

DEVELOPMENT OF DIGITAL AND INTERNATIONAL COMPETENCIES IN STARTUPS THROUGH  
BUSINESS ACCELERATORS

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ARTICLE DETAILS	ABSTRACT
<p><b>Article history:</b></p> <p>Received: 13 november 2020 Accepted: 30 july 2021 Available online october: 27 th 2021</p> <p><b>Double Blind Review System</b></p> <p><b>Scientific Editor</b> Ilan Avrichir</p>	<p><b>Objective:</b> Diagnose how accelerators contribute to the development of international competencies in startups and to verify which are the main international digital and entrepreneurial competencies developed in an acceleration environment.</p> <p><b>Method:</b> We use herein a qualitative approach, in which content analysis was chosen as methodological technique. The data were collected from managers of startup accelerators located in the city of São Paulo (state of São Paulo) and Vitória (state of Espírito Santo).</p> <p><b>Main results:</b> The research results indicate that business accelerators develop international digital and born global competencies in startups. The findings also indicate that certain competencies can be more refined than others in the acceleration process and are concomitantly linked to the main pillars of the accelerators.</p> <p><b>Relevance/originality:</b> This study brings three new emerging categories to literature on startups: Contracts, Finance, and Big data/Data science.</p> <p><b>Theoretical contributions:</b> Business accelerators are predecessor agents in the process of developing international competencies and capabilities. Their role in the innovation ecosystem is to promote strategic innovation and organizational knowledge.</p> <p><b>Managerial contributions:</b> We present herein the necessary knowledge and competencies for an early-stage company to explore global markets.</p>
<p><b>Keywords</b></p> <p>Business Accelerators Competencies International Competencies Digital Competencies</p>	

## 1. INTRODUCTION

Research on the internationalization of companies explore the origin of the development of market and digital competencies based on the studies of Cahen and Borini (2019), Cahen, Lahiri and Borini (2016), Cavusgil and Knight (2004; 2015), and Ribeiro, Oliveira Jr. and Borini (2012). Such studies make room for understanding and deconstructing the main motivations involved in the development of technological competencies in companies that seek to internationalize.

Born global companies are early-stage companies (startups) that target global markets right from the

beginning of their creation (Cavusgil, & Knight, 2015; 2004) and develop business strategies focused on international competencies related to technology, product and service development, quality, and local distribution. International competencies are crucial for startup companies that aim to internationalize<sup>1</sup>.

There are, however, a few studies that explore the internationalization of startups through digital competencies (Cahen, 2019). Some of the international digital competencies investigated in literature are the ability of programming between different cultures, the global-virtual networking, the adaptation of virtual product/service monetization in different markets, and the international

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reconfiguration of business models (Cahen, & Borini, 2019). According to Cahen, Lahiri and Borini (2016), such competencies are crucial to deconstruct barriers to the internationalization of technology-based startups within emerging markets.

While the configuration of startups leans towards the development of market and digital competencies, one may identify in early-stage businesses the contribution and collaboration of acceleration mechanisms for the development of competencies within these companies (Cohen, 2013).

Acceleration mechanisms are organizations that aim to support companies during the intense development of new businesses, products, and services in a determined period of time (Hochberg, 2016). Conforming to Pauwels et al. (2016), business accelerators' processes are based on the intense mentoring with entrepreneurs in order to improve their businesses, focusing on technological, legal, and product development aspects. Bliemel et al. (2019) state that accelerators are environments that develop capabilities; however, the authors do not further delve into which capabilities and competencies are developed in such environment, which makes room for further investigations.

In this research, we selected the competencies that promote the internationalization of startups based on the study of Cahen and Borini (2019) and Cavusgil and Knight (2004; 2015). Considering the configuration of a scenario in which market and digital competencies are essential to the successful internationalization of a startup (Cahen, & Borini, 2019; Cavusgil, & Knight, 2004) and the emergence of business accelerators as driving mechanisms is paramount for the agile development of competencies (Cohen, 2013; Hochberg, 2016), the research question this paper seeks to answer is: *How do business accelerators contribute to the development of international competencies in the expansion of startups in international markets?* We intend to diagnose how business accelerators contribute to the development of international competencies in startups and to verify which are the main international digital and entrepreneurial competencies developed in an acceleration environment.

Noronha et al. (2020a) affirm that the relationship between the development of international competencies in startups and environments where companies are developed, i.e., business accelerators

and incubators, need to be better understood. According to Cavusgil and Knight (2015), these environments can collaborate with the development of specific knowledge and capabilities for the company to internationalize; however, it is still necessary to understand "how" and "which" competencies are used for the internationalization of startups immersed in these environments. Additionally, Noronha et al. (2020b) emphasize a few studies that relate startups and accelerators' competencies, there is however a lack of studies that investigate the phenomenon from an internationalization perspective. Such research gap is addressed by the present study.

The theoretical and managerial contributions of this study point to the fact that business accelerators are to be understood as centers for the development of international competencies. In addition, we demonstrate how and which knowledge can be developed within an accelerator to stimulate entrepreneurs to accelerate their own businesses towards international markets (Sarmiento et al., 2016; Hochberg, 2016).

## 2. THEORETICAL FRAMEWORK

In order to understand how business accelerators collaborate to the development of international competencies, we selected as theoretical foundations the International competencies, extracted from born global companies (Cavusgil & Knight, 2015; Knight & Cavusgil, 2004), and the International Digital Competencies of startups that provide competitive advantage through the provision of knowledge for startups in the international scenario (Cohen, & Borini, 2019).

To answer "how" business accelerators develop competencies, relating them to the theoretical foundations, business accelerators are to be considered based on the pillars of business knowledge development (Noronha et al., 2020b; Bliemel et al., 2019) and how these pillars contribute to the development of each competence presented as foundation in this section.

### 2.1. Born Global companies and their international competencies

The Born Global concept was first brought up by the McKinsey consulting group in an attempt to understand the internationalization phenomenon of companies based on their competencies (Knight, & Cavusgil, 2015; McKinsey, & Company, 1993). Oviatt and McDougall (2005) and Knight and Kim (2009) affirm that these companies seek since their inception to obtain competitive advantage through the allocation of multiple resources and sales in different countries, focusing on internationalization strategies anchored in the creation of competencies.

Noronha et al. (2020a) highlight that the competencies of born global companies are used to internationalize startups. In the same line, Cavusgil and Knight (2004; 2015) indicate the most relevant international competencies developed by born global companies, as well as their characteristics, which precede market orientation and international entrepreneurship. Based on the authors, the international competencies of born global companies that support international expansion are: Technological competence, Unique products and services development, Quality focus, and Leveraging of foreign distributor competencies, which will be further analyzed.

Technological competence comprises the development of new technologies that facilitate the routine of entrepreneurs and managers. It provides innovation through technological platforms, allocating intangible resources through technologies linked to programs and machinery (Oviatt, & McDougall, 2005), and it has the ability to increment innovative technologies to increase organizational performance while reducing production costs (Knight, & Kim, 2009). The utilization of a technological basis to reach market niches around the world, in addition to the development of products and services, enables the communication between global collaborators and partners (Cahen, 2019).

Unique products and services development arises from intensive knowledge and generation of innovations. It refers to the company's ability to adapt to product and service demands in different markets (Cavusgil, & Knight, 2004; 2015). The creation of different products may be a strategic way of winning the loyalty of consumers and should be related to the ability of developing specific products and services to serve specific market niches and to the ability of developing products and services with the existing resources (Cahen, Oliveira Jr., & Borini,

2012). Thus, such competence depends on tacit knowledge for its development and, when offering exclusive products and services based on innovation, customer needs are met and the advantage of local competitors can be minimized (Sharma, & Blomstermo, 2003).

Quality focus refers to the efforts to develop exclusive products that meet customers' needs and expectations (Oviatt, & McDougall, 2005). Such competence considers all available resources and the time necessary to refine a particular product or service (Cavusgil, & Knight, 2004; 2015), requires market research, participants' knowledge, and understanding the market that the company aims to reach out to (Cahen, 2019). The focus on quality relates to a better performance in the local and international market and consumers are vectors for the performance of better quality. The feedbacks of consumers all around the world can be accessed through research platforms or in practice for the refinement of products or services.

Leveraging of foreign distributor competence is based on the use of international distributors to maximize performance; thus, companies establish a relationship with foreign distributors to carry out commercial activities (Sharma & Blomstermo, 2003). Market advantages provided by local distributors and the advantages provided by local markets to reduce the risk of failure in the international environment are a few of the characteristics of such competence. Understanding the competencies of local distributors to create internal competencies within the organization is essential for the development of a supply chain in international markets (Knight & Kim, 2009).

## 2.2. International digital competencies

Digital competencies arise from technology-based companies and structure based on the allocation of tangible and intangible access to technological knowledge (Cahen, 2019; Ribeiro, Oliveira Jr., & Borini, 2012; Ilomäki et al., 2001). Digital competencies are based on skills in the use of internet, information technology, digital communication platforms, digital and media literacy, computer science, and knowledge to manage software and analyze large amounts of data (Ilomäki et al., 2001; Cahen, 2019). Ferrari (2012) and Neubert

(2018) emphasize the role of the internet in the operationalization of the competencies of companies and individuals.

The internet makes digital competence viable by providing flexibility and adaptation, intercultural and social attitude, creative attitude, critical attitude, initiative, and autonomy. Companies that own digital competencies find it easier to readjust their business models and to generate innovations for different contexts (Neubert, 2018; Ferrari, 2012).

Companies like Uber (Cannon, & Summers, 2014) and N-26 (Gimpel et al., 2018) face a few macroeconomic adversities related to the rapid technological change that leads entrepreneurs and managers to articulate their tangible and intangible resources to structure their products, services, organizational culture, and even to guide the process of internationalization aiming at the digital environment (Cahen, 2019; Cahen, & Borini, 2019).

Digital competencies can also collaborate to the internationalization of startups (Neubert, 2018; Cahen, 2019). Such competencies, known as *International Digital Competencies*, streamline the internationalization process by intentionally facilitating the allocation of resources through software and digital platforms connected to the internet, which enable the business model of startups in different parts of the world (Cahen, & Borini, 2019).

Cahen and Borini (2019) suggest four international digital competencies that enable startups to reach out to the international expansion online: *Cross-Cultural Programming Skills*, *Global Virtual Networks*, *Cross-Border Digital Monetizing Adaptability*, and *International Business Model Reconfiguration*. These competencies will be used as foundations to conduct our investigation considering the context of accelerations. Further information on these competencies and their characteristics will be given over the next paragraphs.

*Cross-Cultural Programming Skills*: This competence is linked to the ability to adapt digital interfaces to different places and connect digital products to virtual markets accessible to potential users. It reflects the combination between strong programming skills and cultural sensitivity for online expansion (Cahen, 2019). The use of programming skills to adapt virtual products/services and to develop interfaces is essential for different types of market, serving to effectively reach digital users and

partners for business expansion in global markets (Ferrari, 2012).

*Global Virtual Networks*: This competence is related to the number of users needed to create value for digital products and online virtual partnerships (Cahen, & Borini, 2019). The online virtual network is used both to enable sales and to create products. This competence relies on the skill of entrepreneurs to share digital resources through online platforms and virtual connections that promote the active participation in events that generate knowledge. The creation of online communities enables the wide dissemination of advertising and data exchange that segment the commercialization of products and services to startups (Ferrari, 2012).

*Cross-Border Digital Monetizing Adaptability*: This refers to the ability to identify the appropriate revenue model adaptable to international markets (Cahen, & Borini, 2019). Adaptability depends on the type of business model and must be established based on the users of a chosen location if the company intends to increase virtual revenues or reach out to international users (Neubert, 2018). It enables different forms of payment depending on the behavior of users in different countries and explores all types of monetization considering the consumer culture in the country where the company aims to internationalize (Cahen, 2019).

*International Business Model Reconfiguration*: This competence refers to the adaptation of the initial business model to reach international markets based on digital and technological knowledge (Neubert, 2018). Cahen and Borini (2019) affirm that such competence is the ability to change the business model rapidly and effectively, combining distinct abilities to reinvent new strategies. This competence reflects the company's agility to test and redesign processes that are not working within the business model according to the international context (Cahen, 2019).

### 2.3. Business Accelerators

Business Accelerators are physical workspaces with resources and training and learning programs that aim at the development of early-stage companies (Clayton et al., 2018). Pauwels et al. (2016) explore the business acceleration process in

the field of entrepreneurship, innovation, technological transfer, and company capabilities. The acceleration process may contribute to the establishment of networks, refinement of business models, mentoring, and provision of capital for startups to have a solid performance in the operating markets (Mansoori, Karlsson, & Lundqvist, 2019; Sarmiento, Carvalho, & Rocha, 2016).

According to Cohen et. al (2019), accelerators are modified incubators that offer mentoring services and proximity to contacts for obtaining investments. Factors such as physical space and mentoring and essential for the conceptualization of an accelerator. Bliemel, Flores, Klerk and Miles (2019) reiterate five key factors for an accelerator: standardized seed

funding; time-boxed cohort-based entry and exit; a structured program to develop entrepreneurial capabilities; mentoring; and location/physical space. For early-stage companies that are part of an accelerator, the acceleration process can take from three to six months.

Noronha et al. (2020b) raised the main pillars for the development of capabilities and competencies in business accelerators, namely the development of products and services, legal and financial support, physical space, and mentoring. Each pillar is composed of a series of fundamental processes for the development and structuring of startups, as shown in Figure 1.

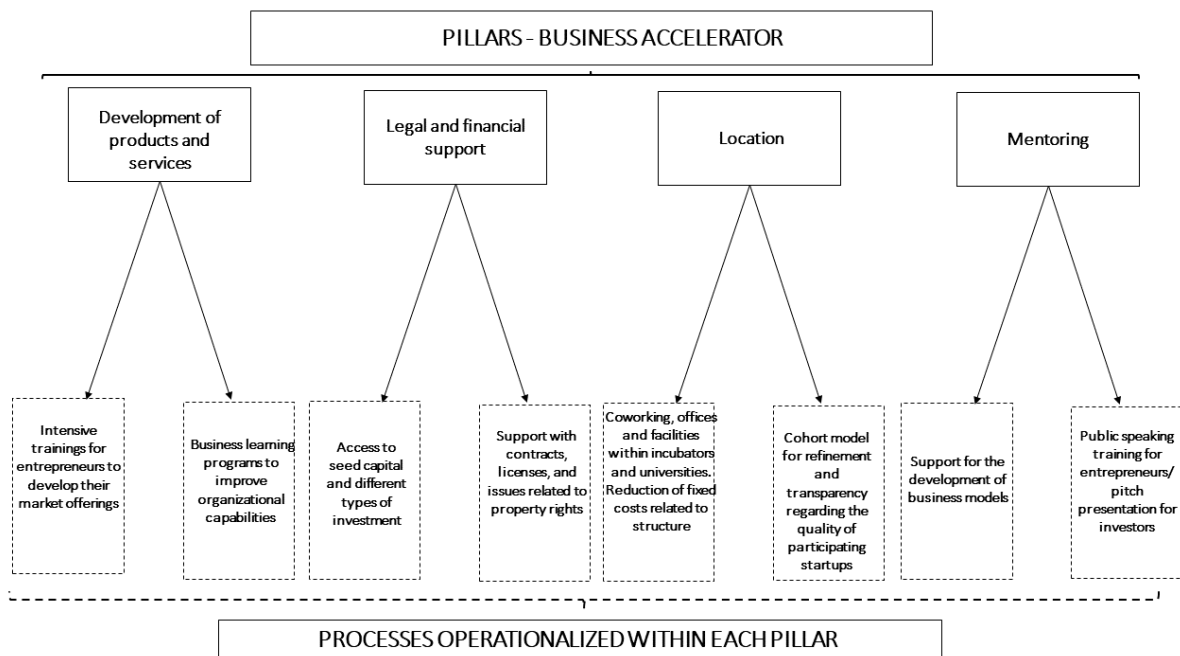


Figure 1. Pillars and processes operationalized by the business accelerators.

Source: Noronha et al. (2020b).

Accelerators have the potential to develop and refine specific knowledge in companies, which can be operationalized as organizational capabilities or manifest itself through entrepreneurial competencies based on the presented pillars (Noronha, 2020b; Cohen, 2013; Bliemel et al., 2019).

These pillars provide entrepreneurs with knowledge related to the development of products and services, helping to improve the quality and refinement of the business model. It is assumed that such knowledge, transmitted through the acceleration pillars, can turn into international

market competencies of born global companies, helping in the internationalization of companies. Thus:

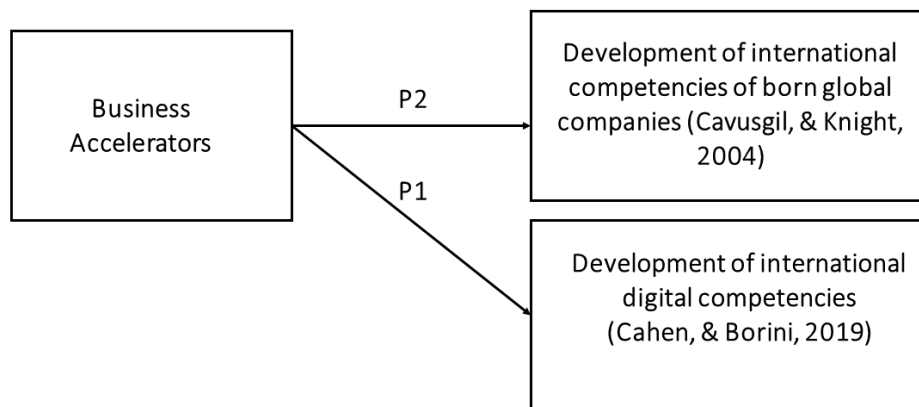
**Proposition 1:** Business accelerators contribute to the development of international digital competencies in startups.

The acceleration pillars rely on digital mentoring, development of products and services, location, and many other processes that make startups acquire

digital programming skills and capabilities to operate online platforms that can subsidize entrepreneurs with the possibility to explore local and international markets (Noronha et al., 2020b; Hochberg, 2016). We propose that business accelerators develop digital competencies that enable the internationalization of startups and provide competitive advantages to explore global markets.

**Proposition 2:** Business accelerators contribute to the development of international competencies of born global companies in startups.

The interrelationships between both propositions are shown in the theoretical model presented in Figure 2.



**Figure 2.** Theoretical model.

Both propositions have deductive nature, as they aim to understand the development of competencies through the pillars of business accelerators in the international context. Their establishment is based on empirical evidence that builds a sequential logic between the existence of competencies and the role of the business accelerator and its pillars (Bardin, 2011; Yin, 2016). The deductive categories are based on the competencies listed in the literature review and shown in the theoretical model, corroborating the investigation conducted herein.

### 3. METHOD

We present herein a qualitative analysis (Yin, 2016) of exploratory nature (Gil, 1995). The methodological path follows four essential phases: delimitation of object under analysis; data collection;

data selection, analysis, and interpretation; and elaboration of conclusions and results (Gil, 1995; Yin, 2015; 2016). After defining the research object, data were collected with managers of startup accelerators in the regions of São Paulo (state of São Paulo) and Vitória (state of Espírito Santo).

The criteria for choosing the sample were: the accelerators have startups that already have internationalized and have gone through experiences in the international market; the accelerators present the pillars mentoring, development of products and services, legal support, and location (Noronha et al., 2020b); and the accessibility to the incubators in the state of São Paulo and Espírito Santo.

Table 1 presents the sample data. The names of the accelerators were hidden in order to ensure confidentiality and to respond to a request from one of the respondents.

**Table 1.** Sample data.

Interviewee	Date	Company	Function
E1	September, 2019	A	CEO and founder
E2	September, 2019	B	Responsible for several acceleration programs
E3	October, 2019	C	Innovation director
E4	January, 2020	D	Specialist in the implementation of innovation habitats, methods, businesses, and technologies
E5	February, 2020	E	Superintendent

The survey lasted one year and three months; it began in January 2019 and ended in March 2020. The collection period took place between September 2019 and February 2020. The interviews were carried out within the acceleration environment, except for E3, who happened to be interviewed during an innovation and energy event.

The data collection instrument used was a semi-structured script so that the interviewees could feel comfortable to talk about the selected themes. As a guide for the construction of the interview script, the questions were developed based on the categories indicated in Table 2 in order to answer the 'how' in the research question.

The interviews were recorded, transcribed, treated, and analyzed with support of Atlas.ti software, which was used to systemize and separate the content, in addition to verifying the relevance of the concepts approached in the theoretical

framework. Content analysis (Gerhardt, 2009) was the technique applied to interpret the data.

In order to conduct the content analysis and the presentation of results, categories were created based on the competencies extracted from the theoretical framework, divided into Deductive and Inductive Categories (Bardin, 2011). Deductive categories come from the literature, while Inductive Categories reflect the findings identified during the application of the research script (Yin, 2016). We have also mapped statistical data on the relevance of the themes, representing the number of times that the interviewees cited deductive (Table 2) and inductive categories (Table 3). The presentation of such relevance indicates the importance of the themes. The categories illustrated in Table 2 and Table 3 are analyzed and presented in the results section based on the relevant transcriptions repeated by the interviewees.

**Table 2.** Deductive categories and relevance.

Reference	Deductive category	Relevance/Repetition
International Digital Competencies	Cross-Cultural Programming Skills	17
	Global Virtual Networks	33
	Cross-Border Digital Monetizing Adaptability	15
	International Business Model Reconfiguration	17
International Market Competencies of Born Global Companies	Technological competence	37
	Unique products and services development	42
	Quality focus	19
	Leveraging of foreign distributors	21

**Table 3.** Emerging inductive categories and relevance.

Emerging inductive categories	Relevance
Big Data and Data Science	14
Contracts	12
Finance	08

### 3.1. Content analysis

The content analysis was based on the three stages proposed by Bardin (2011): pre-analysis; exploration of the material; and data treatment, inference, and interpretation.

In the pre-analysis, the transcribed material was analyzed in depth and then separated to identify categories for systematization.

The material exploration stage relies on the content of the interviews, which was divided and organized with the support of Atlas.ti, allowing for the categorization of the material and the visualization of the main concepts approached during the interviews.

In the treatment of data, inference, and interpretation stage, concepts and reports of the interviewees were linked, correlating them with concepts presented in the theoretical framework and field reports (Yin, 2016).

The results section presents part of the transcriptions regarding the categorizations and the process of content analysis, which delimits the results found and provides qualitative inferences based on a few selected transcriptions.

## 4. RESULTS

The analysis of categories shows that technological competence is the second most relevant category. The interviewees affirmed that, in accelerators, this competence is developed through the mentoring for the development of the skills related to software maintenance and operation and digital platforms, which allow the startup to develop capabilities to operate in the international market.

According to the interviewees, technological functioning is a basic premise that must be aligned with the business model in order to enable the commercialization of a product or service. E1 ratified that accelerated companies already have a technological expertise and improve programming and business model issues based on the type of service and product being offered.

We help startups build their development team, this is a little different than teaching programming. I need the company owner to know how to manage development teams (...) what we do is connect with global technology teams who are the ones that can help with technological development, not teaching programming, but training programmers. The basic knowledge of these programmers is essential for the execution of business models (E1).

We have observed that the abilities related to technology were developed in the accelerators through pillars of product and service development, thus stimulating innovation. E5 emphasizes that the investment in the development of technological skills can reduce the social and managerial risks of companies through the interaction with audiences from different markets. Technological competence is worked within the accelerator, making the entrepreneur incorporate new information systems to operate digital platforms that expand the reach of new audiences and consumers.

Company E seeks product and service innovation and technological competence to address social issues, helping startups in the process of entering different markets. "The development of the technological competence in startups that internationalize helps in the process of inclusion in different markets (...) and it [accelerator] needs to interact with this population and reduce the risks perceived by society, delivering the status that they are ready for digital and social challenges" (E5).

The reports of E1, E3 and E5 corroborate the research of Knight and Cavusgil (2004), who affirm that technological competence is the one that steers the company to refine the offer of products and companies for different markets. In these reports, the managers emphasize that technology is also related to a new emergent category, "Big Data and Data Science", because accelerated companies structure their costs based on technological solutions linked to the maintenance of customer data and strategies associated with digital information banks, which is in line with Kwon, Lee and Shin (2014). These authors affirm that the intelligent maintenance of data allows corporations to innovate strategically and keep up with quality in communication and marketing processes.



One of the companies accelerated by [Company C] is the Delfos. From the maintenance of data from customers' wind farms, the company created a new way to manage data with market intelligence. The startup managed to develop innovative solutions with potential to be outsourced to important wind farm entrepreneurs. When the startup first came to the accelerator, it already had some expertise and the necessary tools to operate its model. We only put the company in contact with professionals so that the business model focused on data management could be refined to serve entrepreneurs around the world (E3).

Reports related to quality refer to the use of company data or secondary data so that startups can be guided by mentors with the necessary expertise in products to refine their offerings for the market. The physical space, in addition to the mentoring offered by accelerators, allows companies to focus their budgets on better marketing and communication quality, contributing to performance in the local and international market (Knight & Cavusgil, 2004; Knight & Kim, 2009).

Usually, companies that went through the assessment process to be in the accelerator, presumably already have a basic marketing and communication strategy, as this is also checked through the methodology for selecting the participating companies. For example, one of our accelerated companies already had a product in the validation phase, but its visual communication was very weak, and the company also didn't use any online sales resource. In addition to doing some research, we sought guidance from digital marketing and communication professionals here at the accelerator and we gave feedback for the entrepreneur to refine his business (E2).

The evidence presented by E3 and E2 indicates that accelerators boost the focus on the quality of services and products of startups based on cohort and mentoring methodologies that refine the business model of the company until it is prepared for different markets around the world. Such affirmation complies with the research of Knight and Cavusgil (2004) and with the study on startup acceleration of Cohen (2013) and Hochberg (2016), in which the authors affirm that for startups to reach certain levels of maturity and operate in different markets, the company needs to have quality and control standards

that enable the commercialization of products and services and their operations in different business ecosystems.

The category related to the development of exclusive products and services appears more frequently (Knight & Cavusgil, 2014) and is in line with Noronha et al. (2020b), showing that this sort of organization works as a hub for the development of products and services based on the stages that refine the business model in a global and innovative way. E3 shows that these stages are carried out globally as they are embedded in the mission, vision, and values of the accelerator itself, allowing for startups to develop not only their products, but also a business model that serves international markets.

It's a business challenge, a two-way street. We have internal challenges that we map, but there is a lot that comes up in the market, things that are not in our spectrum and that make startups look for us. We assess the solutions and there is a technical body in Portugal that serves the entire group. There are specific areas that serve in different parts of the world [...]. We submit these solutions to their analysis, and they respond with a technical opinion, so the solutions to develop a product may come from international markets or from within the company or the accelerator itself (E3).

Another prominent factor in the category referring to the development of unique and exclusive products is the support of mentoring, trainings, and physical spaces that enable the co-creation and the process of innovation in companies. This allows entrepreneurs to improve their orientation towards international markets, as the accelerator has expertise in different designs of business models and technological possibilities.

We work on product quality right from the beginning (...). Product is something very co-created within the process and with the entrepreneur because usually our portfolio is much larger than the company's regarding design and technological possibilities. We have a specific process for creation, but it is not exclusively focused on product quality, but on the conception of the product and quality is part of it. We guarantee development and quality through a series of processes and not a process that guarantees quality in the creation. Quality

is implied in the time for you to decide on the right product for the right customer (E1).

Thus, the access to technology and the guidance obtained through the physical space and the technology provided by the accelerator drives global innovation in startups, as this implies a mix of knowledge between the entrepreneur and the accelerator, which contributes to the development of unique and exclusive products in the international market. Such statements narrow the investigations on the competencies and creation of knowledge that accelerators can leverage in companies that undergo processes of business model improvement and are willing to dive into international challenges (Cavusgil, & Knight, 2015; Hochberg, 2016).

The company is global, so we leverage in the countries where we operate. We run a demo day pitch at the end of the company's immersion. I invite all wind capitals, people from the energy industry, direct competitors, angel investors and other corporate investors. It is an event open to the public to connect these companies with the startups and this already opens many doors. The acceleration turns out to be pretty wide; it provides the opportunity to come to Brazil or to go to other countries. We connect with other wind capital companies and then we also help to expand those with an international interest (E3).

Global networking is another crucial factor that drives the internationalization of startups and the creation of global competencies (Sharma, & Blomstermo, 2003). The interviewees cited events and meetings with investors as connection points, which are also drivers of innovation when connecting companies with the right audiences, i.e., those that will provide support for financial, physical, and digital structure. It is also noteworthy that there are different themes for the accomplishment of networks; for each accelerator, there is a different focus when creating a network, as mentioned by E1.

Actually, there are three types of networking that are highly qualified, the first is the strategist, as we are the ones that talk about the project and we only connect the project in very specific moments. The second type of qualified networking has to do with the investor. In the case of the investor, we work on the same process. So, we present the projects and send out

some reports. When the investor wants to keep up with the project, we provide periodical clippings and eventually the investor gets to know the people, at the right time we connect people. The other type is market opening, which means to talk to the director of a company, who can become a large client or a strategic partner (E1).

This report confirms what other interviewees claim about network and global network: accelerators centralize the interests and deficiencies of startups to solve internal problems through contact and network, thus generating work groups and themes that enable networking and leveraging partnerships, thus reinforcing the investigations on international networking by Cahen and Borini (1999) and on leveraging of distributor competence by Cavusgil and Knight (2015; 2004).

The category related to the leverage of international distributors is directly linked to global network because it is a way through which accelerators can attract the interest of stakeholders to become shareholders or somehow participate in the establishment of the startup in global environments.

Incubation and acceleration are ways to connect with and get new distributors and suppliers (...) we carry out mentoring and support programs with the entrepreneurs to show them which are the right partners to improve their product and thus reduce costs in Brazil or in any other country on which the company focuses (E5).

Global connections allow the creation of a crossover of cultures that enables knowledge focused on programming and technology, enabling companies to improve knowledge in certain areas based on the exchange of information between different cultures (Cahen & Borini, 2019). E3 reports that Company C has built a global process that guides companies to develop their businesses based on face-to-face or virtual meetings and roundtables with investors from around the world.

The three best startups in each module are invited to establish what is going to happen in November, at the end of the WebSummit event in Lisbon. We pay for the trip and fair stands of these companies, the Brazilian companies will already generate business, go public and opportunities may appear. And the innovation areas of other

countries, Spain, Brazil, United States and Portugal, participate in all modules related to technology, programming, and investments. So, people from there come to Brazil, we invite an American company as well, called American Electric Power, which was accelerated here because it was seeking solutions to take to the United States and generate business (...) (E3).

E3 also affirms that different areas of innovation of other countries take part in the processes of global refinement of the company, allowing startups to formulate new types of contracts that will enable investments and the creation of solutions to manage businesses in different markets. In addition, E3 states that partnerships are made with other accelerators and executives in order to obtain diagnose from entrepreneurs and the global startup itself. After receiving the diagnoses, the executives of partner accelerators and of Company C carry out a technical mentoring for the process.

We have an external partner, this year we have ACE, which diagnoses both the entrepreneur and the company. So, in addition to this consulting that we offer to the executives of the company (Company C), which is much more technical, they offer entrepreneurship trainings focused on international markets. Basically, we connect market mentors, investors and even partners to help with the startup's internal supply (E3).

The results of partnerships and contacts are identified as contractual mechanisms for attracting investments. Amongst these contracts, venture capital, private equity, and fundraising models are mentioned as ways to obtain investment and equity stake. Thus, the category "Contracts" is considered in order to organize the main findings of this research that are related to the legal and contractual support that accelerators provide to startups.

There is another case of a startup that has been receiving investment in the region of Campinas. They work with unstructured data and add them to their own platform, working with artificial intelligence and big data. So, this is applicable to many sectors, in addition to having a very wide range of services. This company had great difficulty in hiring data services here in Brazil because they are located in Campinas and compete with São Paulo, and they are inserted in a very competitive market in the IT area. They

came with us to WebSummit 2018 and during the event the entrepreneur signed a contract to provide services in Portugal. Later, by researching the region [entrepreneur], he found that in Óbidos there is a very strong training center for data scientists. So, he has already established a subsidiary in Portugal, and this is an internationalization that has already provided him with several investment and partnership contracts that are being assessed together with the accelerator of Company C (E3).

By analyzing the report, we realize that the "contract" is considered an emerging category, which is supported by Coase (1995) who reiterates that companies are nexus of contracts and that can transact their costs from the vertical integration of hybrid contracts to obtain not only investments, but also the specific contracting of determined services (Williamson, 1991).

The contracts and relationships that provide a direct connection to the process of product development are linked to another emerging category, known as "Finance". The financial process of these startups is refined during the stages of acceleration and development of business models, honed with the startup's strategic planning and financial knowledge. Another variable involved in the category "Finance" is the emergence of fintechs, also known as financial technology companies that refine their business models globally through the knowledge developed within accelerators (Gimpel et al., 2018).

We do a lot of things in-house, like the fintech Pag. Pag is a digital bank, and we also have the Liftbank, but our technology has always been developed in-house right from the beginning, we outsource practically nothing, this is a differential. In addition to the competence that we have in here, we also have expertise in the financial and technological areas, we have digital marketing, acquisition/retention, data science, and a team of data scientists. Not to mention human resources, controllership, investor relations and entrepreneurial experience (E2).

The category reconfiguration of the international business model was mentioned to exemplify cases of accelerated startups that use artificial intelligence platforms and solutions and need a specific

adaptation to operate in international markets (E2, E3, E4, and E5). Many times, accelerated companies seek technical assistance from the accelerator's partners to adapt and reconfigure their business model aiming at the country they want to operate in.

We provided the startup Delfos with a mentorship for strategic guidance (...) we provided them with a panorama on Company C, we do not control the path that the startup will follow. In the Brazilian sector, companies are more worried about managing wind farms, so the focus of the company is to develop this artificial intelligence solution and to improve it. We have connected them with a technical team located in Spain since Brazil is more focused on operation. This also happened with other clients in the wind sector. They are more concerned with managing than improving the algorithm. So, we realized that the algorithm would not be improved in Brazil, and we would have to go to international markets that are more technologically sophisticated, like Spain and the USA. The investment in Delfos was more focused on the participation in international fairs and mentoring with our global executives. This way, the company could grow in two different ways, one would be maintaining the market it already has in Brazil and to expand, and the other through a roadmap of technological evolution (E3).

The report by E3 confirms the findings of Cahen and Borini (2019), who affirm that international reconfiguration depends mutually on the connection with international partners that share different forms of knowledge in global markets to generate competencies. The reconfiguration of the models is present in the acceleration process based on mentoring, which collaborates by providing suggestions of changes and adaptations related to the entrepreneurial payment methods, called by Cahen and Borini (2019) of cross-border digital monetization adaptation.

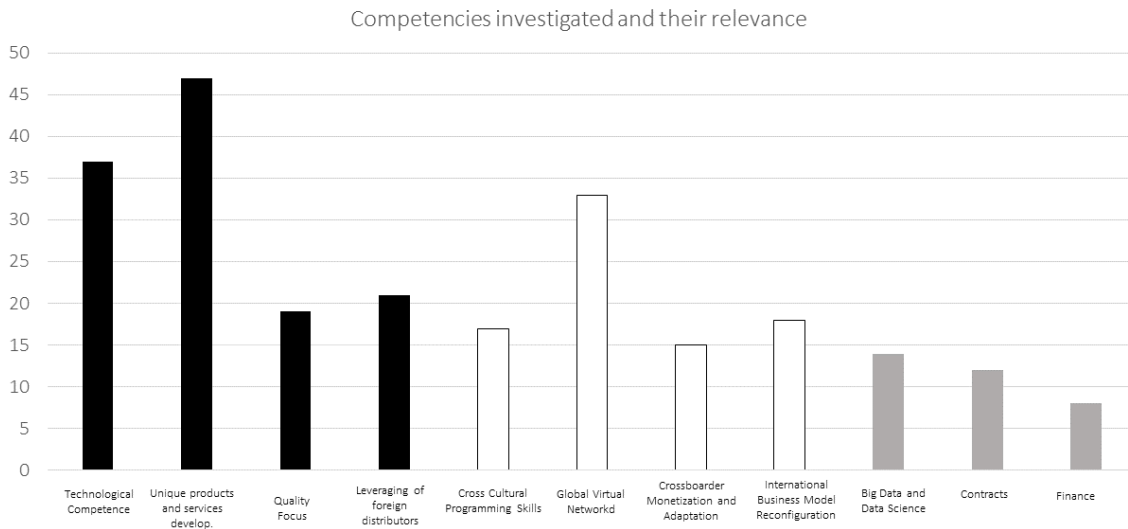
One thing is the business model issue, I think this is usually the first stage we approach. There is a second stage, which is the product market fit, which is the perfect customer to sell to in any market. And the third, which is the most tactical thing in the commercial and financial process of sales and administrative financial control. We have a guided process for the first two, so the business model is the central theme of the first phase of acceleration, and product market fit and financial control are respectively the second and third phase. At the end of the day, we try to go over all models and ways to carry out the operational stage, which are the best strategies and global tools, but a lot of things change in the daily life and according to the evolution of the startup (E1)

The interviewees' reports reiterate the need to adapt the billing and payment format according to the different audiences. Strategically, based on the data collected from customers, potential audiences are selected and, subsequently, the billing format is adapted to local specificities with the aid of the accelerator (Hochberg, 2016).

## 5. DISCUSSION

The results show that, through the acceleration pillars (Noronha et al., 2020b), business accelerators contribute to the development of international digital competencies (Cahen & Borini, 2019) and of born global competencies (Cavusgil, & Knight, 2004; 2015) in startups in a hegemonic and specific way, which confirms propositions P1 and P2 and answers the research question, indicating the achievement of the objective of answering the 'how' and showing the most relevant competencies developed in this context.

Based on the relevance indicated in Table 2 and Table 3, we have identified the role of the accelerator in the development of the competencies investigated herein, as shown in Figure 3.



**Figure 3.** Competencies worked on accelerators and their relevance.

The categories in black reflect the international market competencies of born global companies, mapped in order to know which competencies are mostly worked on by accelerators. Such evidence supports P1, which affirms that accelerators collaborate in the development of competencies of born global companies. All competencies were developed in the acceleration stages and each one in its measure, considering that each acceleration focuses on developing a distinct type of competence.

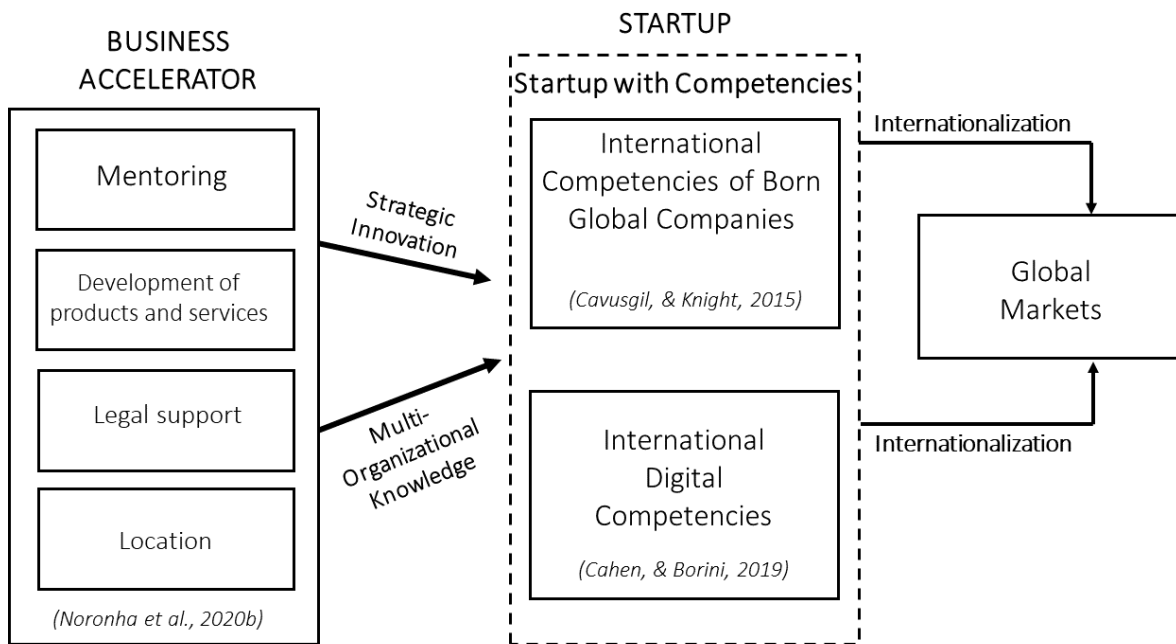
The categories in white refer to international digital competencies and support P2, which affirms that accelerators also contribute to the development of digital international skills in startups.

The categories in gray are the findings of the present research, they represent competencies of digital and market nature not approached by Cahen and Borini (2019) and Cavugsil and Knight (2004; 2015) and can be used in future research.

The order of relevance of the competencies worked on in the accelerators is: (1) Unique products and services development; (2) Technological competence; (3) Global and Virtual Networking; (4) Leveraging of Foreign Distributors; (5) Quality Focus; (6) International Reconfiguration of the Business Model; (7) Cross-Cultural Programming Skills; (8) Cross-Border Digital Monetizing Adaptability; (9) Big Data and Data Science; (10) Contracts; and (11) Finance.

The pillars of acceleration provide strategic innovation and multi-organizational knowledge for the creation of international competencies in startups, promoting the necessary knowledge for a startup to explore global markets.

Based on the results shown herein, Figure 4 demonstrates a model of development of competencies between accelerators and startups that aim to internationalize.



**Figure 4.** Model for the development of international competencies between business accelerators and startups.

## 6. CONCLUSION

The present research provides a model of Development of International Competencies in Startups that approaches the relationship between startups and business environments in ecosystems for innovation (Noronha et al., 2020b; Cavusgil, & Knight, 2004; Bliemel et al., 2019). Such relationship is illustrated based on literature on competencies, which enables the exploration of other theoretical perspectives in the field of International Business that involve dynamic capabilities and organizational learning (Cavusgil, & Knight, 2015; Cohen, 2013).

The theoretical contribution emphasizes that business accelerators are predecessor agents in the process of developing international competencies. Their role in the innovation ecosystem is to promote organizational knowledge and strategic innovation in companies.

As managerial contribution, we have presented which knowledge and competencies are necessary for a startup to explore global markets, showing how the services provided by accelerators can guide entrepreneurs that are looking for structures to develop their companies, such as coworking offices, incubators, and technological and industrial hubs aiming at exploring international markets.

The limitation of this research lies in the sample and its regional characteristics. In addition to the use of data saturation to obtain new results, we also suggest future studies to develop multiple case studies to deepen understanding on the phenomenon. The accelerators approached herein are from the states of São Paulo and Espírito Santo, which restricts the findings to international startups that have been accelerated exclusively in these regions. Thus, location can influence the creation of different types of competencies.

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## DESENVOLVIMENTO DE COMPETÊNCIAS DIGITAIS E INTERNACIONAIS EM STARTUPS VIA ACELERADORAS DE NEGÓCIOS

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DETALHES DO ARTIGO	RESUMO
<p><b>Histórico do Artigo:</b></p> <p>Recebido em: 13 de novembro de 2020 Aceito: 30 de julho de 2021 Disponível online: 27 de outubro de 2021</p> <p><b>Sistema de revisão “Double blind review”</b></p> <p><b>Editor Científico</b> Ilan Avrichir</p>	<p><b>Objetivo:</b> Diagnosticar como as aceleradoras colaboram para o desenvolvimento de competências internacionais em startups e verificar quais as principais competências internacionais digitais e empreendedoras desenvolvidas no ambiente de aceleração de startups.</p> <p><b>Método:</b> A abordagem é qualitativa. O método utilizado é a análise de conteúdo. Os dados foram coletados com gestores de aceleradoras de startups das regiões de São Paulo (SP) e Vitória (ES).</p> <p><b>Principais resultados:</b> Os resultados mostram que as aceleradoras desenvolvem competências digitais internacionais e de <i>Born Globals</i> em startups. Observa-se que determinadas competências são mais refinadas que outras no processo de aceleração e estão concomitantemente ligadas aos pilares das aceleradoras.</p> <p><b>Relevância/originalidade:</b> Traz três novas categorias emergentes para a literatura sobre startups: Contratos, Finanças e Big Data/Data Science.</p> <p><b>Contribuições teóricas:</b> As aceleradoras de negócios são agentes antecessores ao processo de desenvolvimento de competências e capacidades internacionais, e seu papel no ecossistema de inovação é promover a inovação estratégica e o conhecimento organizacional.</p> <p><b>Contribuições para a gestão:</b> Apresentam-se conhecimentos e competências necessárias para que uma empresa em fase inicial possa explorar mercados globais.</p>
<p><b>Palavras-chaves:</b></p> <p>Aceleradoras Competências Competências Internacionais Competências Digitais</p>	

## DESARROLLO DE COMPETENCIAS INTERNACIONALES Y DIGITALES EN STARTUPS DE ACELERADORES DE NEGOCIOS

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<p><b>Palabras-clave:</b></p> <p>Aceleradores Competencias Competencias internacionales Competencias Digitales</p>	

### How to cite this article:

Eurico Soares de Noronha, M., Rodrigues, C. D., Mello, C., & Borini, F. M. (2022). Development Of International and Digital Competencies in Startups from Business Accelerators. *Internext*, 17(1), 46–63. <https://doi.org/10.18568/internext.v17i1.641>

<sup>i</sup> The competencies operationalized by Born Global companies are adopted as startup competencies, operationalized as theoretical foundations in the framework and data analysis, based on Cavusgil and Knight (2015; 2004).