A Literature Review of E-Entrepreneurship in Emerging Economies: Positioning Research on Latin American Digital Startups

Gerardo Quinones, Brian Nicholson, and Richard Heeks

Abstract This chapter critically reviews literature on e-entrepreneurship in order to position future empirical research with a focus on emerging markets (The terms "emerging economies", "emerging countries", or "developing economies" are used interchangeably and refer to the list of countries named as such by the International Monetary Fund (World Economic Outlook. Washington, DC: International Monetary Fund, 2013)) in general and in Latin America in particular. The term 'e-entrepreneurship' has been used to describe the creation of different e-businesses by both start-ups and established companies. Thus, the concept of Digital Start-up (DS) as a specific unit of study of e-entrepreneurship is presented. DSs are defined as start-ups born on the internet to sell only digital products/services exclusively online. The emergence of this new breed of enterprises is opening doors for entrepreneurs to enter new markets with an explosive potential for growth, as demonstrated by the cases of Facebook, Twitter, Instagram and others. This phenomenon acted as a catalyst for a new entrepreneurial ecosystem in emerging markets supported by both private and public entities. However, there are still very limited signs of success outside of the United States, Israel, and Europe. The literature reveals that the lifecycle and ecosystems of DSs have been extensively researched in developed countries; however, there is a relative paucity in the context of emerging economies. E-entrepreneurship research is grouped into six categories: e-business models, digital economy, entrepreneurship, business ecosystems, innovation, and e-entrepreneurship. Relevant theoretical frameworks and their application to DSs are explored. The chapter concludes that gaps remain in the literature on e-entrepreneurship in the context of emerging economies and questions for future research are presented.

Keywords Digital start-up • Business ecosystems • E-business • E-entrepreneurship • Innovation • Emerging economies • Latin America

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R.L. La Rovere et al. (eds.), *Entrepreneurship in BRICS*,
DOI 10.1007/978-3-319-11412-5_11

1 Introduction

As the internet matured, and infrastructure development allowed a larger number of people to be connected, a multitude of ventures were developed to capture a new potential for creating wealth during what was known as the "dot com" era (Zhu et al. 2006). A handful of academics tracked the growing trend of new companies being "born in the internet" (Lockett and Brown 2000), but it was not until the last decade that the terms "e-entrepreneurship" (Matlay 2004) and "Digital Entrepreneurship" were used in reference to a new discipline (Hull et al. 2007; Kollmann 2006). In the last ten years, the explosion of wireless data networks and the ubiquitous presence of smart phones (Berman 2012) has accelerated the number of new businesses that have emerged on the Internet to sell digital products/services exclusively online (Barnes et al. 2004a; Lockett and Brown 2000; Taylor and Murphy 2004; Wall et al. 2007). Hence, several studies have emerged with the purpose of understanding the lifecycle of this new breed of start-ups, which are referred to as digital start-ups (DSs) (Asghari and Gedeon 2010; Effaha 2013; Kollmann 2006; Matlay and Westhead 2005). There are several definitions of a start-up; some are based on the age of the organization (Zahra and Nambisan 2012), while others look at their potential (Arruda et al. 2013). For the purpose of this study, start-ups are defined, according to Ries (2011), as organizations created to build something new under 'extreme uncertainty'.

E-commerce adoption is still increasing and the number of economic transactions executed digitally, the so-called digital economy, is expected to continue growing exponentially to US $4.2 trillion in 2015 (Dean et al. 2012). Such growth is in contrast to flat projections for the overall global economy (UN 2013). For this reason, private investors and governmental agencies across the globe are supporting e-entrepreneurs through grants, digital incubators (Stam and Buschmann 2011), and programs such as the United States' Start-up America, the United Kingdom's Tech City, Start-up Chile, and Brazil Startup, just to mention a few. However, although there is evidence that these efforts in some regions are starting to pay off, almost all of the examples of DSs that have grown to become successful enterprises[1] are still concentrated in the United States, Europe and Israel (Herrmann et al. 2012). The fastest growth in consumers entering the digital economy is expected to come from emerging markets (Nottebohm et al. 2012). However, unless DSs in emerging countries are able to grow and compete in the global digital economy, there will be limited benefit of this new way of creating wealth for emerging countries.

In the particular case of Latin America, the entrepreneurial ecosystem is underdeveloped in comparison with other regions (Kantis and Federico 2012). Therefore, policymakers in several Latin American countries have been very interested in supporting technology-based entrepreneurship, as evidenced by the programs that have been launched in the region (e.g., Brazil Startup, Start-up Chile, Innpulsa

[1] A company valuation over $100 M is a commonly accepted threshold to define a successful venture (Callahan et al. 2014).

Colombia, and Mexico Digital). These government-supported efforts have also been followed or anticipated, in some cases, by private investment funding (Kantis et al. 2012). However, there are insufficient case studies of successful Latin American DSs (tecnolatinas.com) to enable an evaluation of the effect of the public and private sector investment. Thus, it is necessary to improve our understanding of what is impeding the growth of Latin American DSs. The focus of this chapter is to explore existing literature relevant to e-entrepreneurship in emerging economies in order to position the need for future empirical research.

The chapter begins with a section that explains the method employed for the literature selection and review. It is then followed by a presentation of results structured by themes, and it concludes with a discussion of findings and proposed research questions.

2 Method

The literature review was based on keywords related to e-entrepreneurship, e-business and digital start-ups. Adding a focus on small and medium enterprises (SME) seemed relevant because start-ups, by virtue of being in the early stages of development, are micro and small enterprises.[2] Furthermore, terms that have been previously used to refer to a business with an e-business model were included in the search, such as digital start-up, digital enterprise, Internet-based enterprise, online business, and technology-based enterprise. The following searches were executed:

1. Digital business model OR e-business model AND small medium enterprise.
2. Digital economy OR e-commerce OR e-business AND small medium enterprise.
3. Digital entrepreneurship OR e-entrepreneurship
4. Entrepreneurship ecosystems OR business ecosystems
5. Digital start-up OR digital enterprise OR Internet-based enterprise OR online business OR technology based enterprise.
6. A second round of searches was done by adding the keywords 'emerging economies' or 'Latin America' to each of the above terms.

In addition to Google Scholar, the following databases were consulted: ProQuest, Business Source Premier, and Emerald. No filter was applied with respect to the year of publication. This was done in order to identify not only the newest resources, but also those that could be considered seminal within the different fields of study.

[2] Micro and small enterprises definitions vary, but for the purpose of this study they are considered formally established businesses with less than 100 employees and US$3,000,000 annual turnover (Ayyagari et al. 2011).

3 Results

The first search resulted in 310 documents. After looking at the abstracts and skimming through them, 175 were chosen to be further analysed based on the following criteria: (i) documents related to a theoretical framework of a wider academic discipline from which more specialised papers have been drawn, (ii) documents relevant to the unit of analysis, (iii) accessibility of the documents to be coded. Thereafter, each document was analysed and coded by its main theme following a grounded theory method technique (Urquhart 2013). This approach allowed for the categorization of the literature into six main themes. Table 1 shows the number of documents, which included research papers, reports and books per category. After studying the literature of entrepreneurship, a subcategory specialised in incubators was created because it seemed particularly relevant to the phenomenon of DSs, as it will be discussed later on.

The coding process also revealed that the phenomenon of e-entrepreneurship has been studied from four research perspectives:

- Growth process – Refers to literature that looks at the different stages of development that start-ups follow since their creation. It is also referred to in the literature as lifecycle.
- Resources – Provides a description, classification, or availability of resources employed by start-ups and their impact on their growth process. Examples of such resources include, but are not limited to, human, financial, or internal infrastructure.
- Context – Literature with a focus on the effect that external infrastructure and organizations, either private or institutional, have on start-ups. This is the case of literature on business ecosystems, entrepreneurial ecosystems, and systems of innovation.
- Actions – These studies are concerned with the actions and behaviour of e-entrepreneurs and their impact on the success of the start-up. The unit of study in such cases was the entrepreneur and/or the company.

Table 1 Thematic categories and number of documents

Theme	# of documents	Papers	Reports	Books
E-business models	18	15	1	2
Digital economy	44	40	2	2
Entrepreneurship	20	15	1	4
Innovation	25	18	2	5
Business ecosystems	35	29	2	4
E-entrepreneurship	33	29	1	3
Total	**175**	**146**	**9**	**20**

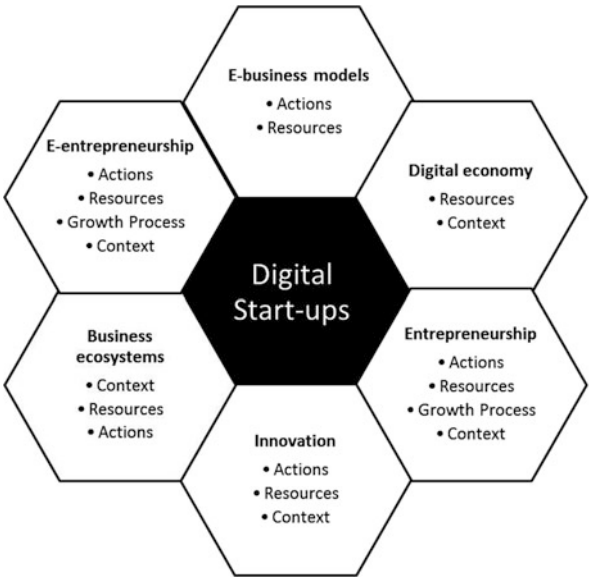

Fig. 1 Thematic categories and research perspectives

Figure 1 illustrates which research perspectives were found in each of the categories. The following sections will present the results of the literature review per category.

3.1 Digital Economy

DSs were defined as newly created enterprises that only produce digital products/services and are born, trade, and operate exclusively online. Therefore, from a contextual perspective, their immediate economic context is not necessarily subject to the constraints of the physical, or traditional, economy (Gopal et al. 2003). In a purely digital context, concepts such as marginal contribution and network effects have a greater impact; for this reason, economic activity must be measured differently (Brynjolfsson and Kahin 2000). Hence, the term 'digital economy', which was first introduced by Tapscott (1996), has been widely used by practitioners and academics alike to encompass an economic system with its own set of attributes (Tapscott 1996).

At the centre of the digital economy is the digital enterprise, or e-business, described by Barr (2001) as a "qualitatively different entity" living in a different environment. In the literature, both e-commerce and e-business are terms that are commonly used interchangeably to refer to a business transaction that is executed electronically (Wall et al. 2007). Therefore, a digital enterprise or a digital business could also be defined as an enterprise executing e-commerce transactions. In this chapter, to avoid confusion, the term e-commerce will be used in reference to a

business transaction and the term e-business to the business or enterprise executing such a transaction.

Much of the focus of academic papers in e-business in the 1990s and early 2000s was actually on how e-commerce could offer existing enterprises an alternative to a traditional way of doing business that allowed them to transform themselves into digital enterprises (Barr 2001; Fillis et al. 2004; Gopal et al. 2003; Tapscott 1996; Zimmerman 2000). However, some of the literature also acknowledged the existence of a new category of digital enterprise, which has remained purely digital since its inception (Barnes et al. 2004a; Lockett and Brown 2000; Taylor and Murphy 2004; Wall et al. 2007). This situation made the term 'digital business' or 'e-business' a wider one, encompassing both traditional businesses that implemented an alternative e-business strategy (e.g., Nike Online, Walmart online), and enterprises with e-business operations only (e.g. Google, Facebook).

Since the uptake of e-commerce in late 1990s, researchers have recognised the opportunity that e-commerce opened for SMEs to enter new markets and to level the playing field with their larger counterparts (Fariselli et al. 1999). However, contrary to what was originally anticipated, SME e-commerce adoption seemed to occur at a slower pace (Fillis et al. 2004; Taylor and Murphy 2004). Therefore, several studies seeking to better understand information and communication technologies (ICT) and e-commerce adoption barriers in SMEs emerged. As shown in Table 2, the literature specialising in the adoption of e-commerce by SMEs is abundant. This literature can be divided into two periods: 2002–2006 and 2007–2012. During the former, the authors seemed more interested in understanding the barriers and success factors (SFs) for SMEs to adopt e-commerce; during the latter, attention shifted towards understanding how SMEs were using e-commerce, what applications have already been implemented with a certain level of success, and what opportunities still remained for SMEs to further leverage e-commerce. From a resource perspective these studies are relevant to the study of DSs because they provide an initial framework with which to understand possible barriers for entrepreneurs to use ICTs as a vehicle for new e-business creation.

Some papers have studied readiness, SFs, and the potential benefits of e-commerce adoption in Latin America. Those concentrated on readiness exhibit primarily a contextual perspective, including infrastructure, laws, government support, education, culture, and competitive forces. As shown in Table 3, the literature indicated different levels of focus in Latin America with country, regional, and emerging markets settings. Papers with a regional approach have performed comparisons among Latin American countries, while those focused on emerging economies compared Latin American countries with other emerging markets. In general, the authors seem to agree on some common barriers/SFs shared between mature and emerging markets, as well as on the fact that there are significant differences (e.g., infrastructure plays a more important role as a barrier in emerging markets). However, barriers/SFs among emerging markets seem to be fairly consistent. Thus, it is anticipated that such differences and similarities between mature and emerging markets can be extrapolated to DSs.

Table 2 Literature on SMEs and e-commerce by focus

Period	Literature	Focus
Main focus on e-commerce use, adoption and application	Al-Weshah and Al-Zubi (2012)	Barriers/SF/Adoption/Application
	Hanafizadeh et al. (2012)	Adoption/Application
	Ghobakhloo et al. (2011)	Adoption/Application
	Li et al. (2011)	Adoption/Application
	Woon Kian et al. (2011)	Barriers/SF
	Wymer and Regan (2011)	Adoption/Application
	Zakaria and Janom (2011)	Adoption/Application
	Alzougool and Kurnia (2010)	Adoption/Application
	Awa et al. (2010)	Adoption/Application
	Wielicki and Arendt (2010)	Barriers/SF
	Mohamad and Ismail (2009)	Adoption/Application
	Chitura et al. (2008)	Barriers/SF
	Hamilton and Asundi (2008)	Adoption/Application
	Chong and Pervan (2007)	Barriers/SF/Adoption/Application
	Elia et al. (2007)	Adoption/Application
	Kartiwi and MacGregor (2007)	Barriers/SF
Main focus on SME e-commerce barriers and success factors (SF)	Stockdale and Standing (2006)	Barriers/SF/Adoption/Application
	Fernando Alonso and Fitzgerald (2005)	Barriers/SF/Adoption/Application
	Fillis and Wagner (2005)	Barriers/SF
	Gengatharen and Standing (2005)	Barriers/SF
	Heeks et al. (2005)	Barriers/SF
	Kaynak et al. (2005)	Barriers/SF
	E. E. Grandon and Pearson (2004)	Barriers/SF
	Houghton and Winklhofer (2004)	Adoption/Application
	Jennex et al. (2004)	Barriers/SF

(continued)

Table 2 (continued)

Period	Literature	Focus
	MacGregor (2004)	Adoption/Application
	Simon (2004)	Barriers/SF
	Simpson and Docherty (2004)	Barriers/SF
	Stockdale and Standing (2004)	Barriers/SF
	Taylor and Murphy (2004)	Barriers/SF
	E. Grandon and Pearson (2003)	Adoption/ Application
	Matlay and Addis (2003)	Barriers/SF
	Daniel et al. (2002)	Barriers/SF
	Fariselli et al. (1999)	Barriers/SF/Adoption/Application

Table 3 Literature with different levels of focus on Latin America

Latin American countries	Latin America region	Emerging markets in general
Knight (2011)–Brazil	Rohm et al. (2004)	Simon (2004)
Travica (2002)–Costa Rica	Gutierrez (2004)	Martinez and Williams (2010)
García-Murillo (2004)–Mexico	Montealegre (2001)	Jobs (2012)
E. Grandon and Pearson (2003)–Chile		

Several authors believe that a higher SME e-commerce adoption rate could have positive effects for the overall economy, in terms of increased productivity and new market opportunities (Boateng et al. 2008; García-Murillo 2004; Hinson et al. 2008). Although this has been found to be generally true for ICT adoption (Middleton and Byus 2011), studies have found mixed results on the intensity of the impact for SMEs in emerging markets (Foley and Ram 2002; Kenny 2003; Rangaswamy and Nair 2012; Zahir 2008). Some authors include recommendations to be implemented by governments, non-governmental organisations (NGOs), or the private sector to improve SMEs' ICT and e-commerce adoption (Kenny 2003; Knight 2011; Ngwenyama and Morawczynski 2009). Nevertheless, there are very few studies with a longitudinal approach that would validate whether such recommendations indeed offer the expected results (Hitt and Brynjolfsson 1996; Nair et al. 2005). Most of the papers reviewed in this category followed a qualitative inductive methodology and there is a paucity of quantitative empirical research to measure the economic effect of e-commerce adoption in emerging economies and what strategies or initiatives may have the largest impact. Although the relationship between ICT and economic impact in general is a topic for research, the current evidence points to a potential positive economic impact of DSs in emerging markets.

3.2 E-Business Models

The term 'business model' is used in the literature in different ways by associating to it more or less scope. However, in all cases it included specific actions expected to be performed by a company, and a specific way to manage its resources. For example, on one hand Timmers (1998, p. 2) defines a business model as follows: "(i) An architecture for the product, service and information flows, including a description of the various business actors and their roles; and (ii) A description of the potential benefits for the various business actors; and (iii) A description of the sources of revenues." Though he intentionally leaves out any marketing activities, he later points out that, in order to have a clearer picture of the way an enterprise will realise its business mission, it is critical to talk not about a *business model*, but a *marketing model*, which is defined as a "business model; and the marketing strategy of the business actor under consideration" (Timmers 1998, p. 3).On the other hand, Sako (2012, p. 23) states that "a business model articulates the customer value proposition; it identifies a market segment; it specifies the revenue generation mechanisms; it describes the positioning within the value network or ecosystem; and it also elaborates on competitive strategy by which the firm gains and holds advantage over rivals." Therefore, Sako (2012) gives a larger set of attributes to the term than Timmers (1998).

Furthermore, some authors point out that a company may have a different business model when applied to a purely digital context (e-business model), than when applied to a traditional brick-and-mortar context (Berman 2012; Weill and Woerner 2013). Therefore, Osterwalder et al. (2002) and Osterwalder and Pigneur (2002) present a framework to explain the elements of an e-business model with a deep level of detail on the conceptualization of terms, components, and relationships among them. Building from them, as well as other authors in the field, Pateli and Giaglis (2003, p. 1) build "a framework that further decomposes the research area of Business Models into specific research sub-domains" that includes definitions, components, taxonomies, representations, change methodologies and evaluation models.

Particularly influential to e-entrepreneurship is the work of Osterwalder et al. (2002) on e-business models. From this original work, the concept of the business model canvas was developed and introduced in the book *Business Model Generation* (Osterwalder and Pigneur 2010). Practitioners have applied this concept to dynamically create e-business models during the entrepreneurial process (Blank and Dorf 2012). Moreover, recently introduced by Ries (2011), the *lean start-up* method coupled the business model canvas with agile development. This amalgamation preaches the benefits of short and fast cycles of product development in order to coach e-entrepreneurs to aim for having a minimum viable product in the least possible time and quickly test related products or services with customers. It also calls for entrepreneurs to incrementally readjust a start-up's e-business model, resulting in reduced risk and increased chances of success during the start-up's early stage (Blank 2013a; Breuer 2013). This method has picked up a great number

of follower practitioners around the world (Blank 2013b). However, it is just in the last two years that some academic empirically grounded research has been done to test the applicability and consequences of this method in DSs, but none within a Latin American context (Breuer 2013; Hui 2013; Lalic et al. 2012; May 2012; Qvillberg and Gustafsson 2012; Yau and Murphy 2013).

3.3 Entrepreneurship

Bhupatiraju et al. (2012) researched the relationship between innovation, entrepreneurship, and technology scientific studies, showing that entrepreneurship as an academic discipline was born in close connection to the study of innovation. Probably the most referenced author within the literature that was analysed, Schumpeter (1934) defines the entrepreneur as the one who undertakes the innovation process with the purpose of creating business value. However, the term 'entrepreneurship' has evolved in different ways, thus creating some ambiguity in the way it is used (Gartner 1990; Morris et al. 2012; Shailer 1994). McQuaid (2002) summarises such different interpretations of the term 'entrepreneurship' in the following five distinctions: a function in the economy, a new business start-up; an owner-manager of a small business; a set of personal characteristics; and a form of behaviour.

Recent entrepreneurship literature is abundant and covers a broad spectrum of areas. Nonetheless, it seems that recent studies in the context of technology adoption converge on the assumption that innovation is indeed part of technology-based entrepreneurial activity. Table 4 summarises the findings of a sample of papers, which were relevant to DSs.

Of particular interest is the work of Morris et al. (2001), since their proposed 'framework of frameworks' provides a detailed theoretical model explaining the lifecycle of start-ups including factors that influence the entrepreneurship process. The model covers a multitude of perspectives grouped in six variables: the organizational context, the environment, the business concept, the resources, the entrepreneur, and the entrepreneurial process. Since the work of Morris et al. (2001) is grounded in literature rather than empirical evidence, and the prior studies upon which they draw are situated within a developed economies context, future research may empirically test the authors' propositions and their applicability to entrepreneurship in emerging economies.

A relevant subcategory of entrepreneurship literature focuses, from an actions and resources perspective, on the role that incubators play in the creation, development and growth of technology ventures. Incubators follow different models, depending on whether they are publicly or privately funded or whether they are based on mature or emerging markets (Carayannis and von Zedtwitz 2005; Stam and Buschmann 2011). Incubator-oriented literature usually refers to the entrepreneur as a new small business owner in the early process of business creation. Carayannis and von Zedtwitz (2005) provide the following definition: "incubators

Table 4 Sample of literature with focus on entrepreneurship and ICT

Literature	Perspective	Findings
McDaniel (2000)	Actions Resources	Entrepreneurship definition is linked to innovation as a function of technology change/development. The entrepreneur is different from a small business owner, or capitalist.
D. Miller and Garnsey (2000)	Actions Resources	Place the entrepreneur as the unit of analysis within a technology diffusion framework to better understand technology advances.
Klepper (2001)	Actions Resources Growth Process	Propose an evolutionarily based theory to explain the creation of employee high-tech start-ups.
Morris et al. (2001)	Actions Resources Growth Process Context	Presents a comprehensive theory of entrepreneurship through the integration of different frameworks.
McQuaid (2002)	Action Resources	Presents five views on the meaning of entrepreneurship are considered. Each of them has differing implications for policies to promote entrepreneurship.
Hindle and Yencken (2004)	Action Resources Growth Process	Propose that entrepreneur's culture and knowledge derived from research are the keys to technological innovation and the creation of new technology-based firms (NTBFs).
Doganova and Eyquem-Renault (2009)	Action Resources	Suggest that business models are market devices that allow entrepreneurs to communicate with stakeholders, thus enabling the economic network necessary for technology innovation.
Martinez and Williams (2010)	Action Context	Explore institutional policies and entrepreneurial activity in the adoption of e-commerce. Concludes that institutions are a strong driver, while entrepreneurship is a weak one.
Chandra and Leenders (2012)	Action Context	Through a study of user innovation and entrepreneurship in a virtual environment, the authors justify a proposition that links their findings to real-world entrepreneurial theories.
Soriano and Huarng (2013)	Resources	Summary of 2012 Global Innovation and Knowledge Academy conference papers. ICT innovations are considered essential instruments of knowledge based entrepreneurship.

are in the business of facilitating entrepreneurs and early-stage start-up companies; and compete with consulting firms, real-estate agents, and other companies for the most interesting and valuable start-ups. Incubators differentiate themselves through their particular competitive scope, strategic objective, and service package." According to their focus and strategic objectives, there are five archetypes of

incubation, including regional business incubators, university incubators, independent commercial incubators, company-internal incubators, and virtual incubators.

An accelerator is known as an evolution of the incubator that responds to the needs of entrepreneurs for more personalised and specialised support. According to P. Miller and Bound (2011), accelerators have some specific characteristics that differentiate them from the original incubator version:

- Accelerators accept open applications for support from entrepreneurs, but are highly competitive;
- They participate in the start-up with pre-seed or seed investment in exchange of equity;
- They usually support only entrepreneurial teams instead of single entrepreneurs;
- They offer time-limited support in the form of methodical development programs, which are 'boot camps' designed to develop maturity and test the start-up business model; they are also often accompanied with mentoring;
- They take several start-ups through this development program in parallel.

Incubators and accelerators must distribute a limited amount of funds among a large number of applicant entrepreneurs (Carayannis and von Zedtwitz 2005; Stam and Buschmann 2011; Thewarapperuma 2013); therefore, sophisticated approaches decide how to select the best prospects. The level of innovativeness is regarded as a determinant that reduces risk and increases the potential of returns (McDaniel 2000). For this reason, innovation weighs heavily in the process of capital allocation (Carayannis and von Zedtwitz 2005). Doganova and Eyquem-Renault (2009) state that possibly one of the entrepreneur's most important objectives in using business models is to reduce the risk perception of venture capitalists or, in this case, incubator managers, who need to decide how to allocate their resources. Stam and Buschmann (2011) suggests that a key element of incubator support is directed towards the creation of a business model based on innovation differentiation. Hence, it could be proposed, subject to future research, that incubated or accelerated DSs exhibit more innovation-based differentiation than their non-incubated counterparts.

Another discourse in the literature on entrepreneurship with a context and resources perspective is focused on technology clusters as a unit of analysis. Pitelis (2012, p. 1371) proposes that "clusters are a form of economic organizations that can involve [inter-firm cooperation], with net advantages that can render it superior to integration, even when cluster firms are involved in similar and complementary activities." For example, La Rovere (2003) proposed that, assisted by ICTs, SMEs in Brazil could be organised in local productive systems to better face the challenges of globalisation. Oakey (2007) looked at the effect that policy assistance has had in what he defines as high-technology small firms (HTSFs); he concludes that policy assistance oriented in the development of clusters of HTSFs has a limited effect in improved R&D collaboration between different firms, given the confidentiality that R&D in high technology entails. However, Oakey (2007) recognises that some potential benefits for HTSFs may arise from these clusters in areas other than R&D, very similar to those offered by incubators, such as shared real estate,

marketing, legal, and other business functions. Finally, it is important to differentiate between high-tech clusters and entrepreneurial ecosystems. The former involves cooperation around an industry and the concentration of firms in a geographic area (Pitelis 2012) while the latter, as will be discussed in the following section, rejects the industry as a unit of analysis.

3.4 Business Ecosystems

The earlier business and entrepreneurial ecosystems literature had a clear contextual and resource perspective, while most recent studies have also incorporated an actions perspective. The idea that entrepreneurship requires a supportive environment was recognised by several authors (Bull and Willard 1993; Carroll 1984; Van de Ven et al. 1984), but it was Moore (1993) who developed the concept of business ecosystems applying the natural ecosystems model to analyse the complex competitive business environment. Since then, the model has been adapted to explain different business phenomena, including entrepreneurship.

Drawing a comparison between the business context and natural science, Moore (1993) refers to the following main constructs: ecological contributors as leaders or followers, ecosystem stages (birth, expansion, leadership, self-renewal), co-evolution, and competition. Moore provides the following definition: "'Business ecosystem' and its plural, 'business ecosystems' refer to the intentional communities of economic actors whose individual business activities share in some large measure the fate of the whole community... A business ecosystem... can also be conceived as a network of interdependent niches that in turn are occupied by organizations. These niches can be said to be more or less open, to the degree to which they embrace alternative contributors." (Moore 2006, p. 3).

Moore applies the notion of ecosystem to describe the actors that influence the business activity of a firm mainly to present the business ecosystem as the unit of analysis in substitution of the industry (Moore 1996). For Moore (1996), the analysis of the competitive environment should be done at an ecosystem, rather than firm, level. In his model, more attention is placed in the structure of the business ecosystem than in the interactions between its components.

Other authors have adopted the ecology model to the study of entrepreneurial context. For example, Van de Ven et al. (1984) look at entrepreneurship with three foci:

- focus on the characteristics of the entrepreneur,
- an organisational focus on the structure and network of people,
- an ecological focus on the population of organizations.

In the latter, Van de Ven et al. (1984, p. 88) frame ecology at an industry level: "The ecological approach is linked with the population ecology perspective, which emphasises that it is the distribution of resources in society, not the motives,

decisions, or behaviour of individuals, that is the driving force which determines whether organizations will be created."

Similarly, Carroll (1984) presents three levels of analysis and approaches to organisational evolutions: organisational level, population level, and the community level. The community ecology is seen as "the collection of all the populations that live together in some region. . . is primarily concerned with the emergence and disappearance of organizational forms." Clearly, with a deterministic perspective, these approaches reduced the importance of the actions that an individual firm may take and emphasised the role of the context and the resources.

Other authors have levelled the playing field between the context and the actions of the entrepreneur. For example, Birley (1986, p. 107) looks at "the extent to which the entrepreneur interacts with the networks in his local environment during the process of starting a new firm."Van de Ven (1993, p. 218) states that "it is the entrepreneur who constructs and changes the [industrial] infrastructure." Neck et al. (2004) studied high-tech new venture creation and pinpointed the lack of research on the relationships between actors of the entrepreneurial system and its context. They looked at the environmental factors conducive to entrepreneurship and proposed six components of the entrepreneurial system: incubators, spin-offs, informal networks, formal networks, physical infrastructure, and culture. Within formal networks, they included university, government, professional and support services, capital services, talent pool and large corporations. In a similar line of argument, Corallo and Protopapa (2007) explored the limitations of Moore's models and used the concept of niche construction to emphasise the interaction of individuals with their environment. For them, niche construction is "the process whereby organisms, through their activities and choices, modify their own and each other's niches" (Corallo and Protopapa 2007, p. 4).

Recently, several authors have tried to offer a more solid theoretical framework to study high-tech entrepreneurship, also adding an actions perspective. Sipola et al. (2013) look at start-up ecosystems through the competence bloc theory and cultural-historical-activity theory in search of the economic actors that are part of the ecosystem. In their approach, the ecosystem is the unit of analysis instead of the start-up. Zahra and Nambisan (2012) follow Moore's business ecosystem framework, but combine it with entrepreneurial strategic thinking to propose four models of business ecosystems from a firm perspective: orchestra, creative bazaar, jam central, and MOD station.

Another clearly contextual approach taken by researchers of university-based entrepreneurial ecosystems is to the triple helix model. For example, Etzkowitz et al. (2013) define such a model as interactions between university, industry and government to build entrepreneurial regions. Within their study, they draw parallels between some elements of Silicon Valley and the Brazilian entrepreneurial ecosystem.

The only paper analysed that concentrates on specific desired outcomes from the ecosystem is presented by Bailetti and Bot (2013). Based on a case from Canada, the authors explore the process in which public funds are converted into jobs.

However, it is presented more in an industry report rather than an academic research format.

Table 5 shows a comparative analysis of the most recent studies found on entrepreneurship ecosystems with a focus on Latin America. Some of them have been influenced by the work of Isenberg (2010), who observed that entrepreneurial ecosystems outside of the United States have different characteristics. On that basis, Isenberg offers nine propositions to foster a local or national entrepreneurial ecosystem. He does not limit his recommendations to high-tech entrepreneurship, but recognises the predominance of this sector in the modern world. Isenberg (2011) also offers a detailed model for entrepreneurial ecosystems by introducing what he defines as the 'entrepreneurship ecosystem strategy'. He positions it as a replacement or "at least a necessary complement, or even pre-condition to, cluster strategies, innovation systems, knowledge based economies, and national competitiveness policies" (Isenberg 2011, p. 1). Similarly, Feld (2012), following an approach similar to Isenberg's, identifies some critical components and common factors found in successful start-up ecosystems. Neither Isenberg nor Feld refer to a specific research method, but both have been very popular with practitioners in the field because of their track record as entrepreneurs and their active sponsorship of entrepreneurship development.

3.5 Innovation

As discussed earlier, innovation as a field of study evolved parallel to the study of entrepreneurship with a perspective mainly on actions and resources. Drucker (2002, p. 5) captures the definition elegantly: "Innovation is the specific function of entrepreneurship, whether in an existing business, a public service institution, or a new venture started by a lone individual in the family kitchen. It is the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth. Moreover, Drucker (2002) looked for the sources of innovation and concluded that a systematic process of innovation relies on a continuous analysis of the sources of innovation and must be adjusted to each business context.

For the last five years, innovation studies have also incorporated a perspective on the context. For example, there has been a rise in research around how innovation targeting the 'bottom of the pyramid' may incorporate this segment of the population into the digital economy with the dual purpose of expanding the market and alleviating socio-economic pressures (Boateng et al. 2008; Foster and Heeks 2013; Nair et al. 2005; Rangaswamy and Nair 2012). For example, Foster and Heeks (2013) explain how the systems of innovation (SoI) and technology diffusion frameworks can be used to study new forms of innovation in emerging markets through the conceptualisation of what they define as 'inclusive innovation'. According to them, SoI has been successfully used by several authors to model factors affecting innovation in the context of emerging economies. It could be

Table 5 Recent entrepreneurship ecosystems studies in Latin America

Literature	Perspective	Contributions
Borges Lemos (2011)	Context	Applies the triple-helix model in combination with Moore's work to look at a case of a Brazilian University research-based entrepreneurial ecosystem. His study is empirically grounded, following a mixed method approach and should inform future research on this area. Probably the most important limitation is its narrow focus on a specific university-based ecosystem which substantially limits it generalizability.
(Cervantes 2013; Cervantes and Nardi 2012)	Context Resources Actions	The study looks at Mexico's infrastructure to support Internet-based start-ups. He followed an ethnographic method and, based on cultural historic activity-based theory, analysed his empirical findings and provided several recommendations to improve what he calls the 'Innovation Infrastructure' of Mexico and other 'middle income countries'.
Arruda et al. (2013)	Context Resources	The authors reference the work of (Isenberg 2011) and OECD (2011) as the models for the study. They build upon six entrepreneurship determinant categories set by the OECD (i.e., regulatory framework, market conditions, access to finance, creation and diffusion of knowledge, entrepreneurial capabilities and entrepreneurship culture) to explore the actors of the Brazilian entrepreneurship ecosystem and what role they play as they operate and evolve. They claim to have identified the 'characteristics, strengths and weaknesses of the Brazilian entrepreneurship environment'. They also compare the Brazilian state of development with that of the U.S. and Israel. They used interviews with the actors in the Brazilian entrepreneurship environment and quantitative analysis using secondary data from official institutions.
Kantis et al. (2012) and Kantis and Federico (2012)	Context Resources Growth Process	The authors build upon the work of Cohen (2006), Isenberg (2011) and Neck et al. (2004) to propose a national system of an entrepreneurship development model to study Latin American entrepreneurial policies based on five countries: Brazil, Mexico, Argentina, Chile and Uruguay. They refer to the ecosystem as a "a set of different interconnected actors within a specific area, which includes at least the following building blocks: universities and R&D institutions, qualified human resources, formal and informal networks, governments, angel investors and venture capitalists, professional service providers, and an enterprising culture which connects all of these factors in an open and dynamic way." The main focus of their study is the policies in these countries that are used to foster the entrepreneurial system in general, and not the start-ups. They conduct a systematic analysis of the state and development of the Latin American entrepreneurial ecosystem based on qualitative and quantitative methods, resulting in a map of the ecosystem components, a model for the development stages of start-ups, a classification of the policies followed to foster the ecosystem and the interactions among all of these elements.

argued that SoI frameworks draw some parallels to the framework of frameworks proposed by Morris et al. (2001), in the sense that both model the macro relationships among the different elements of the system that are, in themselves, looked at through their own sub-framework.

Edquist (2005) explains the framework of national SoI in which the components of the system are organisations and institutions that are interrelated and collaborate in order to promote innovation. These include entities such as firms, suppliers, customers, universities, schools and government ministries, as well as laws, norms, practices and culture, as the institutions that set the rules with which the components operate. In contrast with the entrepreneurial business ecosystem model that focuses on the entrepreneurial process, the function of the SoI is the innovation process itself, whether it is performed by established or new firms.

Edquist (2005, p. 185) explains some the virtues of the SoI model: "it has a holistic and interdisciplinary perspective, it employs historical and evolutionary perspectives, it emphasises interdependence and non-linearity, it uses a comprehensive innovation concept including both products and processes and their subcategories, and it emphasises the role of institutions." Therefore, the SoI model seems to be a strong candidate to study DSs and their interactions with their context. Notwithstanding Edquist (2005, p. 186) recognises some limitations, such as that there is no clear boundary in the definition of the system making it possible to include or leave out any components depending of the system to be analysed, and that SoI "is not considered a formal theory... SoI should be labelled an approach or a conceptual framework rather than a theory."

Finally, innovation can be looked from a technology diffusion framework (Rogers 1962) which, in the context of emerging economies, is highly dependent on achieving low prices that are accessible to low-income consumers (Crespi and Zuñiga 2012; Daude 2010; Hilbert 2010; Lastres and Cassiolato 2003). However, there are many challenges to developing and implementing effective policies in Latin America that facilitate technology diffusion, as shown by the studies summarised in Table 6. The analysis of these papers revealed that existing innovation theoretical frameworks have been successfully used in, and adapted to, both emerging economies and Latin American contexts.

3.6 E-Entrepreneurship

As the digital economy developed, a new breed of companies operating solely on the Internet was born. At the early stages, academics studied the phenomenon under a variety of terms: Internet-based businesses, Internet ventures, Internet start-ups, online businesses and e-businesses, among others. During the second half of the 1990s and early 2000s, the rapid success of companies such as Netscape, Amazon, Google and eBay triggered a wave of studies focused on the particular challenges and opportunities of operating a business solely in the Internet (Afuah and Tucci 2000; Barnes et al. 2004b; Pateli and Giaglis 2003; Souitaris and Cohen 2003;

Table 6 Technology innovation in Latin America; frameworks, challenges, recommendations

Author	Frameworks	Challenges	Findings
Lastres and Cassiolato (2000)	SoI	Information/knowledge economy challenging traditional economies of emerging markets.	The global knowledge economy imposes new competitive dynamics for SMEs in emerging economies.
	Technology Diffusion	How can emerging markets take advantage of new ICT paradigms?	Government has a key role
		Foster local and national innovation and learning policies to incorporate developing economies into the Learning Economy.	
Daude (2010)	Development Accounting	Latin American countries growing slower than other emerging economies.	Low total factor productivity (TFP) as the main reason for slower growth than other emerging economies.
	Technology Diffusion	Barriers to innovation and technology adoption.	Low technology diffusion is due to weak regulatory frameworks and institutions.
		Latin American innovation is low-tech in general.	
Hilbert (2010)	Income Distribution and Technology Diffusion	Digital divide among mature and emerging markets result in lower innovation and productivity.	Neither the real price reduction of ICT nor demand subsidy can be a solution by itself.
			The challenge has to be faced with a sophisticated combination of both options in close public-private cooperation.
Crespi and Zuñiga (2012)	CDM Structural Recursive Model of Innovation and Productivity	Lack of significance of innovation for productivity in Latin America.	Firms that received public financing for innovation invest significantly more.
		In many Latin American economies, firms' innovations consist basically of incremental changes with little or no impact on international markets, and are mostly based on imitation and technology transfer.	Absence or weak development of innovation networks.
			The results of the three variables concerning 'sources of information' differ markedly across countries.
			Company size matters for technological innovation.
			Size is not related to productivity.
			The impact of innovation is far beyond those reported previously for firms in industrialised countries.
			Determinants of innovation are not the same across Latin American countries.

Timmers 1998). However, Matlay (2004) was one of the first authors to use the term 'e-entrepreneurship' specifically in reference to SMEs created to trade exclusively in the digital economy. Other terms, such as Internet entrepreneurship (Batjargal 2005) and digital entrepreneurship (Hull et al. 2007), have been used with a similar meaning. However, it seems that e-entrepreneurship has been more widely used in recent literature than the others. Nonetheless, the definitions of e-entrepreneurship vary and do not seem to solely refer to DSs since, in some cases, they also include SMEs that produce physical products that are traded both offline and online.

As a new discipline, e-entrepreneurship is still in the process of developing theoretical frameworks that are, in most cases, based on those of the related disciplines as shown in Fig. 1. However, since the appearance of works from Afuah and Tucci (2000), Matlay and Westhead (2005), Gundry and Kickul (2006) and Kollmann (2006), among others, research has been building up. Table 7 offers a summary of the areas of contribution of each of the papers analysed and their research perspective.

Table 7 shows that the field of e-entrepreneurship has been developing with a peak of papers making specific reference to e-entrepreneurship, or its synonyms, in the period of 2004–2006, and that it has continued to evolve in recent years. There was a wide variety of perspectives, but with a predominance of actions and resources. Of the papers analysed, nine were empirically grounded, four of them followed a longitudinal approach, four of them were based on surveys of 100 samples or more, and five of them followed case studies. Those studies that followed a quantitative methodology based on surveys included in the sample both companies that mixed traditional businesses with an e-business branch and DSs; so, no definitive conclusion may be derived for the sub-segment of DSs that took part in these studies. Of the studies following a case study approach, only Effaha (2013) and de Medeiros Bezerra et al. (2012) had an exclusive focus on a DS. Matlay and Westhead (2005) and Matlay and Martin (2009) mentioned that the companies studied were e-businesses but, given that they were related to the tourism industry, it is not clear if the sample was related to SMEs solely operating on the Internet or if it also included traditional SMEs who also had an e-business strategy.

In relation to e-entrepreneurship in emerging economies, only de Medeiros Bezerra et al. (2012) performed a study within a Latin-American context with a focus on Brazil. Batjargal (2005) studied Internet entrepreneurship in China, but the sample of companies included a wide range of Internet-related companies and was not focused on DSs. Furthermore, this research, though enlightening, was narrowly focused on the effect of social networks on the survivability of Internet based start-ups. Similarly, Mahmood and Cheng Ming (2005) position their research in the context of Asia Pacific economies, which have a blend of both mature and emerging markets; though informed by the literature and public statistics, their research lacks empirical grounding. All other studies, 17 out of 20 analysed in Table 7, were done within a European or North American context.

Table 7 Summary of Research contribution on e-entrepreneurship

Area	Research	Perspective
Position current and future research	Waesche (2003)	Context, Resources, Growth Process
	Matlay (2004)	Actions, Resources, Context
	Sinkovics and Bell (2005)	Resources, Context
	Asghari and Gedeon (2010)	Actions, Context, Resources, Growth Process
Typology	Timmers (1998)	Actions, Resources
	Matlay (2004)	Actions, Resources, Context
	Lumpkin and Dess (2004)	Actions, Resources
	Hull et al. (2007)	Actions, Resources
Theoretical framework	Afuah and Tucci (2000)	Actions, Resources, Growth Process
	Lumpkin and Dess (2004)	Actions, Resources
	Kollmann (2006)	Actions, Context, Resources, Growth Process
	Gundry and Kickul (2006)	Actions, Resources, Context
	Asghari and Gedeon (2010)	Actions, Context, Resources, Growth Process
Empirical research	Souitaris and Cohen (2003)	Actions, Resources, Context
	Batjargal (2005)	Actions, Resources
	Matlay and Westhead (2005)	Actions, Resources
	Arenius et al. (2005)	Actions, Resources, Growth Process
	Lasch et al. (2007)	Actions, Resources, Growth Process
	Matlay and Martin (2009)	Actions, Resources
	de Medeiros Bezerra et (al. 2012)	Actions, Context, Growth Process
	Effaha (2013)	Context, Resources
Drivers of e-entrepreneurship	Souitaris and Cohen (2003)	Actions, Resources, Context
	Mahmood and Cheng Ming (2005)	Actions, Resources, Growth Process
	Kollmann (2006)	Actions, Context, Resources, Growth Process
	Gundry and Kickul (2006)	Actions, Resources
	Lasch et al. (2007)	Actions, Resources, Growth Process
	Matlay and Martin (2009)	Actions, Resources

Conclusion

This chapter shows how studies in digital economy, e-business models, entrepreneurship, innovation and business ecosystems contribute to our understanding of the recently created field of e-entrepreneurship. Four research perspectives were introduced to define how these disciplines view DSs. In some cases, the role of context was emphasised (vg. business ecosystems), while in others DSs' action and resources played a predominant role (vg. e-business models). Thus, future research must understand these different perspectives and how they can be interrelated.

Innovation and entrepreneurship studies are closely interlinked, and, though they have continued to evolve for several decades, two conceptual frameworks were mentioned as candidates to guide future empirical research: SoI, and entrepreneurship framework of frameworks. It can also be concluded that, given their increasing impact in the practice, entrepreneurial ecosystems and lean start-up models must be considered in future e-entrepreneurship studies in emerging markets. Digital economy studies found that e-commerce adoption barriers and SFs among emerging markets are fairly consistent, and that there are significant differences between mature and emerging markets. This proposition could justify both adapting existing e-entrepreneurship theoretical propositions to accommodate the particulars of Latin American, and expecting commonalities between Latin America and other emerging economies. Actually, it has already been partially supported by some relevant research in entrepreneurship ecosystems, innovation, and incubators in Latin America and other emerging countries. However, notwithstanding the work already done up to the present, Table 8 summarises several gaps that remain in the literature around Latin American DSs as a unit of analysis.

Thus, this literature review has identified the lack of a single comprehensive framework to study DSs through their context, actions, resources and growth process. Entrepreneurship ecosystems literature has proven to be useful in understanding the context in which DSs operate but relegates the study of the DSs as a unit of analysis. Cabrera and Soto (2012) research could be seen as a middle ground, using an ecosystem framework in conjunction with a resource-based theory of the firm. Such an approach may be more suitable to integrate both the influence of the ecosystem and the DS's own resources and actions as critical variables affecting their growth.

Although the available conceptual frameworks should inform and support any future research, the lack of a commonly accepted theory of e-entrepreneurship leaves enough room open for the creation of new models, or the adaption of current ones, to accommodate the specificities of emerging economies. In order to do so, it seems that an empirical approach would be better suited to ground such new frameworks and cover existing gaps.

(continued)

Table 8 Gaps in the literature according to their research perspective

Perspective	Gaps
Resources	Studies in the digital economy provide an initial framework to understand possible barriers for entrepreneurs to use ICTs as a vehicle for new e-business creation; however, they are still to be linked to studies incorporating a context and growth process perspective.
	Only one paper analysed looked at the specific process through which investment of public funds were converted into new jobs. More academic studies are needed that take into account the conversion of public resources into benefits for DSs and their stakeholders.
Context	The overall relationship between adoption of e-commerce and economic impact in general is still an open topic for research. Though the current evidence points to a potential positive economic impact of DSs in emerging markets, it has not yet been thoroughly measured.
	Literature on entrepreneurial ecosystems may have already provided an explanation for why successful DSs are concentrated in the U.S. and Europe, but such models have been built at the cost of dismissing what actions individual DSs can do by themselves to overcome the limitations of their own context.
	The entrepreneurial framework of frameworks was grounded on literature rather than empirical evidence, and the prior studies they draw on are situated within a developed economies context; thus, future research may be done deductively to empirically test the authors' propositions and their applicability to entrepreneurship in emerging economies.
	It was discussed that the main difference between research on high-tech clusters and entrepreneurial ecosystems lies in the unit of analysis; however, there has not been enough research that engages in a reconciliation of the two approaches.
Actions	Some academic, empirically grounded research has been done in the last two years to test the applicability and consequences of a lean start-up method in the growth process of DSs, but none of these studies has been found within a Latin American context.
	The proposition that accelerated DSs are more innovative than their non-incubated counterparts should be empirically tested in future research.
	In business and entrepreneurial ecosystems models, the unit of analysis is the ecosystem, not the start-up. Therefore, in these models, more attention is given to the structure and resources of the ecosystem than the actions of the start-up and how such actions can shape the interactions with the ecosystem.
Growth process	Only 3 out of 11 e-entrepreneurship studies that looked at the growth process of DSs were done in the context of emerging economies, and only one in a Latin American setting.

Therefore, the two research questions that are proposed remain open for future studies:

1. What are the interactions between actions, resources and contexts during the Latin American DS growth process?
2. How can Latin American DSs manage such interactions to improve their ability to grow?

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