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# Digital Startups Survivor and Scalability: Identifying Variables for Accelerated Growth

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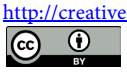




## Abstract

Scalability is the process of rapidly expanding a startup's number of customers and profitability. There are, however, only a few studies on this process, despite the large number of startups, their relevance to the economy and, on the other hand, the low survival rate in this segment. The objective of this study is to develop a conceptual framework that identifies possible variables that contribute to the scalability process in startups. To address this objective, a systematic literature review and subsequent identification of relevant categories were conducted. Consequently, six categories were identified, and the relationships among them constituted a conceptual framework. This framework shows that the existence of a scalable business model, managed with resource orchestration and data-driven decision-making integrated into a monitored business environment, can lead to accelerated growth or scalability. Thus, the startup can reach the development stage required to receive investments considered essential for scaling or its accelerated growth.

## Keywords

Scalability Process, Digital Startups, Accelerated Growth, Systematic Literature Review

## 1. Introduction

Traditional models and structures of entrepreneurship have generally assumed relatively stable and fixed boundaries around an entrepreneurial opportunity, where success is often defined in terms of how well an entrepreneur executes the associated and well-defined business plan (e.g., Brinckmann et al., 2010; Gruber, 2007; Honig & Karlsson, 2004). However, studies in this line of thought contain limited insights into entrepreneurial actions, behaviors, and success in the digitized world (Nambisan, 2017). The lack of focus on more concrete concepts and

constructs that underpin digital entrepreneurship has led to the need for alternative conceptual frameworks that incorporate new ways of measuring business success and inform the factors associated with more dynamic and evolving business processes and outcomes (Nambisan, 2017).

Importantly, digital artifacts, platforms, and infrastructure play a crucial role in shaping constrained business outcomes and processes. Thus, a refined focus on specific aspects and characteristics of digital technologies can offer a promising path for the development of more accurate theoretical explanations of this phenomenon. Based on the evolution of emerging technologies such as cloud computing, big data, and mobile technology, new disruptive businesses have emerged in different sectors of the economy (Sousa & Rocha, 2019). Such technologies have also generated business opportunities that are conducive to scaling, albeit in an environment of uncertainty (Nambisan, 2017). Startups are defined as organizations whose business models are innovative, repeatable, and scalable under extreme uncertainty conditions (Blank & Dorf, 2012; Ries, 2011). Digital startups are a specific type, that can be defined as those where their business models are based on digital technologies (Hull et al., 2007; Steininger, 2019).

In this context, the term "scalability" is defined as the rapid expansion of the number of customers and profitability of companies, mainly in startups (Blank, 2010; Kuratko et al., 2019). Startups become "unicorns" when they are valued at more than one billion dollars; that is, they scale their business model through rapid growth and bring huge returns to their investors and founders (Kenney & Zysman, 2019; Kuratko et al., 2019).

To illustrate the relevance of this business segment, startups can change the dynamism of innovation in a country through innovative solutions that aim to solve emerging problems (OECD, 2016), in addition to driving transition into the digital economy (Ruggieri et al., 2018). Despite their relevance, digital startups are among the least researched types, making them a good focus for future research (Steininger, 2019).

The digital economy has been hailed as one of the most significant economic developments since the industrial revolution, and digital entrepreneurship is directly at the origins of that revolution. However, few studies explore issues of digital entrepreneurship performance at a regional or national level, despite calls for research at a higher level of entrepreneurship (Davidsson & Wiklund, 2007). Although startups play an important role in a country's economic growth (Jansen et al., 2023), they represent high-risk investments because of their low survival rates (Calvino et al., 2015; OECD, 2019). The digital startup survival rate is around 60% after three years, about 50% after five years, and a little over 40% after seven years, and only 10% of digital startups are able to scale up (Marmer et al., 2011).

Given the importance of this segment, this research focuses on the scaling-up process for startups. The term "scale-up" is understood as the period following

business model validation, with a 20% growth in the number of employees or in their turnover for a period of three years. This definition considers a startup to have more than 10 employees at the beginning of the period (OECD, 2007). Despite the relevance of startups and their low survival rates, studies on the scalability of their digital business models are scarce (Jansen et al., 2023; Jinzhi & Carrick, 2019), although the number of studies is increasing.

To fill this gap, this study aimed to develop a conceptual framework that identifies possible variables that contribute to the scalability process in startups. To achieve this objective, a systematic literature review was conducted following a deductive research approach in two phases. Based on this systematic literature review, content analysis was used to identify relevant categories.

In this study, we depart from the technical Systematic Literature Review (SLR) (Tranfield et al., 2003) and focus on studies of startup scalability. In doing so, we address the following research questions:

RQ1. What are the most relevant variables to ensure the scalability of startups?

RQ2. How can these variables relate to the creation of a conceptual research model?

RQ3. What are the possibilities of future research on this topic?

By answering these research questions, we make three contributions. First, we identify the variables that show how entrepreneurs find their way to a sustainable business model in markets where user numbers are seen as the most important indicator of success (Steininger, 2019). Second, we developed a conceptual model that shows how the identified variables can be related, offering clues to the development of a sustainable business model for digital entrepreneurship and contributing to the theme of the digital economy, which has been hailed as one of the most significant economic developments since the industrial revolution (Zaheer et al., 2019). Third, we provide an agenda for future research in the digital economy and digital startups. This research also contributes to practice by identifying variables that must be managed for startups to expand their number of customers and profitability. Therefore, this theme seems to be very interesting for both researchers and practitioners because it identifies factors that can support the development, survival, and success of digital startups.

This literature review is innovative as it resulted in the proposition of a conceptual model that identifies variables responsible for the survival and scalability of startups, an emerging segment of the economy with great potential of growth. The integration of previous studies enabled the identification of the variables involved in the scalability of digital startups and in their connections. Differently from traditional companies, it stands out that changes in the business environment are strongly related to the agility in the operation of digital startups. Furthermore, investment is very important for these companies to acquire the resources required for their growth. Also, although digital startups are small companies, they develop the ability to be data driven.

In the following sections, the article details a method for reviewing the literature on the scalability process in digital startups. Subsequently, it analyzes the

concepts extracted from the literature and presents a framework developed from the list of concepts. The final sections present the final considerations and limitations of the study.

## 2. Research Method

To identify the main variables of digital startup scalability, a systematic literature review was conducted using a deductive approach and qualitative strategy based on Tranfield et al. (2003). This procedure comprises three stages: planning, execution, and reporting. To ensure the quality of the review, scientific rigor is required to conduct each of these steps, and for this purpose, this work was guided by the process used in Crossan and Apaydin (2010).

### 2.1. Research Planning and Keywords Identification

The correct selection of keywords is required to identify the appropriate articles for review. For the proposed objective, the terms were defined as start-ups, scalability, and digital. Regarding scalability, Jansen et al. (2023) identified terms such as scaleup, unicorn, high-growth, rapid growth, fast growth, or gazelle. However, the term "high growth" resulted in articles such as those by Baum and Bird (2010) (312 printing companies), Daunfeldt et al. (2016) (with all the limited liability companies in Sweden), and Coad et al. (2017) (with all UK companies), which use samples with companies in established and sometimes large industries, which do not correspond to the characteristics of digital startups. In addition, Jinzhi and Carrick (2019) explain that due to the scarcity of literature on scale-ups, the articles use a literature review based on high-growth companies.

Thus, in the present research, to establish the property of scaling, the terms were limited to scaleup OR "scale up" OR "scale-up" OR scaling OR scalability OR scalable OR unicorn.

For startups, the keywords included the variation of the words' spelling 'and the terms "new venture" and "young firm" from the references by Jansen et al. (2023). Additionally, for the definition of digital, the keywords were adapted from the review on digital entrepreneurship by Steininger (2019) with the terms tech* OR "information system" OR internet OR WEB OR net OR online OR digital OR digitized OR digitalized OR electronic OR virtual OR computer OR software OR hardware OR mobile OR app OR "cloud computing".

The Scopus database was chosen because it is the largest scientific literature base for rigorously selected global and interdisciplinary references, including more than 24,600 active titles from 5000 editors. In addition, it enables access to original and relevant articles with the option of making analyses, applying filters, and exporting results for preliminary contact with the material (Scopus, 2020).

To narrow the search to purely scientific articles and belonging to the appropriate research areas, other criteria were defined, such as the specifications in **Figure 1**. Under the guidance of Zaheer et al. (2019), for interdisciplinary subjects, it is advisable to use other types of documents in addition to empirical studies

| Criteria | Parameters |
|---|---|
| ***Document type*** | All (Zaheer et al., 2019). |
| ***Publication Year*** | As of 1999, at the start of the internet bubble (Heaton, 2018; Kenney & Zysman, 2019; Ries, 2011). |
| ***Subject Area*** | *Business, Management and Accounting* and *Economics, Econometrics and Finance* (Jansen et al., 2019). |

Source: Prepared by the author

**Figure 1.** Scopus base search criteria.

so as not to miss insights. Regarding the period, the research was limited to documents published as of 1999, when the Internet bubble crisis began, and as a result, investors were more cautious about investing in those companies (Heaton, 2018; Kenney & Zysman, 2019; Ries, 2011). The areas of interest corresponded to those used in the articles cited in the document Jansen et al. (2023).

## 2.2. Conducting the Articles Search

The documents were obtained through a single search, considering the intersection of articles that contained at least one of the key terms referring to scalability, startup, and digital technology in the title, abstract, or keywords. The research conditions defined in the previous section were applied in August 2020, resulting in a 100-document base, including 63 articles and reviews, in addition to 37 of other types, it can be noted that the number of articles prevails over other works, as shown in **Figure 2**.

Based on these results, the process for creating the three groups was used according to the guidelines of Crossan and Apaydin (2010).

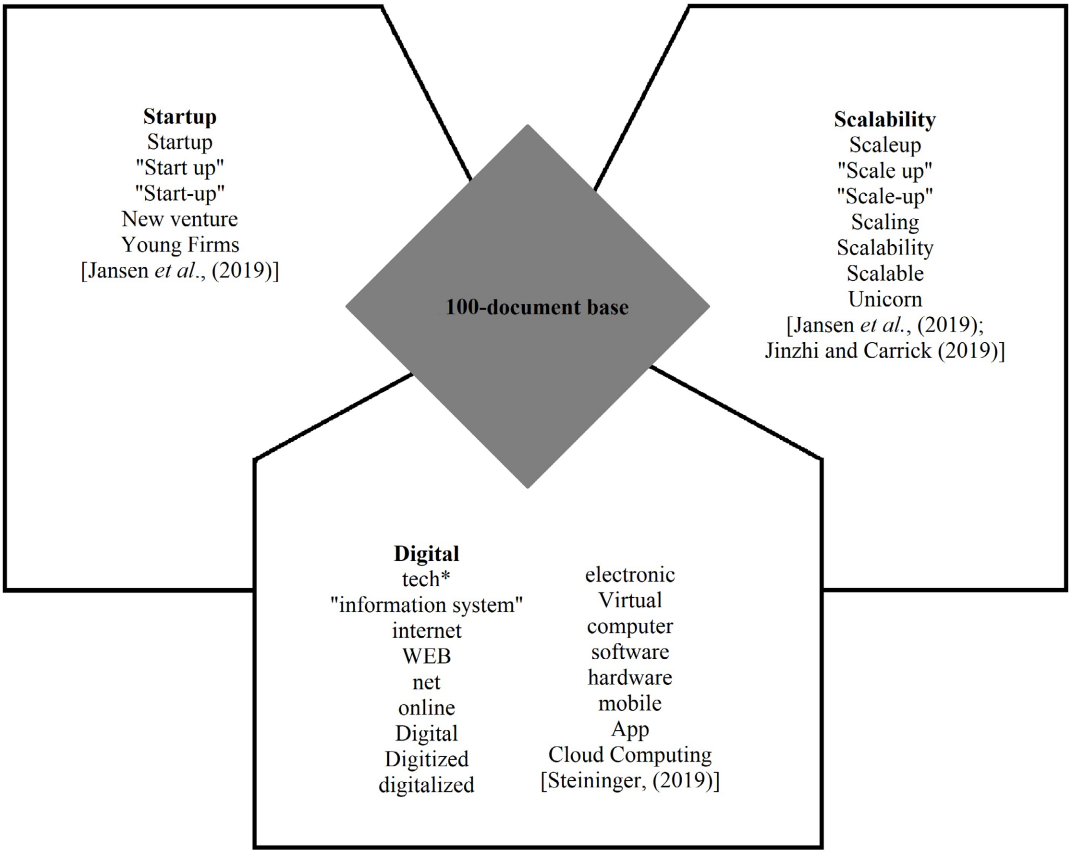
Starting with group I, the articles were defined as reviews and meta-analysis, encompassing the document review type (two articles), search for the term "literature review" (1 article), and for the word "meta" (two articles) in the title, abstract, or keywords. None of the identifications overlapped. Five articles were classified into Group I.

Moving on to Group II, the most cited documents with no overlapping in Group I (two documents) were used, covering those cited at least 10 times in 2019 or with some citations in 2020, making up a set of 31 elements.

Finally, group III covers the most recent documents published since 2018, with no overlap in group I (three documents) and Group II (16 documents), comprising 31 documents.

Up to this stage of the process, 67 documents were selected, as summarized in **Table 1**.

For the first contact with the material, a floating analysis was conducted following the recommendations of (Bardin, 1977) considering the reading of the title, summary, and keywords of each of the 67 documents. In this process, 39 out-of-context references were discarded. Examples of reasons for discarding include addressing other sectors of the economy, sustainability issues, the economy of the sample country, social entrepreneurship, and technical approaches to technology and other topics, as shown in **Table 2**.




Source: Prepared by the author.

**Figure 2.** Research base.

**Table 1.** Articles selected in the process.

| Document selection criteria | Total per criterion | % | Article | Book | Conference | Note |
|---|---|---|---|---|---|---|
| Review & Meta-analysis | 5 | 7.5% | 5 | | | |
| Review & Cited at least 10× in 2019 or any number of times in 2020 (duplicates) | 2 | | | | | |
| Cited at least 10× in 2019 or any number of times in 2020 | 31 | 46.3% | 26 | | 4 | 1 |
| Review & Recent 2018-2020 (duplicates) | 3 | | | | | |
| Cited at least 10× in 2019 or any number of times in 2020 and Recent 2018-2020 (duplicates) | 16 | | | | | |
| Recent 2018-2020 | 31 | 46.3% | 19 | 4 | 8 | |
| Total Selected | 67 | | | | | |

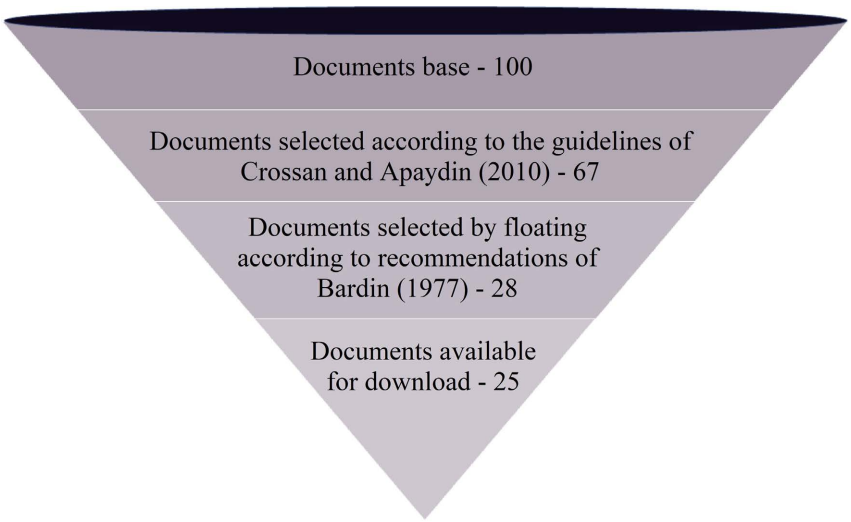
Source: Prepared by the author.

Only 25 of the 28 documents selected for reading were available for download and used in the framework construction. The entire process of creating a database for the systematic literature review is illustrated in **Figure 3**.

**Table 2.** Discarded themes after a floating analysis.

| Theme | Number of Articles |
|---|---|
| Technology | 9 |
| Others | 6 |
| Other industry | 6 |
| Supply Chain | 4 |
| Innovation | 3 |
| Economic growth of sample country | 3 |
| Sustainability | 2 |
| Social | 2 |
| Internationalization | 2 |
| Teaching | 2 |
| Total | 39 |

Source: Prepared by the author.




Source: Generated by the author.

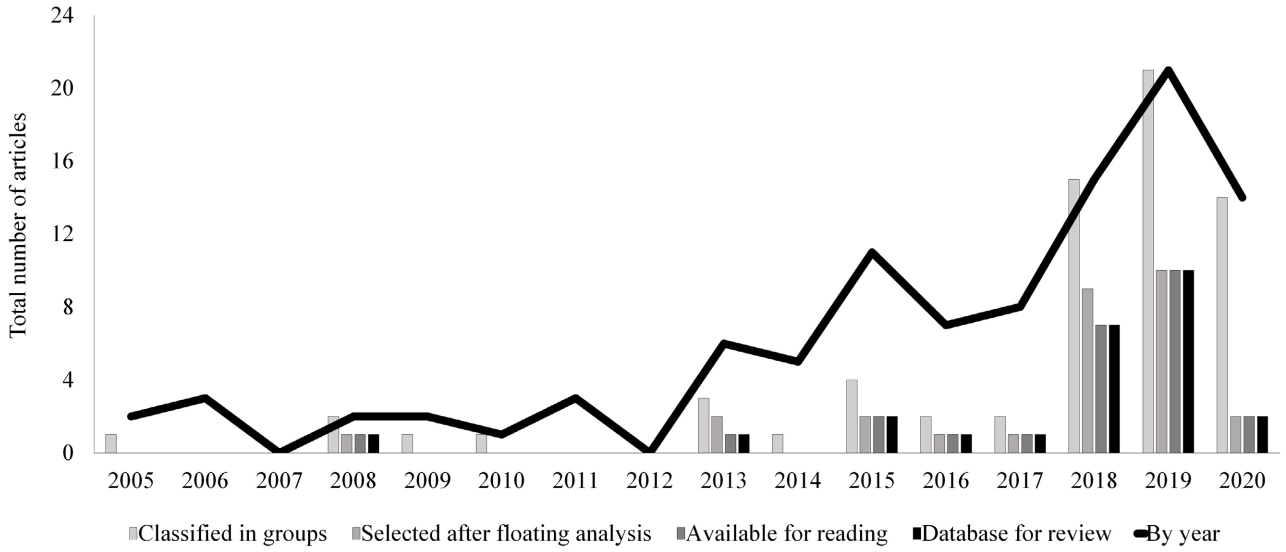
**Figure 3.** Process for constructing the database in this systematic literature review.

The distribution of publications on the theme over the years, as shown in Figure 4, implies the increase in the researchers' interest since 2005, which reinforces the relevance of this research.

## 3. Results

### 3.1. Identifying Categories

Content analysis, a useful technique for examining a large amount of qualitative data, was used to systematically gather, analyze, and discuss insights from prior literature. It was conducted on the 25 selected documents to develop the conceptual




Source: Generated by the author.

**Figure 4.** Documents by publication year.

framework by categorizing them in a two-phase process (inductive and deductive), as recommended by Bardin (1977).

Open coding was used in the first phase, in which concepts related to scalability freely defined the context and registry units. In the second categorizing phase, the themes were related to dimensions, where 11 items were listed. Only six dimensions were considered for the framework because they contain more than five related concepts: a scalable business model, data-driven decision-making, and business environment, in addition to business management, resource orchestration, and investment. The dimensions are listed in **Table 3**.

### 3.1.1. Scalable Business Model

For this dimension, aspects that generate value to the business were identified. The dimension "scalable business model" appears with greater frequency, counting 22 times in the articles. Although the term "scalable business model" seems obvious, what is new in the term refers precisely to the potential for creating scalability, as evidenced by Nambisan (2017), who recommends that alternative theories and conceptualizations are needed, incorporating new ways of evaluating business success and informing about the factors associated with more dynamic and constantly evolving results and business processes. Importantly, digital artifacts, platforms, and infrastructure play a crucial role in shaping constrained business outcomes and processes.

This term refers to the fact that digital startups should have their own business model, offering a service according to customers' needs, without simply replicating an existing model. The business model must be clearly defined, with its target audience and how to reach it, to avoid chaos when scaling (Venkobarao, 2019). According to Ruggieri et al. (2018), a Scalable Business Model must be innovative in terms of value proposition and should have achievable and long-term

**Table 3.** Dimensions identified in the content analysis.

| References | Frequency with which each dimension is cited on literature | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Scalable Business Model | Data-driven Decision-Making | Business Environment | Business Management | Resource Orchestration | Investment | Founder Team | Phases | Enterprise Risk Management | Corporate governance | Mentoring |
| (Venkobarao, 2019) | 5 | | 1 | 1 | 2 | 1 | 2 | | | | 1 |
| (Kenney & Zysman, 2019) | 1 | | 4 | 2 | | 5 | | | | 1 | |
| (Bosch et al., 2013) | 2 | 6 | | 1 | 1 | | | 3 | | | |
| (Barot & Chhaniwal, 2018) | 3 | 1 | 5 | | | 2 | | | | | |
| (Kuratko et al., 2019) | 3 | | 2 | 3 | 1 | 1 | | | | | |
| (Hokkanen & Väänänen-Vainio-Mattila, 2015) | 2 | 4 | 1 | | | | | | | | |
| (Bailey & Tatikonda, 2018) | | | | | 4 | | | | | | |
| (Mac an Bhaird & Lynn, 2015) | 1 | 1 | | | 2 | | 1 | | | | |
| (Bohn & Kundisch, 2018) | | 1 | | 3 | | | | | | | |
| (Ferri et al., 2020) | 1 | | 1 | | 1 | 1 | | | | | |
| (Huang et al., 2017) | | 1 | | 2 | | | | | | | |
| (Say et al., 2018) | | 1 | 2 | | | | | | | | |
| (Ruggieri et al., 2018) | 1 | | 1 | | | | | | | | |
| (Wang et al., 2016) | 1 | | | 1 | | | | | | | |
| (Cavallo et al., 2019) | | | | | | 1 | | | | | |
| (Han & McKelvey, 2008) | | | | | | | 1 | | | | |
| (Njima & Demeyer, 2019) | | | | 1 | | | | | | | |
| (Srinivasan & Venkatraman, 2018) | | | | | | | 1 | | | | |
| (Teberga & Oliva, 2018) | | | | | | | | | 1 | | |
| (Agarwal, 2019) | | 1 | | | | | | | | | |
| (Bohnsack & Liesner, 2019) | | 1 | | | | | | | | | |
| (Chalmers et al., 2020) | | 1 | | | | | | | | | |
| (Kemell et al., 2019) | | 1 | | | | | | | | | |
| (Kunte & Promsiri, 2019) | 1 | | | | | | | | | | |
| (Mancha et al., 2021) | 1 | | | | | | | | | | |
| Total | 22 | 19 | 17 | 14 | 11 | 11 | 5 | 3 | 1 | 1 | 1 |

Source: Prepared by the author.

goals (Kuratko et al., 2019; Venkobarao, 2019), while having a proposition that is difficult to imitate (Kunte & Promsiri, 2019).

Bosch et al. (2013) stated that a startup's challenge is to find a service idea worth scaling and must submit it to the "build-measure-learn" test cycle recommended by the lean startup method (Ries, 2011). For digital startups, it is important to begin with an understanding of the real problem to be solved by the service prior to designing it (Bosch et al., 2013; Hokkanen & Väänänen-Vainio-Mattila, 2015). Customers want to see what they are going to buy, and to confirm the viability of the business, a proof of concept or a minimum viable product (MVP) is required (Hokkanen & Väänänen-Vainio-Mattila, 2015; Venkobarao, 2019). During service development, an iterative improvement process is deployed using customer opinions (Mac an Bhaird & Lynn, 2015). Moreover, Hokkanen and Väänänen-Vainio-Mattila (2015) we suggest collecting user feedback through interviews, prototypes, test users, or even by hiring usability professionals. A good example of a scalable business model is the Chinese fintech "WeCash", which immediately changed the service according to customer needs or inconsistencies found, until it repositioned itself in the market, evolving from online micro loans to online credit, and finally to a full financial services company (Huang et al., 2017). In addition, digital startups should be concerned about constant technological changes (Mancha et al., 2021; Wang et al., 2016). Regarding technology infrastructure, reducing costs while increasing availability creates more opportunities for companies to operate in the digital market (Kenney & Zysman, 2019). For example, startups can be scaled quickly with the adoption of cloud computing (Ferri et al., 2020). Meanwhile, Uber leveraged mobile technology to create a disruptive business model with a platform that undermined those of its competitors and improved the product based on technological innovations (Barot & Chhaniwal, 2018). The goal is to offer value by taking advantage of opportunities to continuously improve and thus increase market share and the number of customers (Mancha et al., 2021). Finally, the recommendation is that the company maintain open communication with all employees (Kuratko et al., 2019), as well as ethical organizational behavior (Barot & Chhaniwal, 2018; Kuratko et al., 2019).

#### 3.1.2. Business Management

"Business management" dimension was noted 14 times in the content analysis. As companies grow, especially those that do so at a fast pace, they need to manage and control resources and customers, ensuring the appropriate structure for the scaling phase (Kuratko et al., 2019). For this, the author additionally suggests the Blitzscaling model, an orientation that does not guarantee success but seeks to avoid obstacles (Kuratko et al., 2019). During the pivoting process, that is, when improving its service to reach more customers or changing the activity segment, the startup can look for new business opportunities that require flexibility and agility. It should also avoid disturbances in the internal environment, such as disagreements in the team, project cost increase, and imprecision in execution

time, in addition to cutting costs if there is still no profit (Bohn & Kundisch, 2018). However, clear objectives should ideally be maintained in such a way that teams are independent in carrying out developments (Bosch et al., 2013). Furthermore, the team needs to ensure the maintenance of control and technical quality when implementing such rapid changes in services or addressing faults (Bohn & Kundisch, 2018; Njima & Demeyer, 2019). Instead, if the company decides to carry out rapid transformations for a new growth period, it can increase performance with new technology, expand its portfolio of offers, or create functionalities for the service (Bohn & Kundisch, 2018; Huang et al., 2017). Startups need to be aware that their focus, concerns, and challenges will change as they advance in their life cycle stages. In the early stages, there were more concerns about service development and finance, followed by challenges for customer acquisition and scaling. On the other hand, challenges in forming teams will always exist (Wang et al., 2016), requiring changes in Human Resource Management to focus on hiring professionals with knowledge of new technologies and the ability to develop faster, thus affecting cash flow by reducing project maintenance time or the need to hire more people with adequate capabilities (Bohn & Kundisch, 2018). In any case, the company needs to adapt its business plan, mainly in terms of sales (Venkobarao, 2019). Some startups operate with negative cash flows because of their disruptive potential (Kenney & Zysman, 2019).

#### 3.1.3. Data-Driven Decision-Making

Although decision-making is part of the company's management process, its importance to be data-driven was highlighted in 19 citations, which illustrates its relevance. Systematic methods for idea validation when developing solutions provide learning that mitigates risks, supports the service's evolution to the next phase or to its withdrawal, and reduces processing time (Bosch et al., 2013). First and foremost, to create or evolve the offered solution, it is necessary to confirm the need for this solution with customers (Bohn & Kundisch, 2018). Through data obtained from interactions with customers, the startup is able to develop the service in an agile way, as suggested in the "lean startup" concept, in addition to facilitating decision-making for growth strategy (Bohnsack & Liesner, 2019; Huang et al., 2017; Mac an Bhaird & Lynn, 2015). On the other hand, it is not easy to obtain feedback from customers, whether due to the team's lack of ability to analyze the data, lack of defining the sufficient number of customers for interaction, or the lack of time to dedicate to this activity; the fact is that this lack of customer feedback limits the support to decision-making (Bosch et al., 2013; Hokkanen & Väänänen-Vainio-Mattila, 2015).

Analyzing the data collected on social media (Agarwal, 2019) can improve the startup's service, as advocated in Growth Hacking practices (Kemell et al., 2019). There is still the possibility of collecting data and statistics from the usage log, which aims to understand where customers are and how they interact to improve the service offer (Hokkanen & Väänänen-Vainio-Mattila, 2015). When the

information or ideas are documented in a standard format, it facilitates the analysis of all the business model aspects (Bosch et al., 2013); even the creation of big data using the startup's services provides valuable business information (Say et al., 2018). The use of artificial intelligence solutions with customer data analysis supports decisions about new business, enables experimentation, explores opportunities, changes processes, and affects the company's results (Chalmers et al., 2020). In the example of the "WeCash" startup, when planning weekly actions to enable rapid scalability, the company monitored several indicators in real time and in detail, such as the user base, growth rates, usage patterns, and financial data (Huang et al., 2017). Another example is Uber, who used knowledge to adapt to local markets and cultures for its global expansion and even offered new products as it obtained customer responses (Barot & Chhaniwal, 2018).

#### 3.1.4. The Business Environment

The "business environment" dimension also featured in the process, being seen 17 times, which shows great importance for digital startups, as described below. Venkobarao (2019) suggests understanding customers' pains, that is, to understand what they need and adapt the solution to that, and to know the values and expectations of the target customers. Say et al. (2018) Note that for startups sustaining the growth of their business in the Chinese market, it is important to understand Chinese consumers' unique behavior and the strength of social innovation that could leverage the business to develop the appropriate business model from that point onward.

In terms of location, a startup located in the vicinity of a business ecosystem is able to increase access to investments, talent and customers (Kuratko et al., 2019). On the other hand, investors can inject money into the business because of the startup's disruptive potential without expecting short-term returns, causing an imbalance in favor of invested companies and inhibiting the emergence of new entrants (Barot & Chhaniwal, 2018; Kenney & Zysman, 2019). Uber can be considered an example of success in relation to its competitors since low price was an important factor for customer choice. However, it faced barriers for expansion, as it suffered lawsuits and pressure from new entrants by imitating its high technology (Barot & Chhaniwal, 2018).

A relevant environmental factor is the role of governments, which can create rules for new platform companies that could affect their competitiveness. It is also unclear what the labor relationship on digital platforms will look like (Kenney & Zysman, 2019). Clearly, the cloud-computing model eliminates several entry barriers that enable businesses to expand into different markets (Ferri et al., 2020).

#### 3.1.5. Resource Orchestration

Like decision-making, resource orchestration takes place during the company's management process, but the subject was specifically mentioned 11 times in the

articles analyzed. First, hiring competent and experienced employees with highly specialized knowledge is an important factor for startup scalability (Kuratko et al., 2019; Venkobarao, 2019). However, the capability of such human capital can vary according to a startup's life cycle (Bailey & Tatikonda, 2018). If there is any plan for project execution, the team can reuse the developed solutions and reduce employee hiring costs (Bosch et al., 2013). However, attention must be paid to avoid work overload, which can lead to human error (Venkobarao, 2019). On the other hand, the possibility of outsourcing for new technology development enables a more flexible allocation of resources; however, high demand for digital service professionals causes a labor shortage and raises wages. If the company does not have skilled people or access to these skills through networking, there will be an increase in the need for financial resources to hire those people (Bailey & Tatikonda, 2018). A way to reduce costs can be seen when a startup adopts cloud computing because there is a reduction in the initial capital for hardware resources, streamlining product development, and launch (Mac an Bhaird & Lynn, 2015). Taking the GameCo Ltd. startup as an example, cloud computing was essential to begin its business activities because of its founders' scarce financial resources for investing (Ferri et al., 2020). One factor that affects the time taken to acquire resources is the degree of technological innovation degree (Bailey & Tatikonda, 2018). It is also noteworthy that startups fail because of a lack of investors' financial resources (Venkobarao, 2019).

#### 3.1.6. Investment

Finally, one more relevant dimension—"investment", was found in 11 occurrences and according to Kuratko et al. (2019), it is relevant because a startup must obtain investment for scaling. The investors' role is to provide capital for selected projects in exchange for equity, which is important in the increased spending and low revenue period. When startups receive investments, they can not only become extremely valuable but also change the economy. For this reason, with amounts greater than those in the Internet bubble era, different types of investors, such as venture capital investors and angels, focus on companies with disruptive potential and absorb losses, enabling startups to operate in the red for a longer period (Kenney & Zysman, 2019). As found in Cavallo et al. (2019), the amount provided by venture capital investors positively affects revenue growth in technology-based companies in their startup and scale-up phases; the same relationship was not found in angel investment. On the other hand, investments can be harmful to the enterprise if the team becomes dependent on financial resources and does not strive to increase the number of customers, causing funds to run out (Venkobarao, 2019). Additionally, investors periodically monitor the results and goals of the invested startups (Jinzhi & Carrick, 2019). However, as can be seen in the study by Kenney and Zysman (2019), startups become unicorns because they are disruptive and show accelerated growth while losing money and have no horizon for profitability. In addition to doubts about the real

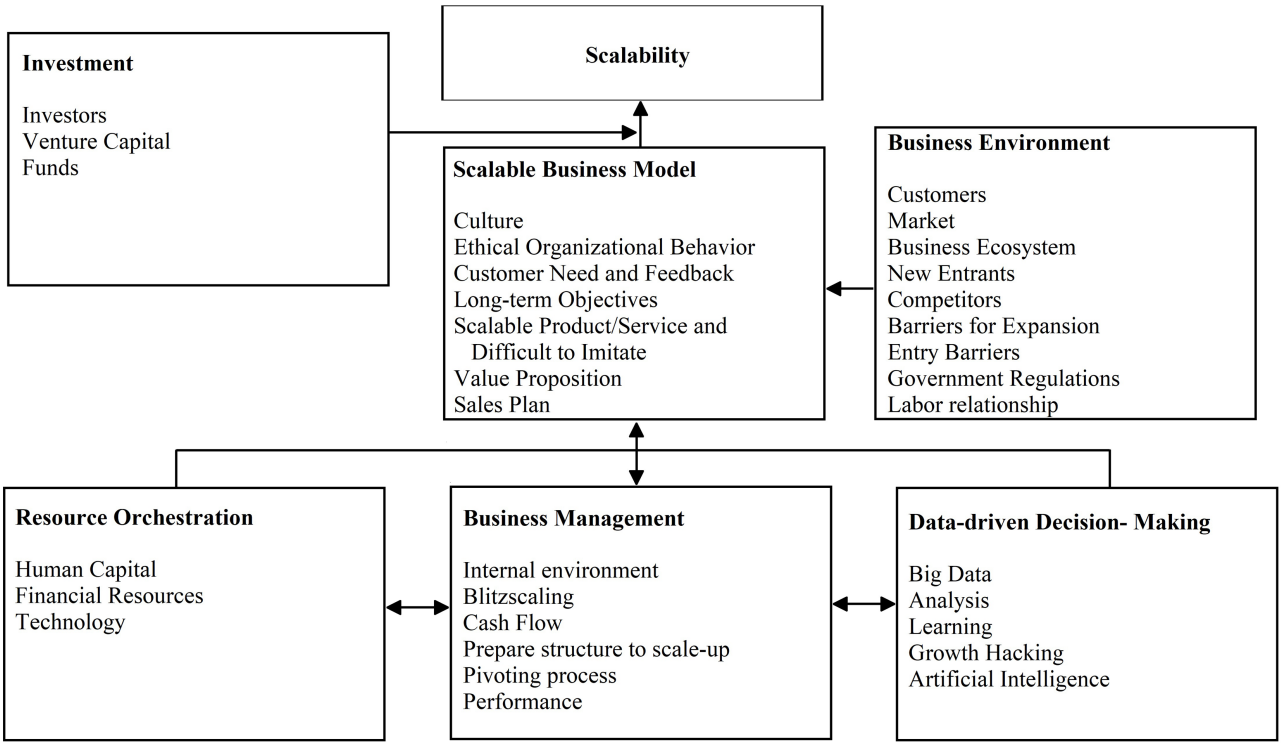
social and economic contributions of these startups, their overvaluation may mask the lack of profitability that would make them disappear completely, leading to ineffective consumption of financial capital. Regarding the effect of technology on investments, cloud computing leverages a startup's scalability by offering possibilities to access different funding modes, such as venture capital or angel investors (Ferri et al., 2020).

## 4. Discussion

The identification of the six categories related to the scalability of startups, in addition to the possible relationships between them established by the literature review, enabled the elaboration of the conceptual framework represented in Figure 5.

For the "scalable business model" dimension, the following scalable characteristics of startups were attributed: having an innovative and differentiated value proposition (Ruggieri et al., 2018), that is difficult to replicate (Kunte & Promsiri, 2019) and is worth scaling (Bosch et al., 2013) to offer a service according to the needs of the target audience (Venkobarao, 2019). In addition, the business model must have long-term objectives (Kuratko et al., 2019; Venkobarao, 2019).

Companies have better opportunities to operate in the digital market if they take advantage of the declining costs of the technological infrastructure and their increasing availability (Kenney & Zysman, 2019). The adoption of cloud computing




Source: Generated by the author.

Figure 5. Digital Startups' Scalability Conceptual.

enables startups to expand rapidly into different markets and scales (Ferri et al., 2020).

As it is the main component and its dependence on other dimensions, the "scalable business model" is positioned at the center of the framework.

The "business management" dimension operates across the entire business life cycle, as management ensures a proper structure for scalability (Kuratko et al., 2019), keeping the goals clear (Bosch et al., 2013). Regarding its management, while the startup is in the process of pivoting, that is, seeking to increase the number of customers or change its activity segment, it must avoid internal imbalance and pay attention to technical quality control (Bohn & Kundisch, 2018). It is important to interact with customers to receive feedback and quickly provide innovation or address bugs (Huang et al., 2017). Management and its challenges change depending on the phase of the start-up's life cycle (Wang et al., 2016). For this reason, it needs to adjust its business plan, especially its sales plan (Venkobarao, 2019). The "business management" dimension supports the company's scalability integrated with resource orchestration and data-driven decision-making.

The company's "data-driven decision-making" dimension encompasses analyses of which adaptations must be made for the business model's scalability. Startups learn with a systematic method (Bosch et al., 2013), using data analysis from direct contact interactions with customers (Bohnsack & Liesner, 2019; Huang et al., 2017; Mac an Bhaird & Lynn, 2015), collecting data on social media, (Agarwal, 2019; Kemell et al., 2019) or in the service utilization log (Hokkanen & Väänänen-Vainio-Mattila, 2015). With this, they have access to big data (Say et al., 2018) and artificial intelligence (Chalmers et al., 2020).

The "resource orchestration" dimension encompasses the search for the best way to adjust human capital, processes, and financial resources towards scalability. Resource orchestration considers the need to hire employees with the appropriate skills (Kuratko et al., 2019; Venkobarao, 2019), the decision on the right timing for acquiring technology (Bailey & Tatikonda, 2018), and the decision to adopt cloud computing to reduce the consumption of financial capital (Mac an Bhaird & Lynn, 2015), in addition to the ability to receive investments (Venkobarao, 2019).

The "business environment" dimension, that is, the external factors that impact business performance, such as the customers' needs, behavior, and lifestyle in the target market, requires monitoring and affects the business independently (Kuratko et al., 2019; Say et al., 2018; Venkobarao, 2019). Business ecosystems can change the dynamics of the environment to gain access to investment, talent, and customers (Kuratko et al., 2019). Insertion into the environment ensures that companies receiving investments have an advantage over competitors and new entrants (Barot & Chhaniwal, 2018; Kenney & Zysman, 2019). Another environmental variable deals with the influence of public policies with new rules for platform companies (Kenney & Zysman, 2019).

The "investment" dimension is critical for start-up scalability (Jinzhi & Carrick, 2019; Kuratko et al., 2019). Venture capital investors focus on companies with disruptive potential and absorb losses by enabling startups to operate in the red for longer periods (Kenney & Zysman, 2019).

From the indicated relationships, a conceptual framework for the scalability process of digital startups was developed, as shown in **Figure 5**.

## 5. Future Research Directions

This systematic literature review identified the most relevant variables to ensure the scalability of digital startups and analyzed them to develop a conceptual model. Thus, based on these findings, future research could explore each of the categories identified in this study to improve the understanding of these companies' environments and critical variables for survival.

Suggestions for future studies include empirical studies with field research to validate and update the framework developed and the relationships identified. Moreover, the analysis provided a compilation of the researchers' proposals for further studies on scalability.

As an initial suggestion, conducting longitudinal research with many startups would expand the studies on digital startups. According to Kuratko et al. (2019), it can be further investigated how scaleups overcome difficulties related to each stage of the life cycle (Kuratko et al., 2019). Such as, whether scalable business models hold up in a highly competitive environment (Barot & Chhaniwal, 2018; Say et al., 2018), and also, the main challenges of digital product development stages (Njima & Demeyer, 2019; Wang, 2016). Another possibility of future studies includes the verification of a possible relationship between adoption of good User Experience (UX) practices and the scalability of startups (Hokkanen & Väänänen-Vainio-Mattila, 2015). Or how their products or services continued to attract and retain customers (Barot & Chhaniwal, 2018; Bohn & Kundisch, 2018; Huang et al., 2017).

Another factor of interest noted by authors was the orchestration of their resources (Bohn & Kundisch, 2018; Wang et al., 2016) and how startups managed financial resources more efficiently (Kenney & Zysman, 2016).

Furthermore, Huang et al. (2017) & Jinzhi and Carrick (2019) suggested conducting quantitative research to validate the results of their case studies on unicorns, which showed the relationship between these data-driven decision-making digital startups and their growth. This investigation makes sense since these companies are digital and use data from the conception of the business model (Barot & Chhaniwal, 2018; Bosch et al., 2013; Ries, 2011). In addition, digital start-ups use customer feedback (Agarwal, 2019; Bohnsack & Liesner, 2019; Huang et al., 2017; Mac an Bhaird & Lynn, 2015). Moreover, startups must monitor external factors that impact business performance (Kuratko et al., 2019; Say et al., 2018; Venkobarao, 2019).

Jinzhi and Carrick (2019) and Kuratko et al. (2019) considered investments as

a critical factor for startup to scale. Thus, more detailed studies are suggested. For example, Cavallo et al. (2019) inquire about the relationship between investments and the performance of digital startups, including the frequency of investments distributed over time. Regarding bootstrapping activities, Mac an Bhaird and Lynn (2015) indicate future studies that focus on the relationship of bootstrapping with challenges and opportunities presented by the external environment, as well as make comparisons between international public policies to build a more effective global system to support startups.

The main limitation of this research is that only one database was used (Scopus), although this is the largest scientific literature base of global and interdisciplinary references. Another limitation is that the study only addresses startups with a digital business model, and other studies can be conducted with other segments, such as environmental, biotechnology, or social.

## 6. Final Considerations

When considering the existence of many startups, their importance to the economy, and, at the same time, their poor survival rate, this study intended to prepare a conceptual framework identifying possible variables contributing to the scalability process in startups, as there is little literature on this topic. To address this objective, a systematic literature review was carried out through a deductive approach in two phases according to a qualitative strategy. Consequently, this systematic literature review identified the following dimensions as the most relevant variables to ensure the scalability of startups: scalable business model, data-driven decision making, business environment, business management, resource orchestration, and investment. However, the conceptual model built is even more relevant, because the framework shows the relationship between the six identified variables.

At the base of the framework, the need for effective business management, which ensures a company's survival, is integrated with resource orchestration and data-driven decision-making. This base leads to the development of a scalable business model that involves a value proposition geared toward customers' needs, identifying achievable long-term objectives, offering hard-to-imitate products/services, learning from mistakes, and a company culture that can lead to achieving company goals. However, this business model is immersed in an environment, and it is important to achieve scalability and monitor the influence of environmental variables on business. Finally, when the startup reaches the appropriate development stage of its business model while already immersed in a competitive environment, it receives critical investments that enable its scalability.

This study has theoretical and practical implications. The main theoretical contribution was identifying the intervening variables in a startup's scalability process given the low survival rate in this segment. By presenting the main interrelated variables in the framework, this study offers a current basis for future qualitative and quantitative studies.

This study has already presented some possibilities for future research. Among these, there is an opportunity to systematize the validation process of a scalable business model. Additionally, a quantitative study was conducted to verify whether there is a relationship between data-driven decision-making and startup scalability. Furthermore, we analyze what happens with the variables identified in each startup's life cycle stages. Finally, one study identifies which factors are related to investments in startups.

In terms of practical implications, the results cite cases and recommendations published in the literature to achieve accelerated growth or scalability.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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