – Resources required (define the resources one has; identifying the resources needed; perceive the gap between them; develop the path to obtain all the resources from suppliers);

4 – Begin and manage the venture (establish a launching plan; develop the business's culture; spot bottlenecks; create a financial, strategic, structural and organizational strategy).

Silva and Soares (2012), state that there should be made a roadmap for planning the long-term objectives of the firm, connecting the business perspective to the requirements engineering, in order to focus their decisions about the development of the product/service, never forgetting all interests from the stakeholders from the prospects of the business.

There are creative exercises to face this problem of failure, such as brainstorming and role-playing and if they are performed with full knowledge of the product/service, industry and market during the whole development process they might avoid problems and constraints that might happen to future clients. If entrepreneurs apply the technique of *roadmapping* it is expected that the outcome should be a temporal diagram with all the business development components (business and technological, at least) and how all of them should act during the project milestones and key decision points. If the roadmap is well made it will be truly effective in order to manage the communication between management groups, sales, partnerships and clients (Silva & Soares, 2012).

Venkataraman (2003) states that there should be seven intangible resources to regionally develop and empower *technopreneurship*: key areas to produce new ideas (incubators/technological parks); create role models of entrepreneurship (that can show society that success in riskier ventures does happen); creation of informal forums of entrepreneurship (to allow networking and sharing experiences to motivate new entrepreneurs); foster region-specific ventures; security networks for failure (institutions that support persons that have failed at developing a business/idea in getting a new job and avoiding the stigma); entrances to larger markets (in order for smaller

countries/regions to not be in disadvantage); and the need for executive leadership (leaders that actually work with entrepreneurs and don't just point out the way).

In order to avoid the risk of failure of the technological product/service it is imperative to make the future clients/users part of the development process, in order to improve the quality of the final outcome with the constant feedback of users with prototype versions, this new tendency is called *User Centered Development* (Silva & Soares, 2012).

The User Centered Development is based on *Use Case Scenarios*, where entrepreneurs observe users in their natural context and their experiences, actions, habits and future potential for the final product/service; therefore, not only optimizing the outcome as to give better details about the tasks that have to be performed, user profile (making a more concrete market niche) and workflows (Silva & Soares, 2012).

These *Use Case Scenarios* also create a “*consumer demand*” especially if the product/service does not exist, so it will create the need in the market, enabling the development of the business (Van de Ven, 2005).

1.5 - Funding as a success catalyzer

The new conjecture of technology we live nowadays, although it may bring development and economic growth, as stated before, it has its disadvantages: a gap in government policy, low human capacity development and few facilities. The fields of research and innovation are still not quite appreciated, meaning that there isn't still the ideal amount of investment affecting the breakthrough of the new product/service and entrepreneurs tend to follow trends instead of being trend-setters (Fowosire *et al.*, 2017).

Regulatory measures tend to improve and empower innovation in these said tech-industries. Some regulators are already taking a stand to enable these initiatives, such as the Financial Conduct Authority in the United Kingdom and Europe is awakening to a new era of financial services powered by technology creating the Revised Payment Service Directive, for instance (Capgemini *et al.*, 2016).

The majority of entrepreneurs need help to fund their activities, as such, there are many ways to do so, but what if the way a start-up is funded can help it to achieve its success?

Nowadays it is common to go straight to the help of business angels, perhaps due to the fact of the success of the TV show *Shark Tank*, in which entrepreneurs sell part of their incomes and sometimes intellectual property to business angels in exchange for monetary aid, advices and access to the angels' network.

According to Venkataraman (2003), if only risk capital exists, it will inevitably produce *low-quality entrepreneurship*, thus they must be associated with other intangible requisites in order to produce *extraordinary wealth*.

There's an urgent need to enhance our portuguese culture of being shy of making questions, phone calls, write e-mails, as well as growing the institutional/private availability of giving answers and helping new business people as well as to promote a riskier investment behavior, because without it there will not be profit for anyone (Trigo, 2012).

There's also support from government funds or, in the case of Portugal, European Union funds and also from the regulations stated at the Green Book of the European Commission, where every company should have access to funds in the several stages of its development, however, such access is mostly constrained by bureaucratic activities, lack of advertisement and investors (Sarkar, 2010).

Political and economic leadership of a country/region tends to be hesitant and inertial towards the entrepreneurial activity due to the fact that it sometimes may be a risky activity. They do want do embrace new economic models that enhance growth, however, they are uncertain about how do develop them and tend to adopt more cautious measures instead of supporting bold ideas (Venkataraman, 2003).

It is quite clear that technology is here to stay and it is imperative for policymakers to adapt the entrepreneurial environment, promote new partnerships with stakeholders, enable R&D in order to create relevant and competitive technologies with the purpose of empowering a country and raise the economy (Fowosire *et al.*, 2017).

An entrepreneur needs a core feature: passion. Passion that gifts the entrepreneur with the arguments he/she needs to raise funds/gain an investor: *If the entrepreneur does not believe in the future of its company, who will?* (Trigo, 2012).

However, some entrepreneurs begin, financially speaking, in the purest form of entrepreneurship, the creative financing strategy of transforming human capital into financial capital the so called *Bootstrapping*. According to Lahm and Little, *bootstrapping*, is divided in two methods: 1 – acquisition and management of resources (intangible and tangible); 2 – the efficient use of those resources to finance the enterprise in order for it to grow and thrive (Lahm & Little, 2005)

The two methods mentioned before focus on the four types of *bootstrapping*: *bootstrapping* product development; *bootstrapping* business development; *bootstrapping* to minimize the need for (outside) capital financing; *bootstrapping* to minimize the need for capital. This process is what one might call as a way-to, when no other options exist, such as banks, business angels or venture capitalists, and consist mainly in the use on the entrepreneurs' personal savings, credit-card debt, loans from close ones and formal sources of private investment (Lahm & Little, 2005).

Another alternative is to franchise, being this a way to distribute products/services of the new business through other autonomous companies with their own logistics. This is a method to consider when the entrepreneurs have no funds and/or lack of the needed soft-skills to run the venture and the outcome is a quicker market share growth; the main management obligations are the franchisor's responsibility; the product/service gets better and bigger marketing strategies and the entrepreneur has more R&D tools available (Hisrich & Ramadani, 2017).

On the other hand, licensing is another option: The difference to the method mentioned above is that this process focuses, mainly on the production/manufacturing of the product/service, being, therefore, a wider-scoped agreement. The advantages are the same as franchising, however the licensee may become a competitor for the licensor and there's a bigger constraint by the quick technological development rate (Hisrich & Ramadani, 2017).

If the method is to form a partnership with other companies, entrepreneurs must focus that these new allies do four things: Discover and enable the discovery of new technologies and worry how they will impact the industry; Help in shaping the ideas and perceptions of business models, prototypes and the flow of the technical features; Top executives should be aware and embrace this project in order to foster a faster implementation and adoption of the new product/service by the company/industry; Be

sustainable and coherent in implementing best practices on their own company (Capgemini *et al.*, 2016).

However, there are other options, such as technological parks or incubators, although they do not give entrepreneurs money per say, they offer them other tools in order to achieve success and/or gain funds (Santos, 2013)

According to Santos (2013) a technological park is a space that is managed by specialists, which have the primary goal of enhancing the wealth of the community through the promotion of innovation and competitive advantage of companies based on technology and knowledge. To achieve this purpose a technological park must promote and manage the flow of knowledge and technology between universities, R&D institutions, companies and the market allowing start-up companies to have success. A technological park should also offer other services of value for companies in high quality spaces.

Therefore, a technological park is an infrastructure that provides technical, logistic and administrative support that a young company needs to enter the highly competitive technological market (Guy, 1996), promoting the interaction between the academic and industrial environment; by performing programs of industry innovation, substituting old and obsolete products/services; by making technology transfer programs that empower certain areas' companies; by providing information programs that develop and manage new and emerging technologies and by giving support services to start-up companies that settle in the park (Bigliardi, *et al.*, 2006).

As for incubators, they give services of support in management, access to funding and technical support, offering spaces and devices that are shared by the several companies in the incubator, in a flexible way, all inside the same infrastructure. The purpose of an incubator is to enhance the probability of survival of start-up companies and to accelerate their development by providing services of value (Santos, 2013).

Despite its' main reason to help and empower startups, it is certain that the technological parks and incubators support it's, sometimes, not enough. Therefore the goal is to achieve cooperation with companies, governments and universities (Venkataraman, 2003) and this should happen in every region of country, even as small

as Portugal, for instance, in order to retrieve as much benefits from it as possible: cultural, economic, political and so on.

As such, incubators and technological parks may not provide an entrepreneur directly with money but they give other tools, services, knowledge and network that will certainly be useful for a technological entrepreneur. Providing a wider scope of the industry and market environment instead of standing alone or be completely scoped by someone's opinion, for more specialized it might be.

A startup can have alliances with universities, suppliers, customers and governments. These relationships form immediate presence for the venture, greater size, enlarges the perceived performance of business and sometimes impacts not only the core industry but also others. These associations can take several shapes and levels of involvement but there are two main types: *partial ownership and contractual control (joint ventures and partially owned subsidiary)* and *contractual control only (R&D partnerships; exchange of personnel; research contracts; technical assistance; joint bidding; purchasing activities and long-term contracts)* (Hisrich & Ramadani, 2017).

It is a common sense that if we increase the number of technological entrepreneurs, there will be an enterprise growth manifested by an innovative capability of a new product/service, especially if associated to other companies that might be using this new product/service. This enterprise growth will lead to a bigger competitiveness, market share, profitability and quality of a larger range of services related with lower transaction costs, greater efficiency leading to greater earnings. Meaning that there is a strong relationship between the number of innovative services used by small and medium enterprises and the growth of entrepreneurship itself (Fowosire *et al.*, 2017).

According to Capgemini *et al.* (2016) these supports that are key success factors for applying innovation must focus on “*Executive Leadership Support and Buy-In; Shifting the Cultural Mind Set of the Organization to Be Agile and Innovative; Clear Strategic Vision and Plan; Willingness to Take Calculated Risk; Willingness to Think Outside of the Box and Challenge Traditional Business Models; Strategic Budget Allocation; Willingness to Replace Legacy Technology; Ensuring Innovation Plan and Business are in Sync*”.

2 - Research Analysis

2.1 – Methodology

This sample was arranged through the approach through e-mail of 443 start-ups that are being developed on 29 portuguese incubators or technological parks. Table 1 shows the relation between the incubator/technological park and the number of start-ups approached and their location on the Portuguese continent, using a qualitative approach.

Table 1 - Relation between incubators/technological parks and the number of start-ups approached

Incubator / Technological Park	Nº of Start-ups approached	Location
Audax	8	Lisboa
Avepark	3	Guimarães
Biocant	7	Cantanhede
CEI	6	Castelo Branco
Centro de Incubação e Desenvolvimento Lispolis	14	Lisboa
Centro Incubador de Caldas da Rainha	2	Caldas da Rainha
Curia Tecnoparque	2	Anadia
DNA Cascais	12	Cascais
Fábrica de Startups	12	Lisboa
IEUA	16	Aveiro
In.cubo	6	Arcos de Valdevez
Incubadora D. Dinis	15	Leiria
Inovagaia	6	Vila Nova de Gaia
Instituto Empresarial do Minho	4	Vila Verde
Instituto Pedro Nunes	13	Coimbra
Iparque	3	Coimbra
IPN Incubadoras	1	Coimbra
Madan Parque	20	Almada
OPEN	1	Marinha Grande
Parkurbis	10	Covilhã
Portus Park	91	Porto
PROMONET	1	Porto
Sanjotec	22	S. J. da Madeira
Startup Braga	24	Braga
Start-Up Lisboa	51	Lisboa
Startup Madeira	2	Funchal
Taguspark	1	Oeiras
Tec Labs	6	Lisboa
Uptec	84	Porto
Total	443	

Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

The platform used was Google Forms and the answers were anonymous.

The sample obtained for analysis was of 33 answers.

In this chapter it will be analyzed the outcomes of the answers that were given by a sample of 33 technological start-ups to an inquiry that intends to prove the assumptions made in the theoretical chapter of this thesis.

3 – Data Analysis and Discussion

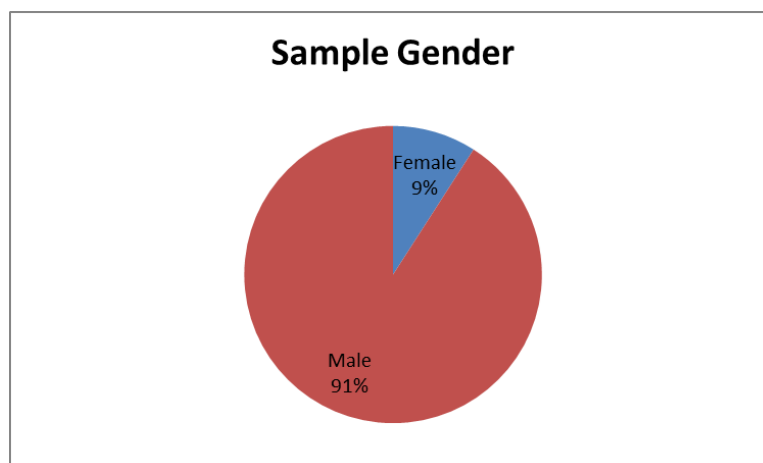
3.1. - Sample Features

The graphics below show the features of the sample that was surveyed:

3.1.1.- Gender

The sample that was surveyed was constituted by 91% of men and 9% women.

Figure 1

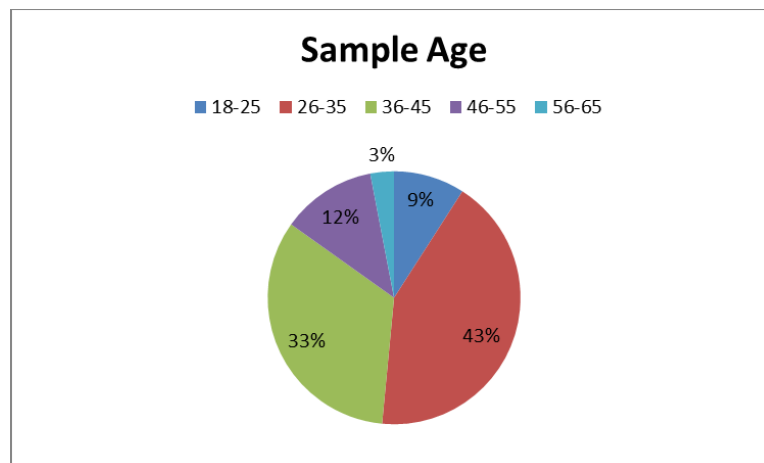


Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.1.2. – Age

The great majority of the interviewees is between 26-45 and 36-45 years old.

Figure 2

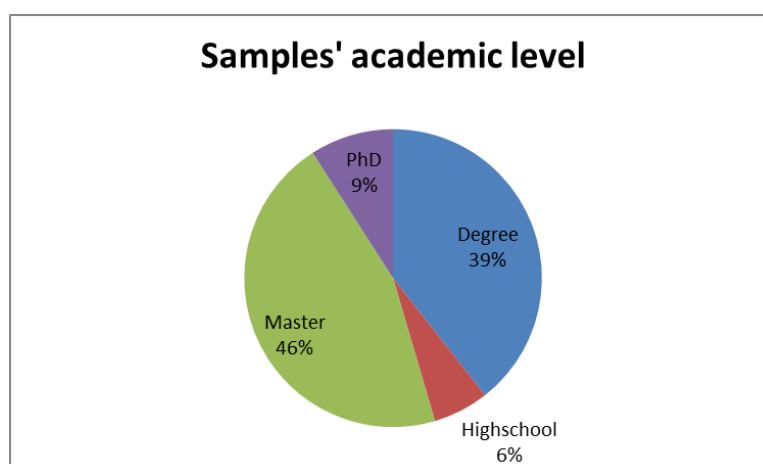


Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.1.3 - Academic Level

The next question of the survey intended to analyze the academic level of the entrepreneurs of the sample. The majority of the interviewees had a degree (39%) or a master (46%), the minority of the entrepreneurs had gone no further than highschool (6%) or a PhD (9%).

Figure 3



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.1.4 - Field of Studies

Table 2 shows the percentage of the field of studies approached by the entrepreneurs in the sample. One can conclude that the vast majority had knowledge in the different areas of engineering.

Table 2

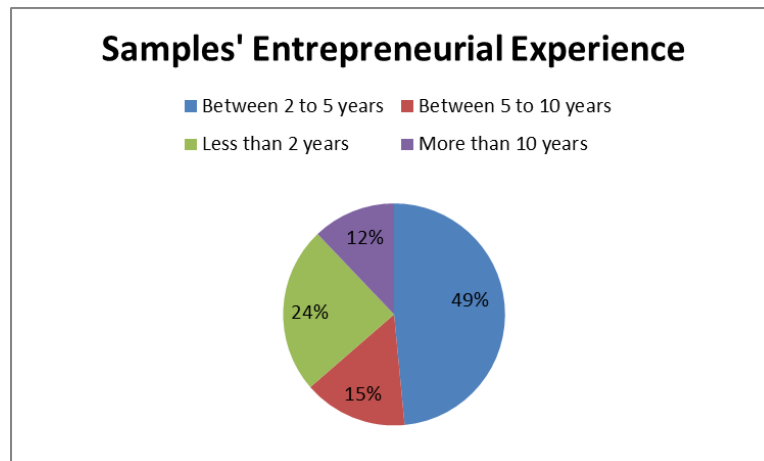
Field of Studies	%
Business Administration	6%
Computer Science	13%
Engineering	58%
Journalism	3%
Management	6%
Management and Accountability	3%
Multimedia and Communication Design	3%
Product Design	3%
Tax	3%

Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.1.5 - Entrepreneurial Experience

The next question of the survey was for how long the interviewee has been an entrepreneur. The answers' options were in clusters and analyzing figure 4 one can conclude that nearly half of the people who answered have been entrepreneurs between 2 to 5 years (49%).

Figure 4



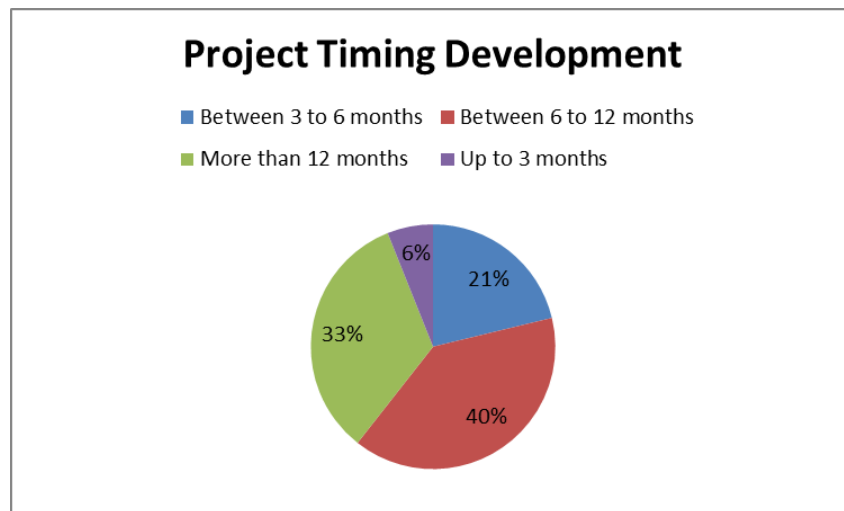
Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.2. - Samples Entrepreneurial Projects

3.2.1 - Project Development Timing

When asked for how long it took from having the idea for the product/service until the company was fully operational the majority of the interviewees answered it took them between 6 to 12 months (40%) or more than 12 months (33%) until the whole concept was working properly, as it can be seen on figure 5.

Figure 5

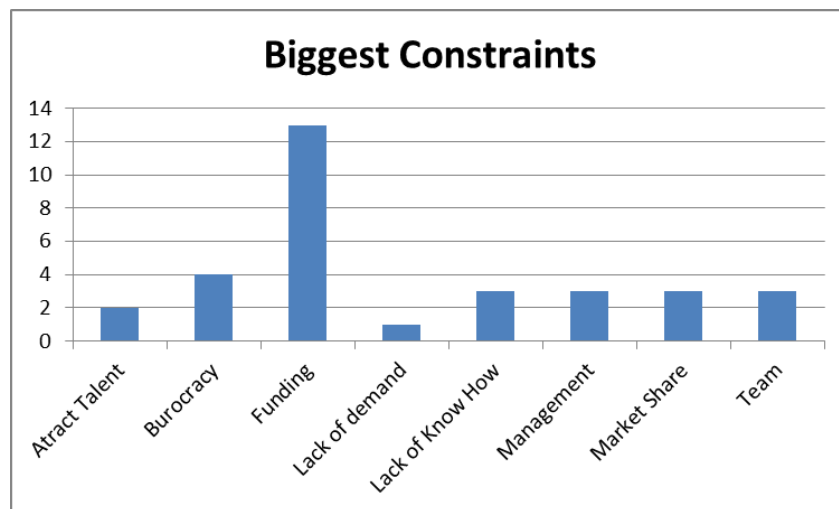


Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.2.2 - Biggest Constraints

The sample considered what were the 3 biggest constraints that the entrepreneurs experienced while running their businesses, the most common were to get funded (27%), arranging the necessary market share (11%) and, equally important, the lack of know-how, attracting the right people to work at the startup and managing a team, with 10% each. Bellow, on figure 6, one can see the other constraints given by the interviewees.

Figure 6



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.3. - Successful vs. Unsuccessful Ventures

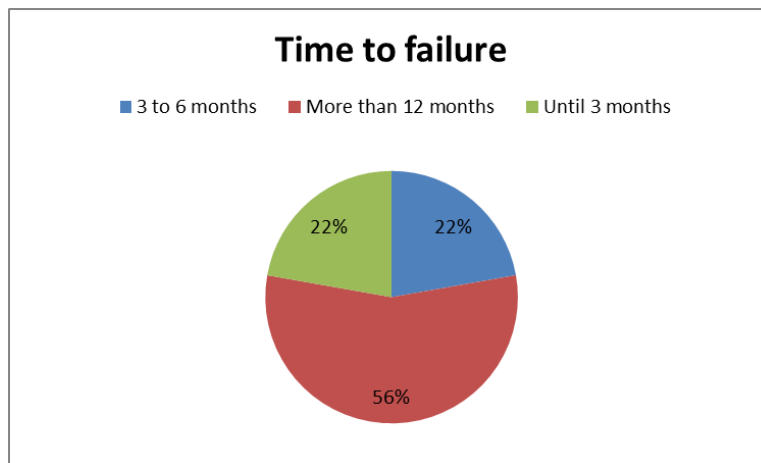
The next questions of the questionnaire intended to test all hypothesis mentioned in the theoretical chapter of the present thesis. In order to do so there was a question that asked if the activity to which the entrepreneurs were referring to was still active: from the 33 answers, 24 startups were still running while the other 9 were considered unsuccessful activities from their own entrepreneurs.

The following analysis separates the successful cases from the unsuccessful ones.

3.3.1 – Perception of Failure

If the startup activity was considered unsuccessful by their own entrepreneurs and when asked how long it took them until they realized the failure, the great majority of them answered that it took them more than 12 months until they realized their activity was unsuccessful (56%) as stated on figure 7.

Figure 7



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.3.2 - Market Opportunity

The first hypothesis tested was if the unsuccessful cases of the sample tested if there was a gap in the market they were entering for the product /service they were developing. Only on the samples' unsuccessful cases 11% of them didn't check if there was an opportunity for what they were offering and all the samples' successful cases checked for this market gap, as in can be seen on figures 8 and 9.

Figure 8

Figure 9



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

Looking at the positive answers the next question was how did the entrepreneurs made that analysis: Figures 10 and 11 shows us that in both cases de majority of the entrepreneurs only did simple research about the market they were entering, although it is clear that the successful entrepreneurs used plenty of other options since surveys, interviews or they even presented the idea to potential customers, or even all the options mentioned before. This shows us that, to be successful, one should commit to the effort to know the market where one's entering and this raises the probability of success. The more knowledge about the product/service the entrepreneur has, plus the knowledge of the market makes him/her more prepared to face the upcoming challenges and also to be able to predict them.

Figure 10

Unsuccessful

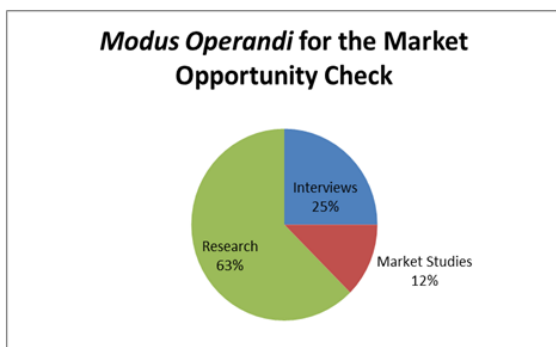
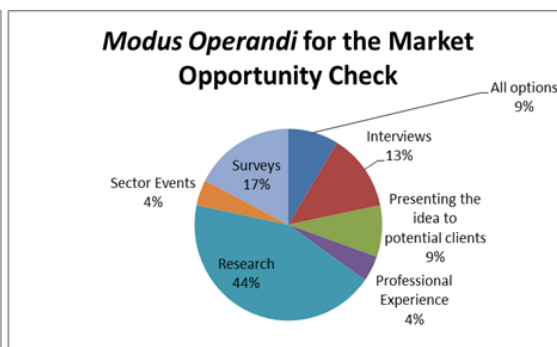


Figure 11

Successful



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.3.3 - Business Plan

When asked if they made or not a business plan to follow during the entrepreneurial activity, one can conclude that in % there are more unsuccessful entrepreneurs that didn't follow one than successful ones, however, that % turned into numbers we can see that the number of successful entrepreneurs that didn't make a business plan is higher than the unsuccessful ones.

Figure 12

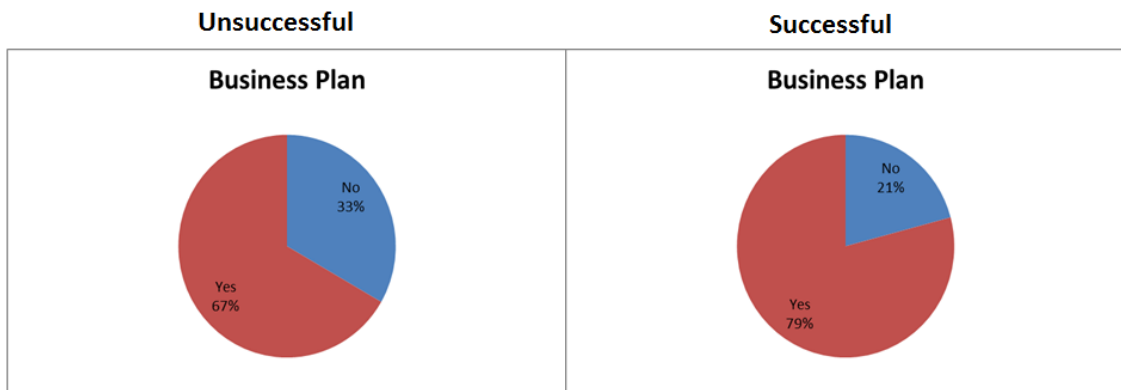
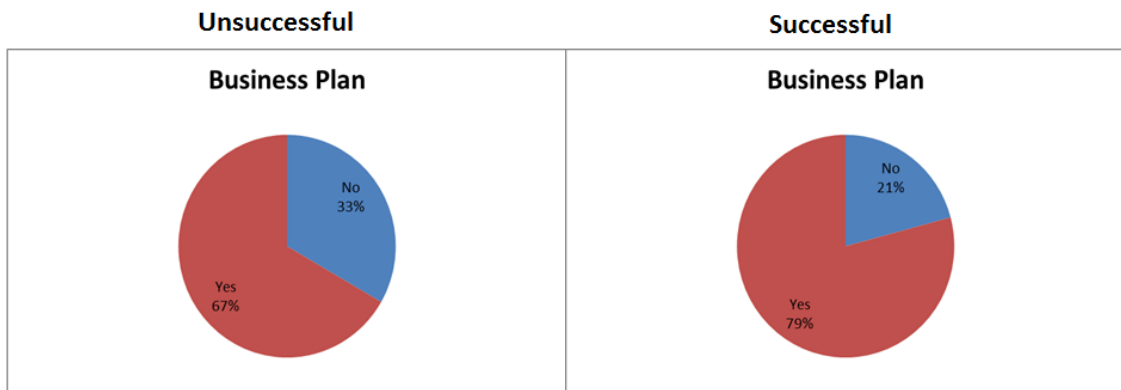


Figure 13



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

When asked if the initial business plan was adjusted according to market changes there were only a percentage of entrepreneurs that didn't adjust in the samples' successful cases (11%).

Figure 14

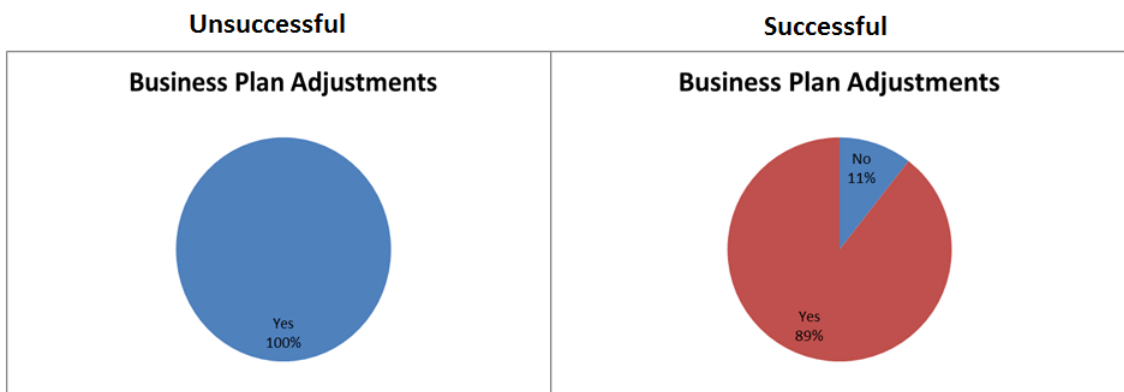
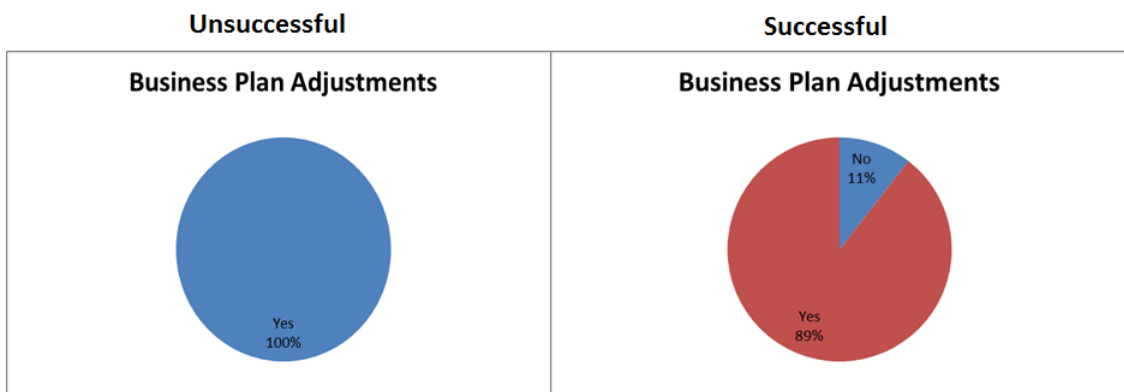


Figure 15



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.3.4 - Business Volume

Looking towards the answers of the samples' entrepreneurs if they predicted or not their business volume for the first year, although the percentage is higher on the unsuccessful entrepreneurs that didn't predict their business volume, converting the percentages of successful and unsuccessful entrepreneurs that didn't predict their business volume into numbers, one can conclude that the same number of entrepreneurs on both situations didn't predict how much they would receive for their first year of activity.

Figure 16

Unsuccessful

Business Volume

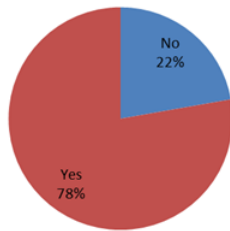
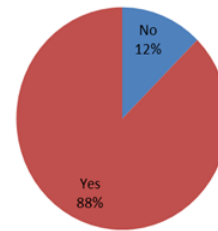


Figure 17

Successful

Business Volume



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.4. – Funding

One of the levels of analysis of this study was to check which type of funding did the samples' start-ups used and if such choice had an impact on the ventures' success. Both the majority of the type of funding for both successful and unsuccessful start-ups analyzed was bootstrapping, however one can see that the successful startups considered more funding options than the unsuccessful start-ups, such as loans, sponsors and arranging funds from other business areas of the company, showing that one must become more creative to arrange funding options if one intends to have a positive debt, not focusing in one strategy to finance the endeavor alone.

Figure 18

Unsuccessful

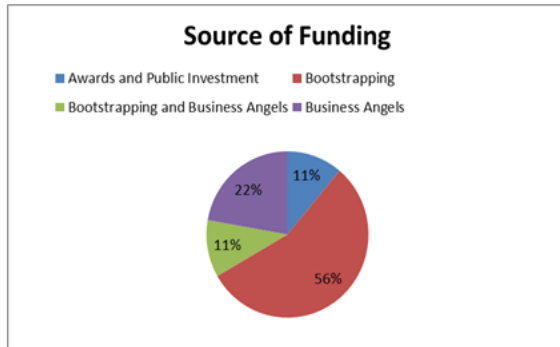
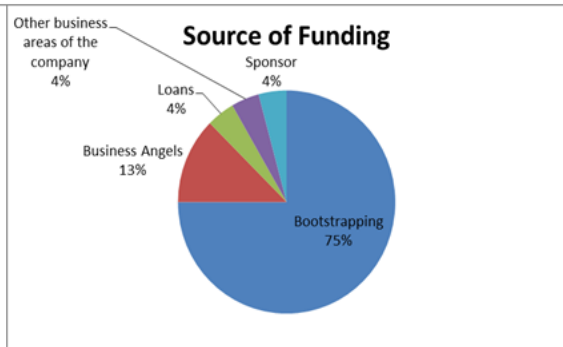


Figure 19

Successful



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.5. -Tangible vs Intangible Resources

Another point of interest was the importance given to tangible vs intangible resources. In the theoretical part one could conclude that in the technological field the most important feature of a company was the intangible resources, due to the fact they could give a higher competitive advantage in the marketplace. The samples' analysis on the successful cases shows that they give a slight bigger importance to intangible resources than in the unsuccessful cases as seen on the graphics below.

Figure 20

Unsuccessful

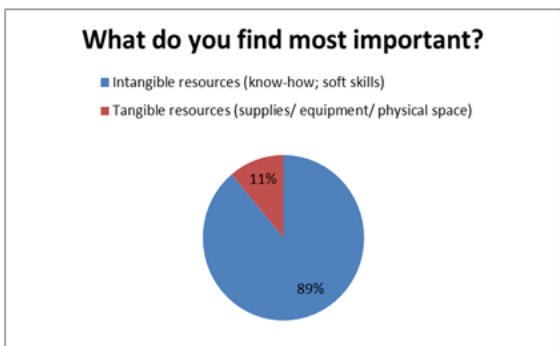
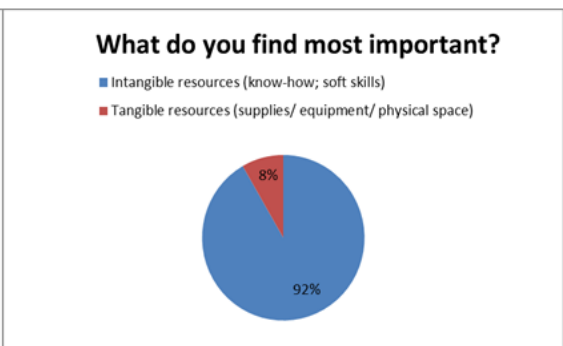


Figure 21

Successful



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.6. - Use of technological parks / incubators

According to the authors mentioned there is a higher probability of success when entrepreneurs use the support of technological parks / incubators, in the samples' analysis there's a higher level of utilization of these infrastructures on the successful cases.

Figure 22

Unsuccessful

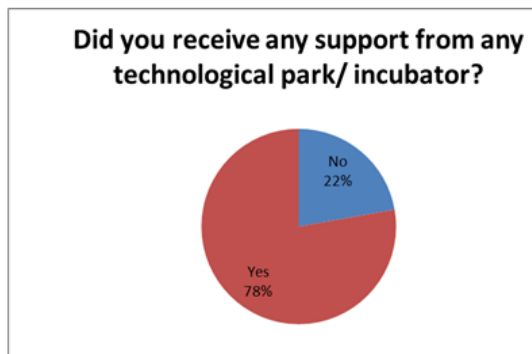
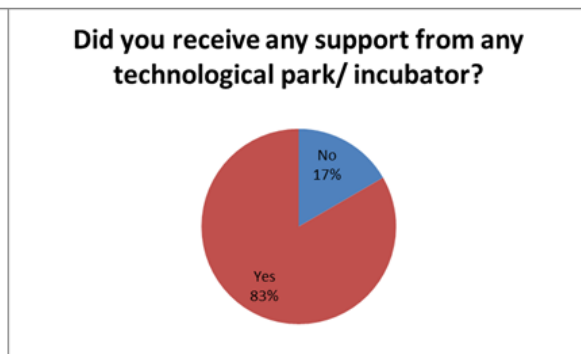


Figure 23

Successful

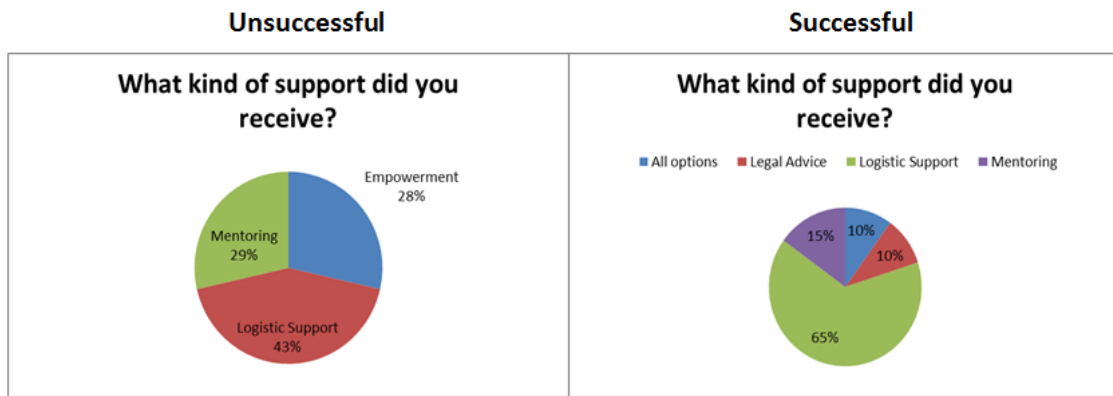


Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

Looking into the cases that used a technological park / incubator, both successful and unsuccessful cases used mainly the logistic support given by these platforms, however the successful cases explored more the support possibilities these infrastructures have to give, 10% of these cases even stated they used every kind of support given, something that was not mentioned by the unsuccessful entrepreneurs, as seen on figures 24 and 25.

Figure 24

Figure 25



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.7. - Time management

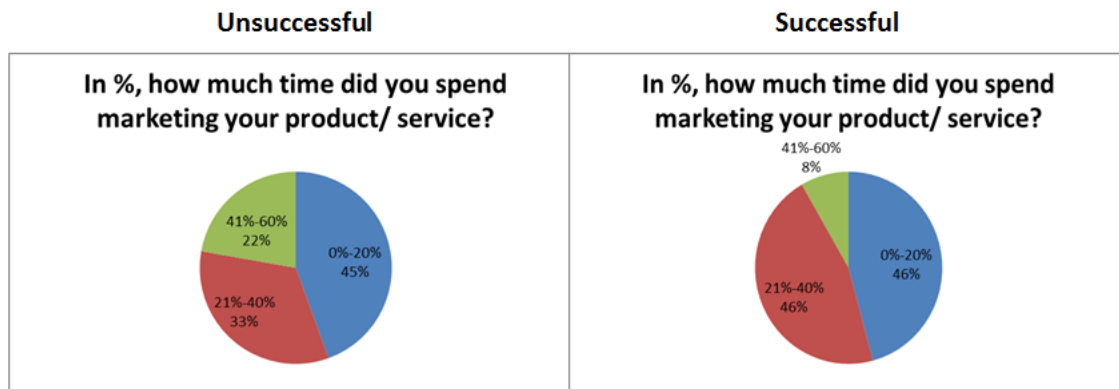
The next step of the survey was to analyze the time management differences between unsuccessful and successful entrepreneurs: How they arranged their time between the several key activities to make a business thrive, such as marketing, daily management and networking.

3.7.1. - Marketing

Analyzing the amount of time spent by the samples' entrepreneurs in marketing their own product/service, one can conclude that both unsuccessful and successful ones spent on average 45,5% of their time on marketing activities, as seen on figures 26 and 27.

Figure 26

Figure 27



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.7.2. - Daily Management

The daily management of the business (performing core actions related to the ventures' development) took to unsuccessful entrepreneurs on average about 21-40% of their time, on the successful cases, looking to figure 29, one concludes that the majority of these entrepreneurs only spent on average until 20% of their time on those same activities.

Figure 28

Unsuccessful

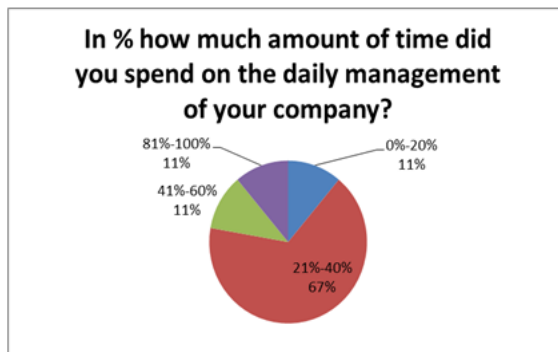
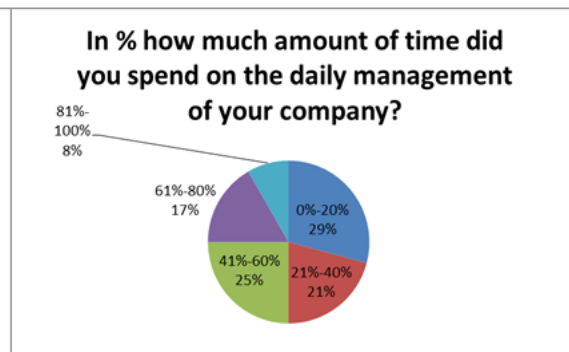


Figure 29

Successful



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.7.3. – Networking

Regarding the % of time spent on networking activities, it is clear to see, analyzing figures 30 and 31 that the vast majority of the samples' successful entrepreneurs spent on average until 20% of their time on connecting to new people that might help to enhance their business, and the samples' unsuccessful cases are quite balanced on the % of time, all three clusters of % of time have an average of 33,5% of unsuccessful entrepreneurs classifying it as their % of time spent on networking.

Figure 30

Unsuccessful

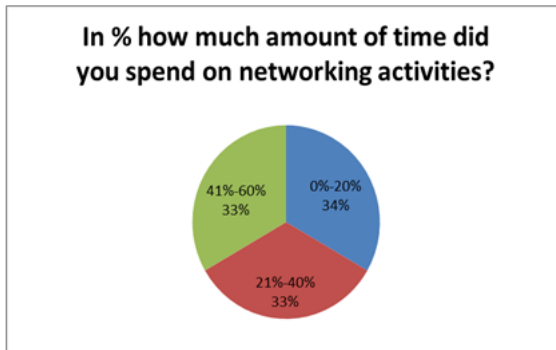
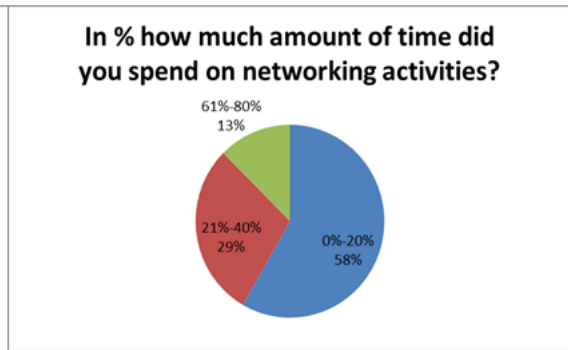


Figure 31

Successful



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

3.8. - Product Obsolescence

When asked if their product /service became obsolete while developing it there's a bigger % of unsuccessful entrepreneurs that faced this challenge as seen in graphics 32 and 33, however, in both situations where this bottleneck occurred, the entrepreneurs adjusted their product /service in order to face and overcome that adversity.

Figure 32

Unsuccessful

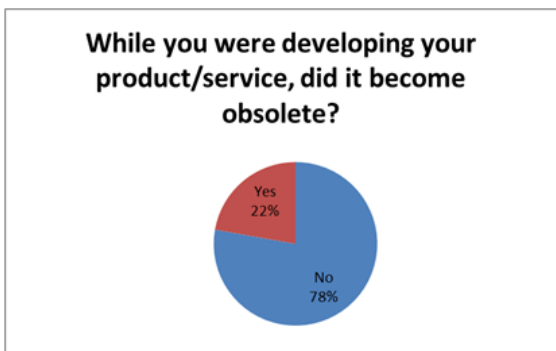
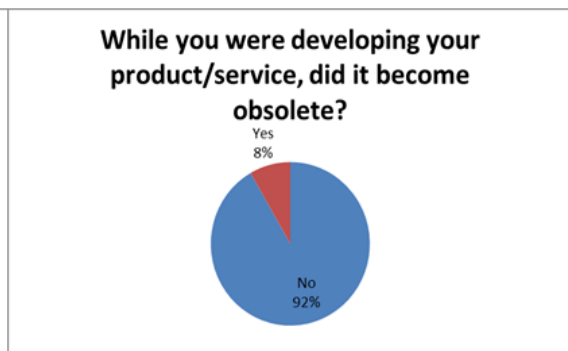


Figure 33

Successful



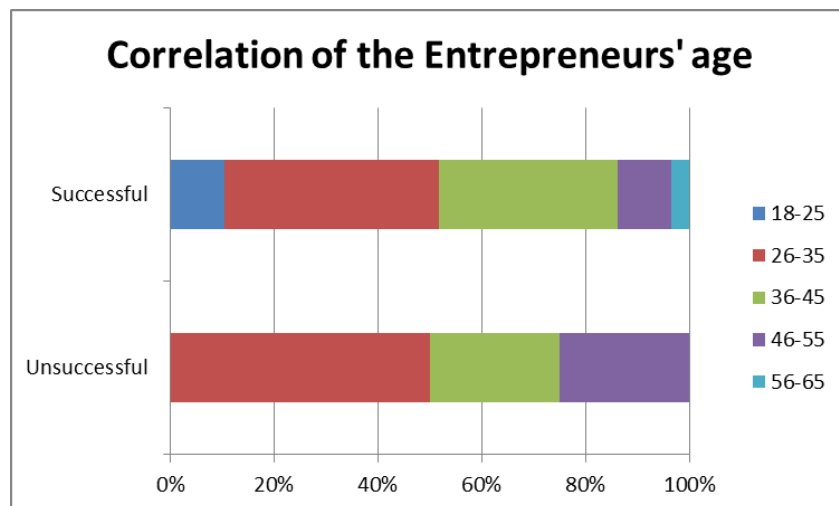
Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

4 – Conclusion

Some interesting facts that one may highlight are related to some of the samples' features in relation to success or failure of the venture: age; academic level; gender and entrepreneurial experience.

Regarding the age and analyzing figure 34 one can conclude that the majority of successful and unsuccessful entrepreneurs are between 26 and 35 years old, however there is a bigger % of successful entrepreneurs that are between 36 and 45 years old and also of unsuccessful entrepreneurs that are between 26 and 35 years old.

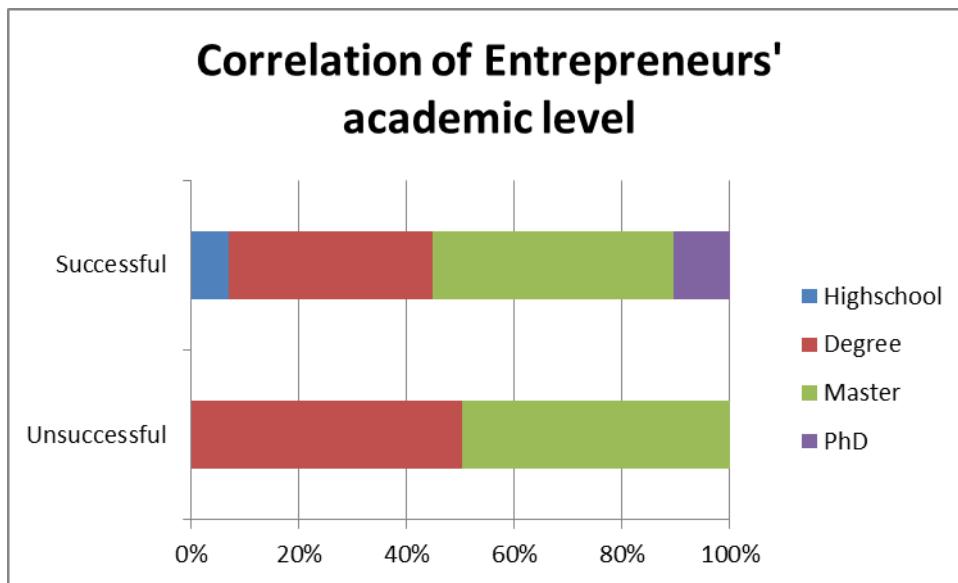
Figure 34



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

Concerning the academic level of the entrepreneurs, figure 35 shows us that the samples' successful entrepreneurs or have a college degree or a master degree, however there is a balance on the unsuccessful entrepreneurs' academic level, where there is a close % of cases that have a master degree and a college degree.

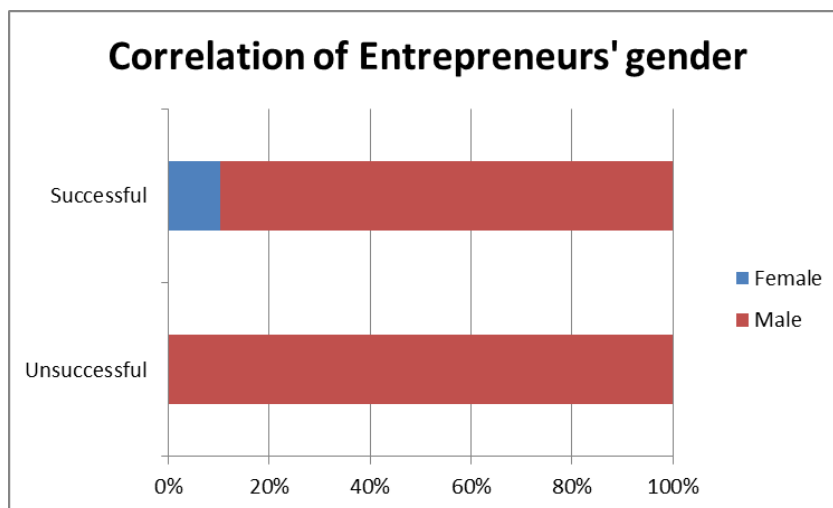
Figure 35



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

The relation between success and the entrepreneurs' gender is affected by the weight of the samples' gender as seen on figure 1. However, all of the samples' unsuccessful cases were male and the % of female entrepreneurs on the successful cases is of 12%.

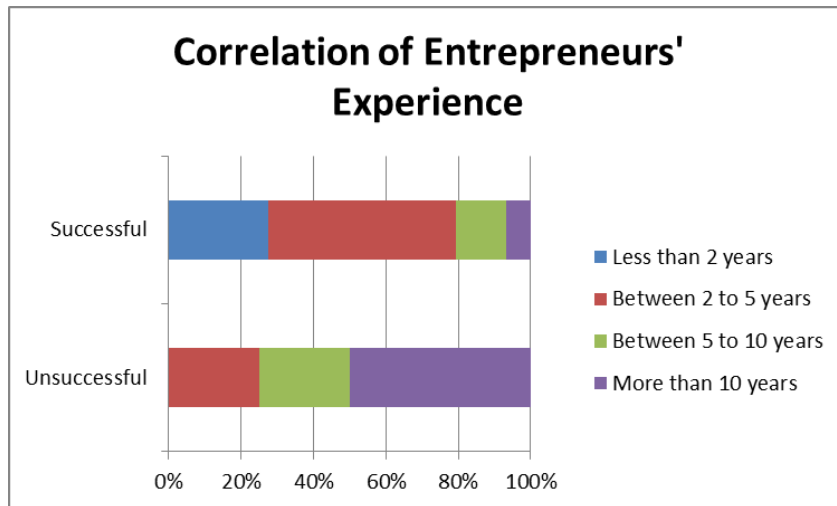
Figure 36



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

When it comes to the entrepreneurial experience: this correlation gives us that the majority of the successful entrepreneurs had the double of time (between 2 to 5 years) of entrepreneurial experience than the unsuccessful entrepreneurs (less than 2 years).

Figure 37



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

The final question to the unsuccessful entrepreneurs was what could have worked better in their case. The majority answered that they would have had a better knowledge of the market and a better time to market. This shows us the importance of the market awareness an entrepreneur should have in order to succeed.

Figure 38



Source: Monteiro, M. (2017) Boas Práticas Empreendedoras no âmbito de startups do setor tecnológico: o porquê do insucesso? [Google Forms]

The theoretical study that was made during the literature review was tested on the data analysis that was made to a sample of 33 technological entrepreneurs spread across Portugal.

The above answers show some constraints. Being the most important the size of the sample: although 433 start-ups were approached and only 33 answered. Having a success answer rate of 7,6% gave us a very limitative sample.

This difficulty was mainly given by the lack of time to answer surveys. Some start-ups were kind to give feedback stating they have a no-answer policy towards surveys, due to the fact that is such a trend theme nowadays that they would do nothing else than answering instead of developing their business.

The lack of answers also provides an opportunity to continue studying the behaviors of tech entrepreneurs meaning that there is still plenty of information to study and analyze.

As part of the analysis it was also asked to the unsuccessful entrepreneurs what could have gone better in their venture process. Below are the answers with their respective weight. One can conclude that their main constraints were a lack of market knowledge and lack of project maturity to enter the market.

At the end of this research one can think about several conclusions that are given by the samples' answers and correlations between different factors. The purpose of these ideas is to help new entrepreneurs to better prepare their business.

One can state that gender and academic level have barely any weight on the success of a venture, the outcomes on these correlations have no significance, however, age and time of entrepreneurial experience give the entrepreneurs some sensitivity and wisdom that might be useful on the development of the new business.

Market knowledge and proactivity are key factors to the success of a venture. An entrepreneur must interest himself/herself by market changes and all aspects of his/her product/service. If there's no deep market and product knowledge, if the entrepreneur

only has an idea that believes it will thrive, unfortunately, just passion will not be enough to succeed. Deep passion and knowledge is what one can conclude to be the success-key.

Despite the knowledge that was mentioned above, planning activities are also extremely important. An entrepreneur cannot go to a live-business without it: He/she needs to build an adjustable solid business plan, that will be the guide of the venture and also to forecast the first cash-flows the venture will have. Without this, it will be a shot in the dark.

Another curious factor is that the majority of the samples' success cases mainly needed logistic support, in spite of the unsuccessful cases that needed more mentoring than the first group. This shows that having a good management perception is also a heavy success factor, this perception is a tool that is gained with experience.

As the study showed, unsuccessful entrepreneurs spend more time in operational activities than on marketing and networking. There must be a good product/service knowledge and already having it solidly developed to then have more time to devote to marketing it and knowing the right people.

If there's not enough time to balance between these activities, mainly because of market changes: operational; marketing and networking, the entrepreneur should surround him/herself by a coherent team to delegate tasks. As stated before, a lonesome entrepreneur will achieve nothing.

Regarding further research it would be interesting to extend the sample size to a larger number, in order to verify other correlations and details that might help entrepreneurs to be better prepared for their venture, as well as other market trends, so that technological entrepreneurs can become successful executives at a larger company.

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