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The age of digital entrepreneurship

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Abstract Understanding the circumstances and reasons which facilitate digital entrepreneurship (DE) is of interest to academic research, and guides business practice, as well as public policies aiming at supporting this phenomenon given its positive impacts in terms of job creation and economic growth. We define some relevant concepts and briefly map current research using a perspective that focuses on the way digital entrepreneurs create digital value by acquiring, processing, and distributing digital information. Through the adoption of a digital information processing perspective, we provide a micro-level approach to research on digital entrepreneurship (DE) that complements existing literature on DE focused at the systemic level (digital entrepreneurship ecosystems and in the digital platforms economy). We show how these two approaches can be jointly used to identify major research streams on DE: digital business models, the digital entrepreneurship process and the creation of digital start-ups, DE in digital platforms, and entrepreneurial digital ecosystems. As is the case with existing DE frameworks, our approach concurs in putting emphasis on the new collaborative and social dynamics enabled by digital tools to support knowledge sharing and facilitate opportunity recognition.

Keywords Digital entrepreneurship · Information · Ecosystem · Start-ups · Business model · Platform

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1 Introduction: digital entrepreneurship and digital information processing

Billion dollar digital start-ups, that started the major waves of digital innovation during the last couple of decades, are quite frequently at the heart of media storytelling. Examples include Airbnb (sharing economy), Amazon (e-commerce), Google (search business), and Facebook (social media). It is not surprising that also in the academic debate the topic of digital entrepreneurship (DE) has received much attention and that DE the object of several reviews and special issues arising from different disciplines including (i) information systems (Du et al. 2018); (ii) innovation (Nambisan et al. 2018); (iii) management and business (Berger et al. 2015; Lanzolla et al. forthcoming); (iv) policy (Nambisan et al. 2019); and (v) strategy (Autio et al. 2018). Several definitions of DE have been proposed and research contributions can be broadly classified in two main categories:

(i) Research on whether and how digitalization is transforming entrepreneurship and the new venture

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creation process as we know it (digital technologies as *enablers*).

(ii) Research on entrepreneurial opportunities generated thanks to digital technological innovation and new venture creation taking place in the digital industry (digital technologies as both *enablers and outputs*).

In particular, noteworthy contributions in the literature identify a significantly novel trait of DE in its systemic and collective nature. By merging ideas from two well-established concepts, the digital ecosystem (Li et al. 2012), and the entrepreneurial ecosystem (Mason and Brown 2014), studies of digital entrepreneurial ecosystems (DEE) provide a conceptual framework to help conceptualizing DE based on major structural components including governance infrastructure, digital market place, digital citizenship, and digital entrepreneurship (Sussan and Acs 2017, more recently revisited by Song 2019) or by analyzing the role of digital affordances in the digital transformation of entrepreneurial ecosystems and localized clusters (Autio et al. 2018).

Other contributions investigate DE to the light of major digital technological breakthroughs such as mobile applications (Bresnahan et al. 2015; Yin et al. 2014;) or digital platforms (Evans and Schmalensee 2016; McIntyre and Srinivasan 2017; Nambisan et al. 2018; Parker et al. 2016) by proposing network-centric view of DE "where entrepreneurship success is intricately connected to the moves of other entrepreneurs and coordinated within and across platforms (Srinivasan and Venkatraman 2018, p. 54)".

Both the DEE and the digital platform (DP) approaches question the individualistic bias that is deeply rooted in entrepreneurship research. This individual bias has served well our research community in many respects, but it has also been unduly extended to the glorification of entrepreneurial digital heroes to the detriment of the collective and complex socio-technical structure that the Internet and the hyper-connected digital world enable to an unprecedented scale. While systemic approaches such as DEE and DP contribute in a significant and novel way to the analysis and understanding of DE at the macro level, we feel that a micro-level approach to analyze the impact of the digitalization of information on entrepreneurial action is needed to complement systemic analysis.

Yoo et al. (2010) argue that pervasive digitalization gives rise to layered modular architecture—a new phenomenon that extends the modular architecture of products by incorporating layers of devices, networks, services, and contents made possible by digital technology. This new scenario leads to changes in how enterprises will prepare for future innovation. Thus, the production, exchange, and consumption of digital information affect digital innovation, new venture creation, and processes. Within this research commentary, these authors develop a conceptual framework and propose a research agenda that includes a focus on the impact on digital innovations. Nambisan (2016) revisits the theme of pervasive digitalization, addressing how this creates a need for new theorizing in entrepreneurship and what should be the components of new relevant theories. Among research paths considered is the impact on entrepreneurial outcomes and processes. Grounded in the strategy literature, Nambisan et al. (2019) suggest that research should incorporate multiple and cross-levels of analysis, embracing ideas across disciplines and acknowledging the role of digital technologies in transforming social relationships as well as organizations. All the above is what inspired this special issue. If the effect on digital innovation is part of new information system research agenda defined by Yoo et al. (2010), then the impact on entrepreneurial outcomes and processes is one of the issues of digital technologies which manifest in the realm of entrepreneurship (Nambisan 2016).

In the next section, we propose a framework to support research on DE based on a simple modelization of digital information processing. In Section 3, we use this framework to review recent literature on DE and identify four major research streams. Finally, in Section 4, we still use the information processing framework to present the papers selected for this special issue and identify areas for future research.

2 A digital information processing perspective on DE

In Fig. 1, we propose a framework built around an information processing perspective to the analysis of DE. The proposed framework is based on our understanding of the emergent DE literature and on the following assumptions.

First, the primary effect of digital technologies is the expansion of human ability to acquire, produce, distribute, and consume information at an unprecedented amount, rate, and reach (Pournaras and Lazakidou 2008). Second, a distinctive trait of business digitalization implies that value creation takes place increasingly through the production of digital information, regardless

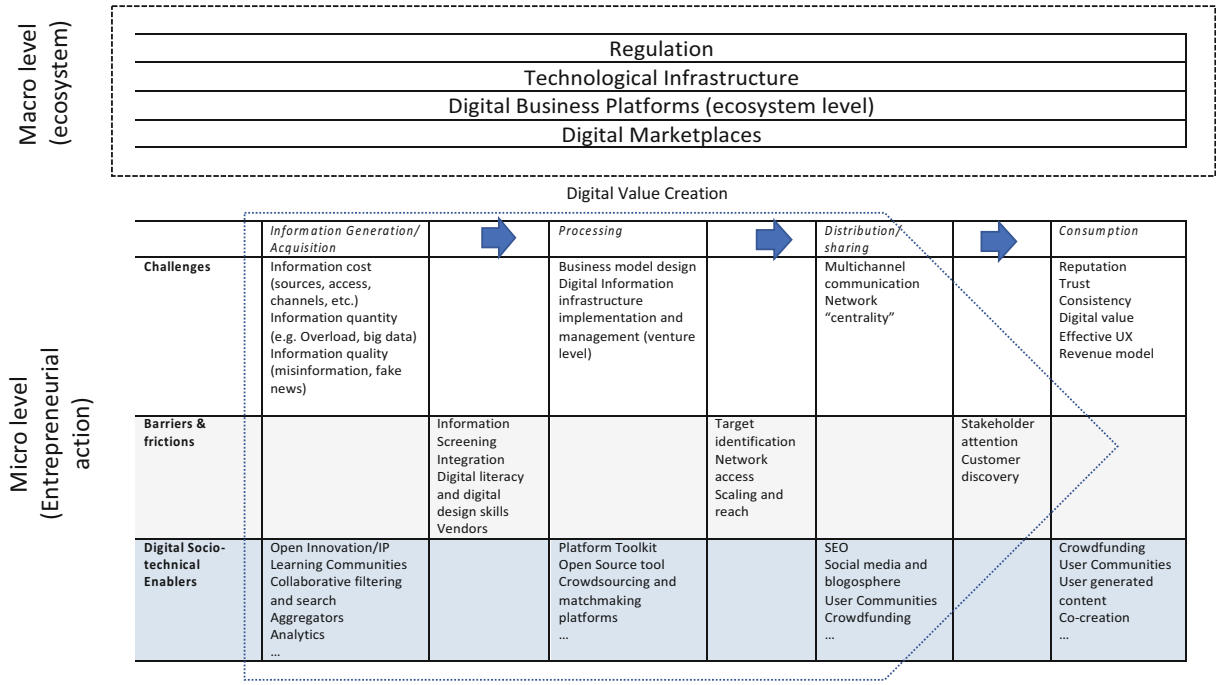

Fig. 1 A digital information management framework to analyze digital entrepreneurship

of whether this digital value is strongly or loosely connected to material products (Bryniolfsson and McAfee 2014). In fact, digital information can be consumed when embedded into smart functionalities of a product or through the creation of pure digital content (e.g., online reputation, following, and other types of digital presence). This also implies that value creation in non-digital ways is severely undermined when it is not accompanied by digital value creation. Moreover, with digital platforms, users of digital information can play the role of consumer or producer and enable the development of multi-sided markets (Tan and Zhou 2017).

Third, the production, distribution, and consumption of digital information create new opportunities but also new threats for entrepreneurs. In particular, the interactions and exchanges of information among users in digital platforms create entrepreneurial opportunities for those that can recognize them (Song 2019). We classify threats in challenges and frictions, depending on whether threats manifest themselves in a phase of the process or whether they make inefficient the passage between two phases. We also identify digital socio-technical enablers that entrepreneurs can exploit to address the challenges and frictions in each phase. Focus on threats allows us to introduce the issue of digital divide between digitally savvy entrepreneurs and those that are struggling to go digital, an issue that has been substantially neglected in DE literature, too often quite prone to celebrate the progressive aspects of the digital revolution. Finally, the production and consumption of digital information at the venture level take place in a wider multilayered ecosystem (Sussan and Acs 2017), comprising the regulatory system, the available technological infrastructure, and the specific business platforms and digital marketplaces in which entrepreneurs operate (Nambisan et al. 2018).

Figure 1 illustrates the components of the proposed framework and offers examples with no attempt to be exhaustive with regard to all possible challenges, frictions, and enablers. The framework is general enough to be used to analyze threats and opportunities in the process of digital value creation at the firm level whether the venture is digital or non-digital. This value chain perspective could also be applied to assess strengths and weaknesses of a firm in the process of digital value creation. For a quick example, let us take the case of a very traditional type of small business such as a small restaurant. The pervasiveness and relative accessibility of digital technologies make the creation of digital value a desirable output for this type of firms as well. It is rather straightforward to see the importance of the digital presence of such an establishment (review sites, social media use, menu apps, online delivery apps, creation of digital followership, and use of digital channels for promotion and community building)

This micro-level perspective should of course keep in mind the expanded and technology-determined set of interrelations within the collective agency and intelligence that digital connection makes possible. For instance, one distinctive trait behind the success of the digital breakthroughs is the amazing speed at which these companies build their user base. This growth can be explained through the scaling effects of social interactions that can be exploited because interaction happens to be digitally enabled and empowered. For instance, how much Amazon or Netflix success is due to collective filtering algorithms through which we are recommended purchases based on "users like you also watched this"?

Other mechanisms enabled by the way the digital network technology works can be mentioned to explain how the entrepreneurial process and new venture creation are affected such as preferential attachment (Jeong et al. 2003), long tail (Anderson 2007), the evolution of intellectual property in digital networks (Benkler 2006), the economics of AI (Bryniolfsson and McAfee 2014), or digitally and community enabled creativity (Anderson 2014; Florida 2006). All of these forces converge toward unprecedented level of market centralization, polarization of the job market, and perhaps social inequality but also create opportunities for smaller ventures as long as they are able to exploit digital technologies for complementary value creation and to establish their digital presence in the long tail.

We claim that entrepreneurship research has ignored the constraints that these mechanisms impose on the ability of entrepreneurs to effectively process digital information and build/maintain a digital value chain along the traditional value chain they already operate in their primary business. Using the proposed framework, in the next section, we provide a new and broader definition of digital entrepreneur and show how an information processing perspective can be used to classify existing literature in DE into a set of major research streams.

3 Digital entrepreneurship: definition and key themes

3.1 Digital entrepreneurship as augmented entrepreneurship

We define DE as the process of entrepreneurial creation of digital value through the use of various socio-technical digital enablers to support effective acquisition, processing, distribution, and consumption of digital information. This definition can be extended and applied to specific types of ventures such as nascent ventures and digital self-employment. For instance, some of these enablers can be used to support the very process of new venture creation, from idea generation and opportunity recognition, to intellectual property protection, production, marketing, and distribution. Technologies such as social media, open-source software and hardware, crowdsourcing, crowdfunding, e-trust and online reputation assessment, 3D printing, digital imaging, and big data are empowering would-be entrepreneurs to reduce significantly the barriers between invention and the creation of a new company (Steininger 2019). The use of digital tools and platforms is favoring the emergence of new type of jobs that is hard to classify unambiguously in the traditional categories of employment, self-employment, freelance, or growth-oriented entrepreneurial undertakings. In this view, we do not agree that DE can be reduced to a subcategory of entrepreneurship (Hull et al. 2007), but rather that DE is "the reconciliation of traditional entrepreneurship with the new way of creating and doing business in the digital era" (Le Dinh et al. 2018, p. 1).

This view of DE as augmented/cyber entrepreneurship is gaining consensus even outside the academic debate, as reflected in the definition already adopted by the European Commission:

> Digital entrepreneurship embraces all new ventures and the transformation of existing businesses that drive economic and/or social value by creating and using novel digital technologies. Digital enterprises are characterized by a high intensity of utilization of novel digital technologies (particularly social, big data, mobile and cloud solutions) to improve business operations, invent new business models, sharpen business intelligence, and engage with customers and stakeholders. They create the jobs and growth opportunities of the future (2005, p. 1).

In the same vein, Steininger (2019) highlights that information and communication technology (ICT) plays four major roles in digital entrepreneurial operations: as a *facilitator*, making the operations of start-ups easier; as a *mediator* for new ventures' operations; as an *outcome* of entrepreneurial operations; and as an *ubiquitous enabler* of new digital business models. However, the analysis of DE cannot be reduced to the addition of ICT or to traditional entrepreneurship.

Following this line of reasoning could lead to the potential misunderstanding that the difference between digital and digital entrepreneurship can be simplistically reduced to the intensity of utilization of novel technologies. In fact, as emphasized by the proponents of systemic frameworks, understanding DE requires creating new conceptual models to analyze the complexity of DEEs without which the micro-level analysis could not be meaningful. We applaud that this complexity is not only under the attention of researchers and academicians but also of policymakers, as testified by the conclusions outlined by the European Commission (2015) drawn from an intense dialog with stakeholders and policy analysts, that identify five "pillars" of digital DE (although the lack of clarity in the distinction between macro-level and micro-level areas of intervention can result in less than optimal policy design): (i) digital knowledge base and ICT market; (ii) digital business environment; (iii) access to finance; (iv) digital skills and e-leadership; and (v) entrepreneurial culture.

3.2 Major research streams in digital entrepreneurship

Starting from a literature review based on a subset of recent articles (47 academic articles and proceedings of "Digital Entrepreneurship" in the Scopus Database for the period 2015–2018, accessed 4 April 2019), and special issues on the topic of DE published up to the spring of 2019 (Acs et al. 2017; Autio et al. 2018; Cavallo et al. 2018; de Reuver et al. 2018; Kraus et al. 2019; McIntyre and Srinivasan 2017; Nambisan 2016; Richter et al. 2017; Srinivasan and Venkatraman 2018) and combining the literature review with our proposed framework, we identified four major streams of research in DE. We briefly describe and report key references for each stream, moving from the macro to the micro level.

3.2.1 Digital business model contributions to strategy literature

The concept of "business model" (BM) dates back to the 1960s (Sahut et al. 2013); however, it is not a coincidence that its popularity increased as the economy was going digital. The BM literature started to become mainstream with (i) electronic business models (eBM) since the emergence of e-commerce during the 1990s; and (ii) digital BM, in the current digital economy (Blank 2013; Osterwalder and Pigneur 2010; Ries 2011; Teece 2018).

The concept of BM started to become relevant in strategy and entrepreneurship because of the higher flexibility that digital technologies offers to coordinate the various phases and steps of the process through which a firm creates value. In this sense, a business model canvas can be seen as a digitally augmented version of the more traditional value chain model that was so popular in the pre-digital age.

While the BM approach originated in strategy, it is relevant to DE because a BM can be seen as the way a new venture expects to create digital value. Although it is possible to draw a business canvas for any company, large or small, digital or not, in actuality, the various alternative BMs are often possible thanks to the multiple ways in which digital technologies can help to implement one more of a BM's building blocks. For instance, the adoption of alternative revenue models, such as the "freemium" model or subscription-based models, is highly enhanced by the flexibility offered by online access and payments; the availability of multiple online tools creates alternative possibilities on how to implement communication channels; the reduction of transaction costs induced by digital collaboration increases the number of ways value creation can be segmented and allocated on multiple actors. We argue that in the contest of DE, digital BMs are in fact representations of how a new venture plans to process and distribute value by leveraging affordances provided by digital and non-digital technologies.

When it comes to DE, this research stream focuses on the description of new BMs typologies enabled by digitalization and on the discussion of the challenges and the opportunities inherent in the emergence of digital BMs (Margiono et al. 2018; Richter et al. 2017). In particular, this research shows that digitalization is pushing firms to change their BM along two key dimensions: (i) the first dimension relates to the understanding of customer needs as digital technologies make it possible to unveil customers' intrinsic motivations in a world in which consumption is increasingly driven by self-expression and not only to collect demographic data and purchase histories (Pariser 2011); and (ii) the second dimension implies moving from a controlled value chain orientation to a network orientation, based on a web of relationships. These new dimensions of value creation form areas of development for the next generation of businesses and entrepreneurs.

3.2.2 The digitalization of entrepreneurial processes

Contributing to entrepreneurship literature, Nambisan (2016) shows that the dynamic and fluid boundaries of innovation have rendered entrepreneurial processes less bounded than in the traditional economy. Consequently, entrepreneurial processes reflect incremental and non-linear paths facilitated by digital artifacts and platforms. The digitalization of entrepreneurial processes has helped to break down the boundaries between the different phases of the entrepreneurial process and has significantly favored the reduction of invention to innovation barriers (Anderson 2014; Steininger 2019). Hence, recent papers on DE do not focus on the identification of entrepreneurial phases, but rather on the manner by which entrepreneurs can scale their ideas into viable businesses while leveraging digital technologies to favor opportunity recognition, ideation, ideas validation and testing, and design of effective business models. In particular, Huang et al. (2017) identify three contingent mechanisms underpinning rapid scaling: (i) data-driven operation; (ii) instant release; and (iii) swift transformation and describe how these mechanisms interact in the rapid scaling of digital ventures. Along the same vein, Srinivasan and Venkatraman (2018) demonstrate that entrepreneurship success is intricately connected to the moves of other entrepreneurs and co-ordinated within and across platforms. These results question how digital entrepreneurs can orchestrate strategic moves that allow them to navigate the complex digital landscape and how their choices can affect entrepreneurial process and success (Le Dinh et al. 2018).

3.2.3 Digital platform contributions to strategy literature

Digital platforms favor collaboration and knowledge sharing among users, firms, and other agents by leveraging network effects (Evans and Gawer 2016); while platforms can be digital and non-digital, the concept has received increasing attention in its digital instantiation. Research on digital platforms in the context of DE spans from more systemic analysis of platforms in terms of structure and governance down to the firm level, focusing on how digital entrepreneurs can strategize to rip the benefits and limit the damage of linking their business to platforms (Srinivasan and Venkatraman 2018). Upstream and downstream cooperation between enterprises can facilitate the development of new products and/or services (Nambisan et al. 2018; Yetis-Larsson et al. 2015). Abbes and Troudy (2017) show that upstream of its offer, a firm, can use digital technologies in response to a given problem (open innovation, open source, crowdsourcing, co-innovation), and to create or customize an offering (mass customization, personalization, or co-design), and/or even to promote it (crowdsourcing advertising campaigns or soliciting opinion leaders). Downstream of its offer, a firm may use digital technologies to co-produce its service (self-service technology), to understand the value attributed to its offer and digital presence (user-generated content) or to provide information in order to improve quality (online discussion at the after-sales service level). A further use of platforms is crowdfunding (Mollick 2014), which makes it possible to collect funds from a wide public through specialized internet platforms designed to host financing campaigns for entrepreneurial projects. Direct contact between project promoters and inexperienced investors poses many problems due to the prevalence of information asymmetry (Cumming and Johan 2008). Crowdfunding platforms and social networks can also be a means for investors to exchange information and better evaluate projects to finance. Following the framework in Fig. 1, at the firm level, crowdfunding requires entrepreneurs to promote effective consumption of their online presence by the public of supporters and investors in order to get visibility and attract the expected amount of funding.

Insights from information systems can be leveraged to advance research on DE in digital platforms. In a good overview that proposes a research agenda, de Reuver et al. (2018) note that digital platforms are finding their way into mainstream information systems literature and suggest that digital platforms are problematic research objects because of their distributed nature and the complex way they are related to institutions, markets, and technology. The authors call for greater conceptual clarity in the definition of digital platforms and their scope, in order to better understand the role of these in social interactions and entrepreneurial ecosystems.

3.2.4 Digital entrepreneurial ecosystem literature

Sussan and Acs (2017) define an entrepreneurial ecosystem as a system composed of entrepreneurs creating digital companies and innovative products and services for many users and agents in the global economy. Acs

et al. (2017) trace the lineage of the entrepreneurial ecosystems literature to regional development and management strategy literatures. The DEE literature aims at providing an overarching and systemic view of how digital technologies are creating new types of entrepreneurial ecosystems (Malecki 2018). The nascent literature on DEE is based on the integration of entrepreneurial ecosystems (281 academic articles and proceedings on this subject in Scopus Database for the period 2015–2018, accessed 4 April 2019), and digital ecosystems. A digital ecosystem is defined as "…a self-organizing, scalable and sustainable system composed of heterogeneous digital entities and their interrelations focusing on interactions among entities to increase system utility, gain benefits, and promote information sharing, inner and inter cooperation and system innovation" (Li et al. 2012, p. 119). Entrepreneurial ecosystems have long been analyzed in the literature (Acs et al. 2014; Jacobides et al. 2018). They are understood as a network of elements favoring the emergence of start-ups and the strong growth of firms given the resources they provide, particularly in terms of access to networks of skills and knowledge (Mathews and Brueggemann 2015). This networking has long been recognized as a key element of localized innovation clusters. The emergence of an entrepreneurial ecosystem is based on the collaboration of public and private actors facilitated by citizen entrepreneurs ("civic entrepreneurs"), architects of skills networks according to Weil (2011), which makes this relational dynamic possible.

Sussan and Acs (2017) provide a framework to fill the gap in our understanding of entrepreneurship in the digital age based on the integration of entrepreneurial ecosystem (institutions and agents) and digital ecosystem (users, digital infrastructure) where the interactions of *agents* and *users* that incorporate insights of consumers' individual and social behavior become the central point of analysis. Since the publication of this model, several articles have focused on this type of ecosystem. Unlike Sussan and Acs 2017 who focused on the converging elements between digital ecosystem and entrepreneurial ecosystem literatures, others sought to reposition the classical literature of entrepreneurial ecosystems by analyzing the implications of digitalization, when necessary introducing new concepts such as the concept of digital affordance (Autio et al. 2018).

In a theoretical paper, Song (2019) proposed a reconfiguration of the initial Sussan and Acs (2017) DEE, with a more sustainable framework wherein (i) users are consumers on the demand-side or producers on the supply side; (ii) digital technology entrepreneurship integrates all agents producing goods and services that connect to the platform; and (iii) a multi-sided digital platform is the intermediary for transactions and also a medium of knowledge exchanges which can be a catalyst for innovative and entrepreneurial activities. This laid the ground for empirical research currently in progress. The new framework is more robust and enriched by its digital dimension; it contributes to the literature that was until now centered on geographic context or industrial clusters.

Cavallo et al. (2018) note that regional development literature ignores the implications of digital technology and suggests directions for future research. We are interested in implications.

4 Contents of this special issue

This special issue of *Small Business Economics: an Entrepreneurship Journal* brings together papers on DE, following a perspective based on information processing/digital value creation perspective. From the start, our intent was to focus in particular on how production and consumption of digital information affects entrepreneurial action and new venture creation process. The articles in this special issue were selected following a thematic open call for papers. Those that were not desk rejected were subject to the usual *SBE* review procedures, with the five articles presented here successfully navigating this process. Given this selection process, the accepted articles do not match all the research streams identified in our review of this emerging literature (see Section 3), but rather contribute toward a better understanding of the DE process and its challenges. In the following, we briefly introduce each article, how it contributes to the topic and perspectives of this special issue.

In "The Entrepreneurial Process and Online Social Networks: Forecasting Survival Rate," Yang Song, Leo-Paul Dana, and Ron Berger investigate whether entrepreneurs' position in online social professional networks has an impact on start-ups survival rate. In our framework, this contribution can be positioned at the micro level with a focus on information acquisition and generation in the creation of new start-ups. The rationale behind the main research question in this work is that the way entrepreneurs connect in digital information

networks has a key impact on their ability to access vital knowledge resources. While previous literature has deeply analyzed the importance of networking on firm's performance in the offline world, online networks add the possibility to map, track, and assess analytically what entrepreneurs do on and through online networks. Using this data bonanza from a popular social network site (LinkedIn), Song, Dana, and Berger present a simulation model that shows how network derived analytics such as network density and time to first collaboration are strong predictors of survival rates as much as the initial wealth available at the start-up.

A key feature of DE is that it widens the domains in which entrepreneurial processes are likely to occur. In particular, DE seems to enhance even further entrepreneurship as a tool to accomplish corporate innovation. It does so in two ways: (i) by providing internal teams with higher agility and flexibility empowered by the use of digital tools supporting collaboration, but also ideation and prototyping; and (ii) by making it easier to build or access innovation ecosystems through digital platforms. Early examples include Innocentive or large corporation involvement into the development of open-source software.

In **"**Corporate Entrepreneurship, Product Innovation and Knowledge Conversion: The Role of Digital Platforms," Wissal Ben Arfi and Lubica Hikkerova combine Nonaka's knowledge conversion process and the MOA model (motivation, opportunity, and ability) to show how small businesses in traditional industries can leverage multi-actors digital platforms to promote corporate entrepreneurship, favor organizational learning, and support more innovative new product development processes. The authors show that not only digital platforms empower the creation of organizational knowledge by making knowledge process creation and exchange more powerful and visible, but also that they do so in ways that are novel and technologically determined by the digitalization of social interaction.

While apparently not central to the topic of this special issue, the paper "Does gender diversity among new venture team matter for R&D intensity in technology-based new ventures? Evidence from a field experiment" by Biga-Diambeidou, Bruna, Dang, and Houanti has been included to emphasize another aspect of how DE is changing the landscape, this time in the hot field of entrepreneurship education. Increasingly we learn through online technologies, but the use of digital platforms to teach and research entrepreneurship is still underdeveloped in our field compared with its potential. The authors use a digital business game to investigate whether the gender mix of the entrepreneurial team has an impact on the level of risk taking in decisions with highly uncertain outcomes, such as R&D investments. Their findings show that gender does not matter and that the thinking that women are more cautious decision-makers is actually a common place that deserves to be demystified.

Two other works included in this issue analyze how the digitalization of economy is having an impact on the most critical activities for start-ups growth and survival: funding. In particular, new mechanisms and sources of funding enhanced or directly enabled by digital networks (via digital information distribution and network access) or by ad hoc platforms are investigated.

In "Corporate Venture Capital in the IT Sector and Relationships in VC Syndication Networks," Braune, Lantz, Sahut, and Teulon present an empirical study on how information technology (IT) companies capture information from venture capital (VC) networks and invest their funding in corporate venture capital initiatives. The authors investigate the CVC practices of a sample of IT companies for several years and show that the R&D investments made by these companies, along with the amount of CVC investments made, are related, once again, to their number of relationships and their central position in VC networks.

In **"**Segmenting "Digital Investors": Evidences from the Italian Equity Crowdfunding Market," Feola, Vesci, Marinato, and Parente offer an in depth analysis aimed at identifying the profiles of crowdfunding investors. Crowdfunding platforms can be positioned in Fig. 1 at the level of digital information distribution and consumption because successful campaigns are driven by the quality of digital content, online presence, and digital followership that the venture is able to leverage. Using data from a sample of Italian crowdfunding platforms, the authors extract six drivers able to provide an effective segmentation of equity crowdfunding investors: confidence in team, confidence in venture, financial pledge and project attractiveness, platform characteristics, community driver, and societal driver. Based on these drivers, they perform a cluster analysis that successfully isolates four clusters: (1) venture trustful; (2) crowdfunding technicians; (3) financial investors, talent scouts; and (4) social dreamers. In addition to showing how crowdfunding is becoming a significant source of funding that follows completely new logic and

mechanism, the study also shed light on the variety of motivations behind crowdfunding investment decisions and on the importance of the ability to build supportive networks of believers and supporters who are not necessarily driven by profit prospects.

5 Toward future research

An objective of this special issue is to contribute to the development of a new perspective for the analysis and understanding of DE. This perspective is based on digital information processing at the end creation of digital value at the firm level. The proposed approach is framed within and connected to the more systemic research approaches developed on the topic of DEE and DE in digital platforms. This backdrop provides relational, technologically determinist, and collective view of DE, while the digital processing framework can be used to model and describe entrepreneurial process and action when they are mediated by or enacted through digital technologies. We think this perspective is very fertile and can lead to significant developments in the field. More specifically, based on what we have learned through the process of curating this issue, we wish to offer some recommendations to advance research in digital entrepreneurship research:

- Entrepreneurship research in the digital economy needs to be expanded to include literature from other disciplines such as political science, marketing, and information systems. Referencing political science literature provides the knowledge necessary to understand the nuances of digital governance and digital citizenship and their importance in the digital entrepreneurial ecosystems. Research from management information systems literature illuminates the background necessary to understand how a system of digital technologies and infrastructure can serve as the germinating bed for digital entrepreneurs. Literature in economics and industrial organization can help to understand how DE unfolds in digital platforms and multi-sided markets (Armstrong 2006; Evans and Schmalensee 2016; Rochet and Tirole 2003).
- Entrepreneurship research should keep focusing on the systemic characteristics of the digital economy that enable DE as opposed to a narrower understanding based on high-impact, high-potential, and high-growth business.
- Given that the digital marketplace has tilted in favor of empowered consumers (Rippé et al. 2015), DE research needs to investigate the inner-workings of the users' in the process of consumption and creation of digital information in order to understand how entrepreneurial agents can extract and capture value from users. Understanding consumers' psychology and social psychology are thus important in the digital economy.
- The potential for digital divide in DE, meant as a gap in the amount of digital skills and knowledge that entrepreneurs need to thrive in an increasingly digitalized economy, requires more attention in DE literature and can have a significant impact on the development of policies and program that can support firms and overall economy competitiveness in the global and digital economy.

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