

SYSTEMATIC LITERATURE REVIEW OF CRITICAL SUCCESS FACTORS OF INFORMATION TECHNOLOGY STARTUPS

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ABSTRACT

In the industry of Information Technology (IT) Startup, high birth rates go hand in hand with a high risk of failure; only one in three survive the first three years. There is a set of factors that influence the success of the Startup. So in this paper we present a Systematic Literature Review of critical success factors of IT Startups. Our keyword search found 1,013 papers and a total of 74 primary studies were selected and analyzed as a result of the systematic review. We identified 21 critical success factors grouped into three categories (organizational, individual and external) and 4 stages of development through which a Startup passes (seed, early, growth and expansion). In addition, we found that the experience previous start-up of the founding team and government support factors affect the seed stage; the venture capital factor affects the early stage; the clustering, technological/business capabilities of the founding team and venture capital factors affect the growth stage; and the clustering factor affects the expansion stage. There are few studies on the stages of development that a Startup undergoes, much less on the factors that affect the stages of development.

Keywords: Critical Success Factors, IT Startup, New Technology-Based Venture, Stage

INTRODUCTION

At the moment of undertaking, fundamentally in the technology sector, it is necessary to carry out a deep analysis not only of the national market, but of the global market, to see if our idea has already been proposed or is already being exploited, since once launched the product or service to the market of a country, its international expansion is practically implicit (Joshi & Satyanarayana, 2014). In many countries in the region and in the world, there is a growing trend towards new innovative businesses, so new technology-based companies (Startups) are born each year (Hormiga *et al.*, 2010). The study by Krejci *et al.* (2015) indicated that a Startup is a new and temporary company that has a business model based on innovation and technology. In addition, these types of companies have a potential for rapid growth and scalability. Startups are known to governments around the world for their contribution to economic stability, growth, and job creation (Sulayman *et al.*, 2014). The figure of Startup has acquired an important relevance in the most dynamic markets of the world as a new model of social and economic growth (Olawale & Garwe, 2010). According to Kelley & Nakosteen (2005), Startups are important for the development of the economies of the countries and especially important in the developing countries. The concept of Startup is identified with those organizations that begin or are in their

earliest stages of development (Spiegel et al., 2015). According to Cho & McLean (2009), Information Technology (IT) Startups, also referred to as new technology-based enterprises, are those temporary organizations that create innovative products and/or services using high technology, but this Type of companies are also known to be inserted in uncertain and risky scenarios, proof of this is their high mortality rate (Preisendorfer et al., 2012). Unfortunately, the failure rate of such firms is high worldwide (Cowling et al., 2006; Colombo & Grilli, 2005; McAdam & McAdam, 2008). According to Ejeremo & Xiao (2014), between 1990 and 2000, only 21 percent of IT Startup in Sweden survived after 5 years. On the other hand, Hyder & Lussier (2016) affirms that more than 80 percent of Startups fail in their first year of existence. In the last decades, an extensive literature on the factors influencing the success of the Startup has been developed (Yoon-Jun, 2010), although there is a lack of consensus in determining what these factors are, along with a lack of knowledge about the Startups (Sulayman et al., 2014), so it is preponderant to identify the critical success factors of the IT Startup, in order to mitigate the risks of failure and, consequently, increase their success. Since 1984, with the work of Van de ven et al. (1984), studies have been carried out to identify, analyze and discuss the main factors that influence the success of the Startup (e.g. Almakenzi et al. 2015, Anh et al., 2012 Balboni et al., 2014, Banda & Lussier, 2015). However, these studies have paid scant attention to categorizing the identified factors, which according to Bocken (2015) all factors must be within a certain category. In addition, factors must be classified to distinguish between different types of factors influencing success. Although there are few studies that have tried to identify the stages of development of the Startup, they have paid little attention to a stage called the exit stage, which determines the sale of the business. Recently, Pugliese et al. (2016) recognized the need for a more complete understanding of the stages of development of the Startup and the importance of knowing how to manage each stage to achieve success. However, it is important to identify which factors of success are relevant or influence the stages of development. However, there isn't a work on literature review that organizes all these works in a systematic way that classifies the success factors into categories, that identifies the stages of development of the IT startup and that determines the factors that influence each stage of the life cycle. In addition, several papers state that there is a large discrepancy in the literature on the factors influencing success or failure. Therefore, our research is in addition to these previous works, making a Systematic Literature Review on factors influencing success, factor categories and factors that are most important at different stages of development, which is summarized in the following research question: What aspects have been developed about the success of the IT startup?

This article is organized in five sections. Section two describes the research methodology used. Section three presents the analysis of the results of the selected literature. Section four presents the discussion of the study and future research is suggested. Finally, in section five, the conclusions are shown, which describes how each of the objectives of the research has been fulfilled.

RESEARCH METHODOLOGY

A Systematic Literature Review is a clear and reproducible procedure consisting of a series of phases that help researchers in defining the goal of research and planning the way in which articles are retrieved and reported (Ardito et al., 2015). This study has followed a series of steps to provide a systemic, transparent and reproducible methodology:

- **Planning the review:** In this phase, the research questions are elaborated and the search protocol is defined.
- **Development the revision:** In this phase, the defined protocol is applied and the primary articles are obtained according to the established criteria.
- **Results the review:** In this phase, we present the results of the search and analysis of the studies that have been selected. This analysis will be described in the Analysis section.

Planning the Review

In order to answer the research question, the following questions are asked about the factors that influence the success of the Information Technology Startup.

Q1: What is success for startup?

Q2: What factors influence success?

Q3: What are the categories and how is success factors categorized?

Q4: What are the development stages and what factors influence each stage?

The search sources are given by Journal banks: Science Direct, Springer Link, IEEE Xplore Digital Library, ACM Digital Library, Emerald, Taylor & Francis. The search period begins in the year 2003, because from that year they increase the studies about the factors that influence the success.

We used the following search string in the titles, abstract and keywords: (factors OR variable OR determinants OR driver OR reason OR category OR agent) AND (technology startup OR software startup OR tech startups OR IT startup OR high tech startup OR new technology-based venture OR technology-based startup OR small business tech OR firms startup).

Development the Review

Inclusion and exclusion criteria have been considered, as shown in Tables 1 and 2, respectively.

Inclusion Criteria	Reason for inclusion
Research focus	Studies that identify the critical success factors and desirable those that categorize the factors and show the development stages.
Quantitative empirical studies	These articles are included because they provide extant empirical evidence, which represents the main interest of this review.
Impact factor	Only articles of Journals with SJR impact factor are considered.
English language	Only English studies are considered.

Inclusion Criteria	Reason for exclusion
Publication type	Exclude books, book chapters, conference proceedings and dissertations.
Unit of Analysis	Exclude studies that do not consider technology-based startups.
Research focus	Studies that do not show research methodology, numerical tests (descriptive statistics) and analysis or discussion.

In the first step, the keywords and their respective descriptors were used to search the primary articles in defined banks. The review was limited to articles in peer-reviewed journals, leaving out books, book chapters, and conference proceedings, since journal articles are considered to be valid knowledge and represent authoritative statements on the subject (Ardito et al., 2015). Specifically, the search was limited to high quality journals in the field of "Entrepreneurship" and "Startup" with an impact factor higher than 1.5. The search procedure considered the available editions of journals from the 2003 period. A total of 1,013 potential studies were identified, these were subjected to a selection process according to the criteria of inclusion and exclusion established. Thus, first, we divide the articles into "excluded articles" (870 articles) and "articles of check the complete text" (143 articles), it was necessary to carry out a previous review of the titles and abstracts. However, many abstracts do not provide a clear understanding of the purpose of the articles, with 112 references being selected. Then, a more detailed analysis of the articles of "full text check", we proceeded to read the introduction and conclusions, obtaining 90 references. Finally, we proceeded to read the complete content of the article in order to determine its relevance for the present study and, mainly, to determine if these studies identify the critical success factors. Thus, the final sample consists of 74 primary studies. It is worth mentioning that the enormous fall in the number of articles that we are facing is not alien to the bibliographical revisions. In fact, most of them often have a large number of articles in a first round of article search (Bakker, 2010), which declines as academics continue with an in-depth analysis of their content against a set of inclusion and exclusion criteria. The high number of articles excluded in the search process is due to the general nature of our search terms. In fact, they are commonly used in different types of studies about entrepreneurship and startups. We believe that this choice is justified by the fact that the selected journals have been published manuscripts of the highest quality for a long time. Therefore, it allows us to review the most representative and highly relevant literature (Ardito et al., 2015).

The applied processes, as well as the results obtained in each step of the process, are represented in Figure 1.

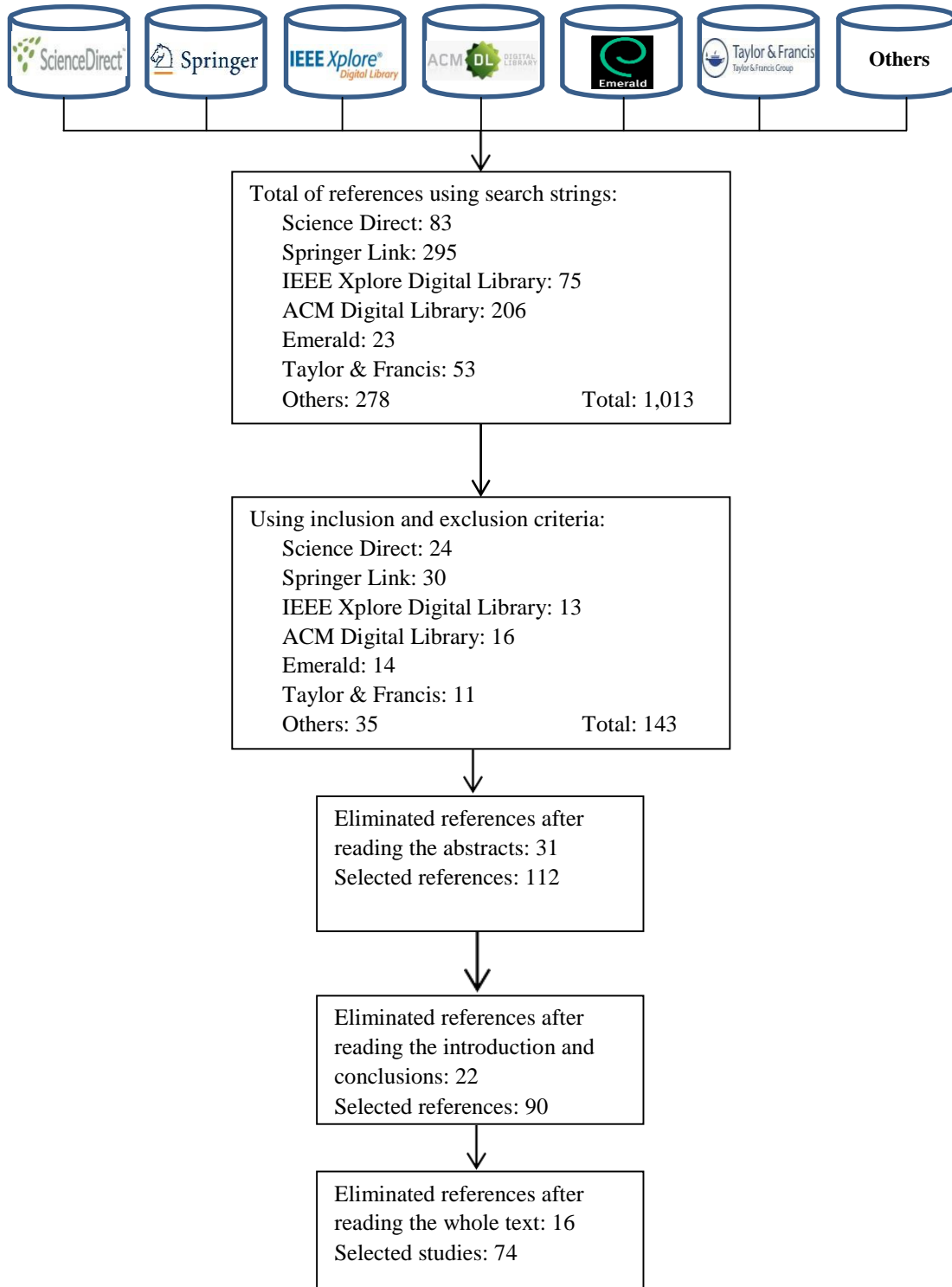


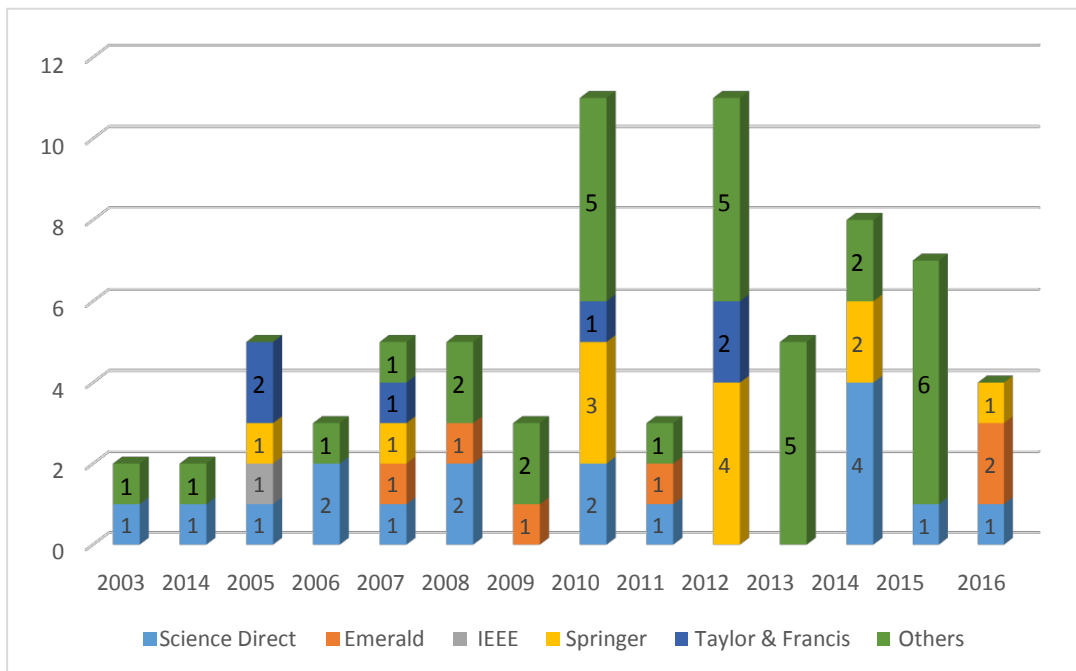
Figure 1
FLOW OF THE PROCESS FOR THE SELECTION OF ARTICLES

Results the Review

The result of the selection process of the articles gave 1,013 studies, of which 74 were selected. Only one study was a Systematic Literature Review (Pugliese et al., 2016), the other 73 were contributions, which were analyzed to answer the research sub questions. In Table 3, the number of studies selected after applying the process flow of Figure 1 is shown.

Sources	Potentially eligible studies	Selected studies
Science Direct	83	17
Springer	295	12
IEEE Xplore	75	1
ACM Library	206	0
Emerald	23	6
Taylor & Francis	53	6
Others	278	32
Total	1,013	74

Once the articles were selected, the trends of publications by each database were identified. The sample of articles resulting from this methodology was published between 2003 and 2016, as shown in Figure 2, but more than half of the studies were published after 2010. The present study, therefore, seems timely, as there was recently an increase in the number of academic papers on the factors influencing the success of the Startup.



**Figure 2
TRENDS IN PUBLICATIONS RELATING TO CRITICAL SUCCESS FACTORS**

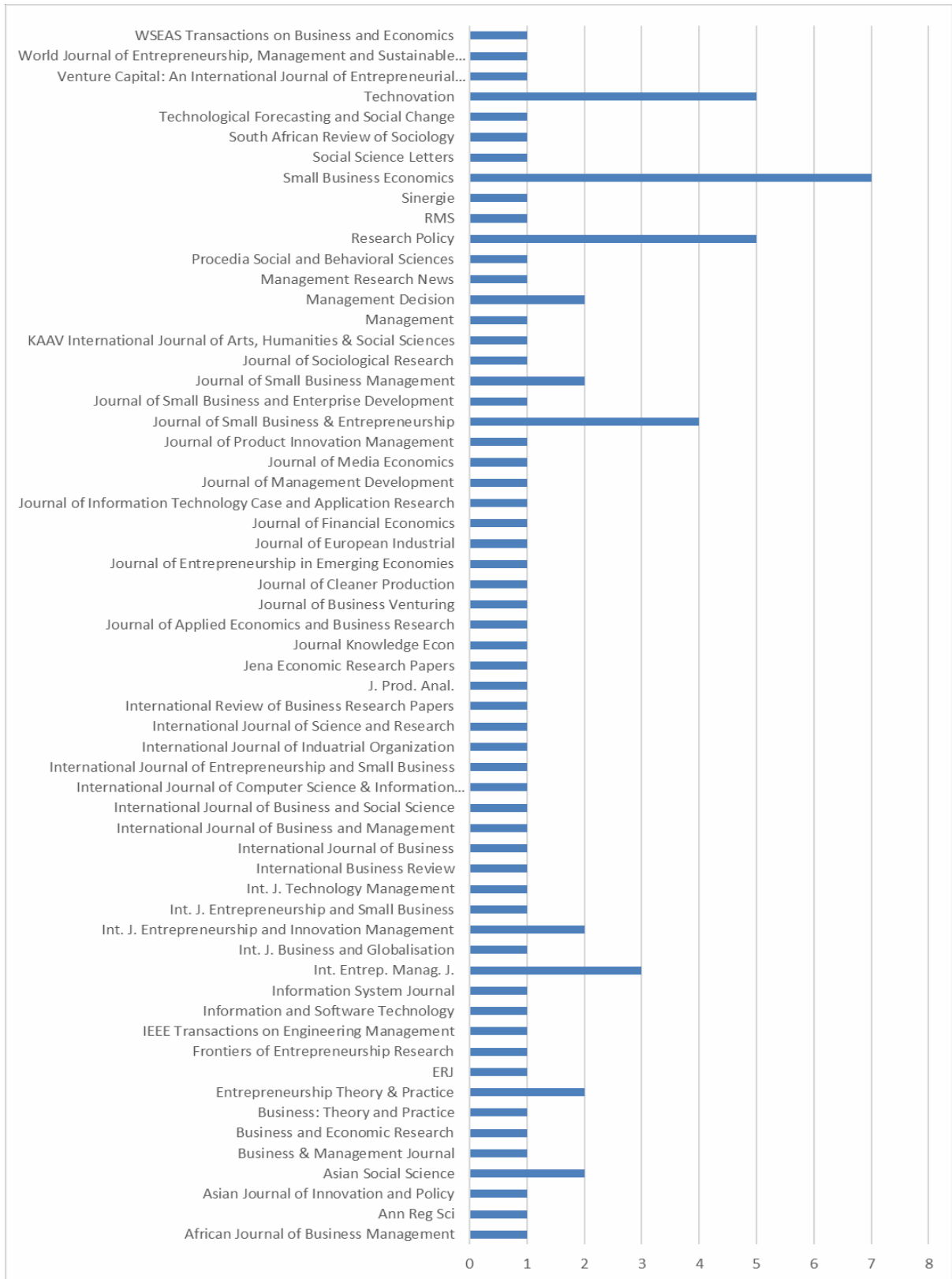


Figure 3
NUMBER OF ARTICLES PER JOURNAL

Furthermore, Figure 3 offers a detailed view of the journals where the selected articles were. It is worthy of note how this topic is widespread in the business and management literature, covering 60 different journals. Specifically, *Small Business Economics* published the most articles (7), followed by *Technovation* (5), *Research Policy* (5) and *Journal of Small Business and Entrepreneurship* (4).

73 of the selected studies have been oriented to carry out case studies on critical success factors, with the United States being the country where the most case studies have been developed, with a total of 11 studies, which represents 15% of all cases of study, as detailed in Table 4.

Region for cases of study	References	Total
Africa	(Preisendorfer et al., 2012; Olawale & Garwe, 2010)	2
North America	(Diochon et al., 2007; Song et al., 2008; Gartner & Liao, 2012; Ouimet & Zarutskie, 2014; Spiegel et al., 2015; Leary & DeVaughn, 2009; Maine et al., 2010; Kelley & Nakosteen, 2005; Davis & Zweig, 2005; Friar & Meyer, 2003; March-Chorda, 2004; Banda & Lussier, 2015)	12
South America	(Arruda et al., 2013)	1
Asia	(Almakenzi et al., 2015; Dornberger & Zeng, 2009; Cho & McLean, 2009; Yoon-Jun, 2010; Kim & Heshmati, 2010; Yoo et al., 2012; Wing-Ki et al., 2005; Ng et al., 2014; Joshi & Satyanarayana, 2014; Kakati, 2003; Morteza et al., 2013; Chorev & Anderson, 2006; Gimmon & Levie, 2010; Abou-Moghli & Al-Kasasbeh, 2012; Hyder & Lussier, 2016; Bou-Wen et al., 2006; Thiranagama & Edirisinghe, 2015; Anh et al., 2012; Thanh, 2015; Lei-Yu et al., 2008; Wei-Wen, 2009)	21
Europe	(Schneider et al., 2007; Gottschalk & Niefert, 2013; Dautzenberg & Reger, 2010; Strehle et al., 2010; Mueller et al., 2012; Festel et al., 2013; Biga & Gailly, 2011; Hormiga et al., 2011; Hormiga et al., 2010; Garcia-Muiña & Navas-López, 2007; Rojas & Huergo, 2016; Miettinen & Littunen, 2013; Marie-Estelle & Francois, 2014; Lasch et al., 2007; Spyros & Nickolaos, 2012; Groenewegen & De Langen, 2012; Van Gelderen et al., 2005; Colombo & Grilli, 2010; Balboni et al., 2014, Colombo & Grilli, 2005; Bertoni et al., 2011; Pirolo & Presutti, 2010; Colombo et al., 2004; Baptista et al., 2007; Ganotakis, 2012; O'Regan & Sims, 2008; Cowling et al., 2006; Krejci et al., 2015; Ejermo & Xiao, 2014; Stucki, 2016; Bocken, 2015; Grilli & Murtinu, 2014; McAdam & McAdam, 2008; Colombo et al., 2010; Sulayman et al., 2014; Cannone & Ughetto, 2014; Chirjevskis & Dvortsova, 2012)	37
Total		73

Several European countries are aware that support for the creation of new innovative technological ventures with a high potential for growth in the market is important for the development of their economies. Meanwhile, the outlook for this type of business in Latin America today is more encouraging, with a range of traditional support programs in seed capital, investment angels and venture capital.

ANALYSIS

This section responds to the research sub-questions raised in the review planning.

Q1: What is Success for Startup?

In the literature there are several studies that try to define the success of the Startup. Success is a term that means different things to different people; it is likely that entrepreneurs define success differently from an investor or a client. For example, an entrepreneur could define success in terms of whether the business can generate higher revenues, another could define it according to whether it achieves personal fulfillment. While an investor can define it as if the company where it invests allows you to earn more money. Table 5 shows the different success definitions found in the selected studies.

Definition	Reference
Success is defined by the number of jobs the company has generated.	(March-Chorda, 2004)
It is given by its share in the market and the size of the customers.	(Van Gelderen et al., 2005)
It is the growth of sales and profitability, which has to be similar or higher than the industry average.	(Wing-Ki et al., 2005; Hormiga et al., 2010)
Success in the entrepreneurial ecosystem is that they buy or get you to go public.	(Colombo & Grilli, 2010; Krejci et al., 2015; Hyder & Lussier, 2016)
It is having a business that allows you to live the way you want. Some employers want to avoid working for someone else.	(Chirjevskis & Dvortsova, 2012)
It is the achievement of the goals and objectives of the company and also as a measure of good management.	(Anh et al., 2012; Thanh, 2015)
Success is in creating something that truly contributes to improving the lives of others.	(Sulayman et al., 2014)
It is the good financial performance of the company.	(Spiegel et al., 2015)

From Table 5, it is observed that there is no standard definition of success in the literature. However, all the definitions have something in common: the growth of the company and the number of jobs generated. With respect to growth, it is a validation that the product and/or service offered by startup has the ability to attract users/customers. On the other hand, the creation of jobs is directly influenced by the growth of the company and the growth of the entrepreneurial ecosystem.

In this study, a successful startup is considered a new company that offers products and/or services capable of being well received in the market, looking for a repeatable, profitable and scalable business model, generating jobs or Manage to transform the way people do things.

Q2: What Factors Influence Success?

For the present investigation, it is understood by factors to those elements that can condition the success or failure of a startup. Of the publications selected, 21 statistically proven success factors have been identified, which are shown in Table 6, where the factors that positively or negatively influence the (+) or (-) signs are identified respectively.

Table 6
FACTORS THAT INFLUENCE THE SUCCESS OF THE STARTUP

Id	Factor	Definiti	References
F1	Experience in the industry of the founding team (+)	Founders with previous experience in the industry have a solid network of contacts that facilitate the development and growth of the company.	(Spyros & Nickolaos, 2012; Preisendorfer et al., 2012; Anh et al., 2012; Baptista et al., 2007; Bou-Wen et al., 2006; Colombo et al., 2004; Dautzenberg & Reger, 2010; Friar & Meyer, 2003; Gartner & Liao, 2012; Hyder & Lussier, 2016; O'Regan & Sims, 2008; Pugliese et al., 2016; Rojas & Huergo, 2016; Thiranagama & Edirisinghe, 2015; Wei-Wen, 2009; Yoo et al., 2012)
F2	Previous experience startup of the founding team (+)	The entrepreneurial experience of the founding team facilitates the launch of the company and prevents the appearance of errors in its management.	(Van Gelderen et al., 2005; Song et al., 2008; Baptista et al., 2007; Bou-Wen et al., 2006; Colombo et al., 2004; Dautzenberg & Reger, 2010; Davis & Zweig, 2005; Friar & Meyer, 2003; Gartner & Liao, 2012; Kim & Heshmati, 2010; Pugliese et al., 2016; Mueller et al., 2012; Bocken, 2015)
F3	Academic formation of the founding team (+)	It is the academic preparation in courses of management of the founding team, which has a positive impact on organizational growth.	(Van Gelderen et al., 2005; Baptista et al., 2007; Bou-Wen et al., 2006; Colombo et al., 2004; Dautzenberg & Reger, 2010; Davis & Zweig, 2005; Gartner & Liao, 2012; Hyder & Lussier, 2016; Pugliese et al., 2016; Rojas & Huergo, 2016; Thiranagama & Edirisinghe, 2015)
F4	Technological/business capabilities of the founding team (+)	Technological and managerial skills, aptitudes and knowledge required to gain competitive advantage.	(Garcia-Muiña & Navas-López, 2007; Groenewegen & De Langen, 2012; Yoon-Jun, 2010; Li et al., 2010)
F5	Experience in R&D of the founding team (+)	In order to develop innovative products and/or services, the entrepreneurial team needs to have previous research experience.	(Baum & Silverman, 2004)
F6	Experience in management of the entrepreneur (+)	It is the experience of the entrepreneur in organization and general management of the resources necessary to bring success to the company. It also describes the degree of competencies (attitudes, skills or abilities) of the entrepreneur to meet the objectives and goals.	(Groenewegen & De Langen, 2012; Van Gelderen et al., 2005; Anh et al., 2012; Arruda et al., 2013; Baptista et al., 2007; Bou-Wen et al., 2006; Cannone & Ughetto, 2014; Hyder & Lussier, 2016; Strehle et al., 2010; Thiranagama & Edirisinghe, 2015; Yoo et al., 2012; Fini et al., 2009)
F7	Leadership of the entrepreneur (+)	They are the characteristics and abilities of the entrepreneurial leader to lead the organization to fulfill its	(Schneider et al., 2007; Wei-Wen, 2009)
F8	Gender of the entrepreneur (+)	It is the participation of men or women as founders of the company.	(Becchetti & Trovato, 2002)
F9	Age of the entrepreneur (+)	It is a relevant factor for the development of a business. The probability of undertaking decreases as the individual's age increases.	(Oakey, 2003)

Table 6			
FACTORS THAT INFLUENCE THE SUCCESS OF THE STARTUP			
Id	Facto	Definitio	References
F10	Initial motivation of the entrepreneur (+)	The motivation of the founder represents his commitment to the project or idea of company.	(Greve & Salaff, 2003; Reynolds & Miller, 1992)
F11	Government support (+)	It is the financial sponsorship of the government, through seed capital, in the initial stage of startup, are also support programs made, especially for startup.	(Lasch et al., 2007; Chorev & Anderson, 2006; Anh et al., 2012; Arruda et al., 2013; Davis & Zweig, 2005; Pugliese et al., 2016)
F12	Venture capital (+)	It is the entrepreneurial capital that consists of financing startup in the phase of growth with high potential and risk.	(Bocken, 2015; Grilli & Murtinu, 2014; Almakenzi et al., 2015; Bertoni et al., 2011; Colombo et al., 2010; Kim & Heshmati, 2010; Strehle et al., 2010; Yoon-Jun, 2010)
F13	Level of competence	It is the intensity of competition between Startups within the same industry.	(Song et al., 2008; Arruda et al., 2013)
F14	Organizational size (+)	It is the number of founding employees of the startup, it is considered that the bigger the size of the entrepreneurial team, the greater the talent.	(Song et al., 2008; Ganotakis, 2012; Baptista et al., 2007; Bou-Wen et al., 2006; Colombo et al., 2004; Dautzenberg & Reger, 2010; Gartner & Liao, 2012; Rojas & Huergo, 2016; Thiranagama & Edirisinghe, 2015; Gottschalk & Niefert, 2013; Joshi & Satyanarayana, 2014; Cannone & Ughetto, 2014; Strehle et al., 2010)
F15	Organizational age (+)	They are the years of operation of the company from its creation.	(Haltiwanger et al., 2012)
F16	Product Innovation (+)	Degree in which new innovative products and/or services are introduced.	(Almus & Nerlinher, 1999)
F17	Location (+)	It is the geographic location of the startup in a given location, being closer to its suppliers and customers facilitates growth.	(Hormiga et al., 2011)
F18	Dynamism of the environment	It is the high pace of changes in the external environment of the company.	(Timmons & Spinelli, 2004)
F19	Science and technology policy (+)	Political authorities give laws for the development of science and technology.	(Scarborough & Zimmerer, 2003)
F20	Clustering (+)	Group of interrelated companies that work in the same industrial sector and that collaborate strategically to obtain common benefits.	(Maine et al., 2010; Yoon-Jun, 2010; Mueller et al., 2012)
F21	Partner (+)	It is a person or company with which an agreement, agreement or alliance is maintained.	(Sefiani & Bown, 2013)

All the factors explained in Table 6 are closely related and must be taken into account when defining the Startup's competitive strategy.

Some critical success factors have different names, for example: *government support* (F11) has synonymous with government funding (Silva & Costa, 2013); *The clustering* factor (F20) is also called support for business networks (Maine et al., 2010); *The academic formation of the founding team* (F3) is also called the education level (Thiranagama & Edirisinghe, 2015); *The venture capital* (F12) is known as external investment (Bocken, 2015),

and finally *organizational size* (F14) is also called the size of the founding team (Rojas & Huergo, 2016). According to Groenewegen & De Langen (2012), entrepreneurship management experience (F6) is often analyzed in the literature, and is that many successful StartUps were run by a CEO who had previous experience in company management. In addition, the management experience allows the entrepreneur to efficiently manage the company's resources to achieve success (Van Gelderen et al., 2005, Anh et al., 2012, Arruda et al., 2013, Baptista et al. 2007; Bou-Wen et al., 2006). With regard to the academic formation of the founding team (F3), IT startup entrepreneurs, on average, have a university education, unlike other sectors (Van Gelderen et al., 2005; Baptista et al., 2007; Bou-Wen et al., 2006). Another important factor analyzed in the literature is the experience in the entrepreneurial team industry (F1), several studies indicate that it directly influences success (Spyros & Nickolaos, 2012; Preisendorfer et al., 2012; Anh et al., 2012; In this paper, we present the results of the initial study of the StartUp, which is based on the results obtained by the authors of the study. The clustering (F20) also contributes to the success of the new company, since they present networking opportunities and can interact with other companies of the same sector (Banda & Lussier, 2015; Hormiga et al., 2011; Abou-Moghli et al., 2012).

From the Systematic Literature Review making the studies selected, 13 critical success factors have been identified and are shown in Table 7.

Factor	Definition	References
Marketing Experience	In order to be able to sell the products and/or services, the entrepreneurial team needs to have previous marketing experience.	(Dimov et al., 2007)
Potential untapped market	They are emerging markets or market segments that have not seen product offerings.	(Berry, 1996)
Market growth rate	Degree in which the average sales of the company increase, with respect to the industry.	(Pandey, 1996)
Distribution channels	Means through which entrepreneurs make products and/or services available to consumers to purchase.	(Stuart & Abetti, 1987)
Initial capital	It is generally used to put the idea on paper and cover the initial expenses of the business.	(Deakins & Whittam, 2000)
Level of independence of the entrepreneur	It is possible to survive with our company or venture, without having to resort to third parties.	(Phan & Foo, 2004)
Social skills of the entrepreneur	It is the ability of the entrepreneur to communicate and negotiate with other people or companies.	(Klepper, 2001)
Business attitude of the entrepreneur	It is the ability to create or start a project, a company.	(Castrogiovanni, 1996)
Personality of the founders	Personality allows the founding team to know how to face the difficult moments in the company.	(Van de ven et al., 1984)
Unemployment of the entrepreneur	It is a factor that conditions the entrepreneur to set up his own company, in order to be able to survive.	(Verheul & Thurik, 2001)
Familiar surroundings	Factor that favors the entrepreneurial initiative, especially when it is in a familiar business environment.	(Malecki, 1990; Davidsson et al., 1994)

Factor	Definition	References
Business plans	Document that includes the objectives, strategies, organizational structure, amount of investment to finance the enterprise.	(Miner & Raju, 2004)
Technological resources	They are an essential part of the company and help to develop everyday operations.	(Alvarez & Barney, 2001)

Table 7 shows the factors that have been proposed in several studies. However, the numerical tests performed in the studies do not confirm their influence on the success of the Startup.

Q3: What are the Categories and how is the Success Factors Categorized?

The categories allow for there to be a classification of the success factors that share common characteristics. Out of the selected studies, 3 success factor categories have been identified: organizational, individual and external.

In the *organizational category*, also called organizational factors, the studies have been focused on factors such as the organizational age (Song et al., 2008) and the organizational size (Ganotakis, 2012; Baptista et al., 2007). In the study of Hormiga et al., (2011), they've taken the role of the location of the company as a facilitating factor for success because it allows the startup to be closer to the providers but especially close to the final clients. On the other hand, Banda & Lussier (2015) claim partners are important for the survival and growth of the Startups.

The *individual's category* represent the challenges related to the human capital of the startup (the entrepreneur leader and the work team). The connection between the human capital of a company and the business success has been studied in many works. In the studies done by Morteza et al., (2013) and Preisendorfer et al., (2012), they study the interaction between human capital and success; the results obtained establish a strong positive connection, especially when the human capital that is involved in the company is well trained and has the necessary experience.

Lastly, the *externals category* is also called characteristics of the environment where the Startups operate. Some researches point out that the external factors can work/act/serve as the driving force behind the performance and growth of the organization. According to Chorev & Andersin (2006), many times the success of a company can be influenced by factors foreign to the company such as the competitive rivalry, innovation, changes in the processes and technologies. In recent years, the study of the ways of financing the startup has caught quite the attention. A better financial capacity gives the startup a better agility in the change of product and technology and these then results in a better adjustment/adaptation to the demand of the client. The lack of financing is often one of the reasons entrepreneurs give up on their business initiatives (Van Gelderen et al., 2005; Song et al., 2008; Morteza et al., 2013; Kakati, 2003). Table 8 shows these categories and the classification of the 21 success factors.

Category	Definition	References	Factor
Organizational	Group of factors that define the firm characteristics of the startup.	(Groenewegen & De Langen, 2012; Preisendorfer et al., 2012; Lasch et al., 2007; Gottschalk & Niefert, 2013; Yoon-Jun, 2010; Festel et al., 2013; March-Chorda, 2004)	F14, F15, F16, F17, F20, F21
Individuals	Consists of the groups of characteristics of the entrepreneur leader and the founding team.	(Groenewegen & De Langen, 2012; Preisendorfer et al., 2012; Lasch et al., 2007; Van Gelderen et al., 2005; Colombo & Grilli, 2010; Gottschalk & Niefert, 2013; Song et al., 2008; Miettinen & Littunen, 2013; Morteza et al., 2013; Hormiga et al., 2010; Gimmon & Levie, 2010; Spiegel et al., 2015; Leary & DeVaughn, 2009; Kakati, 2003; Yoon-Jun, 2010; Wing-Ki et al., 2005; Chorev & Anderson, 2006; Chirjevskis & Dvortsova, 2012; Festel et al., 2013)	F1, F2, F3, F4, F5, F6, F7, F8, F9, F10
Externals	Factors that are in the environmental context and that describe the scene where the startup develops its activity.	(Van Gelderen et al., 2005; Chorev & Anderson, 2006; Song et al., 2008; Yoon-Jun, 2010; Miettinen & Littunen, 2013; ;Festel et al., 2013; Thanh, 2015; Kakati, 2003; Balboni et al., 2014; Wing-Ki et al., 2005; Stucki, 2016; Dornberger & Zeng, 2009; Olawale & Garwe, 2010; Morteza et al., 2013)	F11, F12, F13, F18, F19

Q4: What is the Development Stages and What Factors Influence Each Stage?

The development stages are phases that constitute the life cycle of a startup. In the research done by Wing-Ki et al. (2005), they suggest 6 stages: *preparation for Start-up*, an entrance evaluation is performed in order to assess the incubation program applicants; *incubación process*, where the services and resources are channeled for the creation, consolidation and escalation of the business in the market; *incubatee performance measures*, these measures help to have a better understanding of where their Startups are incubated and how to enhance their performance; the *exit policies*, an experienced business incubator must be capable of providing professional knowledge and experience so as to help their Startups towards graduation; *parental care*, not all incubated Startups may have gained enough maturity to be able to operate independently, an extended period of care can make them stronger in competing with others; and, lastly, *disconnect incubator*, the incubated Startups are ready to become an independent business to enter the competitive world. On the other hand, the study done by Yoon-Jun (2010) identified 3 stages: *incubation*, companies identify the practical business ideas, review and evaluate the possibility of commercialization and produce early products; *growing*, companies start producing, launching and selling their products and/or services as a result of the technology development, and *maturing*, the focus is on maintaining the growth rate and developing additional products. However, Pirolo & Presutti (2010) identified two stages: *Emergence*, the first stage, normally there's very small equipment, it gets put into action and gives way to the first outline and *early growth*, the entrepreneurs typically search the financing of the biggest venture capital from investing angels. Likewise, Mueller et al. (2012) identified 2 stages: *Startup*, entrepreneurs focus on the business opportunity that they plan to take advantage of, the exact starting activities such as

the development of a prototype, the organization of a founding team and equipment purchasing and *growth*, resources are collected to finance a rapid growth; the entrepreneur focuses on the strategic alliances. Meanwhile, Ng et al. (2014) identified 3 stages: *early*, the company builds its initial business team; *growth and development*, this stage is affected by the management of resources and *expansion*, in this stage the human capital appears as the driving force for the companies to expand rapidly, furthermore, the technologic infrastructure helps the enhancement of the critical actives and the innovation of the products and/or services. However, Bocken (2015) identified 4 stages: *seed*, this stage is influenced by family, friends, entrepreneur’s own capital and government support; *young*, in this stage the products and/or services are in production and the first clients turn up; *growing*, the sales and the clients are increasing and the competition intensifies; and lastly, *mature*, the sales and benefits tend to be stable. Nevertheless, competition remains ferocious and a decision needs to be made as to whether to expand the company or not. In the work done by Almakezi et al., (2015), 2 stages were identified: *Incubation*, in this stage the entrepreneur leader evaluates the team’s commitment and validates de business model; on the other hand, in the *Post incubation* stage, the market evolution and the emergence of substitute and competing products are evaluated. Table 9 shows the identified stages of the selected studies.

Reference	Stages of development					
(Wing-Ki et al., 2005)	Preparation for Start-up	Incubation process	Incubatee performance measures	Exit policies	Parental care	Disconnect incubator
(Yoon-Jun, 2010)	Incubation			Growing		Maturing
(Pirolo & Presutti, 2010)	Emergence			Early growth		
(Mueller et al., 2012)	Start-up			Growth		
(Ng et al., 2014)		Early		Growth and Development		Expansion
(Bocken, 2015)	Seed	Young		Growing		Mature
(Almakezi et al., 2015)	Incubation			Post incubation		

In order to identify the factors that influence the development stages in the startup, this work has considered the stages showed in Figure 4.

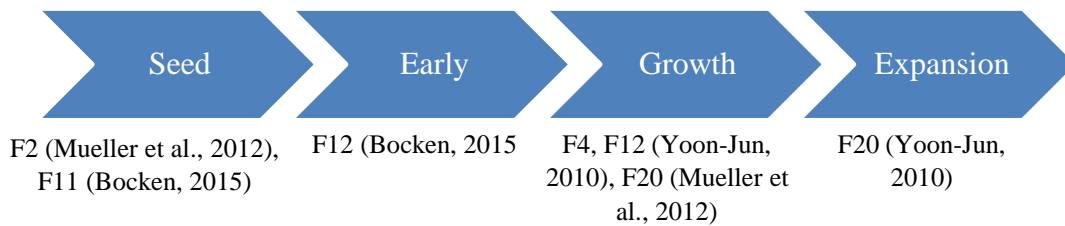


Figure 4
SUCCESS STAGES AND FACTORS

The *seed stage* is also called preparation for Start-up (Wing-Ki et al., 2005); emergence (Pirolo & Presutti, 2010) and start-up (Mueller et al., 2012), in this stage there's no business plan 100% defined, this is why the work team is normally small and they are the ones in charge of shaping said plan. Furthermore, it's usual to use the seed capital or in other words, the contributions given the founders, relatives or some small investor that believes in the project (Mueller et al., 2012; Bocken, 2015). The early stage, also known as Young (Bocken, 2015), here the product is already on the market and everyday there are more clients willing to buy the product and so it is necessary to keep innovating the product (Ng et al., 2014). The *growth stage* is also called growing (Yoon-Jun, 2010; Bocken, 2015); early growth (Pirolo & Presutti, 2010) and growth and development (Ng et al., 2014), in this stage the business model suggested in the initial phase has been perfecting, thus causing the emergence of investment funds specialized in the financing of the startup, in this stage it is important to be competitive through the increase of the market share (Mueller et al., 2012). Lastly, the *expansion stage* is also called mature (Yoon-Jun, 2010; Bocken, 2015), the external financing will turn out to be crucial; in this stage alliances are established with other companies in order to facilitate the settlement in other markets and segments. According to Ng et al. (2014), expansion is motivated by the need to increase profitability, enhance business management and search complementary services.

DISCUSSION

About Success

The success of a startup is similar to the success of a person, out of all people born, few manage to walk the path of abundance, prosperity, well-being and quality of life, the same happens with the Startups, that's why for many researchers it can be baffling that so few Startups reach success.

After reviewing the few studies that deal with the stages of development of the Startups, we have observed that in order to successfully overcome the early stages of its life, where profitability doesn't exist and there's no own capital, the Startups require those platforms because, otherwise, they could barely manage to arrange company projects. Meanwhile, business success has been associated for year to the economic benefits that derive from the commercial activity of the company; however, we can't forget that what will really determine the survival and success of a startup not always depends on obtaining economic benefits, but also on the reception of its product and/or service by the market. Furthermore, success lies in creating something that will truly contribute to the enhancement of people's life and help us change things so that the world becomes a better place.

About Categories and Factors

Researches have revealed a series of firm characteristics as potential success determinants of the startup, for example, the organizational size. Colombo et al., (2010) revealed that even inside the category of small companies, the size of the company is a factor to consider for success. This conclusion is reinforced by the work of Ganotakis (2012) about the success of the startup that indicated bigger companies in the small companies group will tend more towards growth than the smaller ones. Other organizational factors that affect success of the startup are the sector where it belongs to. Cowling et al. (2006), in his research, they found out that Startups of a same industry sector have similar behaviors towards

technological changes and especially towards growth, therefore, we believe that the launching of a business or venture in the same sector where the founder was last employed is connected with success. A factor that is not mentioned often is the participation of the family environment in the decisions of the startup. We believe that the participation and intervention of the family in the management of the business could have significant impact on the success of the startup.

The educational background of the founder or the team doesn't necessarily have a positive effect in the performance, unless said education is complemented by abilities obtained through experience. In fact, the enhancement of the abilities of the founder or the team, such as business, managerial and commercial abilities is a key factor for an Information Technology startup to increase its performance. However, literature mentions a connection between the level of education and the success of the entrepreneurs. Further, it would seem that one of the most frequent problems that affect the founders is their short term vision; most of the founders don't usually develop strategic plans that serve them as a guide for the management of the startup, as mentioned in his work by Spiegel et al. (2015). The lack of experience in management is often the main reason for the failure of new ventures. The entrepreneurs of Startups rely on their previous experience and, that's why, they don't want nor try to expand their knowledge in order to achieve a bigger business range. Additionally, more important than a great business idea to be taken to the market is the work team that will develop the initial idea, since a great idea in the hands of a team that is not committed to the business idea will be doomed to failure. In this sense, it's not only about having the best professionals available in the industry, but also about showing an attitude just as flexible and adaptive as what is required from the startup itself. Studies suggest that the members of the management team that have previous experience in the industry increase the probability of success of the startup, besides, most of the entrepreneurship literature supports the opinion that previous business experience is an important factor in business success. Literature indicates business teams have had a growing relevance in the last years.

For many startups, the pressure to stay up to date with the competition gives a mean to enhance the capacities for innovation, survival and/or growth. Literature suggests that while startups are susceptible to client pressure, these companies will adopt the Information Technology as results of the clients' demands and that involves a growth in their businesses. Moreover, a study done by Pugliese et al. (2016) about startups suggests that external pressure and competitive pressure are fundamental for the success of the startup. Further, the advantage of forming alliances has been stressed for a long time and it was assumed that these benefits extended to new companies. The alliances must benefit the startup because these companies lack sufficient financial and human resources to invest in the technologies needed in order to compete in their dynamic environments. Literature show there is a positive connection between alliances (partner, clustering) and the success of the startup. Nevertheless, the influence of the alliances is not so strong in comparison to other factors of the characteristics of the entrepreneur and the composition of the management team. Additionally, informality is one the barriers that prevent the development of these kind of companies. It would also seem that the role of the government is not enough, although nowadays governments of different countries have developed mechanisms and support programs that promote formalization and training of new entrepreneurs.

It would seem the development of new technologies or products doesn't guarantee the commercial success of the companies that operate in the high technology industry. However,

compatibility and security are crucial for the success of the startup because this can determine the client's acceptance.

It is true that having part of the initial financing covered is a good start but there are other factors that need to be mentioned that are just as or even more important than financing. Regarding the assumption that financing is the main concern in the growing stage, we think there's a significant importance not only in the growing stage but also during all stages of the life cycle. Furthermore, most of the startups suffer from the lack of sufficient financial resources up to the point where owners/managers invest their own personal assets. According to the literature, financial resources are one of the most important resources known as key requirement for the performance of the startup. Therefore, we think a long term sufficient financing is a previous condition for the survival and sustainable growth of the startup.

Public assistance obtained has a positive effect over the growth of the startup. Governments must be aware about the importance of providing the startup with a long term sufficient financing in order to manage the delay between the development of the product or service and the entrance to the market. Thus, financing from the government, short term assistance policies and the introduction of new capitals of other businesses tend to increase the growth of the startup. However, we believe the initial capital for the launching doesn't influence in a significant way because there are other factors far more relevant such as the innovative business idea, market and team work.

About the Development Stages and the Factors

Some authors claim that a startup is like a baby because at the beginning one must take care of it for as long as it's necessary so that it has no problems in its development, it has to be guided through stumbles and, because there are many things that could divert it away from the path or simply harm it. An entrepreneur not only must know what it means and the possibilities a startup can offer, but also the life cycle that it must go through in order to achieve success, we believe these stages are: *seed*, it can be identified as the idea phase, it's a stage where the founding team is formed and the development of the product is launched, the product might start being validated without the actual product, there are experiences and the clients' opinion is heard; *early*, in this phase the product should be on the market, investment is necessary and the first investment round must be conducted; *growth*, the startup is around two to four years old, it must consolidated and the product is optimized. However, rounds about important financing towards the product and marketing are still being conducted; *expansion*, this is the most strategic stage where the business must escalate and expand, additionally, the startup has an important presence in the market. Nevertheless, investments are not obtained from investment angels, these stay behind and it's time to gather with investment funds and venture capital. However, the selected studies that addresses the development stages don't consider a stage referring to the closure or sale of the startup that in other literature is called *exit* or also "exit strategy". There are many *exit* options: the sale to a strategic buyer is the quick and very lucrative sale of a startup to another company that sees in it an opportunity to grow or enhance its product or service. The public offer sale, that is to list their shares in the stock, is not a usual exit done by startups. The liquidation or decline, if things are not doing well, it's better to contemplate if it's worth liquidating and exiting, instead of extending the agony.

From selected studies, few authors connect a success factor to a development stage, Figure 3 shows that out of the 21 success factors identified in the selected studies, only 5 factors (F2, F4, F11, F12 and F20) have been connected to a development stage. However, there still are 16 factors that haven't been connected. This could be due to, although it is true that there are many studies that identify the success factors in startups, only a few are aware of the importance of identifying the factors that impact the development stages. Once all the success factors during the development stages are known and studied, the design of the startups growth and development support strategies could be enhanced, thus, guiding them towards being competitive and sustainable with time.

Our study opens future research, for example, we must determine the degree of influence of the 21 factors identified in this study on the success of the IT Startup, through empirical tests, in addition to analyzing the correlation between the 21 factors identified. Another future research is to link the remaining 16 success factors to one of the development stages IT Startup, including the exit phase. Like all researches, this study has its limitations, since it focuses on the critical success factors of a startup in just one industry, Information Technology and therefore, it cannot be generalized to a startup within other industries. It could also be possible that some of the research literature, which may be of importance for this study, might have been left aside.

CONCLUSION

This study has done a Systematic Literature Review about the critical success factors of Information Technology startups, 1013 primary studies about the subject have been identified, out of those 74 turned out to be the selected research studies. Even though there are many studies about the growth and success determinants of the startup, there's no real agreement in the literature about success factors. Therefore, this study did a Systematic Literature Review with the goal of identifying the critical success factors of the startup.

From selected studies, 21 were the critical success factors identified the same that are classified by the researchers into three categories: *organizational, individual and external*. The startups go through a series of development stages that are also known as the life cycle. However, in the literature there is no established consensus about that matter. This study considers the following stages: *seed, early, growth and expansion*.

There are few releases in South America about success factors, according to Table 4. However, the governments of the countries are making the necessary efforts in order to provide policies and programs that foster the growth and development of the startup. For example, in Peru, the central government promotes the assistance for this type of business, through its program startup Peru. A similar situation is seen in Chile, with its business escalation program startup Chile. In Brazil, there are incubators that have been supporting these companies for more than 40 years.

The obtained results of this study contribute to adding more knowledge to the existent literature about success factors. Furthermore, the results will be important for managers of the startup, entrepreneurs, Information Technology advisors, researchers and governments of the countries, because they can use the reported results in this document as a reference when developing strategies and programs that help the survival, growth and development of these types of companies.

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