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WHY PRICING MATTERS:
A DESIGN RESEARCH ON BRAZILIAN STARTUPS

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A Design Research On Brazilian Startups

Dissertation presented as partial prerequisite for postulating Masters Degree in Administration on the Graduate Program at Universidade do Vale do Rio dos Sinos – UNISINOS

Advisor: Ivan Lapuente Garrido, Dr.

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I dedicate this study to my babyboy, Matteo.

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In God we trust. All others must bring data.

W. Edwards Deming

ABSTRACT

This study analyzes which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework. The literature reviewed the concepts of pricing, startups and decision making process. The method chosen was the Design Science Research (DSR), mainly because the method is recommended for finding adequate – not perfect - solutions for real problems, therefore bringing theory and practice close together. The artifact chosen for this research was a *processual framework.* The artifact was developed to be a useful, practical, flexible, timeless and engaging tool for Brazilian startups with digital solutions. The processual framework proposes the startups decide what is their most suitable revenue model – and pricing – after concluding a six-step-process. Each step proposes questions to be answered and actions to be taken by the startups, and after completing the six steps process, the startup is able to make a decision about their revenue model and pricing. There were two data collection stages: prequalification and artifact testing. The prequalification interviews explored individuals with relevant roles in the startups ecosystem, and the second phase tested and evaluated the artifact with Brazilian startups. This study practical contribution is to bring attention to pricing as a possible strategic ally for startups, and providing them a new tool for evaluating their pricing definition process. The academic contribution of the study is to advance the discussion on startups, bringing the Design Science Research – a mainstream method only in Information Systems and Production Engineering – to the Administration field; and also by expanding the discussion of pricing from a static concept born in economics to a term applicable to the strategy field.

Keywords: Pricing, Revenue Model, Startups, Processual Framework.

LIST OF FIGURES

LIST OF TABLES

TABLE OF CONTENTS

1 INTRODUCTION

Innovation is a collective process of reinventing the world. It has been both a cause and a result for progress throughout time, and a relevant instrument through which organizations and countries rank their competitive advantage in the world. From Gutenberg's press spreading information and Edison's light bulb enabling light, to Brown's combustion engine that led to cars and airplanes. (FAGERBERG, 2004; FONSECA, 2002). Innovation is hold accountable for every major change in human life. One of the main innovation drivers in modern times are startups - companies that break away from traditional corporate paths and are destined for shifting paradigms. (ANTHONY, 2012; RUSEVA; RUSKOV, 2015; THIEL, 2014; TRIMI; BERBEGAL-MIRABENT, 2012).

Startups have an impact on both the economic and the social level. They are capable of transformational innovation, so they can dramatically change individuals, the ecosystem they are in, and society itself. (OUDEN, 2015; THIEL, 2014). Even though it is hard to define all startups under the same label, in general they help to unravel existing models and innovate blending technology and design. (ANTHONY, 2012; RUSEVA; RUSKOV, 2015; TRIMI; BERBEGAL-MIRABENT, 2012). Although startups are a global phenomenon, they do not develop at the same pace in all countries. Emerging economies tend to inflict several institutional obstacles on startups, which contributes to a decrease in the innovation ecosystem's efficiency. Consequently, they contribute to less success in new ventures such as startups. (ANDREASSI; SIQUEIRA, 2006; PRASHANTHAM; YIP, 2017; RAMALHO, 2010).

Hoping to overcome the institutional problem and increase the chances of being successful, startups need to count less on the ecosystem and more on their own support. For that to happen, startups need to focus on self-funding. This project proposes to explore which elements affect startups' decision making in pricing process and how this process could be improved, which could mean generating revenue earlier and faster. Pricing is a wider term for revenue model, which is the specific ways a company enables revenue generation. (ZOTT; AMIT, 2010). Understanding pricing in the startups ecosystem could help startups to become more self-funded, which could ultimately increase their success rate in emerging economies. (ANDREASSI; SIQUEIRA, 2006; RAMALHO, 2010; PRASHANTHAM; YIP, 2017; RAMANUJAM; TACKE, 2016).

The method chosen for the project is the Design Science Research. The research analyzes which elements affect startups' decision making in pricing process and understands how this process could be improved by an artifact - a process framework. The research first defines pricing as an element in the startups' ecosystem and describes their decision making process in Brazilian startups. After the concept of innovation is discussed, and its connection to the decision making process, startups, technology and pricing itself. Finally, there will be the description of the design research steps, data analysis, and conclusion.

1.1 Research Problem

Startups are a byproduct of innovation, and as any other phenomenon, they could be analyzed from many perspectives. They have been studied according to their innovation drivers (PRANGE; SCHLEGELMILCH, 2016; ROSE; JONES; FURNEAUX, 2016; SENGHORE et al., 2015), as a social (DACIN; DACIN; TRACEY, 2011; MIRVIS et al., 2016; VAN DER HAVE; RUBALCABA, 2016) and environmental impact element (DÍAZ-GARCÍA; GONZÁLEZ-MORENO; SÁEZ-MARTÍNEZ, 2015), as a background for gamification theory (ROTH; SCHNECKENBERG; TSI, 2015; THYGESEN, 2007), organizational theory (ANTONIOLI; DELLA TORRE, 2015) complexity theory (BARIN-CRUZ; PEDROZO; ESTIVALETE, 2006; FONSECA, 2002; STACEY, 2003), internationalization theory (GABRIELSSON; GABRIELSSON; DIMITRATOS; 2014; GOLOVKO; VALENTINI, 2011; KAFOUROS et al., 2008); institutional theory (DOBLINGER; DOWLING; HELM, 2015; KOSKELA-HUOTARI et al., 2016; PENG et al., 2009) or decision making theory (SARASVATHY; SIMON; LAVE, 1998; SARAVATHY, 2001).

Recent studies in Brazil discuss startups from an open innovation perspective (VARRICHIO, 2016), research their performance (ARRUDA et al., 2014; MIRANDA; SANTOS JÚNIOR; DIAS, 2016; PADRÃO; ANDREASSI, 2013); explore tech startups through qualitative research - action research and case study - (MACHADO; BEZERRA, 2016; TORRES; GUERRA; LIMA, 2014); analyze startups from institutional theory (VASCONCELOS, 2004), capabilities theory (DULLIUS; SCHAEFFER, 2016), and creative thinking. (CAMPOS et al., 2015).

There are indeed many possible perspectives when exploring startups and their innovation ecosystems. Moreover, there are many possible units of analysis:

processes of innovation, the entrepreneur, the organization, the ecosystem, the entrepreneurial decision making process, among others. (SONG et al., 2008; SARASVATHY; SIMON; LAVE, 1998). This research will focus particularly on the implications of the startups' pricing decision process, in other words, how the startup defines how to generate money. Pricing, or monetization, is the act of receiving money in exchange for a product or service, it is the generation of revenue. (AMIT; ZOTT, 2001; RAMANUJAM; TACKE, 2016). Defining a pricing model could be crucial for the success of any business, especially startups. The revenue model a startup decides not only determines their revenue, but also helps to position the product's value and to increase their chances of endurance in the market. (CARMICHAEL, 2014; PATRICK, 2016; RAMANUJAM; SIMON, 2015; TACKE, 2016).

Pricing definition takes on an even bigger role if specific contexts are considered, such as the emerging countries[1] innovation ecosystems. (CLERCQ; ZHOU; WU, 2016; KISS; DANIS; CAVUSGIL, 2012; PRASHANTHAM; YIP, 2017; YAMAKAWA; PENG; DEEDS, 2008). In emerging countries, startups are born with the same goal as any other countries' counterparts: produce, distribute and drive innovation. (BLANK; DORF, 2012; RIES, 2011; THIEL, 2014). Nonetheless, there are crucial differences between emerging and developed countries, which have to be taken into account. (PRASHANTHAM; YIP, 2017). The American ecosystem, for example, is driven by investment, and it has produced more than 100 unicorn companies[2]. The Brazilian ecosystem is far behind, and it has legal, political, social, economic and cultural barriers startups must face. (ANDREASSI; SIQUEIRA, 2006; KOSTOVA, 1999; 2002; PENG, 2003; PENG et al., 2009; PRASHANTHAM; YIP, 2017; RAMALHO, 2010; SCOTT, 2008; TEECE, 2014; verbal information)[3].

Such divergence definitely reflects on Brazilian startups development. A startup's natural evolution in Brazil is highly different from the one in the USA. While in the USA startups are mainly B2C[4], project large scales and hope to become long-term

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1 Emerging economies are countries of low-income, rapid-growth that benefit from open-market politics. (HOSKISSON et al., 2000).

2 Unicorns are private companies valued at $1 billion or more. (FORTUNE, 2016).

3 Data collected in an interview with respondent G, Innovation manager at Agencia Brasileira de Desenvolvimento Industrial (ABDI), in October, 05th, 2016.

4 B2C is business-to-consumer commercial transactions, and ir means the process of selling products directly to consumers. (BUSINESS…, 2017).

valuable assets, in Brazil startups generally look for B2B[5] models, and meet a very tight deadline for expected revenue. (ANDREASSI; SIQUEIRA, 2006; PRASHANTHAM; YIP, 2017; RAMALHO, 2010; verbal information)[6].

Brazilian startups must generate revenue earlier than startups in mature economies. One of the reasons is the fact simply there are not enough venture capital available in the ecosystem, so startups must also count on their own revenue for funding. They must decide their pricing models and launch their products or services sooner if they want to continue in the market, that is why pricing is more relevant for startups in emerging economies like Brazil. (ANDREASSI; SIQUEIRA, 2006; DANTAS, 2016; RAMALHO, 2010; PRASHANTHAM; YIP, 2017; RAMANUJAM; TACKE, 2016). The Brazilian ecosystem is now so used to this early dynamic, there are even some acceleration programs that require proving of revenue as one of the requirements for acceptance into the program, such as SAP Startup Focus. (verbal information)[7].

Pricing has received attention over the years. It has been studied in different segments, such as the food industry (NOONE; MAIER, 2015), or airline companies (OANCEA, 2006; VINOD; NARAYAN; RATLIFF, 2009); there have also been studies about pricing focusing on competitive markets (HWANG, 2008) and risk in decision making (KOCH et al., 2016; LANCASTER, 2003). And there are studies on general business models that partially analyze pricing. (MAGRETTA; 2002; OSTERWALDER et al., 2014; OSTERWALDER; PIGNEUR, 2010; ZOTT; AMIT, 2008). However, there have not been found studies focused on pricing and its impact on startups or their ecosystem. Research focused on pricing and its impact is important because exploring *pricing* as an agent of change could represent an increase in startups' chances of being successful in emerging economies.

Being pricing a relevant element for startups to consider, especially for Brazilian startups, and being startups an important driver for innovation, the following research question emerge: which elements affect startups' decision making in pricing process and how could this process be improved?

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[5] B2B is business-to-business commercial transactions, and it means the process of selling products or services to other businesses. (BUSINESS…, 2017).

[6] Data collected in an interview with respondent G, Innovation manager at Agencia Brasileira de Desenvolvimento Industrial (ABDI), in October, 05th, 2016.

[7] Data collected in an interview with respondent F, the head of SAP Startup Focus in October, 28th, 2016.

1.2 Objectives

The general and specific objectives sum up the goals intended from this project, accordingly to the design research method as well.

1.2.1 General Objective

Analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework.

1.3.2 Specific Objectives

a) Understand how the revenue generation model is decided today by startups in Brazil;
b) Understand the elements in pricing decision making process in Brazilian startups;
c) design and propose a pricing framework for Brazilian startups to improve their decision making process;

The relevance of the theme and project will be described in the next section.

1.4 Justification

All the countries, organizations and entrepreneurs need innovation. Innovation is linked to success, progress, and high impact development. And leading this revolution are startups, bringing not only new technology, but completely new business models or even new markets. (ABDI, 2016a). Startups were born to develop fast. Whether in technology, transportation, healthcare or financial services, they intend to be groundbreaking in reinventing consumers' relation to products and services. (BAUM; CALABRESE; SILVERMAN, 2000; KIRCHBERGER; POHL, 2016; ROURE; KEELEY, 1990; UNTERKALMSTEINER et al., 2016).

The Global Competitiveness Report 2013–2014 shows that an increase of 10% in investments in technology results in a 0,75% increase in a country's Gross Domestic Product (GDP). (ABDI, 2016c; SCHWAB, 2014; 2016). Moving from physical manufacturing to digital - focusing on technology - contributes directly to the efficiency

of manufacturing processes through a better resources allocation and monitoring, resulting in cost reduction and increase in revenue. (ABDI, 2016c; DEWETT, 2001; BRYNJOLFSSON; HITT, 2000; POWELL; DENT-MICALLEF, 1997; INDUSTRY 4.0, 2017).

Although proven groundbreaking, technological innovation is still a challenge for several countries. (CARMICHAEL, 2014; RAMANUJAM; TACKE, 2016; PIETROBELLI, 2010; ROZTOCKI; WEISTROFFER, 2011; PRASHANTHAM; YIP, 2017). Startups indeed play a central role in this digital revolution around the world, but unfortunately, there is much more failure than success in startups' stories. 75% of companies in general fail. 72% of all new products or services fail. (CARMICHAEL, 2014; RAMANUJAM; TACKE, 2016). For startups, this number is even higher: at least 90% of all startups fail. (MURPHY, 2013). These high failure indicators are a result of several problems new ventures face (CROWNE, 2002; MCGRATH, 1999; SONG; BENEDETTO; SONG, 2010; SONG et al., 2008; VAN GELDEREN; THURIK; BOSMA, 2006), and one of them is institutional context. Emerging countries present a specific *institutional profile* (KOSTOVA, 2002, p. 2017, our emphasis), meaning they usually face inadequate supply of infrastructure, inefficient government regulations, and bureaucracy. (BEUGELSDIJK; KOSTOVA; ROTH, 2016; DUTTA; LANVIN; WUNSCH-VINCENT, 2016; KOSTOVA, 2002; PENG, 2003). These institutional factors affect business in general, which means they affect startups even more. (PRASHANTHAM; YIP, 2017).

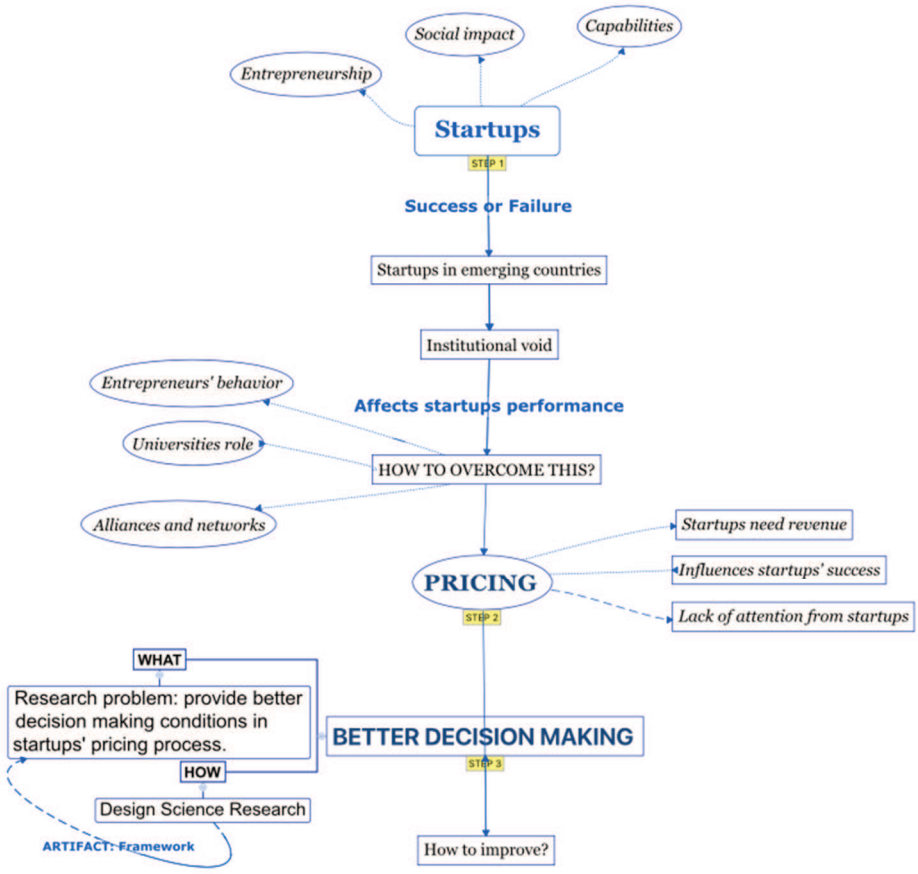
There are several academic discussion on how startups could overcome all of these difficulties. Some studies believe startups could increase their success level focusing on the entrepreneurs' behavior (DIMOV, 2010; FARMER; YAO; KUNG-MCINTYRE, 2011; LEE; LEE, 2014; ROSE; KUMAR; YEN, 2006); others state the role of universities is central (APARICIO; URBANO; AUDRETSCH, 2016; LEE; OSTERYOUNG, 2004; UNTERKALMSTEINER, 2016), or the role of alliances and networks (APARICIO; URBANO; AUDRETSCH, 2016; BAUM, CALABRESE; SILVERMAN, 2000; DAS; BING-SHENG, 1997); and some studies believe a greater access to funding could increase startups' success rate. (LINDGREN; MUNCH, 2015; SANTOS; PATEL; D'SOUZA, 2011).

There is no consensus on how startups could increase their success level rate; however, there is consensus on how the institutional void affect startups in emerging economies. The ecosystem's lack of investment usually forces the startup to fund itself,

an action called self-funding or *bootstrapping*. Even though self-funding is vital in emerging economies like Brazil, startups lack attention on the process of pricing itself. Startups do not put much time and effort in pricing their products and services and struggle with this decision making. (BOOTSTRAPPING, 2017; CARMICHAEL, 2014; PATRICK, 2016; RAMANUJAM; TACKE, 2016).

This project proposes startups need better conditions for their pricing decision making, so they can make a more grounded decision based on a faster and clearer evaluation. Exploring which elements affect startups' decision making in pricing process and, ultimately improving this process, would trigger startups to put as much effort in pricing as they put in product design and technical development, and it would increase their chances of self-funding successfully in emerging economies. (CARMICHAEL, 2014; PATRICK, 2016; RAMANUJAM; TACKE, 2016; verbal information)[8]. Figure 1 represents this projects' research problem development:

Figure 1 - Research Problem process



Source: The author.

[8] Data collected in an interview with respondent F, head of SAP Startup Focus in October, 28th, 2016.

It is important to state there is still a lot of ground to cover in academic studies about startups, especially startups in emerging countries. Most studies on startups still focus on mature economies. (PRASHANTHAM; YIP, 2017). The term *startups* in the SPELL database will provide only 9 results, and in the Web of Science database, only 362 results appear. Moreover, *pricing* itself is still a misunderstood concept, often being analyzed from a side perspective in academic studies, not as a central agent of change. (DEAN, 1976; CARMICHAEL, 2014; JOHANSSON; et al., 2012; RAMANUJAM; TACKE, 2016). Therefore, this project also aims to advance the discussion about startups in emerging economies, as well as discussing pricing as an element of influence on startups' success rate.

2 THEORETICAL REVIEW

In the design research method, the literature review supports both the research problem and the artifact development. It must include relevant theory and empirical studies on the class of problem chosen for the research, which is vital for projecting the solution proposed in the research on future studies. (HEVNER et al., 2004; LACERDA et al., 2013; VAN AKEN, 2004).

The theoretical review in this section will be a retrospect on innovation and its role throughout modern history, from a broad definition up to the core of the theme: startups. Since the focus of the project is to explore which elements affect startups' decision making in pricing process and how this process could be improved, the theoretical review will connect the evolution of the decision making theory – from both the behavioral science and organizational science perspective – to the concepts of pricing and startups' pricing in emerging countries.

2.1 Innovation

The making of new things with the purpose of innovating is intrinsic to human history. Back in prehistoric times, the cognitive revolution drove *homo sapiens* to reshape the world evolving from hunter-gatherers groups to eventually populating the world with the first notions of society. The agricultural revolution, and later on the industrial revolution reflect the incredible ability human beings have to make social and behavioral adaptations to constantly reframe life. (GIBBONS, 2002; HARARI, 2015).

Curiosity, ingenuity, imagination, and inventiveness are part of humanity upbringing, and originated what would be eventually called innovation. The prehistoric cognitive revolution allowed human beings to create through language an imagined reality that would go far beyond the physical existing environment, such as trees and rivers. The imagined reality arose from myths, beliefs, sensations and symbols, and would become what is called now *culture*. The very beginning of humanity, imagined reality and culture are all an important background to understand how innovation was born and why it is so important in modern life. (DUNBAR, 2011; HARARI, 2015; MELLARS; BOYLE; BAR-YOSEF, 2007).

Imagining a world that did not physically existed allowed human beings to imagine infinite ways of reshaping this non-physical world. Infinite imagination led to

innovation. And, in modern times innovation would then be considered a key factor for economic progress. The concept of innovation shifted in modern times to the economic perspective, which began discussing progress through the make of new things and how to scale them. (FREEMAN; SOETE, 2000; FAGERBERG; VERSPAGENA, 2001; HARARI, 2015).

Innovation and progress background research has two major mainstream origins. The first is understanding innovation as a rational planning process, originated in the classical and neoclassical economics. The second origin is known as evolutionary economics, which focuses on understanding innovation as a social and cultural process, not purely rational. (FONSECA, 2002; FREEMAN; SOETE, 2000).

Classical economics theories are a reflex of the social-political context of the eighteenth century. They focused on developing models to understand growth, progress, and the future path of the market. Their models at that point in time were developed chiefly from a nation-level perspective. (NELSON; WINTER, 2005; COHEN; LEVIN, 1989; FREEMAN; SOETE, 2000).

The course of economic history shift with the crisis of mercantilism in Europe, when it was set in motion a phenomenon called economic liberalism. During that period, innumerous economist began questioning the role of the State in any country's economy, and preaching economic progress would occur freely – not controlled by the State. (STEINDL, 1979; FREEMAN; SOETE, 2000).

Economic liberalism preached perfect systems that would work on perfect markets regulating themselves. The industrial revolution and the economic context of Europe influenced the idea of a one-size market controlled by supply and demand. Manufacturing and machinery improvement would allow business to scale, and economic expansion set in motion a regime called capitalism. (SMITH, 1952; SAMUELSON; NORDHAUS, 2012; RICARDO, 1975).

Capitalism unfolded not only an economic discussion, but also a social one. Smith (1952; 2013) debated *the invisible hand* in a possibly free market, however manufacturing would develop a labor division and a class segregation. Classical economics believed deeply in their existing models and in the current speed of progress. Nations were the unit of analysis of most studies, and economic systems began being developed as a reflection of each country's economic context. (SMITH, 1952; FREEMAN; SOETE, 2000).

In the classical political economy of Smith (1952), Ricardo (1975), Malthus (1983), and Mill (1958), technological progress was considered an element of economic progress, however in different levels. Smith (1952) believed technological progress would make markets more efficient through and more and more labor division; Ricardo (1975) believed technological progress would have a role in controlling marginal productivity; Malthus (1983) stated that any escalation of income would generate population growth, which hinders increase in technology; Finally, Mill (1958) believe progress could come from investing in education and people's participation in the political decisions.

Considering the second origin of innovation, evolutionary economics, the main difference from the classical economics perspective is the fact innovation would no longer be considered only a variable in manufacturing. (FONSECA, 2002). Evolutionary economics focus on explaining why economic growth happens, rather than simply considering it as consequence of other actions. Schumpeter (1939) believed innovation had to be understood from both a social/organizational and a psychological perspective. Although Schumpeter's (1939) theory of economic development discusses the definition of entrepreneurship, it mostly focuses on the creation of value by combining resources in a unique way, which will ultimately produce innovation. Value creation in evolutionary economics will be the byproduct of entrepreneurial opportunities, and it could be one of the answers to what happens after an entrepreneurial action. (FONSECA, 2002; KANTER, 1989; MORRIS; SCHINDEHUTTE; ALLEN, 2005; SCHUMPETER, 1939).

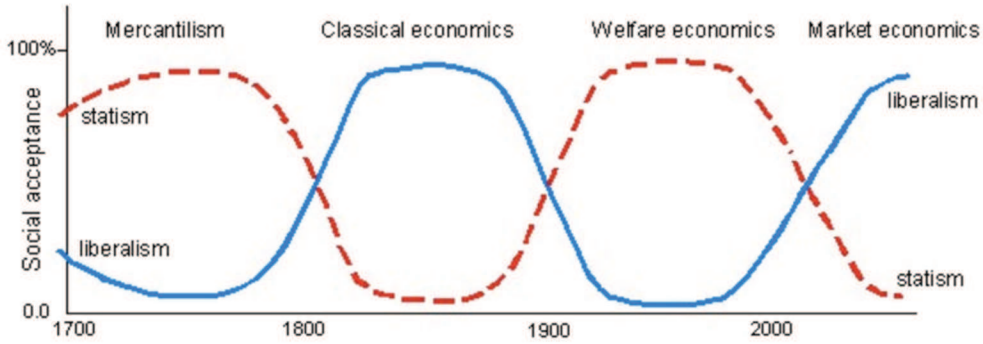
According to Fonseca (2002, p. 3), "[…] evolutionary economists argue that technological innovation should not be reduced to the narrow perspective of technological determinism." This means there should be more variables influencing innovation than classical and neoclassical economics believed. Schumpeter (1939), as an economist, believed innovation from a systemic perspective. He was a representative of the evolutionary economics, especially because whereas his framework discussed innovation as both an output and input organizations received from the environment, he also considered individuals and their relations. (AMIT; ZOTT, 2002; FONSECA, 2002).

Schumpeter (1939) stated innovation could not be predicted because economic growth moved towards disequilibrium, defying an important law of economics: equilibrium of the market. He considered innovation's unpredictability related to

individual entrepreneurship, which stretched the thinking on innovation in economics. Schumpeter (1939) contributed to innovation by enlarging its definition bringing variables such as entrepreneurial individual role, but also strengthened the classical economic perspective by comparing innovation to the systems theory.

Schumpeter put history and context back into economics, and developed a business cycles theory in innovation. (FREEMAN; SOETE, 2000). According to Schumpeter (1939), there were successive waves of economic development, and they would happen by the transformation of the economy caused by technology. Figure 2 portraits the waves considering liberalism and statism throughout time:

Figure 2 - Waves in Economics



Source: Kwasnicki (2017).

General theoretical orientations of liberalism[1] and statism[2] showed in figure 2 represent how history was affected by waves of economic development, as proposed by Schumpeter (1939). Schumpeterian innovation brought to light the relevance of technological change and innovation in value creation and to the theory of economic development, which was key for the post-second-world-war period.

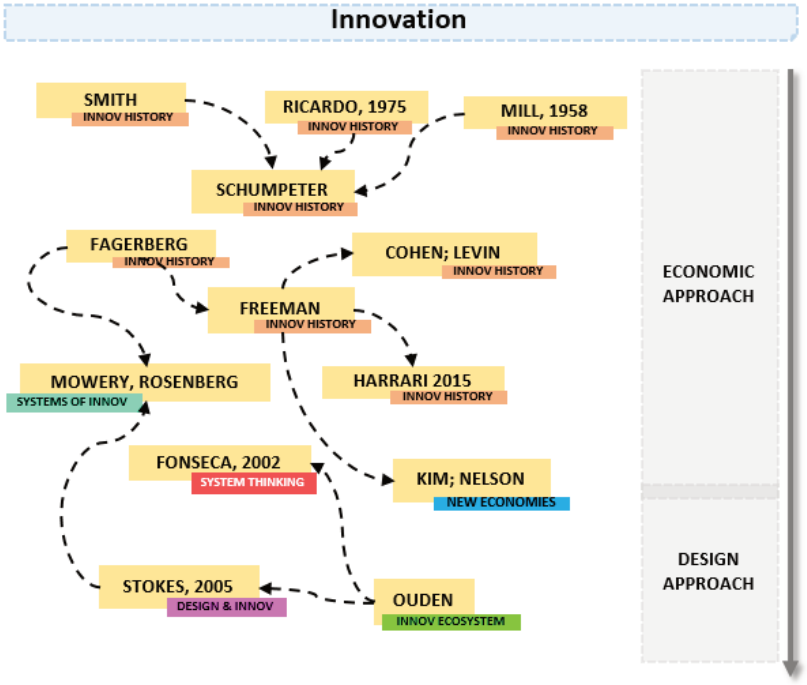
In the post-second-world-war period the importance of technology for innovation and progress became evident, especially in the United States. The country invested heavily in Research and Development (R&D). Data shows in 1969 the US invested a total of $25,6 billion in R&D, while the sum of Western Germany's, France's, United Kingdom's and Japan's investment was not even half of that: $11,3 billion. (MOWERY;

[1] Liberalism is a political, economic and social phenomenon, that describes ideas of liberty and equality. (KATZENSTEIN; KEOHANE; KRASNER, 1998).

[2] Statism is a general theoretical orientation that preaches the autonomy of state institutions. (KATZENSTEIN; KEOHANE; KRASNER, 1998).

ROSENBERG, 2005). This massive investment in R&D led to the exponential development of industries such as chemicals, energy, and electronics, which resulted in far more possibilities any country saw possible. The US raised the bar on innovation by successfully building something triple helix: universities, government and organizations working together in favor of innovation. (KIM; NELSON, 2009; MOWERY; ROSENBERG, 2005; STOKES, 2005). The decades that succeeded the post second world war shaped innovation as the concept we know now. Figure 3 shows the literature selected for this project and how the studies are connected:

Figure 3 - Systematic literature review on Innovation



Source: The author.

The decision to consider an economic approach meeting a design approach in innovation was based both on the connection to the method chosen – design research – and to the relevance of the design approach for startups. (BLANK, 2013; KIM; NELSON, 2009; MUELLER; THORING, 2012; OUDEN, 2015). After the macroeconomic perspective of innovation discussed so far, the research will focus on the microlevel perspective of innovation, focused on firms.

Research on innovation shows it has been typically measured in empirical studies through the concept of innovativeness. (KNIGHT, 1997). The concept is measured according to the firm's entrepreneurial orientation (AMIN et al., 2016;

COVIN; WALES, 2012; FELZENSZTEIN, 2015; MARTENS et al., 2016), corporate entrepreneurial orientation (GARCÍA-MORALES; BOLÍVAR-RAMOS; MARTÍN-ROJAS, 2014), speed or performance in the market (MORENO-MOYA; MUNUERA-ALEMAN, 2016; YANG; ZHOU; ZHANG, 2014; SCIASCIA, 2014), entrepreneurial behavior from an individual's perspective (LEE et al., 2009; RENKO et al., 2015; ZINGA; COELHO; CARVALO, 2011), product innovation (URBAN; STREAK, 2013), knowledge acquisition (BOJICA; FUENTES; GÓMEZ-GRAS, 2011) or even intrapreneurship (AĞCA; TOPAL; KAYA, 2012; ANTONCIC; HISRICH, 2001; TURRO; LOPEZ; URBANO, 2013).

As discussed throughout this section, innovation stands out since the beginning of humans in the world. However, technology and the internet brought a global revolution. They changed how information is accessed, distributed and stored (FELDMAN, 2002); they advanced the discussion on governance (EETEN; MUELLER, 2012; MANSELL, 2009), intellectual property (WEISER, 2003), urban mobility (GAKENHEIMER, 1999; SCHAFFERS et al., 2011), entertainment (CURRAH, 2006), the entire music industry (EASLEY, 2005; ELBERSE; BERGSMAN, 2008; MEISEL; SULLIVAN, 2002; TSCHMUCK, 2012) and mostly innovation itself (FELDMAN, 2002; LYYTINEN; ROSE, 2003).

Technology and the internet made it possible to develop new ideas outside the corporations' structure, and to create unimaginable business models. Thiel (2014, p.10) states that "new technology tends to come from new ventures — startups." Whereas corporations are resourceful, scalable and structured, startups are fast, horizontal and constantly operating "on search mode" (BLANK; DORF, 2012, p. 33). Therefore, startups are definitely not smaller versions of large companies (BLANK; DORF, 2012; Thiel, 2014), they are a category of their own, which will be discussed in the next section.

2.1.1 Startups

Innovation could be shortly described in four eras. The first is mainly the invention era, where innovation came from individual actions: Thomas Edison's light bulb, Alexander Graham Bell's telephone, Marie Curie's X-rays, and several others. The second era shifted experiments from labs to corporate labs. Corporations transformed into innovation creators and along with universities and government

became intertwined in the triple helix concept. That was the period the national innovation system was established in the US (ANTHONY, 2012; MOWERY, 1991; MOWERY; ROSENBERG, 2005).

The third era was the base for the incredibly technological context would follow right after. Companies started to grow and become full of bureaucracy, and the generation at the time, - baby boomers - were fighting hard against the hierarchy of huge corporations. It was the perfect moments for the *rebels* to form new companies and new business models. On the first and second era civilization was slowly inventing their way through progress, up to the point technology emerged as a miracle: humans could do more with less, fast-forwarding life to a technological modernity (ANTHONY, 2012; MOWERY, 1991; MOWERY; ROSENBERG, 2005; THIEL, 2014).

Lastly, the fourth era is the present time. Startups now benefit directly from the complex environment technology brought, and defy the markets notion of risk. (ANTHONY, 2012; MUELLER; THORING, 2012; THIEL, 2014). Figure 4 is a matrix that shows how they are redefining the market:

Figure 4 - Matrix

	Bring an offline behavior online	Aggregate the long tail and drive discovery	Make it a subscription	Bring rentals to market at lower cost	Make a paid product free or very cheap	Create a marketplace	Build a discovery driven experience (push model)	Build a vertical brand	Produce original and exclusive content
Shopping		wayfair	amazon Prime	JOYMODE		ebay	Pinterest		
Mobile Video									
Gaming									SUPERCELL
Travel						airbnb			
Kids									
Education					UDACITY				M
Fashion			RENT THE RUNWAY			POSHMARK	STITCH FIX	WP	
Sports	FANDUEL								THE ATHLETIC
Media			Spotify						NETFLIX

Source: Stromberg, 2017.

Figure 4 shows startups and their action in the market. Netflix became a content producer in the media industry; e-bay created a marketplace concept in the online shopping segment, just as *Airbnb* created the same marketplace in traveling; *Spotify* positioned itself as the major music subscription service; *FanDuel* brought the fantasy sports trend from offline to online. These are only a few examples of how fluid the market became after startups. (STROMBERG, 2017).

There are several attempts at defining startups. Blank and Dorf (2012, p. 13) states a startup is *"*a temporary organization in search of a scalable, repeatable, profitable business model*"*. It is also defined as a "[…] small groups of people bound together by a sense of mission have changed the world for the better." (THIEL, 2014, p. 10). According to Ries (2011, p. 27) "[…] a startup is a human institution designed to create a new product or service under conditions of extreme uncertainty". Table 1 summarizes the existing definitions:

Table 1 - Definitions of startups

Definition	**Authors**
A startup is a group of people searching for a repeatable and scalable business model, working in an extremely uncertain environment.	Moreira (2010)
A startup is a human institution designed to create a new product or service under conditions of extreme uncertainty	Ries (2011)
Startup is a temporary organization in search of a scalable, repeatable, profitable business model.	Blank and Dorf (2012)
Small groups of people bound together by a sense of mission have changed the world for the better.	Thiel (2014)
Startups were garage-based companies starting with very low investment. Now corporate catalysts can use startups to accelerate innovation.	Anthony (2012)

Source: The author.

The definitions on table 1 agree on the fact startups were born to innovate. However, it is clear the term startup does not have a definition in the literature. Moreira (2010) focuses on defining startups as scalable business models, even though several startups do not focus on continuous growth; Ries (2011), on the other hand, clearly states startups must create new products and services, which is debatable in the ecosystem. There are several startups that only improved existing solutions, and did not create anything new. Blank and Dorf (2012) believe startup is a temporary organization, which is something any other author has agreed with. Thiel (2014) and Anthony (2012), contrary to the rest of the authors, focus on the informality that startups can present. They believe startups can be just a group of people, sometimes even garage-based. The diversity of meanings shows the definition of startups is far from substantial, which contributes to thinking startup is a concept that is still unfolding.

For the purpose of this research the definition considered is *A startup is a human institution designed to create a new product or service under conditions of extreme uncertainty*. (Ries, 2011). Although there is no consensus on the definitions of startups, it is apparent the story of startups and innovation is deeply connected to the story of technology. From the windmills to the steam engine, humans were always inventing new things to make their lives better. As Whitehead (1925, p. 98) wisely states, "The greatest invention of the nineteenth century was the invention of the method of invention." As time passed, the gap between invention and the application of these inventions in products and processes got smaller. It was at slow speed, but developed countries started learning how to create a more favorable environment for innovation, and foresaw the social and economic value that could come from this environment (KRISZTINA, 2016; MOWERY; ROSENBERG, 2005; THIEL, 2014).

Emerging countries, however, present a learning gap to be filled in innovation. (FREEMAN, 2002). Startups development in emerging countries is slower, especially because the companies need to put more effort in compensating the ecosystem's inefficiency. (KHANNA; PALEPU, 2010; PRASHANTHAM; YIP, 2017; RADJOU; PRABHU, 2012). Brazil, as many other emerging economies, could be considered a catch-up country, since technology took a longer period to be acquired and implemented. (FREEMAN, 2002). The next section will explore the history of startups in Brazil.

2.1.2 Startups in Brazil

In Brazil the term startup only started being used around 2000, in the dot.com boom. The Brazilian startup ecosystem is quite different than the American. According to respondent A, Board President at AG2 Nurun, Brazil's high interest rates make bonds an obvious choice, contributing even more to Brazilian investors' low risk tolerance[3]. Brazilian business legislation also plays an important role in this scenario, due to the legal obligations an investor faces merely by investing in a startup. Since it is both risky and a huge responsibility, investments in startups are not exactly encouraged in Brazil (SIGNORI et al., 2014; MOREIRA, 2010; CID, 2013). However there are some institutions that try to incentive startups nationwide, such as ABDI,

[3] Data collected in an interview in September, 19th, 2016.

ABRAII, ABSTARTUPS, Anjos do Brasil, Inovativa Brasil. They promote relevant discussions in the Brazilian innovation ecosystem and are an important asset for the ecosystem's growth. (AGÊNCIA BRASILEIRA DE DESENVOLVIMENTO INDUSTRIAL, 2016b; ASSOCIAÇÃO BRASILEIRA DE EMPRESAS ACELERADORAS DE INOVAÇÃO E INVESTIMENTO, 2016; ASSOCIAÇÃO BRASILEIRA DE STARTUPS, 2016; ANJOS DO BRASIL, 2016; INOVATIVA BRASIL, 2016).

Since direct investment is not the obvious choice for Brazilian startup ecosystem, other solutions appear, mostly local. It is also possible to find these local solutions in other emerging economies, such as India and China. (KHANNA; PALEPU, 2010; PRASHANTHAM; YIP, 2017; RADJOU; PRABHU, 2012; STEINFELD; BELTOFT, 2014). In Brazil, corporate accelerators are an expanding phenomenon and are considered one of the most applicable models for emerging economies. (KOHLER, 2016; PRASHANTHAM; YIP, 2017). Corporate accelerators are "company-supported programs of limited duration that support cohorts of startups during the new venture process via mentoring, education, and company-specific resources" (KOHLER, 2016, p. 2), and hope to contribute to startups growth in emerging countries. (PRASHANTHAM; YIP, 2017). Corporate venture is only one of the possible paths innovation growth could take in Brazil, and the beginning of the discussion. It seems Brazil might need to fight the underdog feeling and realize there is a lot of potential in innovation in the country (ROUX, 2016). Figure 5 shows a recent attempt to map the Brazilian startup ecosystem:

Figure 5 - Mapping of the Brazilian Startup Ecosystem

Source: The author, adapted from Roux, 2016.

The map demonstrates different characters in the Brazilian ecosystem scenario, such as networks, coworking, media and events, education, corporate, public entities, local venture capital entities, global venture capital entities and accelerators. There is a concentration of capital in public entities, local and global VCs, and, more recently, in corporate projects. The map shows important players in content production for entrepreneurs, as well as the low participation public entities have. Corporate involvement is growing, but participants are mostly major corporations with global strategy and not a Brazilian-thought project. (ROUX, 2016).

As the map shows, Brazilian ecosystem is broad: from individuals to huge players. There are entities concerned in strengthening the ecosystem, especially by producing relevant content for entrepreneurs and stakeholders. The ecosystem has many issues to be addressed, and some have been receiving more attention than others have: There are workshops for startups on business modeling, leadership and capital funding promoted by accelerators (ROUX, 2016); Endeavor, Wylinka and Insper contribute to professionalizing the ecosystem through discussing relevant issues (ROUX, 2016); Universities such as USP (SP), Inatel (MG) and Unisinos (RS) even offer business plan classes on undergraduate courses.

However, there is still a lack of attention on the process of pricing/monetization itself. (PATRICK, 2016; RAMANUJAM; TACKE, 2016). According to Patrick Campbell, Co-Founder of a reference company called Price-Intelligently, “[…] people put so much effort and time on building their product, but pricing them is pretty much a guess-and-check thing.” (PATRICK, 2016). Startups struggle when deciding on pricing. Or simply disregard the decision at all. (CARMICHAEL, 2014; PATRICK, 2016; RAMANUJAM; TACKE, 2016). But, since pricing in startups must be carefully chosen through a decision making process, this project will review the decision making theory and explore its connection to the pricing theory.

2.2 Decision Making Process

The history of decision making began long before decision making became a process. For many years, human beings attempt to interpret signs of nature or even their own dreams. It is only recently the history of decision making is told from an interdisciplinary perspective. Choices were based It has contributions from

mathematics, sociology, psychology, economics, political science, among many others. Their main goal is to understand how individuals make decisions and how to improve decision's outcomes. (BUCHANAN; O'CONNNEL, 2006).

Decision theory has three approaches: descriptive decision theory, prescriptive decision theory and normative decision theory. While description decision theory is concerned with how decisions are made, prescription decision theory tells people how they should make decisions. A descriptive theory normally proposes a model or framework that organizes and summarizes a great amount of data into a simpler conclusion. The third approach, normative theory, looks for the perfect way to make decisions. Since normative theory disregards human common errors, they are as simple and to the point as possible. (GRANT; ZANDT, 2009).

The most popular and accepted normative theory in the traditional economy was *expected utility theory (EUT)*, which was a rational model that analyzes risk in decision making. EUT is a mathematical equation that "States that the decision maker (DM) chooses between risky or uncertain prospects by comparing their expected utility values." (MORGIN, 1997, p. 01). The utility value is an economic term that dates back to 1738, when it was first mentioned in an essay by Daniel Bernoulli, and it is described as the total satisfaction received from consuming a good or service. (GRANT; ZANDT, 2009; MONGIN, 1997; PARMIGIANI; INOUE, 2009). The economic utility value of products or services has been considered important because it influences the demand, and consequently price.

The expected utility theory has been the basis of rational decision making theory, and the main model for explaining how decision makers avoid risk. Back then, economics focused in industries, governments and regulatory affairs, which is defined as macroeconomics. But, as economies grew, micro-operations became important at the economic level, causing new areas to emerge, such as management and operations in microeconomics. Microeconomics brought an individual-level approach to economics, however still concerning with how people *should* behave, and claiming people always act rationally. (BUCHANAN; O'CONNNEL, 2006; GRANT; ZANDT, 2009; PARMIGIANI; INOUE, 2009).

Some economists such as Irving Fisher, Wesley Mitchel and Frank Knight (BRESLAU, 2003; KNIGHT, 1921; PRESSMAN, 1999) also attempted to understand decision making as a pure logical action. Mintzberg and Westley (2001) describe rational decision making as a sequential process: first define, then diagnose, design,

and finally, decide. However, they acknowledge behavioral studies indication that decision making is often an ambiguous process. Individual or organizational choice present complex elements that are not normally found in organizational behavior theory, which contributes to the unpredictability of the decision making theory. (MARCH, 1987; MINTZBERG; WESTLEY, 2001).

The utility theory only started being questioned in the late 70s. There were two theories born in the 70s that moved away from mainstream ideas in economics: Prospect Theory (KAHNEMAN; TVERSKY, 1979) and the Theory of Consumer Choice (THALER, 1980). The Prospect Theory describes the how people choose between alternatives involving risk, when the decision maker knows the probabilities of outcomes. The theory discusses individual decision making under risk, and questions some elements of the expected utility theory by proposing a two-phase process: editing phase and an evaluation phase. The editing phase organizes the options turning evaluation and choice a much simpler process. (KAHNEMAN; TVERSKY, 1979). In the same direction, the Theory of Consumer Choice is a theory that relates consumers' preferences and demand curves, analyzing customer's desires and their expenditure limitations. The theory analyzes how customers *do* behave rather how they *should* behave. (THALER, 1980).

The acknowledgement of irrational decision making was the rise of a new field: behavioral economics. Behavioral economics was born from the union of two fields: economics and psychology. (ARIELY, 2008; THALER; SUNSTEIN, 2009). Based on behavioral economics, decision making could be defined as an individual cognitive process, in which someone weigh options and choose a specific path. (ANZAI; SIMON, 1979; SIMON, 1975; 1976). Freud (1993) believed people's decisions were actually influenced by their unconscious mind. Decision making became a largely discussed concept in psychology and behavioral science, and developed also as a management and organizational theory. (HARRISON; MARCH, 1984; MARCH, 1987; MINTZBERG; WESTLEY, 2001; SIMON, 1979; 1984).

Simon (1979; 1987) was one of the first researchers to to state decisions are not completely rational, and to focus on the decision making process. Decisions must normally be made within a limited amount of time, and with a limited amount of information – whether because the information is not available or because human brains cannot process much data at once. (BUCHANAN; O'CONNNEL, 2006). This concept was defined as bounded rationality (SIMON, 1979; 1987), which argues there

is a limited capacity to a person's mind regarding decision making. Bounded rationality is an economic concept that takes human cognitive limitations into consideration (SIMON, 1979; 1987) and its emergence broadened the discussion on decision making.

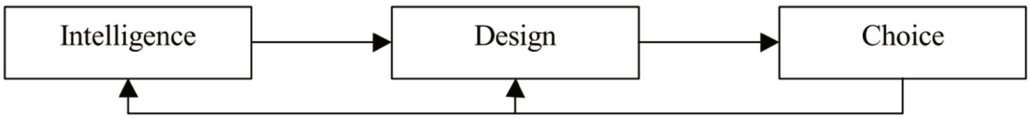
These theories that considered cognitive bias as an undeniable trait in human behavior deepened the discussion on rationality. Simonson and Tversky (1992) states the context deeply influences decision making; Shafir, Simonson and Tversky (1993) discuss decision makers often unconsciously find reasons to justify their choices; More recently, Gladwell (2007) explores the power of unconscious decisions, and how the so-called rational decision making system has trouble being objective; Ariely (2008, p. 239) affirms "We are cognitively unhindered in weighing the ramifications of each potential choice"; And finally Kahneman (2011) explores biases and intuition by conducting countless experiments, and enhance people's ability to recognize errors of judgment.

Some biases are now studied for years in behavioral economics, such as *anchoring* and the *decoy effect*, for example. Anchoring is when people attach - or "anchor" - a reference point to something, even though the reference may have no logical relation to the decision they are making. This is extremely relevant when consumers decide to purchase or not to purchase a product or service, since they always anchor their decision in a previous reference to thar product or service. (ARIELY, 2008; TVERSKY; KAHNEMAN, 1974).

The second bias is the decoy effect. It is also relevant in consumer behavior, because this bias shows consumers tend to have a change in preference between two options when they are also presented with a third option that is asymmetrically dominated. This means this third option - inferior to one option and only partially dominated by the other – increases the probability of consumers choosing the dominant option. (ARIELY, 2008; MASATLIOGLU; ULER; 2013).

In hope to understand how decision making works and how it could be improved, Simon (1960) and later Simon and Newell (1972) focused in defining decision making as a process. Simon (1960) developed a decision making model, that would be largely explored in the Psychology and the Economics field. The model consisted of three steps - intelligence, design, and choice - as described in figure 6:

Figure 6 – Simon's model of decision making



Source: Dillon, 1998.

In the *intelligence* phase, the individual scans the environment to identify the problem or situation that calls for a decision; this phase could be also called *deciding what to decide*. The intelligence stage could be comparing the current status of a project with its original plan, or a way of exploring the environment. The second phase is the *design*. In this stage the goal is to develop alternatives for the problem or situation defined in the first phase. And the third and final phase is the *choice*, which describes the action of selecting the most suitable plan from the alternatives previously created. (DILLON, 1998; SIMON, 1960; SIMON; NEWELL, 1972).

Decision making process is proven to be extremely complex. It is imperative to create new ways of presenting information. As shown above, schemes, frameworks, maps, diagrams, flowcharts, among other, are known tools used to ease on the decision making process and to reduce the risk. Defining a company's strategy, their channel distribution, segment, market positioning or even pricing strategy for any given product or service are all crucial factors when it comes to decreasing risk. (BUCHANAN; O'CONNNEL, 2006).

It is important to highlight there are several studies on pricing decision making from the consumers' perspective (ABBEY et al., 2016; CALDENTEY; LIU; LOBEL, 2017; CHEN; HALL; KELLERER, 2017; DUKESHIRE, 2016; KUO; JOU, 2017; MUNSON; LU, 2010; SU; LIU; LIN, 2017). This research focuses on improving the decision making process of pricing from the startups' perspective, this is why the decision making process theory was discussed, as well as the theory about pricing will be thoroughly reviewed in the next section.

2.3 Pricing

Money is only a few centuries old. At the beginning of civilization people used to trade whatever they could make for other people's goods. Money only became a unit of value because it came from an unbiased element of authority, the state.

Commerce shaped human activity and developed the social science of economics, mainly because monetizing goods turned out to be the most efficient way in order to guarantee they would continue being produced. (ANDERSON, 2009).

The term monetization was born in finance, and it is a concept as old as money is in the modern capital world. It was academically discussed in macroeconomics mostly describing a country's performance in the market. It was referred to as monetary policies and concentrated in a country's economic development analysis. (CAVUSGIL; CHAN; ZHANG, 2003; LAUMAS; PORTER-HUDAK, 1986). In recent past, it has shifted from a country's perspective to an organization's perspective, and new terms came along, such as pricing, pricing strategy, revenue model, among others. (RAMANUJAM; TRACKE, 2016).

For the purpose of this research, pricing will be treated as the simple act of deciding how to receive money in exchange for goods or services. Pricing is a general term for *revenue models*, which refer to the generation of revenue, strictly from an economic perspective: The revenue model is the specific ways a company enables revenue generation. (ZOTT; AMIT, 2010).

Traditionally, in the industrial market, companies could only monetize *goods* or *services*. Goods were tangible items, manufactured, distributed and retailed for end users; and services were intangible, heterogeneous, inseparable and impossible to stock. (PARRY; NEWNES; HUANG, 2011). However two important factors influenced the way consumers viewed products or services in general, and consequently pricing decisions: *meaning* and *technology*. Both factors will be explored in the next sections.

2.3.1 Pricing and Meaning

Although goods or services have always had a practical – and economic - usage, their reason for existing and their relationship to the consumers have expanded. However the strategic design perspective reveled goods or services could have an affective dimension, or *meaning*. (VERGANTI, 2009).

Objects could be not only offers from companies to consumers, but a proposal to them. If consumers think of goods or services as meaningful to them this could represent a shift even in sociocultural models, specially because every product people interact with help to shape a place's culture. (VERGANTI, 2009).

When companies understand goods have meaming to consumers, they can understand them as people, not users. And interacting with them through their meaningful relationship to the product helps companies understand their consumers' sociocultural context – how is their family like, what they do for a living, what are their aspirations and dreams. (BURDEK, 2006; MARGOLIN; BUCHANAN, 1995; VERGANTI, 2009).

Companies realized pricing and how the consumers interact with price and value is also affected by this affective dimension towards goods. (BOZTEPE, 2007; VERGANTI, 2009). Christensen et al (2007) agrees with this approach in the *jobs-to-be-done* theory, stating every consumer purchases a product or service for a specific reason, they *hire* the product to do a *job* for them. If the company finds out what this job, they can start communicating with the customer in that direction. Sometimes the reason they are selling is different than the reason consumers are purchasing. This connection between pricing and meaning shifts pricing from a sheer financial perspective to a more strategic perspective.

The concept of pricing has been discussed in several other areas, such as strategic management (ZOTT; AMIT, 2008), marketing, innovation, and more recently, behavioral economics. In strategic management, one of the main focus is understanding firm performance, and monetization is one of its indicators. Monetization in strategic management has been discussed as part of a company's strategy, and helps explain firms' outperformance over others. (ZOTT; AMIT, 2008).

In marketing and innovation, monetization has been discussed related to value creation. Marketing studies state the revenue model must have synergy with both the value being proposed to the customer and the marketing strategy the company chose. (MAO, 2016; REEN et al., 2017; SCHINDLER; KIBARIAN, 1996). In innovation, synergy is vital as well, once the revenue model is held responsible for part the success or failure of new products or services. (CARMICHAEL, 2014; CHESBROUGH; ROSENBLOOM, 2002; RAMANUJAM; TRACKE, 2016).

Finally, in behavioral economics, monetization is recognized as both a rational and an irrational process. When an organization plans a revenue model, they must consider psychological factors influence the buyers, and they consider them when presenting the price. How much a customer wants to pay for a product or service, or their *willingness to pay (WTP)*, is an important information for the organization to know before choosing a revenue model. Behavioral economics states giving too much

information to the customer could even complicate their decision into buying or not. Therefore, behavioral economics focus more on the value rather than the price. (BRANDENBURGER; STUART, 1996; CHUNG, 2017; COULTER; GREWAL, 2014; RAMANUJAM; TRACKE, 2016).

Pricing has been discussed in behavioral economics from several different perspectives. Some studies examine how self-associations in product prices, such as birthday numbers, could actually increase purchasing intentions (COULTER; GREWAL, 2014; PERKINS; FOREHAND, 2012; JONES; PELHAM; MIRENBERG, 2002); others discuss how allowing the customers to put their own price on products – pay-as-you-want (PAYW) model - would affect result in sales (CHUNG, 2017; ELBERSE; BERGSMAN, 2008; KIM; NATTER; SPANN, 2008); some studies explore the effect of free on pricing and customer's willingness to pay later for a premium product (ANDERSON, 2009; GUPTA; MELA, 2008; MAO, 2016), among others.

When a company decides to launch a new product or service, they have several concerns, such as: segment, target market, channel distribution, value proposition, market positioning, among others. To summarize all of this information companies usually develop a business plan, or a business model. (JOHNSON; CHRISTENSEN, KAGERMANN, 2008; SAHLMAN, 1997). Business plans are not a guarantee of success, but they help everyone involved in the project to understand the core message of the product or service. Business plans must inform who is responsible for each activity, the context in which the idea will be presented, as well as the risk and the opportunities in the project. They should be a representation of a company's strategy. (HONIG; KARLSSON; 2004; MASON; STARK, 2004; SAHLMAN, 1997).

Business models, a more modern approach to business plans, have been studied in strategy, entrepreneurship and innovation. A business model is the union of elements that create and deliver value, such as customer value proposition, revenue model, resources and processes, among others. According to Amit and Zott (2012, p. 46), "A revenue model complements business model design, just as a pricing strategy complements a product design". Since it is traditionally only a part of the business model, the revenue model has not been studied as a field of its own. *How* a company will generate revenue and *how much* revenue will be generated has been mostly left in the background. (PATRICK, 2016; RAMANUJAM; TRACKE, 2016).

The revenue model can be decided considering first pricing strategy and after, the revenue model to be practiced in the market. The most common pricing strategy

options are economy, skimming, penetration and premium pricing. (DAWSON, 2014; RAMANUJAM; TRACKE, 2016). Figure 7 demonstrate the four possible pricing strategies:

Figure 7 - The Pricing Strategy Matrix

Source: The pricing… (2017).

Economy is a strategy that focuses on low-cost and low-quality. The main goal here is to find scale, since the margins in low price goods are also low. Skimming would be also a low cost strategy, but proposing a high price product. The idea is to attract the customers with the most willingness to pay at first, and then after lowering the price and attract the other more price-sensitive segments. Penetration is a more aggressive strategy, especially for market entrance. High quality goods or services are offered a low-price hoping to attract new consumers. Finally, premium strategy is offering a high-quality product for a matching high-price. (DAWSON, 2014; THE PRICING…, 2017; RAMANUJAM; TRACKE, 2016).

After the pricing strategy is defined, the revenue model must be chosen. The pricing strategy is macro - defines a company's intention in the market - and the revenue model is the method they use to translate the strategy into action. Hence,

there are logical combinations of certain pricing strategies and revenue models, which are detailed below:

Table 2 - Types of revenue model

Revenue Model	Definition		Pricing Strategy Options
Dynamic Pricing	Dynamic pricing models allow price adjusments in order to have better resource management - which might be underused. Example: UBER, Airline companies.		Penetration or Skimming
Market-based Pricing/Auctions	The price is determined by the market, competitors and similar products or services. Auctions are market-based models that allow the customers to bid for products.		
Freemium Pricing	This model offers products or services for free. But free products or services are usually an entrance strategy, and the goal is to attract the customer for an upgrade for a premium product. Example: Linkedin, Dropbox.		
Alternative Metric Pricing/Pay as you go	The customers pays only for what/how much they access: number of users, period of access, or any other indicator defined in contract. Example: Telecommunication companies.		
The subscription model	Customers pay a monthly/annualy fee in order to access the product or service, according to features desired. The goal is to have recurring revenue. Example: Netflix, Spotify.		

Source: The author.

Dynamic pricing is a flexible pricing strategy. It means developing different tiers of prices according to demand, time of purchase, availability, or other criteria. *Uber*, for example, uses a term called surge pricing to define their dynamic pricing strategy. They developed an algorithm to set prices in their driving service, setting the fares according to demand from passengers and offer from drivers. The same driving service could vary up to 2.5 times the original price. (ROSENBLAT, 2016; UBER, 2017). Airlines, sports games or hotels are also examples of dynamic pricing. Their main goal adjusting

prices are twofold: boosting revenue and trying to operate at their best capacity. (BALIGA; ELY, 2013; BUTSCHER; VIDAL; DIMIER, 2009; LIEBERMAN, 2016; SAMPERE, 2016).

Market-based pricing, or market-oriented pricing is a method which bases price in current market conditions. It used to be defined only as competition-based strategy, since it compares similar products or services being offered on the market before setting the price higher or lower than the competition. This pricing strategy requires special attention on customer's price sensitivity and a deep understanding of who really are the company's direct and indirect competitors. Eventually market-based pricing evolved to the auction model, which proposes a dispute between customers for a product or service. *Google* is an example, since it proposes customers outbid each other for better advertisement positions on their website; And *E-bay* is also an example, fitting in the category of marketplace: connecting buyers and sellers. (RAMANUJAM; TRACKE, 2016; SHAPIRO, 1988).

Freemium pricing is the strategy of offering free services – especially online services – as a basic version, planning customers will upgrade in the future for a paid premium version. Freemium is not actually a revenue model *per se*, since it needs to combine another monetization model in order to generate revenue. Common revenue models to be used with freemium are advertisements or subscription model for a paid version. There are several successful companies using this model, such as *Spotify*, *Dropbox* or *Linkedin* in technology, and *Procter & Gamble* in retail. However, there is still a lot of ground to be covered in research of the freemium model, since there are few studies proving successful conversion from free to paid users. (ANDERSON, 2009; TEECE, 2010; WAGNER; BENLIAN; HESS; 2014; NICULESCU; WU, 2010).

The forth revenue model possible is *pay as you go* (PAYG). This model allows consumers to have some control over the final price of products or services, paying as much as they want, or for how much they actually use. There has been some doubt about this model, once customers could decide to pay nothing. (KIM; NATTER; SPANN, 2008). However, studies show customers do pay what they consider a fair amount for the product or service. (CHUNG, 2017; ELBERSE; BERGSMAN, 2008; KIM; NATTER; SPANN, 2008; SCHMIDT; SPANN; ZEITHAMMER, 2014; SPANN; TELLIS, 2006).

And the last model is the subscription model. It allows the consumer to have access to the product or service by paying a monthly or annually fee for it. The model

exists ever since magazines and newspapers adopted it, but is now used by several products and services, especially online. The subscription model is part of a transition happening in the market from ownership to access. (DANTAS, 2016; WAGNER; BENLIAN; HESS; 2014). Music is no longer property sold in hardware, but only accessed on *Spotify* and streaming platforms; The same happens with cars, since consumers slowly shift from owning cars to only having access to them through services like *Uber* or *Lyft*. (BALA, 2012; BALA; CARR, 2010; DANTAS, 2016; WOODS, GHANBARI, 2008; SKUGGE, 2011).

The current wide range of revenue models is partially a result of technology and how technology can provide whole new products and services. After the internet boom, several new business models were created, and the possibilities for revenue models increased. (RAMANUJAM; TRACKE, 2016). Since the unit of analysis of this research are startups with digital solutions – which is deeply affected by technology - the connection between pricing and technology will be explored in the next section.

2.3.2 Pricing and Technology

As mentioned in the startups section, technology has definitely been a core ingredient to the evolution of startups and new business models. It has made it possible for any company not only to accelerate innovation in products, services or processes, but in completely new business models. Technology-based companies have made innovation cycles shorter in order to avoid obsolescence, and tagged all the market along with them (ANTHONY, 2012; RUSEVA; RUSKOV, 2015; TRIMI; BERBEGAL-MIRABENT, 2012). Startups that are technology-based are frequently growth-oriented businesses and require not only large investments, but also a passionate and talented team to drive the innovation process (COLIN, 2015; KOHLER, 2016).

Nonetheless, the possibilities broaden not only for business models, but for pricing as well. The discontinuous change provoked by technology requires startups to outthink their competition when it comes to revenue generation. The music industry is an example of how much a monetization model could change an entire market. Apple transformed the music market with *iTunes* in the early 2000s by offering a much more convenient and well-designed way of consuming music. It completely changed consumers' relation to the music, and eliminated recording labels as the dominant players in the segment. *iTunes'* revenue model was about charging customers for

accessing a platform, and not for the hardware. (DANTAS, 2016; WAGNER; BENLIAN; HESS; 2014; WESSEL, 2011). Ten years later *Spotify* came along, and once again, the music industry would change. *Spotify* is similar to itunes in their business model, however, their revenue model is totally different. While *itunes* charges per song, *Spotify* charges a subscription for accessing their vast library. And, for shifting the monetization model, *Spotify* created a different experience for consumers. (CARMICHAEL, 2014; RAMANUJAM; TRACKE, 2016; WESSEL, 2011).

Technology reaches other segments and their pricing models. Important players in the publishing industry decided to change their pricing model and offer free content online, such as the *New York Times*, the *Washington Post* and *The Wall Street Journal.* (ANDERSON, 2009; BAKKER, 2002).Technology and the internet took monetization to the next level for the video game industry. It is a dynamic market that transitioned to countless mobile devices, and eventually approaching different models, such as freemium and the subscription model. (ANDERSON, 2009; MARCHAND; HENNIG-THURAU, 2013). Technology and startups have made it possible to innovate in rather conventional segments, such as accounting and bookkeeping. Bench is an example of an accounting company that delivers value by proposing a different monetization model. (BENCH, 2017). Moreover, the internet invented a completely new segment: e-business. Online transactions expanded the variety of monetization models, especially for startups. (AMIT; ZOTT, 2001; GÜNZEL-JENSEN; HOLM, 2015; ZOTT; AMIT; MASSA, 2011). As Amit and Zott (2001, p. 464) state: “E-business has the potential of generating tremendous new wealth, mostly through entrepreneurial start-ups and corporate ventures.”

If on one hand there are more options of revenue models in the startup ecosystem, therefore extending monetization possibilities, on the other hand startups have the downside of limited resources when testing revenue models. Startups struggle in both choosing and validating their pricing model, which increases the risk of failure and contribute to the discouraging statistics on new business: 72% of new products and services do not have the expected revenue, 90% of startups fail, 65% of all products and services fail. (CARMICHAEL, 2014; RAMANUJAM; TRACKE, 2016).

In order to theoretically ground the research problem - analyze which elements affect startups’ decision making in pricing process and understand how this process could be improved by a framework – the key concepts explored in the research were

Innovation, *Startups*, *Decision making process* and *Pricing*. The summary of the theoretical review is described on table 3:

Table 3 - Theoretical review summary

Keyword	Author	Concept
Innovation	DUNBAR, 2011; HARARI, 2015	Human beings imagine infinite ways of reshaping this non-physical world. Infinite imagination led to innovation.
	FREEMAN; SOETE, 2000; FAGERBERG; VERSPAGENA, 2001	Innovation would is considered a key factor for economic progress. The concept of innovation shifted in modern times to the economic perspective, which began discussing progress through the make of new things and how to scale them.
	FONSECA, 2002	Evolutionary economics focus on explaining why economic growth happens, rather than simply considering it as consequence of other actions. Innovation is no longer only a variable in manufacturing.
	SCHUMPETER, 1939	Innovation had to be understood from both a social/organizational and a psychological perspective.
	MOWERY; ROSENBERG, 2005	In the post-second-world-war period the importance of technology for innovation and progress became evident, especially in the United States.
	AMIN et al., 2016; COVIN; WALES, 2012; FELZENSZTEIN, 2015; MARTENS et al., 2016	Innovation could be measured according to the firm's entrepreneurial orientation.
	LEE et al., 2009; RENKO et al., 2015; ZINGA; COELHO; CARVALO, 2011),	Innovation could be measured through entrepreneurial behavior from an individual's perspective.
	FELDMAN, 2002; LYYTINEN; ROSE, 2003	Technology changed how information is accessed, distributed and stored.
Startups	ANTHONY, 2012; MOWERY; ROSENBERG, 2005	Technology made it possible for humans to do more with less, fast-forwarding life to a technological modernity. Startups now benefit directly from the complex environment technology brought, and defy the markets notion of risk.
	STROMBERG, 2017	The market became more fluid after startups.
	RIES, 2011.	A startup is a human institution designed to create a new product or service under conditions of extreme uncertainty.

	(KHANNA; PALEPU, 2010; PRASHANTHAM; YIP, 2017; RADJOU; PRABHU, 2012).	Startups development in emerging countries is slower, especially because the companies need to put more effort in compensating the ecosystem's inefficiency.
	(FREEMAN, 2002)	Brazil, as many other emerging economies, could be considered a catch-up country, since technology took a longer period to be acquired and implemented.
	SIGNORI et al., 2014; MOREIRA, 2010; CID, 2013).	Since it is both risky and a huge responsibility, investments in startups are not exactly encouraged in Brazil.
	KOHLER, 2016; PRASHANTHAM; YIP, 2017	In Brazil, corporate accelerators are an expanding phenomenon and are considered one of the most applicable models for emerging economies.
	ROUX, 2016	There is a concentration of capital in public entities, local and global VCs, and, more recently, in corporate projects
Decision-making process	BUCHANAN; O'CONNNEL, 2006	The decision making field's main goal is to understand how individuals make decisions and how to improve decision's outcomes.
	BUCHANAN; O'CONNNEL, 2006; GRANT; ZANDT, 2009; PARMIGIANI; INOUE, 2009	The expected utility theory has been the basis of rational decision making theory, and the main model for explaining how decision makers avoid risk. Back then, economics focused in industries, governments and regulatory affairs, which is defined as macroeconomics.
	BUCHANAN; O'CONNNEL, 2006; GRANT; ZANDT, 2009; PARMIGIANI; INOUE, 2009	As economies grew, micro-operations became important at the economic level. Microeconomics brought an individual-level approach to economics, however still concerning with how people should behave, and claiming people always act rationally. .
	Mintzberg;Westley, 2001)	Decision making as a sequential process: first define, then diagnose, design, and finally, decide.
	Simon 1979; 1987	Decisions are not completely rational, and we must see decision making as a process.

	Simon 1979; 1987	Bounded rationality is a limited capacity to a person's mind regarding decision making. It is an economic concept that takes human cognitive limitations into consideration.
	Simon, 1960.	The decision making model consisted of three steps - intelligence, design, and choice.
Pricing	CAVUSGIL; CHAN; ZHANG, 2003; LAUMAS; PORTER-HUDAK, 1986	The term monetization was born in finance, and it is a concept as old as money is in the modern capital world.
	RAMANUJAM; TRACKE, 2016).	In recent past, pricing has shifted from a country's perspective to an organization's perspective, and new terms came along, such as pricing, pricing strategy, revenue model, among others.
	(ZOTT; AMIT, 2010).	Pricing is a general term for *revenue models*, which refer to the generation of revenue, strictly from an economic perspective: The revenue model is the specific ways a company enables revenue generation.
	VERGANTI, 2009	Objects could be not only offers from companies to consumers, but a proposal to them. If consumers think of goods or services as meaningful to them this could represent a shift even in sociocultural models, specially because every product people interact with help to shape a place's culture.
	Christensen et al, 2007.	The *Jobs-to-be-done* theory states every consumer purchases a product or service for a specific reason, they *hire* the product to do a *job* for them.
	ZOTT; AMIT, 2008	Monetization is one of the indicators In strategic management, and one of the main focus is understanding firm performance.
	MAO, 2016; REEN et al., 2017; SCHINDLER; KIBARIAN, 1996	Marketing studies state the revenue model must have synergy with both the value being proposed to the customer and the marketing strategy the company chose.
	ANDERSON, 2009; MAO, 2016	Pricing has been discussed in behavioral economics to understand how consumers are influenced to different revenue models.

	PATRICK, 2016; RAMANUJAM; TRACKE, 2016	Business models are the union of elements that create and deliver value, such as customer value proposition, revenue model, resources and processes, among others. Since it is traditionally only a part of the business model, the revenue model has not been studied as a field of its own.
	RAMANUJAM; TRACKE, 2016	The current wide range of revenue models is partially a result of technology and how technology can provide whole new products and services. After the internet boom, several new business models were created, and the possibilities for revenue models increased.
	ANDERSON, 2009; MARCHAND; HENNIG-THURAU, 2013	Technology and the internet took monetization to the next level.
	AMIT; ZOTT, 2001; GÜNZEL-JENSEN; HOLM, 2015; ZOTT; AMIT; MASSA, 2011	The internet invented a completely new segment: e-business. Online transactions expanded the variety of monetization models, especially for startups.
	CARMICHAEL, 2014; RAMANUJAM; TRACKE, 2016	72% of new products and services do not have the expected revenue, 90% of startups fail, 65% of all products and services fail.

Source: The author.

3 METHOD AND RESULTS

Results are usually presented in a different section than the method. However, this section will describe both the method and the results of the research, since the Design Science Research is a dynamic methodology, and proposes a constant analysis throughout the steps of the research.

Qualitative research is the study of human behavior in the complexity of their social interaction. There are multiple possible perspectives from qualitative analysis, and they all attempt to describe the diversity of human interaction. (PUNCH, 2013). Scientific research needs to be conducted by a scientific method of data collection and analysis, and ultimately begins with a research problem. (HAIR JR et al., 2005). This research is supported by the design science, which claims artificial science – anything created or interfered by men – must have a different approach from traditional science. The design research method seeks to project new solutions or tools for existing problems in both organization and society level. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; SIMON, 1996).

The method chosen for this project is the design research. It is important to highlight there were many possible scientific approaches to this proposed research problem, and the researcher made a decision based on the understanding of the research problem. The design research is a method based on action. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; SIMON, 1996). It is indicated for testing possible solutions to a given problem, which is the aim of this project: explore which elements affect startups' pricing process and how this process could be improved. According to Weber (2003), *the search for an effective problem representation is crucial to finding an effective design solution.*

The design research method is recommended for finding adequate – not perfect - solutions for real problems, therefore bringing theory and practice closer. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; HEVNER et al., 2004). There are several different approaches for design research proposed over the years, and they vary slightly, as shown in table 4:

Table 4 - Contributions to Design science

Author	Contribution to design research
Bunge (1980)	Focus on understanding the research problem. Propose a hypothetical -deductive analysis model.
Takeda et al (1990)	Developed the design circle, used for computer-aided design (CAD) technology.
Eekels and Roozemburg (1991)	Similar to Takeda et al (1990), based on design cycle. However they proposed more focus on the research problem and how to find a solution.
Nunamaker, Chen and Purdin (1991)	First publication from design science on information science.
Walls, Wydmeyer and Sawy (1992)	Focus on design as a product - result to be produced - and as a process.
Vaishnavi and Kuechler (2004)	They evolved the design cycle proposed by Takeda et al (1990) in the information science.
Cole et al (2005)	They propose a combination of design science and research-action.
Manson (2006)	Manson (2006) proposes follow-up steps for every stage of the design research method.
Peffers et al (2007)	They suggest the research does not have to follow step 1 to 6 in a sequence. Steps could be overlapped.
Gregor and Jones (2007)	Their method focused on the theory development.
Bakersville, Pries-Heje and Venable (2009)	They created the soft design research, focused on organizations problems.
Alturki, Gable and Bandara (2011)	They presented a method review combining all the previous work in the field, especially in information science.

Source: The author.

The approaches are different in their contributions to the method; however, there is an attempt to summarize a design research in seven criteria (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; HEVNER et al., 2004):

a) creation of an artifact: it is mandatory for a design research to have an artifact. It could be a tool, software, or a framework, like the one proposed in this research;
b) relevant problem: the problem proposed by the design research must be relevant for a group of people, an organization or even a segment;
c) proper evaluation: the artifact must be tested and present quality and effectiveness, as well as propose real benefits;
d) research contribution: the research contributions must be thoroughly described and verifiable;
e) research rigor: both the data collection and the data analysis must be rigorous, and follow the method guidelines;

f) design as a research process: it is vital that there are suitable ways to test the artifact and collect the data needed, preserving the integrity of the environment where the test will occur;
g) research communication: the research and its findings must be presented.

These criteria describe the design research as a method that proposes a *solution* to a *problem*, not only describe, explore and explain this problem.

Design research is not a mainstream method for research in the administration field. It is difficult for researchers to define it, assess it or even differentiate it from other methods. (JUNIOR et al., 2015; PEFFERS et al., 2008). According to Punch (2013, p. 6), "Methods should follow from questions. *How* we do something in research depends on *what* we are trying to find out." This research aims to explore which elements affect startups' decision making in pricing process and how this process could be improved – this is the *what*; and the design research method is the *how*.

There were two main phases of the research process: a pre-qualification phase, and an artifact development/testing phase. Table 5 summarizes them:

Table 5 - Two phases of the research

Phase	DSR Step	DSR Step
Pre-qualification	1	Problem Identification
	2	Problem Awareness
	3	Systematic Literature Review
	4	Artifact and Class of Problem Identification
Artifact development/testing	5	Artifact Proposal Designed for the Research Problem
	6	Projecting the Artifact
	7	Development of the Artifact
	8	Evaluation of the Artifact
	9	Learning Description
	10	Conclusions
	11	Generalization for a Class of Products

Source: The author.

The pre-qualification interviews' scripts are available in Appendix B and C. Although this order was respected, it is important to highlight the Design Research method allows the researcher continually to return to previous steps and review the

process. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015). The next section will describe the unit of analysis in both phases.

3.2 Unit of Analysis

The unit of analysis for this first phase were relevant players in the Brazilian startups' ecosystem, which helped the researcher to have a better understanding of the possible research problem. This pre-qualification phase will be thoroughly described in section 3.3.1, in the *Problem Identification* step.

According to Webster and Watson (2002), the unit or units of analysis chosen for a research must not only be clearly described in a research project, but the reasons the researcher considered when deciding must also be clear to the reader. The unit of analysis chosen to best test the artifact were startups. In order to properly test the artifact, the startups were chosen according to these characteristics below:

a) They must present revenue;
b) Their solution must be digital;
c) They must focus on B2B solutions.

The startups had to be generating revenue, as their previous financial performance would be important when testing the artifact. Their value proposition had to be a digital solution, and the reason is twofold: there is a natural market movement shifting more and more physical manufacturing processes to digital ABDI, 2016c; DEWETT, 2001; BRYNJOLFSSON; HITT, 2000; POWELL; DENT-MICALLEF, 1997; INDUSTRY 4.0, 2017); and physical manufacturing would bring several variables impossible to examine in this research, such as resources allocation and monitoring, stock cost, among others.

And the last characteristic, the startups must focus on B2B solutions, was defined because they are the majority in Brazil. As discussed in the Research Problem definition – Section 1.1 – Brazilian startups generally look for B2B[1] models, once this is the model they find more suitable to generate revenue and remain small or medium-sized companies. (ANDREASSI; SIQUEIRA, 2006; PRASHANTHAM; YIP, 2017;

[1] B2B is business-to-business commercial transactions, and it means the process of selling products or services to other businesses. (BUSINESS…, 2017).

RAMALHO, 2010; verbal information)[2]. Considering these criteria, the startups interviewed were: Quanto Sobra, Runrun.it, Zeeng and Loyalnow. The interview script developed in phase 2 whith the startups is available in Appendix D. The startups will be described in the next sections.

3.2.1 Quanto Sobra?

Quanto Sobra is a startup located in Santa Cruz do Sul, Rio Grande do Sul. They are a company that provides enterprise resource planning (ERP) software solutions for small retail businesses. Their software manages several areas in the business, such as finance, stock, sales, electronic invoicing, among others. All of these offering a fair price and technical support via several channels: online chat, telephone and WhatsApp.

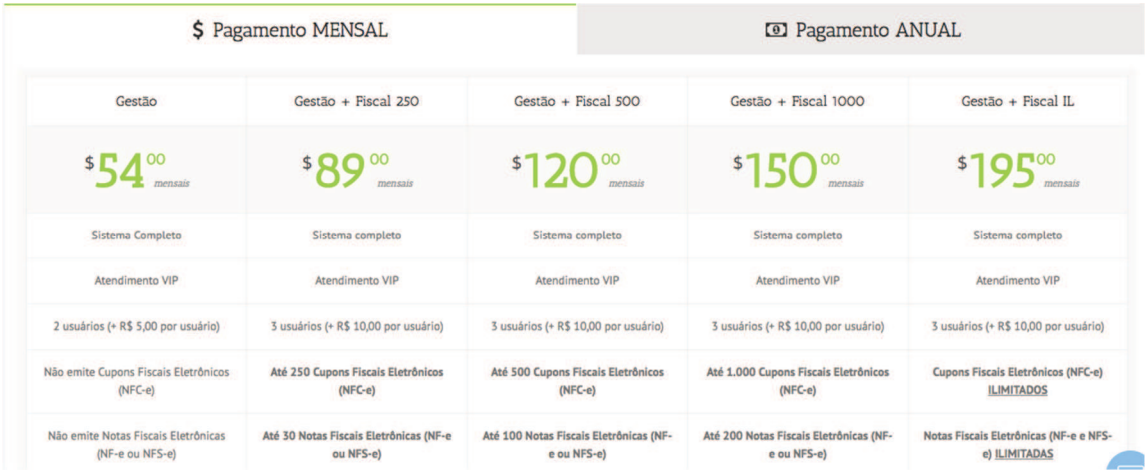
The startup was founded by two entrepreneurs that came from different backgrounds. One worked in management for a medium-size tech company, and the other was a lawyer who was always interested in entrepreneurship. Together they decided to create a new venture, based on a gap they found in the market: ERP software for small retail businesses. They focus on local business in the central area of Rio Grande do Sul state, and they are a team of thirteen people now.

Their pricing strategy from the beginning was always focused on the subscription model, offering several options according to the features the customer wanted in the software. Their criteria to create the layers was according to what they thought was already working in the market. At the beginning, their biggest rival – and inspiration – was *Conta Azul*[3]*.* Their current pricing page shows the huge variety of plans they have:

[2] Data collected in an interview with respondent G, Innovation manager at Agencia Brasileira de Desenvolvimento Industrial (ABDI), in October, 05th, 2016.

[3] Conta Azul is the biggest financial platform focused on small businesses. (CONTA AZUL, 2017).

Figure 8 - Quanto Sobra pricing page



Source: Quanto Sobra (2017).

According to one of the founders, their biggest mistake was to have a cheap entry plan. Their upgrade rate to other plans became very low, which means the customer who is paying $54 do not see the value in upgrading to the next plan, which is $89. So their Customer Acquisition Cost (CAC) became high, since attracting new customers is more expensive than working on the upgrading the current customers. Their current data show they have a very low ticket for an ERP software company.

Another important factor is Quanto Sobra was born in a moment when software was already walking towards commoditization[4] in Brazil. So they quickly realized it was hard to focus on value if they were selling a *product* and a *solution to a problem.* Software for itself was losing value in the market, and several players left the retail business to focus on other segments. This year the company then decided to alter their prices in hope to keep only the customers who valued their solution the most, but it has been hard. The company says the idea seemed reasonable in theory, but they cannot afford losing several customers at once.

3.2.2 Runrun.it

Runrun.it is a startup located in São Paulo. They provide a digital solution for Project and tasks management, focusing on an easy and agile way for companies to

[4] Commoditization is the process which goods that once had uniqueness and distinguishable economic value end up becoming simple commodities for consumers. (DAVENPORT, 2005).

follow their workflow. They do not focus on one specific segment, and they advertise they offer the software every manager should have.

The startup was founded by a group of entrepreneurs who had been in the digital solutions market for a while. Before Runrun.it, the founders had an app company. And managing their company was hard because they could not adapt to the options of project management software available in the market. So when they successfully sold the app company, it was clear they would found a new company to create the software they wish they had before.

Since the founders have a lot of experience in the market, they decided it was important to have a long validation process before launching the new software. They created a free beta version[5] of the software, and after several downloads, they started searching for investment. Since they needed financial projections to acquire venture capital, the easiest answer was to create a premium version of the software, and consider the first users as part of a freemium strategy. Pricing and the revenue model were not a major concern at this point.

Since the company received investment from the start, they focused a lot on their financial indicators. They decided to have three pricing plans: Teams, Corporate and Enterprise. They had to send monthly reports to their investors, and their main concern was to decrease their Customer Acquisition Cost (CAC) in their plans. Their first attempt towards this decrease was to adopt a self-checkout process for their entry pricing plan. Customers would only talk to a sales team when quoting the middle or premium plan, since their price would afford the sales team cost.

The startup found out their customer's main necessity was number os users. So they decided to design their pricing plans according to the number os users available. From their point of view, the more users, the bigger – and more profitable – the customer was. Their pricing plans on figure 9 reflect this idea of focusing on different sizes of companies:

[5] Beta Version is the term used on the first version of a software to gather feedback on bugs and on new features. (MACCORMACK, 2001).

Figure 9 - Runrun.it pricing page

Source: Runrun.it (2017).

By defining three major layers of a segment, the startup realized it made sense to have three different sales approaches. At the beginning it seemed possible to work in distinct ways according to the size of the customer, but things became complicated along the way. The founders realized companies behaved differently, even though they were the same size or even the same segment. The companies valued different features of the software, and their pricing page did not reflect these discrepancies. Runrun.it is now focusing on redefining their pricing strategy, hoping the new pricing plans could be more aligned with their strategy.

3.2.3 Zeeng

Zeeng is a big data analytics platform focused on marketing and communication companies, located in Porto Alegre. Their platform allows customers to understand their reputation in the market, since they will have access to stratified data through an intuitive interface that eases the decision-making process. They can monitor their brand' reputation on blogs, social networks, and websites in general, and analyze these data in a personalized online platform.

Zeeng was founded by two friends and former coworkers. One had a technical background and worked and several companies in software development. The second founder had several years of experience in marketing and communication. They realized Zeeng would be the first player to offer a big data analytics platform in Brazil, and they decided to take on the challenge.

The startup considers they had two major turning points at the beginning of the company. The first was related to their pricing decision was to start with a high ticket and focus on enterprises. The idea backfired because according to the founders, the size of the company did not reflect their maturity to value Zeeng's solution. They decided to focus on specific segments: advertising agencies and communication companies. These segments valued the platform features, but they were not compatible with the high ticket initially proposed. So the company had to think about decreasing their Customer Acquisition Cost (CAC), and the best way was to trust in the maturity of the segment. Zeeng's sale strategy would count on Inbound Marketing[6] - usually 62% less expensive than traditional marketing. (PEÇANHA, 2015).

Zeeng's second turning point was deciding not to charge *per user*, but *per brand,* their customer could monitor on the platform. Their initial pricing plan charged R$ 2.500,00 monthly for unlimited brands, and a limited number os users. Understanding how their acquired customers behaved, they shifted the plan for an unlimited number of users, but a limited number of brands to be simultaneously monitored in the platform. Their current pricing page displays this shift:

Figure 10 - Zeeng's pricing page

Source: Zeeng (2017).

[6] Inbound marketing is a marketing methodology that focuses on getting found by prospects through of content marketing (blogs, podcasts, website pages, etc). The content produced in the inbound marketing method attracts qualified prospects. (CARAGHER, 2013).

The founders highlight the importance of having an understanding of the local marketing. American companies in the big data analytics segment usually charge *per user*, but this proved to be ineffective for Zeeng's value-proposition. Charging per user would mean the customer would only perceive value with more and more users, and this would depreciate improvements in the platform's features. Zeeng has many advantages for being a pioneer company in the segment, but they also face the challenges of establishing new ground.

3.2.4 Loyalnow

Loyalnow is a startup located in Joinville, Santa Catarina state. The startup officially started in 2016, and in March, 2017 they were selected to participate the mentoring program for startups of Sebrae – a prestigious program that chooses innovative ideas and provides mentorship focusing on growth. The main founder worked for a while as a product manager in a company called Conta Azul, and had a lot of experience in digital solutions before deciding to develop Loyalnow.

Loyalnow's software is an NPS platform that measures their customer's overall satisfaction, focusing on opportunities for the companies to grow while potentially decreasing their subscriptions cancellations. NPS stands Net Promoter Score, and it is an index accepted internationally that ranges from - 100 to 100, and measures the willingness of customers to recommend a company's products or services to others. The index categorizes customers into three groups: Promoters, Passives and Detractors. From these categories is possible to extract several information to help decision making about customer satisfaction. (UNO, 2015).

The startup's first decision was to search for existing business models in the market. This action made them realize it would be hard to charge the same way American startups charged, for example. Since the Brazilian market was different, they decided to not present their prices on their website. Another reason to omit the prices was because the company realized they should customize the prices according to how much the customers could pay: the bigger the size of the company, higher the price of the solution.

Loyalnow's main sale strategy is to focus on upselling[7]. They charge the plans per research in the platform, and plans vary from 1000 to unlimited researches. However, they allow customers in the first months to use more researches they hired on their plan, so they can show the customer through real data they actually need to upgrade their plan. This action helps them not only to reduce their Customer Acquisition Cost (CAC) – since selling on the installed base is less expensive – but also to have a negative churn rate[8] - existing customers are more loyal than new customers. These rates are important because Loyalnow is bootstrapping, they do not have any external investment in the company; So if on the one hand they do not have to report themselves to investors, on the other they must support themselves financially.

The startup's main challenge now is to grow, but at a healthy pace. Since improving the software is expensive, they decided to focus on specific segments and make the platform valuable for them. This reduces their development cost, and allow them with more time to expand the platform in the future.

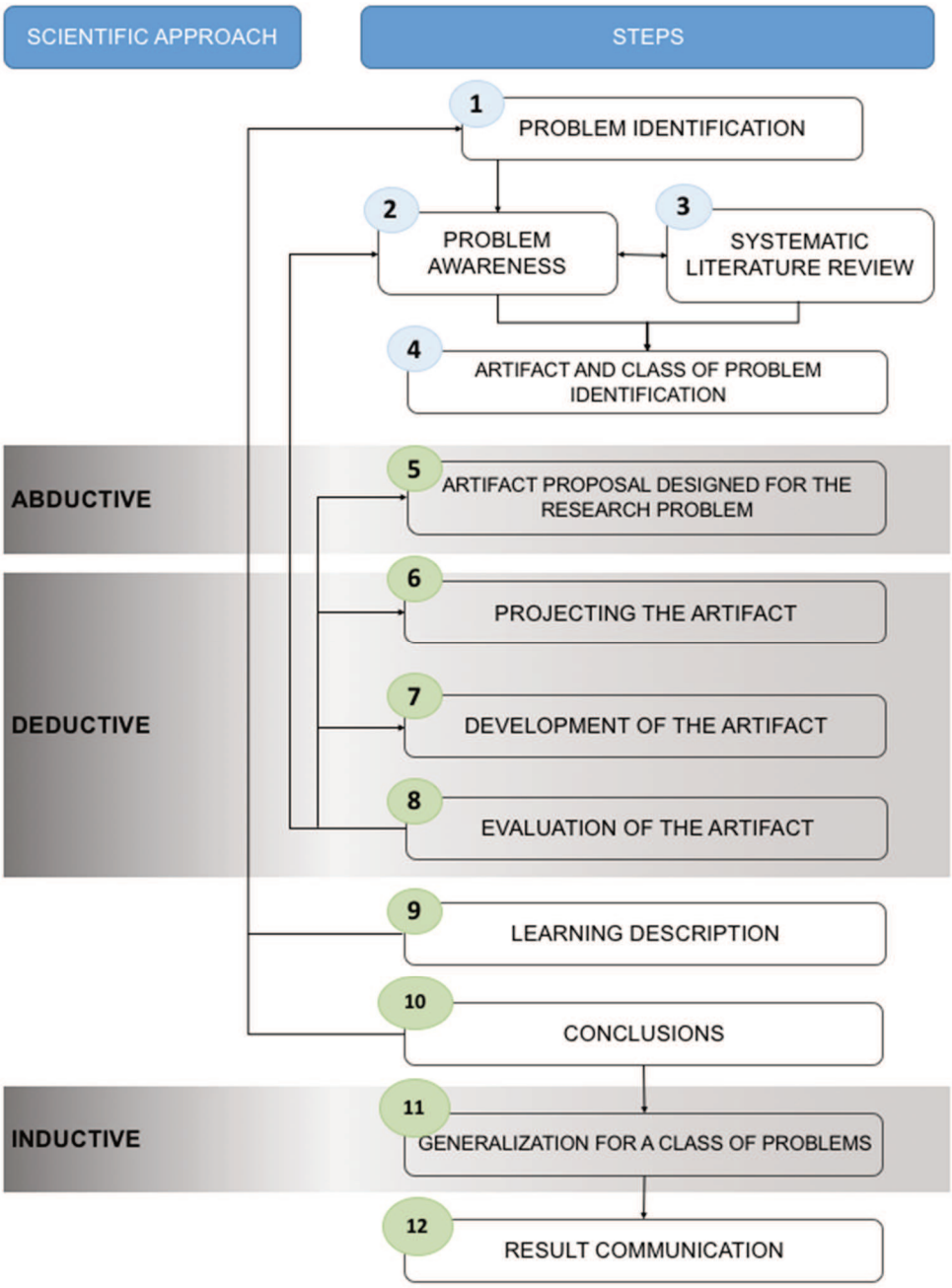
3.3 Design Research Process

For this project, the step by step followed will be the one on figure 11:

[7] Upselling is selling within the existing customers, by offering them lower cost products, and focusing on upgrading them to higher value products. (GALLEGO; RATLIFF; SHEBALOV, 2015).

[8] Churn rate is "the percentage of subscribers to a service who discontinue their subscriptions to that service within a given time period." (CHURN RATE, 2017).

Figure 11 - Design Research Steps



Source: Adapted from Dresch, Lacerda and Antunes Júnior (2015, p. 125).

As mentioned on the beginning of the Method section, there were many possible design research approaches to this proposed research problem, and the researcher made a decision to use the steps proposed by Dresch, Lacerda, Antunes Junior (2015) based on the understanding of the research problem.

There are twelve steps: problem identification, problem awareness, systematic review, artifact and class of problem identification, artifact proposal, design selected

artifact, artifact assessment, learning discussion, conclusions, generalization to a class of problems, results communication. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015). The steps will be carefully described in the next sections.

3.3.1 Problem Identification

The first step in the design research method is the problem identification. This is the time when the researcher decides to investigate a solution to a specific problem, or even a class of problems. The problem must be relevant to real life, and must be precisely defined in the shape of a research problem. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; GREGOR; HEVNER, 2013). In order to properly define the research problem, eight interviews were made between September and November 2016. The details are in table 5:

Table 6 - Problem identification interviews

Respondent	**Role**	**Date**	**Duration**	**How**
A	Angel Investor	13/09/2016 e 19/09/2016	45min	Skype
B	R&D Coordinator - INATEL	13/09/2016	1h 10min	Skype
C	Founder and CEO	22/09/2016	1h 20min	In person
D	Founders	22/09/2016	50min	In person
E	NEMP Coordinator - INATEL	20/09/2016	1h 10min	Skype
F	SAP Focus Coordinator	28/10/2016	50min	In person
G	Innovation Director - ABDI	05/10/2016	1h 45min	Skype
H	Cubo CEO	17/11/2016	45 min	Skype

Source: The author.

There were a total of 63 pages in transcribed interviews. The interviews contributed to the understanding and relevance of the problem. They were planned in order to include different elements of the startups ecosystem: Universities, govern entities, big corporations, incubators and startup founders. It is essential for the researcher to try understanding the respondents' environment before the interview, which contributes to exploring more thoroughly the data found. (BAUER; GASKELL, 2000). In this project, there were two different scripts for two different groups of respondents: members of the ecosystem in general, and startups. Having two different scripts was important for a thorough exploration of the problem. The pre-qualification interviews' scripts are available in Appendix B and C. Table 7 shows the most relevant insights from the interviews:

Table 7 - Pre-qualification interviews' insights

Respondent	Role	Quote	Category	Date	Duration	How
A	Angel Investor	"One of our biggest challenges in Brazil is to find a functional business model - and consequently a revenue model - coherent to the ecosystem of startups"	Pricing	13/09/2016 e 19/09/2016	45min	Skype
		"Discussing investment for startups in Brazil is discussing governance and its role. How far goes the investors' commitment?"	Brazilian risk aversion			
		We have to be careful. There are a lot of companies calling themselves as startups, when they are really not. Having an idea does not make a startup.	Lack of entrepreneurial education			
B	R&D Coordinator - INATEL	"Inatel has an initiative called Competence Center, where we put students and corporations together solving real problems. It is something is was missing here in our region"	Lack of entrepreneurial education	13/09/16	1h 10min	Skype
		"There was a lot of mistrust when we started focusing on entrepreneurial education on our graduation courses. People still believe Brazil is impossible to invest in."	Brazilian cost			
		"Without collaboration it is very hard to succeed with a new company. As a startup, you have to rely on the ecosystem to become a real business and generate revenue."	Pricing			
		Government in Brazil has difficulty maintaining credit availability, mainly because they cost management is horrible. So companies in general suffer, and especially startups.	Brazilian cost			
C	Founder and CEO	"Brazilian environment is hard. We decided to try the American market right at the beginning because it seemed more promising"	Brazilian cost	22/09/16	1h 20min	In person
		"Our biggest challenge was to find investment. Accelerators, banks, they all said no"	Investment			
		"We priced our product only according to our cost of production"	Pricing			

		"The collective investment we received proved potential customers valued our product."	Value			
		"The 2016 crisis hit us hard. We had to let 2 people go, and the consumption decreased a lot"	Brazilian cost			
		When we finally started negotiating funding with accelerators, we saw investors were trying to get at least 50% of our company"	Brazilian risk aversion			
		"Angel investors prefer receive a good return on fixed investments than investing on a startup"	Brazilian risk aversion			
		"The fact our product already had revenue - even though the margin was slim - made a huge difference in attracting funding"	Pricing			
D	Founders	"We defined our pricing according to the existing competition. There was no time to test anything else"	Pricing	22/09/16	50min	In person
		"Without investment we had to work part-time to have an income˜	Investment			
		"We discovered acceleration programs months after we had faced several problems˜	Lack of entrepreneurial education			
		"It was harder to define the revenue model being a marketplace. We didn`t know who should pay more - consumers or businesses˜	Lack of entrepreneurial education			
		"Brazilian investors need solid numbers. Without real revenue, there's no investment˜	Brazilian cost			
		"Having revenue makes it easier for the investors to calculate their payback"	Brazilian risk aversion			
		In general accelarators have trouble delivering what they promote. They usually are a startup themselves˜	Lack of entrepreneurial education			
		"We have very little contact with investors outside the state (RS). Even with the acceletator's help˜	Lack of entrepreneurial education			
		"Failing in Brazil is not accepted. But the startup's job is mostly failing"	Brazilian risk aversion			

		"We were recently bought by a bigger company. They decided on us mainly because we presented recurrent revenue"	Pricing			
E	NEMP Coordinator - INATEL	"We realized focusing on entrepreneurship was beneficial to all of the ecosystem. Corporations hired more innovative people, startups had more confidence to grow, and we solved part of the investment problems Brazil faces. It was win-win."	Lack of entrepreneurial education	20/09/16	1h 10min	Skype
		"The Nemp Institute has more than 60 ongoing projects, and it has focusing on startups' mentorship because it is the most effective way to help them to become real businesses solving real problems."	Pricing			
F	SAP Focus Coordinator	"SAP believes the startups are the main contributor to innovation on our HANA Platform"	Innovation	28/10/16	50min	In person
		"SAP's main goal is to have an influential position in the global startup ecosystem"	Innovation			
		"The startup's focus in Brazil are mainly B2B. And SAP has a very privileged spot in the B2B market, which makes our program extremely beneficial for startups"	B2B			
		"75% of the global GDP go through our SAP software"	Innovation			
		"SAP does not become the startup's partner. We do not consider ourselves like regular investors, we only offer consulting and mentorship"	Lack of entrepreneurial education			
		"It's mandatory for startups to already be generating revenue in order to be accepted into the program"	Pricing			
		"There's a governance problem in Brazil, and startups suffer from this. The high levels of family businesses affect the professionalization of the ecosystem"	Brazilian cost			
		"Startups find it hard to define their value to customers - mainly because of these brazilian characteristics"	Value			
		"We see startups that are lost. They do not focus on strategic decisions such as finding their revenue model right from the start, which is a mistake"	Pricing			

		"I believe investment will be less valued. The startups will be valued for the revenue generated, and not for the venture capital raised"	Pricing			
G	Innovation Director - ABDI	"Unicorns focus on being disruptive. They're B2C companies and they do wish to change the customer experience overall. Of course the environment plays a huge role in the emergence of these companies, because in the Silicon Valley you don't have to explain to everyone why you want to change the world, and not only create a company"	Brazilian risk aversion	05/10/16	1h 45min	Skype
		"There are several revenue models a startup can choose from. Their challenge is to find the correct one according to their strategy"	Pricing			
		"Generating revenue is not a major concern for investors in the Silicon Valley. Some companies have never generated revenue, and their valuation is huge (Uber, for example).	Pricing			
		"In Brazil there's no real ecosystem for a startup to try to be the next Uber. Startups have to monetize, because you have to be a "real business" and not "a dream to change the world"	Pricing			
		"B2B is the only possible model to be operated in Brazil."	B2B			
		"Since B2B is the best model, generating revenue is the obvious validation process. That's the reason startups in Brazil need to sell first"	Pricing			
		"In Brazil entrepreneurs in startups are actually businessman. They need to manage their company first, and then only after being a sustainable business is that they can think about major disruptions."	Pricing			
		"Brazilian industry has a history of being an "offer economy". Proposing value is something relatively new to our country."	Lack of entrepreneurial education			
		"If a startup is not generating revenue, then why does the company exist? In a B2B ecosystem like Brazil the biggest indicator is how much revenue you're generating."	Pricing			

		"One of the biggest problems startups face is difficulty in accessing the market. Corporations say startups are high-risk companies, the industry is very used to commoditizations instead of innovation"	Brazilian risk aversion			
H	Cubo CEO	"I believe now Brazil is going towards an integrated startups ecosystem. We're much less disconnected we were years ago"	Lack of entrepreneurial education	17/11/16	45 min	Skype
		"Every study about innovation in the world says you need 5 variables to innovate: access to capital, to talented people, entrepreneurial culture, a regulatory environment and density"	Innovation			
		"One of our major roles at Cubo is to teach corporations how to work with startups"	Lack of entrepreneurial education			
		"Corporations have a history of avoiding risk at any cost. And startups are made of main risk. That's a barrier we have to overcome"	Brazilian risk aversion			
		"After 2013 startups started focusing on Business Model before anything else. Without a business model is impossible to generate revenue, so this is not a startup in the first place"	Pricing			
		"For a startup to be accepted for incubation here at CUBO, they have to be generating revenue. Otherwise it's impossible to consider them a potential business"	Pricing			
		"A Startup has to find a solution to a real problem. When you think about this solution, it is mandatory to think about pricing at the same time. They are inseparable."	Pricing			

Source: The author.

Based on the data from the interviews categories were created. Categories are important in the problem identification step because they help the researcher who is exploring the problem and defining the exact research problem. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; GREGOR; HEVNER, 2013). These categories are presented in figure 12 in a word cloud:

Figure 12 - Problem Identification word cloud

Source: The author.

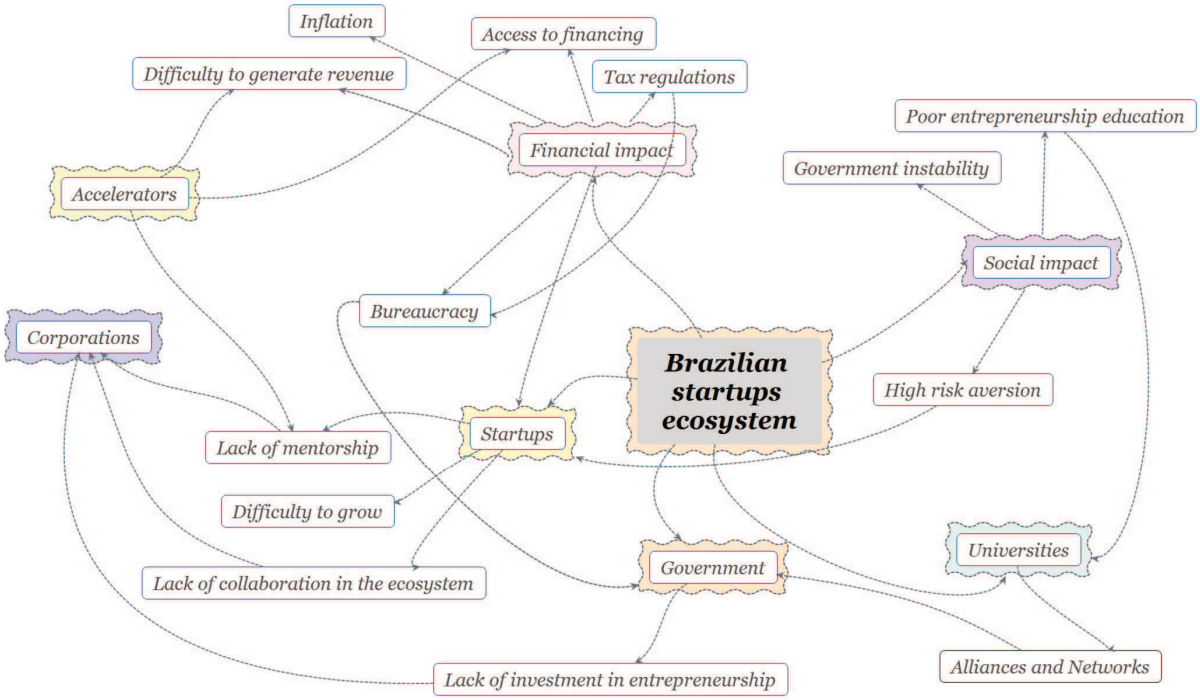
There were many important issues raised in the pre-qualification interviews. The authors in the ecosystem have different concerns, but they all try to understand the Brazilian context and have opinions about what could change. The goal in this step was to investigate a solution to a specific problem (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; GREGOR; HEVNER, 2013). The investigation shows becoming a real company was an issue for startups in Brazil. The result was a preliminary definition of the research problem, to be explored in the next step, *Problem Awareness*.

3.3.2 Problem Awareness

The second step was problem awareness. In this stage, it is important the researcher tries to understand the problem on a deeper level. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015). The researcher must understand the problem from different perspectives, searching for causes, consequences and the general context of the problem. There are several possible approaches suitable for this step, and the

choice depends on the type of research problem. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; SIMON, 1999). Andrade (2006) suggests a systemic structure helps connecting ideas and identifying possible causes for the research problem. Based on this premise, on the data gathered from the interviews, and on related studies on the literature, a systemic structure was developed by the researcher:

Figure 13 - Systemic scheme about startups ecosystem



Source: The author.

Figure 13 represents the Brazilian startups ecosystem and its members, as well as their interconnections. It is a representation of the research problem context using systemic thinking, connecting relevant ideas and elements in as many ways as possible. Through the scheme, it was possible to visualize different scenarios in the ecosystem, and actually test different research problems. Both the related studies and the respondents with their perspective on the ecosystem helped the researcher to have a broader understanding of the research problem.

Among the many issues raised in this step, one stood out: startups were finding hard to grow in Brazil. There could be many causes, however generating revenue and growing were their biggest challenge. Based on this fact, the raw idea for this research proposal was to understand how the process of generating revenue could be improved.

3.3.3 Systematic Literature Review

The third step in the design research method is the systematic literature review. It is essential the researcher review the existing literature basing their research problem, and even the previous studies on their class of problems. This is the moment to understand both seminal and state-of-the-art work about the artifact and the possible solution to the research problem. After this step not only the research problem must be completely defined, but the direction of the research towards the artifact must also be clear. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; GREGOR; HEVNER, 2013; SIMON, 1999).

In order to properly support the research problem, the literature review on this project was built considering three main constructs: innovation, decision making theory and pricing/revenue model. The database chosen for the literature review was the *Web of Science*. The review was based on scientific principles: although an extensive range of studies were researched, the selection was cohesive with the research's proposal, planning not to be just a large number of citations. (JHA; BOSE, 2015; WEBSTER; WATSON, 2002).

The steps followed in the literature review are the principles of inductive categorization: (a) selection of relevant scholarly output medium, (b) identification of relevant research papers, (c) categorization and analysis of articles based on their contribution, (d) analysis of previous literature to identify the gaps, and (e) development and reporting of a model to synthesize the finding. (DUBÉ; PARÉ, 2003; JHA; BOSE, 2015). Table 8 summarizes the criteria in the literature review:

Table 8 - Systematic literature review criteria

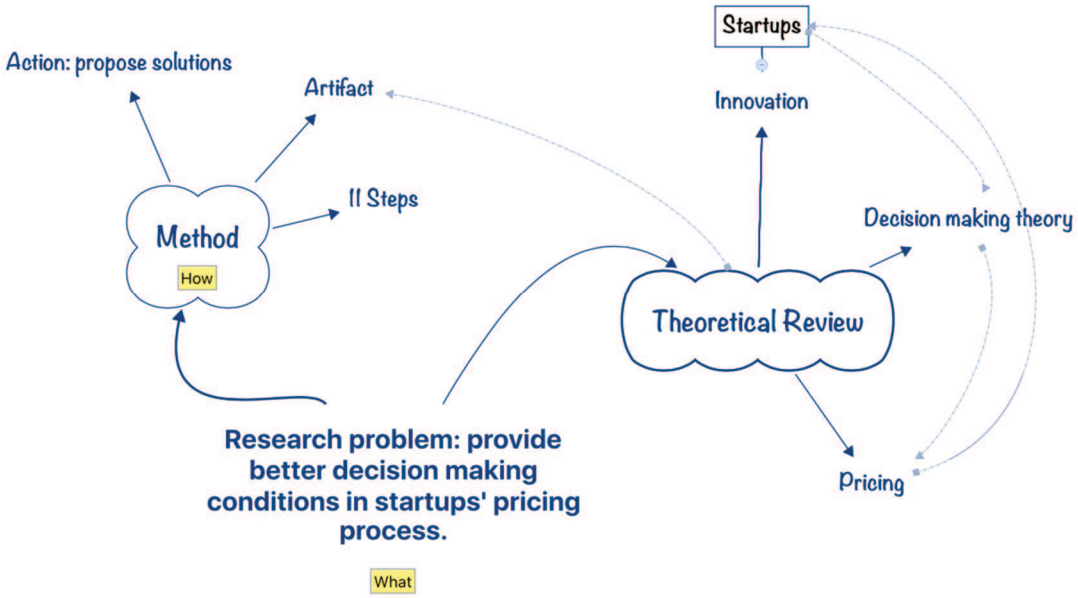
Keywords	("innovat*" AND "startup*")
	("innovat*" AND "pricing*")
	("innovat*" AND "revenue*")
	("startup*" AND "pricing*")
	("startup*" AND "revenue*")
	("startup*" AND "technology")
	("startup*")
	("decision-making* AND "process")
Journal Selection criteria	Most respected Journal in the respective fields of Innovation, Entrepreneurship and Strategy, according to their Impact Factor.

Selected Journals	*Strategic Management Journal, Journal of Revenue and Pricing Management, International Entrepreneurship and Management Journal, MIS Quarterly, Academy of Management Journal, MIT Sloan Management Review, Entrepreneurship: Theory and Practice, Harvard Business Review.*
Type of documents	*("Article" OR "Review" OR "Editorial Material")*

Source: The author.

After the identification of relevant research papers as described in Table 8, the analysis of articles results in the connections between *what* – the research problem – and the *how* – method, to the theoretical review. Figure 14 shows this connection:

Figure 14 - Theoretical review mind map



Source: The author.

Innovation could be studied as a process, as a driver, a consequence or even as a empirical phenomenon. (FREEMAN; SOETE, 2000; FAGERBERG; VERSPAGENA, 2001; FONSECA, 2002; KNIGHT, 1997; NELSON; WINTER, 2005; SCHUMPETER, 1939; MOWERY; ROSENBERG, 2005). The theoretical review on this project focused on exploring innovation historically until the rise of technology, in the interest of connecting innovation to startup.

Since startups are a more recent phenomenon, available literature is not as broad as innovation. Existing studies explore startups as processes of innovation, and from the entrepreneur's, organization's or the ecosystem's perspective. (SONG et al.,

2008; SARASVATHY; SIMON; LAVE, 1998). This project focused on how startups affect economies by being innovation drivers in these emerging countries. (ANTHONY, 2012; BLANK; DORF, 2012; MOWERY, 1991; MOWERY; RIES, 2011; ROSENBERG, 2005; THIEL, 2014).

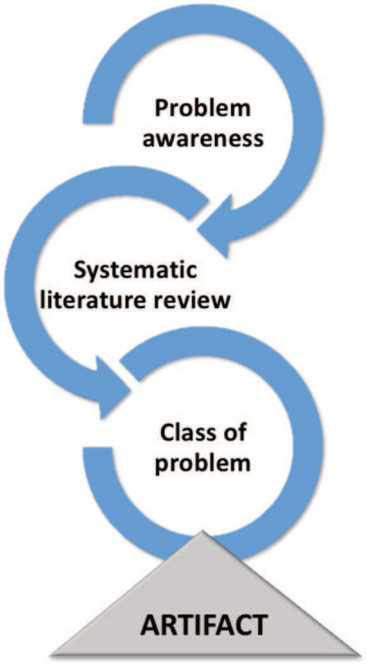
Regarding decision making, there is a research stream that discusses decision making from a risk decrease perspective. Alternatively, the behavioral approach tries to understand how the decision making process works. (BUCHANAN; O'CONNNEL, 2006). This project focuses on the decision making in pricing. It is important to highlight most empirical studies focus on pricing decision making discuss the consumers' perspective (ABBEY et al., 2016; CALDENTEY; LIU; LOBEL, 2017; CHEN; HALL; KELLERER, 2017; DUKESHIRE, 2016; KUO; JOU, 2017; MUNSON; LU, 2010; SU; LIU; LIN, 2017), however this project focuses on the startups' decision making process.

After the theoretical review, the following step aims to identify the class of problem, and the artifact. It will be described next.

3.4.4 Artifact and Class of Problem Identification

The forth step - artifact and class of problem identification – follows the problem consolidation developed on the first three steps. Once the research problem is clear, the researcher must choose the most suitable *artifact* to develop the research. Artifact is commonly defined as an object that has been intentionally designed for a certain purpose. (LACERDA et al., 2013; SIMON, 1999). In research, artifacts could be a software – or any technological intervention, a mathematics model, a process, a tool, a framework, or any other artificial intervention the researches builds in order to propose a solution to a given problem. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; GERGOR; JONES, 2007; GREGOR; HEVNER, 2013; LACERDA et al., 2013; SIMON, 1999). Figure 15 represents the initial steps until the artifact is defined:

Figure 15 - How to build the artifact



Source: The author, adapted from Lacerda et al. (2013).

Artifacts contribute to the generation of knowledge in the research, and enable researchers to understand, explore and measure more effectively the research problem. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; JUNIOR et al., 2015; LACERDA et al., 2013). As Hevner et al (2004, p. 77) states: "[…] artifacts enable design-science researchers to understand the problem addressed by the artifact and the feasibility of their approach to its solution." Since this research objective proposed was to analyze which elements affect startups' decision making in pricing process and understand how this process could be improved, the artifact chosen was a *processual framework.* The artifact will be thoroughly described on sections 3.3.6 and 3.3.7.

In order to be a valid artifact in design science research, it is required the artifact could be extended to a class of problems, and not only to one specific and unique problem. (LACERDA et al., 2013). There is not an official definition for class of problem in the literature, but it could be described as a group of practical or theoretical problems composed by related artifacts. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015). Here are some possible class of problems:

Table 9 - Examples of artifacts and class of problems

Class of problem	Artifact	Author
Cost measurement	Framework for supply chain performance measurement	GUNASEKARAN; PATEL; MCGAUGHEY, 2004
Process mapping	Value Stream Map	ROTHER; SCHOOK, 1999
	Architecture of Integrated Information Systems ARIS	SCHEER, 2005
Project management	CPM (Critical Path Method); PERT (Programme Evaluation Review Technique)	GOLDRATT, 2002
Strategic alignment	Balanced Score Card	KAPLAN; NORTON, 1992; 2000
	CANVAS	OSTERWALDER; PIGNEUR, 2010
	Organizational Fitness Profiling	BEER; EISENSTAT, 1996
	Porter's Five Forces Model	PORTER, 1980
	Business model framework	HWANG; CHRISTENSEN, 2008
International entrepreneurship	Effectuation Theory	SARASVATHY, 2001
International business	Eclectic Paradigm/OLI-Framework	DUNNING, 1977

Source: The author, adapted from Dresch, Lacerda and Antunes Junior (2015).

Class of problems are not defined and established categories. They must be designed by the researcher according to each research problem. The class or category of problems helps both the generalization and the communication of the results in the design research process. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015).

As mentioned at the beginning of this section, design research is not a mainstream method for research in the administration field. Most artifacts developed and validated in research belong to other fields, such as information systems and engineering. (JUNIOR et al., 2015). Therefore, it is important to thoroughly describe the artifact and its composition, so the research could contribute to the existing gap in administration and strategy field in design research. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; JUNIOR et al., 2015).

3.3.5 Artifact Proposal Designed for the Research Problem

Based on the data collected on *Problem Identification*, *Problem Awareness* and the *Systematic Literature Review*, the artifact designed for this project is a *processual framework*. According to Sein et al (2006), the artifact in a Design Science Research must be useful when analyzing the research problem; if all the elements in the

framework are “meaningful, natural and well-defined” (p. 330); and if the “categorization is complete and exhaustive” (p. 330).

According to Simon (1981) artifacts have an outer and an inner environment. The outer environment is considered as the requirements imposed on the artifacts’ objective; and the inner environment is the internal organization of the artifact. This definition is known as the most common representational construction for an artifact. The artifact proposed for this research is a procedural framework - the inner artifact - that hopes to analyze which elements affect startups’ decision making in pricing process and understand how this process could be improved – the outer artifact. It will be described in the next section.

3.3.6 Projecting the Artifact

The artifact for this research was projected considered the issues raised on the pre-qualification phase, whose research question is: to analyze which elements affect startups’ decision making in pricing process and understand how this process could be improved.

It is important to remember not only to properly project the artifact, but also thoroughly evaluate it. Evaluation is so critical in Design Science Research, it is normally broken down into *micro-evaluations* that happen along the process. (HEVNER et al., 2004; PRAT; COMYN-WATTIAU; AKOKA, 2015; VAISHNAVI; KUECHLER, 2004). Peffers et al. (2007) even states two separate actions: demonstration and evaluation. The demonstration shows how the artifact works and actually solves the problem; and the evaluation must be a more formal process, and it must show the real utility of the artifact.

Evaluation of artifacts in Design Science Research is still mostly undefined, and there is not a consensus in the design science literature. (HEVNER et al., 2004; PEFFERS et al., 2007; PRAT; COMYN-WATTIAU; AKOKA, 2015). Here below are the guidelines defined for the artifact in this research:

a) Useful: The framework must be useful. Not only provoke good questions, but also provoke action.
b) Practical: The framework must be simple and easy to use.

c) Flexible: Although there is an order proposed by the researcher, the framework must be flexible enough to allow different orders among the steps without losing the original goal.
d) Timeless: The framework has to allow the startups to use it many times as possible, and in different stages of their lives.
e) Engaging: The framework must be well designed in order to retain the user's attention as much as possible. The important concepts must be clear, and the framework must be as visual as possible.

The guidelines were defined aligned with the *problem* to be *solved* by the artifact proposed in the research. The criteria will be thoroughly evaluated in step 8, section 3.3.8, *Evaluation of the Artifact*.

Another important aspect of the data analysis of the design research is validity. (WORREN; MORRE; ELLIOTT, 2002; VAN AKEN, 2005). These are some validity premises in design research:

a) the research must observe the development of the artifact and how they can contribute to the class of problems, and not focus on the artifact itself (DRESCH; LACERDA; ANTUNES JUNIOR, 2015);
b) the environment and context of the research must be clear and thoroughly explained, so the choice of the artifact is explained (DRESCH; LACERDA; ANTUNES JUNIOR, 2015);
c) the procedures and operational details must be richly described (LACERDA et al., 2013);
d) every step of the research must have partial validation (LACERDA et al., 2013).

This research considered the validity premises above in the artifact-testing phase, in order to test the efficiency of the framework as a tool for the research problem: explore which elements affect startups' pricing process and how this process could be improved. The most common artifact validation methods are according to table 10:

Table 10 - Design evaluation methods

Evaluation method	**Approach**
Observational	Case Study; Field Study
Analytical	Static analysis; Architecture analysis; Optimization; Dynamic analysis.
Experimental	Controlled experiment; Simulation.
Testing	Functional testing; Structural testing.
Descriptive	Informed Argument; Scenarios.

Source: Hevner et al., 2004, p. 86.

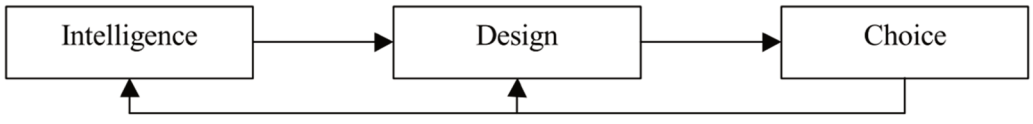
This research used a descriptive and observational evaluation method, as it will be described on step 8, section 3.3.8, *Evaluation of the artifact*.

3.3.7 Development of the Artifact

The artifact was developed based on the literature review and on the data gathered from the pre-qualification interviews. The idea was to create an artifact that would be aligned with the research question: which elements affect startups' decision making in pricing process and how could this process be improved?

The core concept for the artifact design was Simon's model of decision making (DILLON, 1998; SIMON, 1960). The model proposes a three-step decision making process: Intelligence, Design, and Choice. The framework was designed to include these three phases, hoping to help the individuals to: explore the environment, to develop alternatives for the problem or situation defined in the first phase, and selecting the most suitable plan from the alternatives previously created. Figure 16:

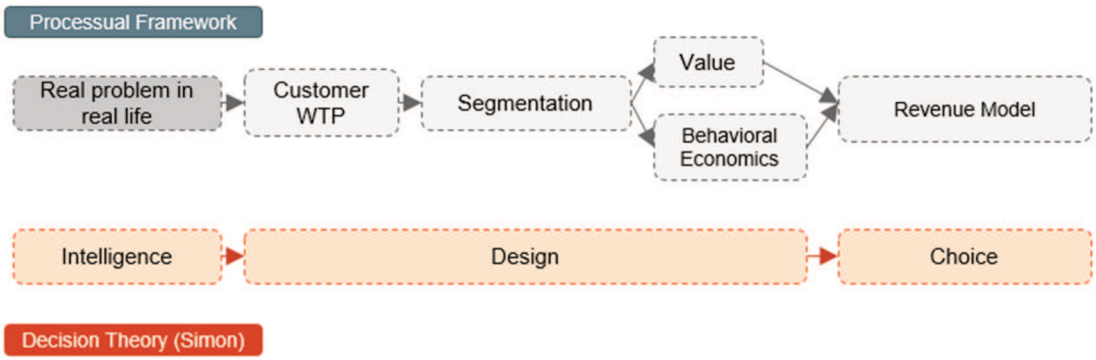
Figure 16 - Simon's model of decision making



Source: Dillon, 1998, p.

There were two versions of the artifact developed. The first was a static version, designed to join Simon's model of decision making (DILLON, 1998; SIMON, 1960) to the steps of the artifact proposed, as shown on figure 17:

Figure 17 - First version of Artifact



Source: The author.

The idea of the first version was to align the steps of Simon's model of decision making – Intelligence, Design, and Choice – to the steps proposed in the framework. The first step of the framework, real problem in real infe, was based on the the *intelligence* phase developed by Simon (1960), because it provokes the respondent to explore the environment to identify the problem: in this case, explore what problem the startup is solving. The first step of the framework is also supported by the idea of how pricing is connected with meaning. (BUCHANAN, 1995; VERGANTI, 2009). So in order to decide what revenue model the startup should follow, their first step should be understanding what their product or service means to the consumers, and this should help them go through the rest of the steps of the framework. (BURDEK, 2006; MARGOLIN; BUCHANAN, 1995; VERGANTI, 2009).

The next four steps of the framework – Customer Willingness to Pay (WTP), Segmentation, Value and Behavioral Economics – were based on the second phase proposed by Simon (1960), called *design*. Since the goal of the second phase is to develop alternatives, the phases of the framework were developed to promote this development. The *Customer Willingness to pay* step immediately follows the first step to propose the startup think about how much their consumers are willing to pay for the problem they solve. The following step, segmentation, was thought considering the startup should then create their segments according to their willingness to pay for the benefit they receive. And the following step, Value, was developed considering companies realize pricing and how the consumers interact with price and value is also affected by this affective dimension towards goods. (BOZTEPE, 2007; VERGANTI,

2009). Finally, the last step based on the *design* phase is the Behavioral Economics. This step was included in the framework because the Behavioral Economics considers cognitive bias as an undeniable trait in human behavior. So in order to think about the consumers' decision making process about purchasing or not, the startups should also consider unconscious reasons these consumers have to justify their choices. The idea of presenting prices differently could have an affect on consumers' willingness to pay. (ARIELY, 2008; KAHNEMAN, 2011).

And the third and final phase is the *choice*, which describes the action of selecting the most suitable plan from the alternatives previously created. (DILLON, 1998; SIMON, 1960; SIMON; NEWELL, 1972). The framework then proposed the startup to decide which revenue model is more adequate based on answers from the previous steps. So based on this first version, and on literature discussed on the theoretical review, the second version was created. This second and dynamic version was developed in a platform called Prezi Next. There, it was possible to test the framework with the startups in real time, step by step. Figure 18 shows the overview of the artifact:

Figure 18 - Artifact: Processual Framework

Source: The author.

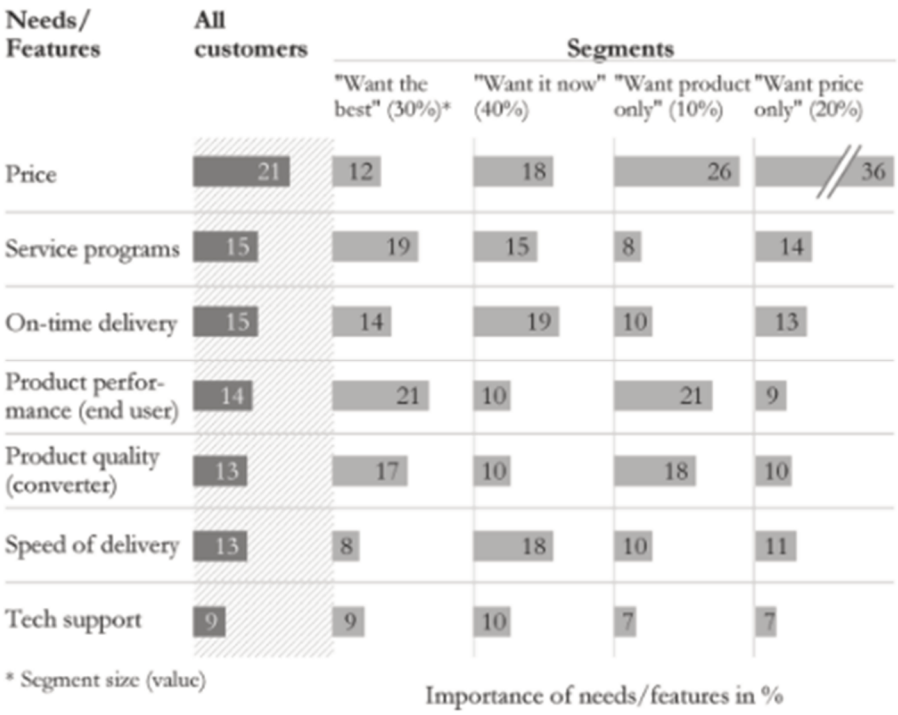
The artifact was developed in Portuguese, because all the startups being interviewed are in Brazil. The design is cyclic, and every step proposed a continuous reflection that results in answering the main question: What is my revenue model?

The first step, *Real benefit*, asks the startup what is their real contribution to their customers' lives. What problem are they really solving? What does the product/service delivers to their customers? Here was introduced the *jobs-to-be-done* theory to help explaining the importance of a real benefit to customers. According to Christensen et al (2007), every consumer purchases a product or service for a specific reason, they *hire* the product to do a *job* for them. If the company finds out what this job, they can start communicating with the customer in that direction. Sometimes the reason they are selling is different than the reason consumers are purchasing.

Having discussed in the first step what is their real benefit to customers, the startups can then move on to step number two. Here they must reflect about a concept called willingness to pay. As discussed in section 2.3.1, willingness to pay (WTP) is how much a customer wants to pay for a product or service. (CHUNG, 2017; RAMANUJAM; TRACKE, 2016). How much are their customers willing to pay to access the benefit discussed on step one? This question introduces the idea of defining pricing based on their customer's willingness to pay for the benefit. This step also requires the startup to think about how accurate their current pricing is, and based on what type of information their current revenue model is based. This is only possible because the person being interviewed was actively involved in the startup's revenue model definition, and because the company is currently generating revenue.

Step three raises questions about the startup's segmentation process. Customer segmentation traditionally means identifying key characteristics that can categorize consumers into groups that can be targeted. These categories are usually related to general characteristics (company size, revenue, location, segment consumers are in, etc). (RAMANUJAM; TACKE, 2016). The idea of this step is to scape from the traditional approach on segmentation and to propose a continuous line of thought: what if the segmentation were defined based on the customers' willingness to pay for the benefit they receive? The framework proposes that traditional segmentation processes companies use make it more difficult to generate proper revenue, because they usually segment accorging to visible characteristics. The framework discusses in step three examples of how segmentation aligned with their customers' willingness to pay would work. The most powerful example is figure 19:

Figure 19 - Segmentation according to WTP



Source: Ramanujam and Tracke (2016, p. 62).

Figure 19 shows a company that segmented their customers according to their willingness to pay for each feature they valued most from the company. Customers who are under the profile “Want price only”, for instance, did not value technical support as much as other segments. This allows the company to properly allocate their (limited) resources focusing on customers who really appreciate them.

After thinking about step one, two and three, the startup focus on step four. Step four discusses the idea of *value,* which is what the startup really wants to deliver to their customer when they purchase their product. (AMIT; ZOTT, 2012; ZEITHAML, 1988). It is important to discuss value here because there is two core information in this step: it is essential to communicate value in the revenue model (CARMICHAEL, 2014; RAMANUJAM; TRACKE, 2016; WESSEL, 2011); and value in software as a service (SaaS) could be constantly expanding. (PATRICK, 2016).

Communicating value through the revenue model means the startup’s strategy must be aligned with how they actually generate revenue. *Spotify* did not create the concept of streaming music service, but innovated it in the revenue model: instead of charging per song – like *iTunes* - , they stablished a new one: charging a subscription. This action empowered the customer by allowing them to have an entire library at their

disposal, and it was a revenue model consistently aligned with the value they were providing the customer. (CARMICHAEL, 2014; WESSEL, 2011). And the second core information in this step is the fact value in software as a service (SaaS) could expand. Since software is a dynamic product, the customer's perception of value could increase. This fact supports the idea startups could constantly review their revenue models, so they are adjusted to their value creation. (PATRICK, 2016).

The fifth step is Behavioral Economics. This topis is part of the framework because this field of study discusses that decisions are influenced by people's unconscious mind. (ARIELY, 2008; THALER; SUNSTEIN, 2009). Since the framework proposes to analyze and improve the elements affect startups' decision making in pricing process, the unconscious decisions in behavioral economics could be used on their favor. In the framework two concepts are discussed: the *anchoring* effect and *decoy* effect, mentioned in section 2.2. (ARIELY, 2008; TVERSKY; KAHNEMAN, 1974). Anchoring is used in the framework to show the startup is possible to create pricing reference points – or anchors – to help the decision making process from consumers. And the decoy effect shows how a third option in the pricing strategy could help the consumers to decide in the most favorable pricing decision for the startup.

And finally the last step: the revenue model decision. The idea of this step is to show the connection between the previous steps to the final decision: what is the best revenue model the startup could adopt? There is no need for the startup to choose one by the end of the interview, but to consider the possibility of reflection about this subject. Table 11 shows the operational guidelines applied on the artifact testing:

Table 11 - Operational Guidelines of the artifact

STEP	Concept	Operational Guidelines	
		Questions the startup must answer	***Actions***
Real Benefit	The real benefit from a product is a solution to a real problem consumers have. It is a real contribution to the customers' lives. It is what someone actually receives when purchasing the product.	Why do consumers purchase your product? (Not why you sell them) What real benefit do customers get from purchasing your product?	Interview your consumers. The startup's own perception is not important here. Define your company's real benefit as clearly as possible: write, draw, design, make a video, etc.
WTP	Willingness to pay (WTP) is how much a customer wants to pay for a real benefit delivered from a product or service.	How much does you consumer is willing to pay for the **benefit** they receive from your product? Do you have real data to support this? Has your development (technical) team been involved with this information from the beginning? Do you know your consumer's WTP for each feature/characteristic of your product? Have you been prioritizing resources according to your consumers' WTP?	Interview your consumers. There are several tools, such as Focus Group, Guided Purchasing, Price Sensitivity Model, etc. Define the price of your product according to their willingness to pay (WTP). Define the customer's WTP for every feature/characteristic of your product.

Segmentation	Customer segmentation traditionally means identifying key characteristics that can categorize consumers into groups that can be targeted. These categories are usually related to general characteristics (company size, revenue, location, segment consumers are in, etc).	What are the segments among your consumers, according to their WTP? Could you categorize your consumers in groups according to their WTP?	Segment the consumers according to their WTP, and not according to their visible characteristics.
Value	Value is what the startup really wants to deliver to their customer when they purchase their product. This is from the startup's perception.	Does your current revenue model represent the value your offering to your consumers? Does your price/revenue model follow the increasing value of your product?	Define in price (how much) the value your product actually has.
Behavioral Economics	Behavioral Economics is a field of study that combines psychology and the economic decision-making processes of individuals and institutions. The field discusses decisions are influenced by people's unconscious mind.	How many options of prices do you have? What's is the reference price point for your product in the market?	Design different price tiers according to the features consumers value. Define the reference price point of your product.
Revenue Model	The revenue model is the way a company generates revenue. It is a key	What's your current revenue model?	Choose your revenue model according to the data found on the previous steps.

	component of a company's business model.	How was the process of deciding your revenue model? Who was involved in this process?	Define when the revenue model will be discussed again, who will be involved, and what are the financial indicators in the revenue model definition process.

Source: The author.

The operational guidelines show the questions and actions proposed to the startups in the interview process, and it could serve as a guide for future applications of the artifact. It is important to clarify the questions and actions developed in the research took under consideration the profile of the startups defined as the unit of analysis. The image of the complete dynamic version of the framework is available in Appendix E.

3.3.8 Evaluation of the Artifact

The original idea was to test the framework in workshops. However, due to the nature of information being disclosed by the startups taking part in the research, the author decided to test the framework on private interviews. The interviews happened according to the table 12 below:

Table 12 - Phase 2 interviews

STARTUP	**Date**	**DURATION**	**HOW**	**Goal**
Quanto Sobra?	June, 12th, 2017	39min	Skype	Interview 1 - Understand how the company decided their current revenue model strategy
Quanto Sobra?	July, 27th, 2017	47min	Skype	Test the framework
Runrun.it	June, 19th, 2017	43min	Skype	Interview 1 - Understand how the company decided their current revenue model strategy
Runrun.it	August, 04th, 2017	46min	Skype	Test the framework
Zeeng	June, 14th, 2017	44min	Skype	Interview 1 - Understand how the company decided their current revenue model strategy
Zeeng	August, 07th, 2017	43min	Skype	Test the framework
Loyalnow	June, 08th, 2017	33min	Skype	Interview 1 - Understand how the company decided their current revenue model strategy
Loyalnow	August, 08th, 2017	41min	Skype	Test the framework

Source: The author.

The evaluation of the framework (and its application) was made according to the guidelines defined on step 6, *Projecting the Artifact.* After transcribing the interviews, the researcher analyzed them to find specific parts that exemplified the criteria definied essential for the artifact: useful, practical, flexible, timeless and engaging. The evaluation is described on table 13 below:

Table 13 - Artifact evaluation

STARTUP	Criteria	Evaluation
Zeeng	**Useful**	"We have already discussed some of these questions before, but never with a proper reason. I see why asking ourselves these questions would be relevant now"
	Practical	"As a company, we should have thought about several things at the beginning. It would have been much easier to have thought about pricing all along"
	Flexible	"I like the fact I could use different steps with different people in my team."
	Timeless	"We should think about these questions from time to time. It does not seem coherent to forget about them once you have done it"
	Engaging	"I think following step by step makes it so much easier for me to follow through. I really like it"
Quanto Sobra?	**Useful**	"I learned a lot about how much thinking about our revenue model could do to our business model."
	Practical	"We are a very informal company. It is hard to follow a methodology of any kind, but I can see myself putting this into action"
	Flexible	"I would use step 1, 2 and 3 with all the company. Steps 4, 5 and 6 seem more complex, but I can see ourselves benefiting from it anyway"
	Timeless	"It would made sense to have asked ourselves these questions at the beginning. But it still does make sense to think about it now, there's still time"
	Engaging	"I want to present this to the rest of my team. They should think about these questions!"
Runrun.it	**Useful**	"We are going through a transformation process in our company, starting with our revenue model. It is amazing to start all the process from the real benefit the customer receives. We never did that"
	Practical	"I like it is short. We have never been able to have a meeting for more than 1 hour when we think about strategy"
	Flexible	"Do you mind going back to step 3? I think we should recap step 3 before moving forward because it makes more sense in our case"
	Timeless	"We should ask ourselves about pricing all the time. We are thinking about our customers, and who are the most important personas for us. I don't think this a static situation. We are not the same company we were 2 years ago"
	Engaging	"Do you mind if I call my Product Manager to watch this with us? There are some things I really need him to see"
Loyalnow	**Useful**	"It's very simple and to the point. It's hard to find any method that delivers a real benefit to us"
	Practical	"Some of the questions are complex, but I like there are only 6 steps, it does not require a lot of time from us"

	Flexible	"I could think about all of these questions by myself or with my team right, this is great."
	Timeless	"Loyalnow suffered at the beginning because we had no clue of how to propose our business model. But thinking about these steps I can see we could change several things now"
	Engaging	"Why didn't we think about this before? Of course the benefit has everything to do with the price we choose!"

Source: The author.

There were several contributions that came from the interviews that are not described here. The startups evaluated the artifact both positively and negatively in different aspects, and all of their feedback will be used to continue further developing the artifact. That is why evaluating is so important, once the idea of the evaluation is to make the design process even more creative. Building and evaluating is essential in the design research. Hevner et al. (2004, p. 78) agrees with this when they state "The evaluation of the artifact then provides feedback information and a better understanding of the problem in order to improve both the quality of the product and the design process." The framework proposed in this research will be developed by the contribution in the testing and evaluation step, demonstrating how important the evaluation guidelines are relevant to the design research.

3.3.9 Learning Description

In this step, after evalutating the artifact, it is the moment to interpret the results. This is the stage where the the researcher can present the practical academic lessons learned, and also describe all the limitations found during the research. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; GREGOR; HEVNER, 2013). In order to carefully describe this step the section will be split in topics.

a) Relation to the objectives: The objective of this research was to analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework. The research analyzed the startups' ecosystem and investigated the startups' decision making process when it comes to deciding their revenue model; The artifact proposed the startups look at pricing from a new angle, and tried to improve their decision making process.

b) Practical significance: All the startups interviewed evaluated the artifact positively. They mentioned how the framework could be used professionally, not only as an academic tool. Some of the startups even requested more material after the interview, and mentioned the framework could be used as a consulting business model.
c) Theoretical significance: The contribution was threefold: advancing the discussion on startups; bringing the Design Science Research – a mainstream method only in Information Systems and Production Engineering – to the Administration field; and also expanding the discussion of *pricing* from a static concept born in economics to a term applicable to the strategy field.
d) Limitations: The most relevant limitations to the research were the impossibility of testing the framework with a higher number of startups; the elements that could not be explored in the research, and that could also affect the startups' ecosystem; and finally the difficulty in accessing financial data from the startups.
e) Future research: This artifact could be tested with startups from different segments or locations; The artifact could also combine a financial step, and propose a qualitative-quantitative analysis of the revenue model.

The aspects of the Learning Description step – Relation to the objectives, Practical significance, Theoretical significance, Limitations and Future research - will be thoroughly discussed in the Conclusion of this study.

3.3.10 Conclusions

Table 14 summarizes the steps from the Design Research and this research project:

Table 14 - Research Project Steps

Step Project	**Step Design Research**		**How**	**When**
Data collection	1	Problem identification	Literature/Interviews	Qualification Project
Data collection	2	Problem awareness	Literature/Interviews	Qualification Project
Data collection	3	Systematic literature review	Literature	Qualification Project

Data collection	4	Artifact and class of problem identification	Literature/Interviews	Qualification Project/ Dissertation
Data analysis	5	Artifact proposal designed for the research problem	Literature/Interviews/Interviews part 2	Dissertation
Data analysis	6	Projecting the artifact	Literature/Interviews/ Interviews part 2	Dissertation
Data analysis	7	Development of the artifact	Literature/Interviews/ Interviews part 2	Dissertation
Data analysis	8	Evaluation of the artifact	Literature/Interviews/ Interviews part 2	Dissertation
Data analysis	9	Learning description	Literature/Data collected	Dissertation
Conclusion	10	Conclusions	Literature/Data collected	Dissertation
Conclusion	11	Generalization for a class of problems	Literature/Data collected	Dissertation
Conclusion	12	Result communication	Publication	Dissertation

Source: The author.

The conclusion will be thoroughly described in the final part of the research project.

3.3.11 Generalization for a Class of Products

It is important the analysis ensure the data will generate knowledge and be used for others problems in the same category, both in the practical and the academic field. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; VAN AKEN, 2005). The researcher may have new ideas during the analysis, which may lead to adjustments in the research, or even the beginning of a new research. This aspect reflects how fluid the method is, since it is possible to review the research in order to find an adequate solution to the problem. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015).

The fact the knowledge generated in the design research is amplified to a category of problems contributes to the progress of the method. The various problems in a category could benefit from a solution found in a design research. The results must be communicated in journals, seminars, congress, among others, hoping they may help both organizations and the academic community. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015; LACERDA et al., 2013). Table 15 outlines the classes of problems previously discussed on step four:

Table 15 - Classes of problems

Class of problem	**Artifact**	**Author**

Cost measurement	Framework for supply chain performance measurement	GUNASEKARAN; PATEL; MCGAUGHEY, 2004
Process mapping	Value Stream Map	ROTHER; SCHOOK, 1999
	Architecture of Integrated Information Systems ARIS	SCHEER, 2005
Project management	CPM (Critical Path Method); PERT (Programme Evaluation Review Technique)	GOLDRATT, 2002
Strategic alignment	Balanced Score Card	KAPLAN; NORTON, 1992; 2000
	CANVAS	OSTERWALDER; PIGNEUR, 2010
	Organizational Fitness Profiling	BEER; EISENSTAT, 1996
	Porter's Five Forces Model	PORTER, 1980
	Business model framework	HWANG; CHRISTENSEN, 2008
International entrepreneurship	Effectuation Theory	SARASVATHY, 2001
International business	Eclectic Paradigm/OLI-Framework	DUNNING, 1977

Source: The author, adapted from Dresch, Lacerda and Antunes Junior (2015).

In order to be a valid artifact in design science research, it is required the artifact could be extended to a class of problems, and not only to one specific and unique problem. (LACERDA et al., 2013). There is not an official definition for class of problem in the literature, but it could be described as a group of practical or theoretical problems composed by related artifacts. (DRESCH; LACERDA; ANTUNES JUNIOR, 2015). Based on the classes of problems presented on step four, the artifact proposed by this research is categorized as a *processual framework*, in the category of *strategic alignment*. This means the artifact could be tested in other examples in the same class of problem.

4 CONCLUSION

To answer the research question *which elements affect startups' decision making in pricing process and how could this process be improved*, the main objective of this research was to analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework. This main objective was unfolded in three specific objectives: the first was to understand how the revenue generation model is decided today by startups in Brazil; the second was to understand the elements in pricing decision making process in Brazilian startups; and the third was to design and propose a pricing framework for Brazilian startups to improve their decision making process.

This study achieved the first objective, which was to understand how the revenue generation model is decided today by startups in Brazil. The data collected in the pre-qualification interviews, and in the specific interviews with the startups, showed how inconsistent and confused this process is for startups. The respondents declared not having spent much time thinking about pricing, and some not even considered this a relevant step at all. The revenue model they ended up deciding was mostly according to existing models in the market, even if did not match their business strategy. Most startups decided prices based on the size of their customers; and all of the startups were facing difficulties in choosing a method to analyze their pricing strategy. Overall, *pricing* ended up an overlooked aspect of these startups business development.

After understanding how was the startups' pricing decision making process, the second specific objective was accomplished, which was to understand the elements in pricing decision making process in Brazilian startups. There are several elements that affect pricing decision making process in Brazilian startups – or elements that even contribute to the disregard of pricing as a relevant step, such as:

a) Entities - Corporations, Universities, Accelerators and the Government: Startups complain about the lack of public investment in the Brazilian ecosystem, and say this has a negative impact on the ecosystem's growth. Some corporations and accelerators fill this gap by providing more mentorship and access to funding. And some universities try to focus on entrepreneurial education, which is a long-term action for the Brazilian startups ecosystem.

b) Financial impact: There are some elements that contribute to the financial impact in the Brazilian ecosystem, such as high inflation, bureaucracy in public services and complicated tax regulations.
c) Social impact: The lack of entrepreneurial education in the ecosystem contributes to a lack of mentorship, which makes startups feel the ecosystem should be more collaborative than it is. Another element relevant here is the high-risk aversion Brazilians investors show, which means they are more willing to invest in conservative companies than on startups.

After developing the first and the second objective, the study accomplished the third objective, which was to design and propose a pricing framework for Brazilian startups to improve their decision making process. The third objective was developed because it was clear the pricing decision making was an overlooked process by startups, and for those who attempted to try, there were no practical tools that took into consideration the characteristics of the Brazilian ecosystem.

The artifact was developed in accordance with the Design Science Research guidelines, and it was defined as a *processual framework.* The artifact proposed the startups to test their pricing decision making process as a guided and interactive exercise, making a comparison with their first experience deciding about prices and revenue. The artifact was developed to be a useful, practical, flexible, timeless and engaging tool for Brazilian startups with digital solutions. These guidelines were defined aligned with the *problem* to be *solved* by the artifact proposed in the research.

The *processual framework* was designed based on Simon's three-step model of decision making: Intelligence, Design, and Choice. (SIMON, 1960). The framework proposes the startups decide what their most suitable revenue model – and *pricing* – is, after concluding a six-step-process: Real Benefit, Willingness to Pay (WTP), Segmentation, Value, Behavioral Economics and Revenue Model. Each step proposes questions to be answered and actions to be taken by the startups. After completing the six steps process, the startup is able to decide on their revenue model and *pricing*.

These three specific objectives helped to achieve the main purpose of the research, which was to analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework. The Design Science Research determines the research must propose a solution to the

research problem, so the *processual framework* proposes a new method for improving the decision making process in pricing for startups as the solution.

This study makes contributions at different levels. From the professional perspective, the study brings attention to *pricing* not only as a step on a business development checklist, but as a possible strategic ally for startups. The research on pricing and its impact explored *pricing* as an agent of change that could represent an increase in startups' chances of being successful in the market in emerging economies.

Still on the practical applications of the research, since no tools have been found so far focusing on pricing and its impact on startups or their ecosystem, the framework presented in this study is a professional improvement. The processual framework is a practical tool ready to be used by startups, regardless of their current development stage. Since the framework's step by step is thoroughly described in the Method and Results section, the possibility of future replications in startups is a legacy from this study.

From an academic perspective, the study contributes to: advancing the discussion on startups, a field so diverse that the definition of the term startup itself is still under development; it also contributes by bringing the Design Science Research – a mainstream method only in Information Systems and Production Engineering – to the Administration field. The method enabled an original approach to the research problem in this dissertation; finally, the study also contributes by expanding the discussion of *pricing* from a static concept born in economics to a term applicable to the strategy field.

It is important to describe there were limitations to the research, such as: the reduced number of startups in the framework testing stage; some elements that could not be explored in the research due to the limitations of the research itself, but that could also affect the startups' ecosystem; and finally the difficulty in accessing financial data from the startups, which restricted a possible quantitative analysis in the processual framework.

Future research could include testing the framework with startups from different segments or locations; the framework could also be redesigned considering different variables brought up in the interviews with the startups ecosystem; and future research could also adopt a qualitative-quantitative approach by proposing a financial step in the framework, providing a quantitative analysis.

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APPENDIX A – DESIGN RESEARCH PROTOCOL

Design Research Protocol	
Project	Artifact: Processual framework Objective: Analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework
Artifact development	The idea of the first version was to align the steps of Simon's model of decision making – Intelligence, Design, and Choice – to the steps proposed in the framework. Based on this first version, a second version was created, which was dynamic. The dynamic version was develop in a platform called Prezi Next. The artifact was developed in Portuguese, because all the startups being interviewed are in Brazil. The design is cyclic, and every step proposed a continuous reflection that results in answering the main question: What is my revenue model?
Artifact evaluation	a) Useful: The framework must be useful. Not only provoke good questions, but also provoke action. b) Practical: The framework must be simple and easy to use. c) Flexible: Although there is an order proposed by the researcher, the framework must be flexible enough to allow different orders among the steps without losing the original goal. d) Timeless: The framework has to allow the startups to use it many times as possible, and in different stages of their lives. e) Engaging: The framework must be well designed in order to retain the user's attention as much as possible. The important concepts must be clear, and the framework must be as visual as possible.
Learning process	a) Relation to the objectives: The objective of this research was to analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework. The research analyzed the startups' ecosystem and investigated the startups' decision making process when it comes to deciding their revenue model; The artifact proposed the startups look at pricing from a new angle, and tried to improve their decision making process. b) Practical significance: All the startups interviewed evaluated the artifact positively. They mentioned how the framework could be used professionally, not only as an academic tool. Some of the startups even requested more material after the interview, and mentioned the framework could be used as a consulting business model. c) Theoretical significance: The contribution was threefold: advancing the discussion on startups; bringing the Design Science Research – a mainstream method only in Information Systems and Production Engineering – to the Administration field; and also expanding the discussion of *pricing* from a static concept born in economics to a term applicable to the strategy field. d) Limitations: The most relevant limitations to the research were the impossibility of testing the framework with a higher number of startups; the elements that could not be explored in the research, and that could also affect the startups' ecosystem; and finally the difficulty in accessing financial data from the startups.

<table>
<tr><td></td><td>e) Future research: This artifact could be tested with startups from different segments or locations; The artifact could also combine a financial step, and propose a qualitative-quantitative analysis of the revenue model.</td></tr>
<tr><td>Conclusion</td><td>To answer the research question which elements affect startups' decision making in pricing process and how could this process be improved, the main objective of this research was to analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework. This main objective was unfolded in three specific objectives: the first was to understand how the revenue generation model is decided today by startups in Brazil; the second was to understand the elements in pricing decision making process in Brazilian startups; and the third was to design and propose a pricing framework for Brazilian startups to improve their decision making process.

These three specific objectives helped to achieve the main purpose of the research, which was to analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework. The Design Science Research determines the research must propose a solution to the research problem, so the processual framework proposes a new method for improving the decision making process in pricing for startups as the solution.</td></tr>
<tr><td>Generalization for a problem class</td><td>Based on the classes of problems presented on step four, the artifact proposed by this research is categorized as a processual framework, in the category of strategic alignment. This means the artifact could be tested in other examples in the same class of problem.</td></tr>
<tr><td>Result communication</td><td><table>
<tr><td></td><td>Essay</td></tr>
<tr><td>X</td><td>Dissertation</td></tr>
<tr><td></td><td>Thesis</td></tr>
<tr><td></td><td>Article in Journal</td></tr>
<tr><td></td><td>Article in Congress</td></tr>
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APPENDIX B – SCRIPT 1 – PRE-QUALIFICATION INTERVIEWS

SCRIPT 1 - ECOSYSTEM			
Research problem	Which elements affect startups' decision making in pricing process and how could this process be improved?		
General objective	Analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework.		
Specific objectives	**Question**		**Authors**
Understand how the revenue generation model is decided today by startups in Brazil.	**1**	Qual a sua visão do "ecossistema" de startups no Brasil? Para onde ele se direciona?	ANTHONY, 2012 BLANK; DORF, 2012 FREEMAN, 2002 KOHLER, 2016 ROUX, 2016 THIEL, 2014
	2	Como você enxerga o seu papel nesse ecossistema?	
	3	Na sua opinião, qual a importância das startups como fonte de inovação?	
Understand the elements in pricing decision making process in Brazilian startups.	**4**	O objetivo da pesquisa é discutir monetização. Qual a importância da monetização para o processo de desenvolvimento/lançamento de uma startup no Brasil?	BUCHANAN; O'CONNNEL, 2006 CARMICHAEL, 2014 KOHLER, 2016 ROUX, 2016

APPENDIX C – SCRIPT 2 – PRE-QUALIFICATION INTERVIEWS

SCRIPT B - STARTUPS			
Research problem	Which elements affect startups' decision making in pricing process and how could this process be improved?		
General objective	Analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework.		
Specific objectives	**Question**		**Authors**
Understand how the revenue generation model is decided today by startups in Brazil.	**1**	What was the biggest obstacle you faced when started your startup?	ANTHONY, 2012 BLANK; DORF, 2012 CARMICHAEL, 2014 RAMANUJAM; TRACKE, 2016 THIEL, 2014 ZOTT; AMIT, 2008
	2	How was the pricing definition process of your product/service?	
	3	Have you gone through an acceleration process? If so, how was this process?	
Understand the elements in pricing decision making process in Brazilian startups.	**4**	Is there any tool used by the company for decision making processes?	ARYELI, 2008; THALER; SUNSTEIN, 2009 BUCHANAN; O'CONNNEL, 2006 KAHNEMAN; TVERSKY, 1979 PAHL; RICHTER, 2015 SIMON, 1975; 1976

APPENDIX D – SCRIPT INTERVIEW PHASE 2

SCRIPT INTERVIEW PHASE 2 - STARTUPS			
Research problem	Which elements affect startups' decision making in pricing process and how could this process be improved?		
General objective	Analyze which elements affect startups' decision making in pricing process and understand how this process could be improved by a framework.		
Specific objectives	**Question**		**Authors**
Understand how the revenue generation model is decided today by startups; Understand the elements in pricing decision making process in Brazilian startups;	**1**	How was your pricing and revenue model decision-making when you first started?	ANTHONY, 2012 CARMICHAEL, 2014 RAMANUJAM; TRACKE, 2016
	2	Who was involved in that decision?	
	3	How long did it take?	
	4	Have you ever reviewed your revenue model?	

APPENDIX E – PROCESSUAL FRAMEWORK (TESTED MODEL)