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Developing Entrepreneurship in Digital Economy: The Ecosystem Strategy for Startups Growth

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Abstract

The transition of the economies toward the digital era is determining the arising of a type of entrepreneurship based on factors and features quite different from established game rules. These changes disclose a series of opportunities for those firms which will be able to adapt at the new parameters and functionalities related to digital technologies diffusion. This contribution underlines some dynamics that should be considered from policy makers who aspire, on the one hand, to promote the emergence of a significant number of startups operating in the digital field and, on the other hand, to nurture the growth process of startups into scale ups. Due to social and economic troubles of many western areas, this latter aspect is even more important. According to a flourishing research stream on entrepreneurship, an interpretative approach for achieving the dual objective is to implement a specific strategy to create an appropriate regional ecosystem. The ecosystem represents a clear challenge within the traditional entrepreneurial policies frame, whose results have so far often been unsatisfactory. Despite its initially selective approach, from an ecosystem, many potential benefits can descend. However, creating an ecosystem for digital startup is a complex and burdensome task, which requires a safe and competent guidance, as well as the active involvement of many local actors.

Keywords: entrepreneurship, digital technology, ecosystem, high-growth firm, startup

1. Introduction

Since 1980s, in many western countries, the focus of industrial choices has changed substantially as consequence of the transition from SMEs policies to entrepreneurship policies. More recently, to react to the deep economic and financial crisis of 2008 and to sustain the diffusion of ICT, industrial policy measures have been fundamentally finalized at providing instruments increasing starting-up and the emergence of the self-employment in general, by spreading entrepreneurial culture and stimulating the direct participation of citizens in entrepreneurial process.

New ventures have been believed as a pathway for increase employment, especially for youth suffering from a disproportionate lack of job opportunities [1–3], while the startups, considered as innovation-based new ventures, have been spurred by the ambition of accelerating the adoption and diffusion of border line technologies, in doing so counteracting the competition of Eastern countries benefiting of lower production costs [4, 5].

These purposes have been sustained by measures improving the business environments, trying to make them economically conducive for firm emergence. Among these new measures, there are R&D grants and tax benefits, business accelerators and incubators, incentives and facilities for university-based spin-offs, financing of risk initiatives, and so on.

Nevertheless, this strategy has often led to unsatisfactory results, notably as regard to the contribution to territorial economic growth, innovations spreading, and dissemination of skills and competencies. Even in local contexts where high ventures birth rates were registered, there have been no relevant increases of key economic indicators, such as gross income, firms' survival, or profit level (e.g., [6–8]). A managerial and business research stream [9–11] argues that the weak impact of the mentioned measures on local economy development could be linked to three main aspects.

Firstly, a nebula idea of the entrepreneurship concept exists. A wide range of economic activities is used to be included in this term, even if the scientific literature has been clarifying its real meaning since many decades [12, 13], as detailed later.

Secondly, usually new firms are considered in a similar manner and often equated at startups. But not all new firms necessarily are startup, as well as startups are dissimilar in terms of value generation or job creation [14, 15]. A basilar matter is that too few startups are able to become high growth firms, which are able to assure a tangible contribution to the territorial context in terms of employment, income, investment, knowledge, and competencies [16, 17]. Indeed, startups are unsteady activities, with high probability of failure or destined to remain small business, when not simple micro-firms or self-employment activities. In the last circumstances, the contribution to regional growth is rather limited, if it exists [18, 19].

Thirdly, an excessive emphasis on technological innovation exists. Technological innovation in itself is not a panacea as it is risky and normally takes a long time to deploy its effects and to be fully appreciated. These peculiarities contrast with the typical weaknesses of new ventures, when they are not able to evolve in more established societal or legal forms [20–22]. The overwhelming focus on technologies innovation might acquire an ambiguous meaning when related to startups [23]. Firms operating into the so-called traditional sectors (automotive, domestic appliances, furnishings, etc.) of Western countries often exhibit higher growth rates than firms placed at the technological border. The capacity to propose, over the time, more and more effective business models could, therefore, overcome the prominence of technological factor [24]. Hence, all high growth firms are neither necessarily high-tech startups nor a new business in general.

With this in mind, the incoming of digital technologies in the realm of entrepreneurship represents a new challenge for entrepreneurs and policy makers [25]. When applied to manufacturing, digital technologies (such as social media, mobile computing, data analytics, 3d printing, cloud, and cyber solutions) lead to a remodeling of productive patterns originating new market opportunities, higher revenue streams, faster time-to-market, enhanced service provision, and increased productivity [25, 26]. Moreover, digital technologies also deeply modify the boundaries of products and processes, in doing so transforming the nature of uncertainty inherent entrepreneurial processes and outcomes, as well as the ways of dealing with such uncertainty [27]. All these changings are shifting the traditional way of creating and doing business, determining the emergence of a new specific type of entrepreneurship, the *digital entrepreneurship* (Nambisan, 2017).

Broadly defined as creating new ventures and transforming existing businesses by developing novel digital technologies and/or novel usage of such technologies [27], digital entrepreneurship needs to be properly fueled and enabled in many directions. Among these, European Commission [25] suggests the creation of

specific digital knowledge base and ICT markets, the creation of digital business environments, an easier access to finance facilitations, the diffusion of digital skills, the creation of e-leadership, and the creation of entrepreneurial culture. These complex aims assume a heuristic and wide-ranging approach that, presumably, requests a reconsideration of the logic that leads to the emergence and development of startups operating in the digital setting.

This chapter aims primarily to discuss how the current focus on startups could be addressed, so that the digital era becomes a source of opportunities more than risks. Specifically, the paper is consistent with an up-warding audience of scholars [28–31] according to the best answer for collecting the business opportunities and channeling the benefits for local areas appears the creation of ecosystems able to support scale ups; that is, startups with high potentiality to grow-up [32].

The debate on the importance of these companies for local development and growth is really dated. The novelty is that, instead of an undifferentiated starting-up, a selective approach centered on startups with the better potentialities is now explored by creating specific business environments aligned to the purpose of systematizing, promoting, and sustaining their growth [3, 33, 34].

The chapter is organized as follows. After this introduction, Section 2 specifies the concept of entrepreneurship oriented for the purpose of the regional economic development. Afterward, the notions of startup and scale ups are clarified in Section 3. Section 4 deepens the dynamic meaning of an entrepreneurial ecosystem functional to scale ups development. Section 5 identifies the link existing among the challenges linked to digital technologies and the advantages provided by ecosystems. Some conclusive remarks are showed in the last section.

2. Entrepreneurship and entrepreneurialism

An aspect systematically ignored by policies concerns the concept of entrepreneurship, often considered as an undifferentiated phenomenon whose only evaluable output is the birth of new ventures. This is because, on one side, a shared definition of entrepreneurship is missing, as well as a precise knowledge of its boundaries and factors from which it originates. On the other side, it descends from the fact that, by logic, this concept can only derive from that of entrepreneur [13]. In turn, the figure of entrepreneur is ambiguous, confused with other economic roles such as the owner or the capitalist, not always easy to identify inside the firm, and whose assignments and tasks are not easily framed. Not by chance, the *Huffalump* metaphor, the imaginary animal impossible to capture [35], was introduced.

However, more recently, entrepreneurship literature has shed much light on these aspects. But these advances do not seem fully absorbed in determining policy measures. So that, even if a propulsive thrust of economy is expected from the entrance in the digital economy ([27], Nambisan, 2017), there is a real possibility that not all contexts will be able to benefit from the emerging opportunities.

In this view, this chapter emphasizes the thesis for which standardized policy actions addressed to support an undifferentiated starting-up risk to obtain limited, when not counterproductive effects. Investigations on firms' turnover have showed that an increasing birth rate is often accompanied by an almost similar increase of death rate. This faster turnover has not a positive impact on the social and economic context if the surviving ventures remain micro or individual firms [1, 2, 36]. In other words, just favoring a high *entrepreneurial activity*—the percentage of adults involved in the process of the creation or management of an enterprise—does not necessarily ensure the emergence of a sufficient share of companies that are able to succeed in the medium or long term with a positive impact on local context.

This assumption is coherent with the supposed *U-shaped relationship* between the entrepreneurial activity of a country and its per-capita Gross National Product (GNP). Leading scholars belonging to the *Global Entrepreneurship Monitoring* [4, 37] explain that the entrepreneurship activity is higher for countries with either a low or a high GNP per capita.

In countries with low GNP per capita, entrepreneurship activity is higher owing to the lack of professional alternatives and other revenue sources—‘necessity’ driven entrepreneurship rather than ‘opportunity’ [38]. When GNP per capita grows, countries with middle-income, activity gradually decrease up to a certain minimum point. That is because the emergence of scale-intensive firms operating in mid-technology sectors offers stable employment perspectives, which reduce the motivation toward starting up. After this point, activity newly increases. In areas with a higher GNP per capita, the presence of advanced technology and scale economies allows larger and established companies to meet the growing demand of expanding markets, exerting a positive attraction to would-be entrepreneurs. In these circumstances, high startups rates are predictable. They could begin an economic virtuous circle.

This theory, therefore, supports the existence of an *equilibrium rate* of entrepreneurial activity, which varies consistently in line with the degree of national development. This rate is considered “an ‘optimal’ industry structure, operationalized either in terms of the number of business owners or in terms of the small-firm share in value-of shipments” ([1], p. 3). Deviations from the equilibrium rate caused by cultural forces, institutional changes, and economic trends risk to cause negative consequences for national growth, since “economies can have both too few and too many businesses and both situations can imply a growth penalty” ([36], p. 285). A too low equilibrium rate may imply few stimuli toward innovation and change. A too high rate could determinate the failure to exploit scale and scope economies, a reduction in R&D expenditure, or an excess of price-based competition, forcing firms to reduce output/input quality or resorting to shadow economy. Consequently, regions deviating from the level of entrepreneurial activity compatible with their GNP, risk to obtain lower rates of overall economic growth.

The optimal equilibrium rate is dependent on both the *weight* of sectors, — dynamism in services business is statistically much greater than in manufacturing industry—and the *type* of entrepreneurship created. Hence, generic starting up policies could not be a panacea for local economic and social troubles, neither present nor future. This statement is supported by many evidences.

One of the most quoted scholar of entrepreneurship states that new firms do not always have an innovation propensity higher than incumbent firms, “even for a developed country such as the United States, only a very small fraction of new startups is really innovative” ([39], p. 8). Without innovative capacity, in a contestable market, these firms have limited chance to growth.

Likewise, usually the large majority of incumbents firms are destined to remain a small firm or even a self-employment venture. This possibility is more likely when the entrepreneurs’ teams that manage such firms do not possess an adequate level of entrepreneurship, but only *business entrepreneurialism*, that is, a generic spirit or state of acting in an entrepreneurial manner in the broader sense [38]. A pioneer in the field of entrepreneurship research and education [40] explains that there is a “continuum” along which each entrepreneur or aspiring entrepreneur has a different increasing subjective level of entrepreneurial capabilities. In addition, the more the business is small, the more the relationship among entrepreneur’s potentialities and firm’s performance tends to be stronger.

Generally, policies do not care or are not able to select aspiring entrepreneurs with the better potentialities. Hence, it is surprising to discover neither high failure

rates nor large share of micro-firms from policies directed to favor undifferentiated startups. While firms which are unable to grow and develop rarely can disseminate knowledge or innovations, high failure rates are associated with a possible dispersion of public funds and sunk costs.

These contingencies introduce the specific problem regarding the *quality* of the arising entrepreneurship: “business ownership and entrepreneurship are not synonymous ... entrepreneurs are a small fraction of the business owners” ([36], p. 275). It is worth to underline that a seminal article on the nature and quality of entrepreneurship goes back to Carland et al. [12].

Authors distinguish entrepreneurs with the highest level of entrepreneurship and capabilities, identified as *true entrepreneurs in the Schumpeterian sense*, from other typologies of entrepreneurs with a lower level of entrepreneurship. Among the latter, there is the *small business owner* (“an individual who establishes for the principal purpose of furthering personal goals ... the owner perceives the business as an extension of his/her personality, intricately bound with family needs and desire”) ([12], p. 358) and the *self-employer*, a personal response to the lack of professional alternatives, implying a low entrepreneurial level [38]. Businesses undertaken by small business owners and self-employers who “are not dominant in their field, and don’t engage in any new marketing or innovative practices” ([12], p. 358) usually exhibit a low propensity for expansion, change, and knowledge adoption, while we have a high probability of failure. Often these entrepreneurs “have incomes below the poverty line” (Stam, 2015, p. 123).

On the contrary, a true entrepreneur is an individual who creates an *entrepreneurial venture* in Schumpeterian sense. That is a venture “characterized by innovative strategic practices ... employ strategic management practices in the business” ([12], p. 358). An entrepreneurial venture does not necessarily mean a large firm, but a business able to develop and to reach profitability and success, thereby having a relevant and stable impact on local growth. The ability to found and manage an entrepreneurial venture mirrors entrepreneurs’ subjective predispositions, personal traits, experiences, knowledge and competences, innate or acquired, that shape their capabilities in a business’s management, as well as in lifestyle [41].

The logic of this brief exposition concerns the opportunity, in some circumstances, to abandon policies that aim to support generic entrepreneurial activity by proposing top-down measures, such as granting subsidies or facilitations. The simple improving of the environmental framework risks to favor an undifferentiated creation of new businesses and/or startups, as well as the survival of incumbents no more competitive.

As researchers agree to sustain that the entrepreneurial process is the result of a complex interaction between individuals, cultural, social, and environmental factors, the alternative that is intended to endorse is to concentrate efforts on entrepreneurs/aspiring entrepreneurs who show the best business plans, the preeminent entrepreneurial features, and the ability to withstand market difficulties [3, 28, 34, 42]. These entrepreneurs have the higher probability of founding and managing *entrepreneurial ventures*.

3. The transition from startups to scale up

3.1 The concept of startup

A focus of entrepreneurship policies has been, as explained, increasing the number of startups and spreading the entrepreneurial culture by providing tangible (grants, real services, and facilitations) and intangible tools (training, incubators,

consultancies). The corner stone of this policy sinks its roots in the belief that the startups are a powerful tool for spreading innovations and knowledge locally [21].

It is therefore essential to clarify what the startups are. Alike other social and economic phenomena based on individual or collective behaviors, different interpretations of startup exist. Each one offers a viewing angle for reading, analyzing, and evaluating the startup process.

This chapter follows and deepens one of the best known definitions of startup: “a temporary organization searching for a repeatable and scalable business model [32].” Although extremely concise, this definition is very widespread and effective.

A startup is an “organization” that is a systematic complex of human, material, and financial resources, tangible and intangible assets, coordinated by someone with a rough business idea for reaching a unitary scope. Often, it is a venture which is trying to become something to evolve in a steady enterprise. There is no certainty about a happy end of this process. This organization is designed to create a new product or service works under conditions of extreme uncertainty; hence, it is “searching.” Statistically, it is more likely that the founders decide to abandon the project or to sell the idea they were working on. Then, a startup can and must evolve into an enterprise, or fail, or dissolve. This is why it is “temporary.” Behind the possibility of becoming a company, however, there must be the perspective of transforming a business idea into a business model. Of course, this contingency does not imply that a startup will become a big company. It can remain a small firm with few employees or even an individual firm.

Consistent with the pillar of Schumpeterian theories, the focus of a startup is expected to be on innovation. Innovation understood as a positive change compared to a pre-existing situation, therefore not only technological but also managerial, organizational, productive, or technical, who allows and sustains a company in the proposition of a profitable business model. The latter has to be “repeatable.” It means that the way in which company creates, delivers, and captures value has to be sustainable with recurring profit. Startup also has to be “scalable.” It implies that the company must be able to serve profitably an increasing number of customers. Some business models can be repeatable but not scalable or scalable but not repeatable; but only when they are in the meantime both repeatable and scalable, they can catch the interest of venture capitalists [32]. The role of venture capitalists is essential for the startup dynamic because, often, traditional banks have neither the instruments to finance the starting-up processes nor competencies to judge business model potentialities.

As reminded by Blank [32], a scalable startup created from the very beginning by founders who believe that their proposal could change the world is different from a startup created by people just aspiring to become self-employed or to satisfy family need through a small business which is not designed to scale. In short, scalability is the basilar feature which distinguishes a startup with potentialities from other types of enterprises generically defined newborn ventures. This potentiality to profitably expand their boundaries is a crucial aspect which allows to clarify some doubt about the overall startups policies efficacy for the territorial development.

Some researchers [9, 14, 23] are quite skeptical about the advantages of the starting-up in general, describing a blanket policy focus on startups as “bad public policy.” It occurs when startups born, thank to public facilitations and supports, and limit themselves at crowding-out existing companies that have not benefited from support or when they replicate existing business model taking advantage of greater operational and management slenderness by virtue of learning by others mistakes (“copycat”) or if they absorb all the resources allocated for policy measures. Moreover, high startups death rate could determinate relevant sunk costs for society

and aspiring entrepreneurs. In these circumstances, “evidence suggests the contribution of entrepreneurial startups to the economy is limited and in some cases can be potentially damaging” ([15], p. 136).

Moreover, some types of startups normally offer a lower contribution to local economy development. Among them, there are [32] *buyable startups*, namely startups born to be bought; *large company startups*, for answering to changes in customer preferences, new technologies, legislation issues, competitors pressure; or *social startups*, whose mission is to make the world a better place for a welfare purpose. Hence, to consider startups in a similar and undifferentiated way is a limit of industrial policy.

3.2 The concept of scale up

If entrepreneurship literature is rather skeptical about the effectiveness of startups, it agrees to sustain that the so-called high growth firms (henceforth HGFs) have significant spill-over effects: “small businesses that become middle-sized and ultimately large businesses, over a comparatively short period of time, are central to economic prosperity” ([14], p. 208). That is because HGFs are the preferential channel in the net jobs creation [6] and are beneficial to the development of other enterprises placed in the same context [43], as well as in industrial clusters [44], as they provide meaningful stimulus within economies by increasing competition, promoting innovation, and improving the efficient allocation of resources [23]. Not by chance, HGFs tend to exhibit high levels of productivity, innovation, export-orientation, internationalization, and investments in human capital [29, 43, 45]. Consequently, “the ability of a country to nurture the growth of such businesses is probably the most important element in enterprise development” ([14], p. 208).

HGFs are neither exclusively young businesses [18] nor predominantly in high tech sectors [6], and just few are venture capital backed [8]. Moreover, only episodically exhibit a linear growth, while they can expand organically or with external acquisition [23]. In line with these assumptions, a thriving stream of research stresses the necessity to favor the emerging of *scale ups* [22, 28, 29].

A univocal definition of scale up company still does not exist since the metrics, that is, the characteristics that distinguish it from the startup, vary according to the size of the reference context, the type of sector in which they operate, and the business model (usually b2c or b2b) [46]. Consistent with Blank [32], a scale ups can be framed as fast growing startups that have already overcome some phases on which the activity of the startup is focused. In particular, the scale up is a company that has developed its product or service, has defined its business model (scalable and repeatable), and can therefore focus on its growth on the market to take it forward in a controlled and sustainable manner. Hence, terminologically and consistent with the previous startup definition, only startups can become scale ups, while incumbent ventures can become HGFs; often just for a limited period of time [16].

A scale up stands out for some parameters attesting its success like market traction, 1–10 million € turnover annually, at least 1 million users (in the b2c), 20% growth in revenues or headcount for 3 years running after at least 10 people and \$ 1 million in revenues, and 20% of the turnover from the foreign market [47]. Their highest ambition is to become a “centaurus”—valued more than 100 million dollars—or an “unicorns”—valued over 1 billion dollars.

3.3 Favoring scale ups diffusion

As other entrepreneurial ventures, the possibility that scale ups come to light is strictly linked to their intrinsic capacity to discover, to exploit, and to successfully

manage economic opportunities. The incoming of digital era certainly is a source of uncountable opportunities. A new wave of economic openings linked to the Industry 4.0, where digital platforms will be coupled and connected with sophisticated infrastructures of sensors, cyber-physical systems, and robots, is expected [48]. Furthermore, digital innovations are bringing substantial new challenges on how to handle with technology, management, government policies, stakeholders' engagement, and so on [49]. Hence, the digital economy represents for ventures both a challenge and a requirement for conformity. It is a challenge, if they wish to set out a developmental pathway; it is a duty, if ventures are forced to adapt their organizational and productive pattern in order to remain competitive.

To look for strategies that are able to increase the presence of scale ups engaged into digital economy should be a primary aim for researchers and policy makers of many western countries. In this perspective, literature (Brown and Mason, 2012) [19, 34] specifies that this possibility is linked to the capacity to create a specific business environment consistent with scale ups needs. Only when effectively planned, this framework provides consistent outcomes. In Italy, for instance, the low number of scale ups created is not believed to depend on the lack of quality startups but mainly on their need to move abroad to find sufficient risk capital investments for tackling scaling, as well as for the shortage of connections with external actors [47].

Hence, new policy measures are requested, as the environments in which scale ups prosper are distinct from those which have high rates of startups [17, 21] (Brown and Mason, 2013). Scale ups also need to access to specialized resources that differ significantly from those supporting new firms [28, 32] (Brown and Mason, 2012).

To this purpose, the necessity to create a distinctive type of supportive economic and social framework emerges. It should be planned to captivate entrepreneurs with wide economic potential [16, 19, 42]; to establish steady and productive relationships among all the local stakeholders; to provide relational forms of support (such as network building, institutional alignment of priorities, strategic guidance, leadership development, and mentoring) ([20], p. 2016), instead of money-based facilities (from grants to tax incentives or subsidies) that have showed limited impact [10]; to attract different businesses funding resource (such as debt finance, crowd-funding, and peer to peer) targeted to the specific requirements of the businesses [43]; to nurture the developing of the innovation system joining local customers end users, suppliers, universities, and so on [50]; to guarantee the recognition of unprotected and open sources innovations, respect on technological innovations and the protection of intellectual property rights [46]; and to limit its action at regional or local level [33].

The specific environments and the specialized resources scale ups and HGFs need are usually defined *ecosystems* (Napier and Hansen, 2011) [24].

4. An ecosystem for the emerging of scale ups

4.1 The basilar features

In the last decade, the *entrepreneurship ecosystem approach* has emerged as response for the propagation of scale ups and HGFs in general (e.g. [11, 28]). An ecosystem encloses the "set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organizations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, numbers of high

growth firms, levels of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sell-out mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment" ([8], p. 5).

There are more models of entrepreneurial ecosystems, but each one is unique, that emerge under an inimitable set of conditions and circumstance and only where it finds fertile soil [31]. However, ecosystems usually share some common crucial features.

Firstly, an ecosystem cannot come to light in a vacuum [24] but generally arises where there are place-based assets, such as a previous strategic location of other industrial activities, even if of traditional type, or cluster [8]. This is not a surprising assumption, as researches indicate that firms that are located in "clusters" exhibit higher growth than those in other locations [44], and that in clusters usually have high number of graduates in technical disciplines who support the adoption of innovations [50]. However, the entrepreneurial ecosystem approach offers a distinctive perspective on the clustering of economic activities respect to the original concept of Porter [51].

Notably, the core of a thriving ecosystem is the presence of one or more large successful established businesses, preferably knowledge based. Their primary role is to deliberately cultivate the ecosystem itself [31]. Large companies provide outcomes of their R&D, are magnets of skilled workers, provide a market for local subcontractors, and shape specialized personnel who can decide to leave the firm to assume other roles (entrepreneur, mentor, angel investor, etc.) in the same context. These companies also invest in the local territory financing universities, research centers, and social initiatives and attract specialized suppliers that fertilize the context spreading knowledge [8, 11].

About the *cross-fertilization* process, it is crucial to underline the so-called entrepreneurial *recycling* process. It is fostered by entrepreneurs whose successful business idea/startup (*blockbusters*) was taken over from another firms or who, having already reached entrepreneurial significant goals, decide to remain in the cluster reinvesting their profit, time, wealth, experience, and expertise in supporting new entrepreneurial activities as serial entrepreneurs, venture investors, advisors, or manager of other firms [52]. The spillover effect of these entrepreneurs is particularly significant in the developmental process of the ecosystem, and these businesses in turn are the source of further waves of spinoff activity (Mason, 2009) [29]. Hence, potential entrepreneurs are themselves important players in creating the ecosystem and keeping it healthy [53].

Another key role is played by *deal-makers*, "individuals with valuable social capital, who have deep fiduciary ties within regional economies and act in the role of mediating relationships, making connections and facilitating new firm formation" ([54], p. 24). They can be entrepreneurs, investors, or service providers who are well-connected, qualified, and experienced who informally or with a fidelity role offer support to young firms and startups, helping them to develop their potential [29]. *Deal-makers* also support information sharing process. This is consistent with a relevant feature of the ecosystem, that is, an information-rich environment in which knowledge is both accessible and shared according to the principle of open innovation and cooperation for tacit dissemination. For successful entrepreneurship, the presence of dealmakers is more important than the measures supporting local entrepreneurship or investors networks, and it is a valid predictor of the health state of the regional entrepreneurial economy [54].

For the effectiveness of an entrepreneurship ecosystem, a prominent role is also due to the presence of universities and other research centers. The most significant lapel is not as much the research output transfers as the predictable presence of innovative spinoffs and startups that spread knowledge in the ecosystem itself.

Evidence shows that ecosystems have typically emerged in places that already have an established and highly regarded knowledge base which employs significant numbers of scientists and engineers. Universities and research and corporate R&D laboratories are a primary source of skilled personnel who can found innovative startups [55]. Anyway, sometimes the substantive disconnection between universities and their surrounding local entrepreneurial and innovation ecosystem belittles entrepreneurial spillovers from universities [50].

Another propulsive role is played by services providers that perform no-core activities which are outsourced. Three types of services facilitating the process of business startup and growth by enabling new firms to focus on their area of expertise can be highlighted: (1) specialist business services (law, marketing, accountability, management, consultants familiar with the unique needs of technology startups, technology marketing and assessment consultants, and PR firms), (2) technical services offering precision machining, prototyping, testing, and so on, (3) finance providers, such as venture capital firms or investment banks.

From financial perspective, the most important aspect concerns the availability of a critical mass of seeds and connections with local and foreign investors and venture capital funds [10], while the importance attributed to venture capitalists tends to be minor, as most firms are initially funded through a combination of self-financing, loans from family and friends, and bootstrapping. Despite a cluster is likely to stagnate or decline without these actors [44], in ecosystems venture capital seems lags, rather than stimulate, the emergence of entrepreneurial activity (Mason, Brown, 2014). This type of financing is more suitable for high growth technology-based firms [10].

4.2 The entrepreneurial enablers

An ecosystem has to be planned and managed. Often traditional decision makers of political origin have not suitable and enough technical and economic competencies to follow the implementation of the ecosystem: “however challenging the encouragement of entrepreneurship may seem, it is truly too important to be left to policy specialists” ([10], p. 264). In this regard, Isenberg [28] argues it would be better to establish new organizations with a ‘sell-by date’ composed of experts with specific entrepreneurial competencies—*entrepreneurial enablers*.

The tasks of these temporary organizations are to assure a holistic approach that considers especially bottom-up measures, as the major needs for the firms belonging to the entrepreneurial ecosystem do not concern the offering of grant and subsidies. The latter could have self-defeating effects respect on a Darwinist natural and spontaneous selection of the best firms and business models [5, 28]. As explained, ecosystem is chiefly founded on the active input coming from the entrepreneurial community. Hence, the involved firms require *relational* rather than *transactional* assistance during the different stages they run across, with the provision of intensive support and mentoring, as well as facilitations for startups through business incubators. The latter provides business advice, networking with mentors, business angels, banks, and service providers. The purpose is to build “bridges” between different actors through the creation of communities of best practices or entrepreneurial networks [8, 21]. Therefore, it is important primarily to establish steady and effective *connections* among all the involved actors and networking linkages.

These tools answer to the essential presence of startups which aspire to expand and develop. Sometimes, in the early stages of establishing an ecosystem, to stress on supporting the starting up processes helping these ventures with organizational and human capital development, internationalization support and access to growth capital could be necessary. But a mature ecosystem needs to focus its efforts on companies

with the greatest potential. Entrepreneurial enablers should possess the ability to understand the right moment to shift the focus of their intervention. In addition, as the creation of an ecosystem occurs by phases which evolve over time, the organization's experts have to be able to determinate metric to evaluate strength, weakness, and bottlenecks of the ecosystem through a continue monitoring, identifying whether and how to intervene, and verifying over time the effectiveness of such interventions. Consistent with the described selective approach, they should also have the political strength to concentrate resources (public and/or private) primarily on a small number of high-potential early stage firms to accelerate their development [6, 46]. As success breeds, resources have to be granted in a selective way and not equally distributed [28].

Among the enablers duties, another vital aspect concerns the creation and diffusion of a specific *culture*. There is the necessity to plan initiatives acting on the cultural pattern of the territory, stimulating universities and school to focus on entrepreneurial education and promoting events which celebrate local entrepreneurship and innovation. The purpose is to valorize the entrepreneurial choice among citizens favoring a mentality changing and stimulating imitation. In this perspective, it would be significant to already have in the ecosystem HGFs or other successful examples to imitate. In parallel, as basic informal rule, an ecosystem should be characterized by the acceptance of failure as a normal outcome of entrepreneurial activity. The consequence is that there is no diffidence to employ workers coming from other companies, even if they have failed [11]. Being based on largely trustworthy relationships, the ecosystem has also to be pervaded by the typical optimistic and positive business climate which feeds of self-confidence among entrepreneurs [41].

Last but not least, a prosperous ecosystem also depends on innovations diffusion and industry conditions. For instance, even if riskier, technological advances of disruptive nature, which create “discontinuities,” are believed to produce the largest opportunities [27, 50]. Consequently, often the emergence of an entrepreneurial ecosystem depends on the development of markets for newer technologies [8, 55]. Digital technologies are a remarkable example of this type, with a lot of opportunity that could be disclosed for new would-be entrepreneurs and the local context [48]. From this last perspective, entrepreneurial enablers have a great responsibility in connecting the ecosystem to the technological and innovation dynamics. To collect all these changes and challenges, the business environment has to show a high social capital [54], while firms show a high level of intellectual capital, in form of the three interrelated human, relational, and organizational components [56].

The overture described is in line with the increasingly widespread theses according to which economic behavior can be better understood within its historical, temporal, institutional, spatial, and social contexts. Contexts provide individuals with opportunities and set boundaries for their actions and influence entrepreneurial choices, helping to understand who, when, how, and why someone becomes involved. But also entrepreneurship impacts on context, modifying its features [3]. Consistent with some influential experts [57], the next shift in policies will lead from “regional entrepreneurship policy” to “policy for an entrepreneurial regional economy,” that is the ecosystem approach.

5. Perspectives for digital startups birth and scale ups diffusion

5.1 The digital technologies

Observing the transformations taking place in the industrial system, it is clearer how, on the one hand, technology becomes much more pervasive by entering more

and more directly and intensely in production processes, products, and services. From the other hand, the technology-based competition is intensified, with new comer countries that force Western countries to continuously renew the bases of their technological and competitive advantage. This dynamic makes R&S activity and the related ability to propose innovations increasingly necessary [49].

With specific regard to digital technologies, “the biggest transformation in business the world has seen in over a century” ([48], p. 5), they are radically changing the way people live, work, communicate, and play. Their pervasive diffusion is also causing significant repercussions on the dynamics of companies in European countries: 2.6 new digital job for each job destroyed is expected, manufacturing can achieve growth from 15 to 20% by 2030 if digitalized, revenue coming from digital technologies will growth of 2% for year, big data technology and services are expected to grow worldwide to USD 16.9 billion in 2015 at a compound annual growth rate of 40%, while companies using that data become 5–6% more productive [48]. Also, the way of carrying out many of the traditional production processes is modifying considerably, as well as consolidated theoretical approaches regarding the methods of supplying resources, the product management, and service offered are questioned. Indeed, the possibility of constantly introducing new functionalities for a product or service, even in remotely, would seem to alter the validity of theories on the product life cycle, on the genesis of the innovation, or on the product development process [25, 26].

Consequently, by proceeding with digital technologies adoption and implementation, an almost infinite number of economic opportunities for existing or new ventures is emerging, waiting to be grasped. Even more by considering that the boundaries of digital technologies in the three interrelated components of digital *artifacts*, *platforms*, and *infrastructures* are still unexplored, and every innovation such as cloud computing, data analytics, online communities, social media, 3D printing, and digital makerspaces contains indefinite applications.

The magnitude of this change is so significant and visible that a specialized literature has arisen—the *digital entrepreneurship*. It analyzes the effects of digitalization on the traditional methods of conducting a business to success. For instance, about the digital artifacts (the digital components, applications or media content that are part of a new product/service and offers a specific functionality or value to the end-user), the decoupling of information from its related physical form or device has led to the gradual infusion of such digital artifacts into a wide range of products and services and discloses a plethora of business occasions for different industrial sectors [58]. Digital artifacts are continually embedded in wider and constantly shifting ecosystems, such that they become increasingly editable, interactive, reprogrammable, and distributable [59]. Similarly, digital technology that offers communication, collaboration, and/or computing capabilities to support innovation digital infrastructures requires new personnel with different roles (customers, investors, partners, etc.) in all stages of entrepreneurial process, from opportunity exploration to venture launch [59].

Furthermore, “digital infrastructures (digital technology tools and systems that offer communication, collaboration, and/or computing capabilities to support innovation and entrepreneurship) infuse a level of fluidity or variability into entrepreneurial processes, allowing them to unfold in a nonlinear fashion across time and space” (Nambisan, 2017, p. 6), making less stable boundaries in both entrepreneurial outcomes and processes. This, in turn, leads to changes in behaviors and actions among digital entrepreneurs. Indeed, digital firm’s success tends to step away from the exploiting of a certain opportunity, or the execution of a detailed value proposition, as it needs to follow a continuously evolving value proposition, namely actions that leverage the potential of a continuous re-scoping of business model [27].

The continuous changes associated with the implementation of digital technologies also support a transformation in the figure of the entrepreneur and his orientation to primarily seek economic performance. On one side, in fact, the most important aspect of the firm, especially if in the initial stages of life, becomes the validity of the business idea that it intends to develop and the consistency with the skills already possessed. The goal is to ensure the future competitiveness of venture or its attractiveness toward larger companies that might decide to buy it. On the other side, the focus of the decision-making process could depend on the pool of employees, probably coetaneous of the entrepreneur but with more digital skills, who are able to identify and collect market opportunities and transforming in business [26].

In the meantime, less importance of funding sources is expected in favor of the role of connections. In fact, unreleased opportunities to resort to financing with methods such as crowdfunding or crowdsourcing or obtaining support from customers and suppliers are arising. In this way, the traditional funding gaps for new businesses, particularly in technology sectors, normally looking for small amounts of finance, can also be easily filled [43].

On closer inspection, these changes are intrinsic conditions and functionalities belonging to the entrepreneurship ecosystem approach. In ecosystems, the goal of profit is fundamentally subordinated to the desire for self-realization or experimentation with innovative ideas of aspiring entrepreneurs (the pleasure of discovery), while the presence of networks of stakeholders along the productive process and the supply chain is believed crucial. Likewise, a continuous rotation of employees who pushed by personal objectives of income, job satisfaction, or self-efficacy tends to offer their competencies to other neighboring companies or to create their own startup, is judged spontaneous.

These behaviors improve not only the processes of dissemination of knowledge and innovative ideas within the ecosystem but also their propagation speed. This high fluidity of people and resources within the ecosystem is considered a strategic lever for its success [28]. But fluidity is also a key feature of digital technologies which often have low access barriers and are cheap to adopt and exploit.

In addition, re-programmability and re-combinability of digital artifacts and platforms, on their own and in conjunction with other factors, enable the introduction of new functionalities in different market contexts, thereby refashioning existing pathways or opening new chances to create value, i.e., rendering existing market offerings less bounded from already existing opportunities. Digital firms could not feasibly operate without the Internet-enabled digital platforms (shared, common set of services and architecture that serves to host complementary offerings, including digital artifacts), which meet producers and consumers and facilitate the exchange of goods, services, or social currency, also enabling value creation for all through the digital landscape [25]. The difficulty to establish boundaries for digital platforms is therefore confirmed. In addition, the interaction of digital artifact properties with other contextual features resulting from the challenges linked to digital technologies (e.g., new legislative regulations, new pricing mechanisms, etc) also can radically change the definition of value in a market, proposing new further functionalities or business opportunities [59].

5.2 The role of ecosystem

On these premises, ecosystems could assure a fundamental contribution facilitating the developmental pathway for digital startups. Indeed, an ecosystem guarantees the passage of the traditional business environment to one no longer linked to individual or company factors but to a network of specialized partners with a wide availability of knowledge and open innovations.

Due to the presence of research centers disseminating knowledge, universities forming graduates in technical disciplines, and consultants, it is highly probable that these specific environments are linked to regional or urban areas. Not by chance, some authors (e.g., [33, 60]) put cities as the key organizing unit for innovation, entrepreneurship, and economic growth and argue about how digital startups and scale ups may take in place in cities and, sometime, require them as preferential ecosystem that help lever their development [58, 60].

Even the ecosystem tendency to the concentration of activities is coherent with the nature of digital companies. Their location choices do not depend on factors such as proximity to the market or availability of tangible inputs or from the availability of large physical space difficult to find in an urban area. As digital companies include online retailers but exclude retailers which have a physical presence on the 'high street' and are linked to the generation and diffusion of knowledge, as well as to the presence of specific support services or specialized human capital and venture capital, they should give priority to the agglomerations of competencies typical of urban context with the presence of universities and research centers [8, 61].

Belonging to an ecosystem presents another advantage for digital companies. In the ecosystem, the innovative and creative processes are no longer centered on the individuals or on the ventures, but looks at the entire regional context meant as fertile environment from which economic opportunities can arise. Therefore, the innovative and entrepreneurial critical processes become linked to the entire external environment, considered as a place of aggregation of individuals, companies, individual talents, institutions and support services [28]. This feature is consistent with the needs of digital entrepreneurship, where the most important productive factors are the availability of specialized personnel, of venture capitalists, and knowledge generation sources. To be placed in an ecosystem also could help all the memberships companies to obtain legislative rules that ensure, for example, the ownership of the innovations introduced and the cyber security of client companies, in doing so encouraging the adoption of the same technologies [62].

Anyway, to grow, digital startups must incorporate quickly new management functions, from operations to marketing, evolving from an unstructured chaotic day-to-day to an evolving structure, mature, and dynamic organization. Consequently, they have to bring out the need of new competencies, especially of digital nature. They have to be able to possess, manage, dominate, and develop digital technologies and the inherent knowledge. These competencies enclose hard skills (from the ability to use computer programs and packages to the use of specific machines and tools for production such as social, mobile, analytics, cloud, artificial intelligence, robotics, Internet of Things, and cybersecurity) and soft skills (linked to relationships and behaviors of people enabling the effective use of new digital tools such as problem solving, knowledge networking, the new media literacy, etc.) [63]. Consistent with the ecosystem features reminded in the previous sections, even from this last perspective, the ecosystem approach seems the more suitable for digital startups and their growth.

6. Conclusive remarks

The diffusion of digital technologies with their still undefined boundaries announces a new era in entrepreneurship, where traditional ways and forms of pursuing entrepreneurial opportunities will be increasingly reshaped. A new horizon of business opportunities only waits for being discovered and then managed profitably [27, 48, 57].

Relevant changes also are involving the basilar criteria of management and organization of companies and the ways to compete globally. From these modifications,

new criteria to start a business and pathways for its development and growth descend: the emergence of *digital entrepreneurship* [25, 62].

For policy makers, the main challenge is to assure both that the domestic ventures are able to collect digital business opportunities successfully and to provide benefits for the whole territorial context, along a development route stable and persistent in terms of net employment, income, and cross fertilization. A flourishing entrepreneurship research stream believes that a chance to reach the above objectives lies in the ability to implement specific business environments called *ecosystems*. These are targeted on selective measure supporting the emerging of ventures with innovative business models but also their development and growth ([24]; Napier and Hansens, 2011). While, according to empirical evidence, policies only focused in favoring the firms birth rate may not be the best solution to the problems of employment and growth of many Western countries.

Anyway to support scale ups and high growth firms in general is a hard task that must be carried out by specialized personnel and with the appropriate skills. This is because there are not many cases of good practice to follow, but only a basic logic according to which all the domains (a favorable culture, enabling policies, availability of adequate financing, high-quality human capital, safety-friendly markets for products, institutional supports, etc.) that make up an ecosystem must be aligned and coordinated (*holistic approach*). Moreover, the ecosystem needs to involve, since the beginning, many stakeholders/actors (at least an interested large corporation, policy makers, local bankers, and venture capitalists, people acting on the local culture, local universities, etc.) [24, 54]. The more intense the cooperation among these key actors is, the more likely the ecosystem will be to succeed.

Nevertheless, both domains and actors are characterized by proximity and include hundreds of variables interacting in highly complex and idiosyncratic ways. They should be able to converge toward a set of shared objectives according to a series of priorities [31] (SEP, 2018).

Despite the complexity to create an ecosystem, its features and functionalities seem well-suited with digital enterprises features, as they focus on the development of the *intellectual capital*, which has to sustain the growth of firms operating with a new disruptive technology [8, 56]. Indeed, the roots of a well-operating ecosystem lie in a specialized and motivated *human capital*, open to innovation and with a widespread entrepreneurial culture. It is also founded on a dynamic system of connections among all the stakeholders of a context who are interested into its development, the *networking capital*. Again, the ecosystem rests its strength on the quality of the firms enclosed in terms of values, managerial philosophy, organizational patterns, and informative systems; in other word, the *organizational capital*.

To this aim, therefore, policy makers are called to sustain a great effort. Not by the chance, up to now a lot of attempts aiming at creating conducive environments failed. Moreover, there is an effective risk that the entrepreneurial ecosystem remains a tautological concept (Stam, 2015): entrepreneurial ecosystems produce successful entrepreneurship, but where there is a lot of successful entrepreneurship, there is apparently a good entrepreneurial ecosystem.

Beyond this theoretical-conceptual paper, aimed to connect the increasing sector of digital firms with a specific business environment, future surveys should focus their analyses at least on three directions. Firstly, a clear individuation of the needs and resources requested by digital firms and startups in the light of their own specificities; secondly, the detailed examination of the operative mechanisms of existing ecosystems precisely focused on digital technologies; and lastly, an investigations on the coherence among digital technologies with the local background of competencies and knowledge to individuate possible gaps to fill.

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