

59th ERSA Congress

Cities, regions and digital transformations: opportunities, risks and challenges

27 - 30 August 2019, Lyon, France

S18. Entrepreneurship and local development: symbiosis and/or dissonance?"

**Start-up: the rediscovery by the ecosystem of the victorious entrepreneur? A Research Agenda Program**

Claude Lacour, GREThA, Université de Bordeaux, lacour@u-bordeaux.fr

Nathalie Gaussier, GREThA, Université de Bordeaux, gaussier@u-bordeaux.fr

**Preliminary draft**

**Keywords:** Ecosystem, start-up, entrepreneurial system, entrepreneur

**JEL:** L26, M13, R10, R58

**Abstract:**

This paper highlights the main theoretical issues to understand how start-ups operate in metropolitan ecosystem(s). We discuss the strong ideas in the form of contextual research hypotheses likely to carry a renewed theoretical framework. The method is based on the analysis of the literature, the theoretical frameworks and the modalities of their renewal. It is also nourished by a monographic approach and preliminary investigations. The paper discusses and highlights seven fundamental hypotheses that are illustrated in particular from the study of the Bordeaux metropolis.

The paper is structured as followed. The first part discusses the reference to the ecosystem to deal with entrepreneurial ecosystems and start-ups. It investigates the role of start-ups in entrepreneurial ecosystems between revolution, new paradigms and banalization. The second part issues the territorial and metropolitan anchorages of start-ups ecosystem. Then, the last part underlines the metropolitan ecosystem as a biotope of the start-ups ecosystem, as a new research agenda program.

## Introduction

This communication is part of a research process marked by two trends.

The first trend is founded in what we had, a decade ago, illustrated by the *clusties* neologism: cluster in, by the City. It stands for whatever the cluster means that *clusties* considered the city as a privileged space for understanding phenomena, policies aimed at developing clusters, competitiveness clusters and any other form of support for high-tech innovations in a globalized and digitized world.

The second trend is more related to research opportunities from different actors and institutions. It is embedded in local and external contexts and temporalities that nourish our questions.

In 2015, we were asked by the Scientific Council of the Economic and Social Observatory of LGV -the Bordeaux-Paris High Speed Line- to analyze the strategies of companies and institutions on their perception of the 2017 arrival of the new LGV in Bordeaux - two hours from Paris: cautious wait-and-see, active anticipation, benevolent neutrality or no interest and *a priori* no effect (Gaussier and Lacour, 2015). At different workshops presentations and major communication and actors meetings, appeared what we called "*Bordeaux on the wave*": an image suddenly shared and revealed that Bordeaux was at the forefront of media and economic news by building new infrastructure (new stadium, Cité du Vin, new auditorium, restoration of the large glass roof of Saint-Jean station) at the same time the town was gaining places in tourist rankings. Especially Bordeaux appeared as "*a regional and metropolitan entrepreneurial ecosystem*" which is affirmed and claimed by politicians and major professional institutions. *Bordeaux on the wave* has become *an ecosystem on the wave*, with particular attention to start-ups and to the metropolitan label French Tech Bordeaux obtained in 2014.

This "revelation", however, strongly questioned us: what was this ecosystem about? Was it an ecosystem based in part on start-ups, which is largely ignored and even less analyzed, and which would have appeared such as a singular form of spontaneous generation or a self-fulfilling affirmation, *in the air*; that uses this formulation of an ecosystem approach to talk about more classical phenomena aimed at the importance of the innovations considered in the digital age? Could this "ecosystem" terminology have become systematic and a guarantee of modernity, of the creation of new economic, political and cultural milieus, producing relations based on cooperation and communication? This intrusion of a carrier vocabulary that is found declined in virtually all environments, would it then reflect the effects of exogenous shocks that the arrival of the LGV in Bordeaux in July 2017 would be the emblematic example?

Unless, on the contrary, this metropolitan-regional ecosystem probably linked to the long phase of the LGV operation's maturation, was born on this occasion: less the exogenous shock and its diffuse effects than the realization of processes, encounters and informal links

that would be acclaimed for the national and international media. So, would the call to the metropolitan - regional entrepreneurial ecosystem indicate a revolution in ways of thinking and acting or, on the contrary, would it simply mark an update of the vocabulary to enter the world and codes of the French Tech?

## **1. Between revolution, new paradigms or banalization: ecosystems, the entrepreneur and the start-up**

Start-up, ecosystem, entrepreneurship and entrepreneur: so many common terms that requires definitional, theoretical and operational deepening.

It is temporarily assumed that the call to the ecosystem underlines the recognition of a relatively homogeneous and autonomous but largely open world, with specific actors, codes and strategic logics, coming from singular heritages or functioning by mimicry; worlds wanting to be transparent, at the service of society, without forgetting tribal and corporatist predilections.

Revolution, paradigms or banalization? We are faced with two sets of contradictory injunctions.

### **1.1. The reference to the ecosystem**

There are two canonical markers of profoundly different nature that seem to feed each other.

#### **1.1.1. Ecosystem: the original Tansley model**

An inexhaustible source of reference, the original idea of Tansley (1935) is that of a "*dynamic whole of living organisms that feed back to each other and to the environment in which they live*". Probably a revolutionary idea in the thirties, developed and enriched in ecology and science of biodiversity, appropriate in human sciences, especially in ecological economics, mobilized in practices (Likens, 1992, 4), it has become today almost banal. It will give rise in economics to approaches in terms of ecosystems (Grimm *et al.*, 2003, Stam and Spiegel, 2016), to evolve more and more towards taking into account of ecosystem services (de Groot *et al.*, 2002, Kumar, 2010): "*The ecosystem concept describes the interrelationships between living organisms (including people) and the non-living environment, it provides a holistic approach to understanding the generation of services from the environment that both provides benefits and delivers costs to the people*" (Kumar, 2010, p. 44). In De Groot (2002), ecosystem functions are "*the capacity of natural processes and components to provide goods and services that satisfy human needs, directly or indirectly*" (p. 394). The strong idea is centered on the diversity defined in 1992 by the Convention on Biological

Diversity: "*Variability of living beings from all origins including among others terrestrial and aquatic ecosystems and the ecological complexes of which they are part: this includes the diversity within species, as well as that of ecosystems*". We will see below the interest of the reference to aquatic ecosystems. There is increasing evidence that "*the biocenosis is so modified that it is now an 'anthropocenosis'*" (Bethléem Ecosystem). Especially in cities and larger cities, spaces are increasingly artificialized, for functional reasons imposed by the economy in the broad sense (industry, commercial areas, automobiles, housing...): we destroyed the nature that however, we try to reintroduce: the green city, the Nature city as much as the smart city.

In this line, the approach in terms of ecosystem (AES) is a model of heuristic reflection (Cusinatto, 2016), a theoretical framework, a declination of ecosystem services with nomenclatures and measures by a series of indicators, by the appreciation of the modalities of the benefits offered by biodiversity, operations and investments - costs to maintain, repair the outrages made to Nature understood in a broad sense. Parks and Gowdy (2013) review what "*economists have learned to take into account the value of nature*", they note with humor that in the Classics the discipline of ecology did not exist, neither did the ecosystem services but recognized the contribution of these services by reference to '*natural agents*' and '*natural forces*' (p. 2).

In this orientation, principles have been developed to manage, anticipate ecosystems through the use of the market, regulations or interventions in the form of taxes. In theory, accounting (which reminds us of the regional accounts of the sixties and seventies), operational, as well as those of politics and ideologies, a real paradigm has been built which has as its banner climate change and battles for biodiversity. The new draft constitutional reform envisages a formulation of Article 1 of the Constitution which would require the French Republic "*to act for the preservation of the environment and biological diversity and against climate change*" (P. Roger, *Le Monde*, 1.6.2019). Grimm *et al.* (2003) believe that the ecosystem approach helps to understand "*how cities work, how they interact with surrounding local and global ecosystems, and how expected changes in landscapes and regions resulting from increasing urbanization will affect the future Earth's systems. (...) Take the stance here that cities can be understood as ecosystems and that ecosystems concept is highly appropriate to understand both ecological and social dynamics (and their interactions) in cities*" (p. 95).

These authors, following Odum (1989), use the concept of ecosystem as "*a model of an open thermodynamic non-equilibrium system with the emphasis on the external environment*" and define **the boundaries, structures and functions** of the ecosystem that make it possible to understand urban ecosystems: "*in many ways cities are like any other ecosystem*" (p. 99). There are some things in common: « 1. *the number of species diversity... is probably comparable to or perhaps even higher than surrounding systems; 2. soils represent major storage pools of nitrogen and carbon relative to inputs; 3. primary productivity except in the*

*most intensively urbanized parts of the city, is probably not appreciably different than it is in other ecosystems in the region" (p. 99).*

But characters make cities "unique": « *they are heterotrophic ; they require large input of energy and materials recycling is very high compared with other types of ecosystems they produce copious amount of waste and often lack effective assimilation mechanisms to handle these wastes ; urban ecosystem function is controlled not just by biophysical factors but also by social and political forces and humans exerts overwhelming control on ecosystem process* » (A synthetic presentation of this article by Rondel, 2008). The Urban Ecosystems Challenge (call for a 2019 project from the CNRS Mission for Transversal and Interdisciplinary Initiatives) stated that "*the city can be considered as a complex ecosystem in rapid evolution and developing through social, spatial, ecological dynamics and technology processes strongly linked to each other*" but it also added that the purpose of the operation was "*to promote the expression of research related to an urban ecology heard in a broad way to project the city of the future face to climate change and other global changes*": on the one hand, an opening towards urban ecosystems but on the other, in our view, a "closure" since what seems to be expected should be in the field of urban ecology and not, or a little, in urban economy.

We can clearly see the expectations of a whole series of works that want to "green" and vegetate spaces, to transpose by metaphorical reflex, by break-in or by analogy, the ecosystem especially for the analyzes of the city and the urban: "*the city as a metabolism*" for example in the path opened by the "Brussels ecosystem" and the works of Duvigneaud (1976): "*the concept of metabolism is close to the School of Brussels because it compares cities to living organisms and during their operation they produce waste*" (Bethléem Ecosystem).

From Tansley and his successors strongly appear ideas of environments, the need to define living organisms, to emphasize what Likens (1992) highlighted, the diversity and complexity, the feedback modalities and the modes of relations between outside and inside these environments, networks and nodes.

### **1.1.2. The ecosystem: strategic community of destiny or interests**

The second type of ecosystem is in line with Moore's work: "*a strategic community of destiny or interests*". This business ecosystem directly refers to entrepreneurs, entrepreneurship and start-ups and leads to "*the will to build paradigms, that of (re)making the entrepreneur as the hero of modern times*" (*Les Echos*, 6.2.2019). Entrepreneurship would become (again) the most advanced form of revolutions based on disruptive innovations, high tech and STEM (Science, Technology, Engineering and Mathematics) (Cooke, 2019). Start-ups would create new worlds with "*new people in new places to create*

*new value*" (Stam, 2015). We should then rely on the theorizations of the Rise of the Silicon Valley, and deify the geniuses that have created the Gafa worldwide unicorns.

But Cooke (2019) notes a kind of "*disaffection for innovation*", as far as we see the occurrence of their limits or even the dangers: "*the innovation seemed a benefit for the business but it tends to become a tumor which touches the ethics, the incentives to illegal activities that the negligence of the neo-liberal policies allowed*", it is particularly aimed at the FAGAMi (Facebook, Google, Amazon, Microsoft). Here we come, more broadly, to the question of predation in our capitalist societies: Villette and Vuillermont (2007) show that the entrepreneur can be considered as a predator, entrepreneur-predator of market imperfections, playing on morality which, in a consequentialist approach, will always forgive its misdeeds in the end. It is time then to return to "*good practices*" and define rules of transparency, control and planning of the *company Towns*. If it is now recognized that start-ups are related to high technology, digitalization, we should not limit them to this aspect: "*it would be too fast and wrong to reduce start-ups to their only adaptability; the fact remains that (this) character is essential as the common denominator*"(CESER Normandy, further CN, 2019, p. 11).

The greatness of the heroes fades, the disruption is debated, the Rise give way to the Fall and the departure of the companies of the Bay of San Francisco become too expensive and unequal, to find in part the charms of Old New England, on the East coast (Storper et al., 2015, Schafran, 2018)... Start-ups would only be the hidden face apparently still attractive of the Entrepreneurial decline (Cooke, 2019): "*the 'business dynamics' are generally not in good condition, small-firm performance has of late been underwhelming, start-up business are drying up and entrepreneurship data, in general, have registered substantially declining profiles*". In the same vein, some start-ups would be just *zombies*.

Disruption, "*the process whereby a smaller company with few resources is able to successfully challenge established incumbent nosiness*" (Christensen et al., 2015), would be out of focus and be called into question (Vallat, 2017). But Christensen et al. (2015) see disruptive innovations in mature or end-of-life markets or new markets as "*a way to transform a non-consumer into a consumer*". The glorification of start-ups should be reviewed as they should respect simple rules, common sense principles developed in books for the general public (Martinaud, 2017): the start-up in fifteen lessons and twenty rules... Finally, far from being a hero, the entrepreneur would react as "everyone", as evidenced by the great diversity of start-ups: from a vague idea, without a business model or market study, he would quickly start relying on its means, personality, networks and knowledge. Silberzahn (2014) develops the thesis of the "effectuation" in five principles: from his own resources, the entrepreneur would be able to take advantage of surprises, build a project with regard to committed stakeholders, reason in terms of acceptable loss and transform its environment. We are far from the classic approach of the extraordinary entrepreneur, visionary and lonely, defining strategies and goals to achieve.

## 1.2. Fundamental revolution or semantic?

### 1.2.1. Greatness, decadence and resurrection of the entrepreneur

Before wondering if entrepreneurship is a revolution, we need to know what we are talking about. Admittedly, it is a word and an environment that is marked by complexity and it would have "a self-eco-(re) organized character" (Couture and Albert, 2016) which in their paper make an interesting inventory of variations of meaning between the French and English words. Isenberg (2011) makes the same observation and notes that "*in the broadest sense, entrepreneurs (as we do not have a native English word 'native'), buy inputs as cheaply as possible, transform them by taking risks and sell them at a high price*". Couture and Albert (2016) note that "*by chance, the Quebec Office of the French Language OQLF aims precisely to dispel many confusions in the fields of economics and human sciences as well as to make professional communication more precise and more effective*"(p. 2). For them, the word "entrepreneur" has three meanings: "*entrepreneur, owner-manager of a company and a special meaning relating to the execution of construction works, public works, forestry or agriculture*". They also mention "intrapreneurship" (p. 4) "*which would be entrepreneurial spirit rather than entrepreneurship*" to which could be added "extrapreneurship" which would concern the environments, the living environment for and in the ecosystem. Taking up Julien (2008), they emphasize that entrepreneurship is "*a phenomenon at the same time economic, managerial and anthroposocial*" (p. 4), that it "*has its determinants in an indefinite depth of indeterminisms, where autonomy and dependence 'intermingle at any time'*" (p. 10). They give us a schematization (p. 10 and 11) a kind of a Morin transposition of the "*entrepreneurship in complexity*".

Management sciences strive to construct paradigms of entrepreneurship, either through an inventory of possibilities, or in the manner of Cooke remembering the Schumpeter of 1934, namely a recombinant paradigm: "*the entrepreneur conceives the organization or rather new combinations*"(Verstraete, Fayolle, 2004, p. 6). We find the entrepreneur of Perroux, whose profit remunerates the joint functions of authority and creation. Stam (2015) sees it as "*a sympathetic critique of entrepreneurial ecosystems and regional politics*", which is certainly nice, but largely useful for our own concerns.

A whole dedicated literature is developing including the four research paradigms proposed by Verstraete and Fayolle (2004): the business opportunity, the creation of an organization, the creation of value, and the paradigm of innovation. Couture and Albert (2016) extend the list and enrich it in an appendix of a great value: they identify eight paradigms specified by distinctive elements, evaluation criteria and possible links with other paradigms that gives a heart to research and that would justify we are faced with a theoretical and methodological revolution.

Isenberg (2010) wonders: "*How to Start an Entrepreneurial Revolution?*», a title we almost want to return: How an entrepreneurial start-up gives rise to a revolution? He starts from the strong idea that "*the role of the entrepreneur is to show permanently that the conventional wisdom and the market could also be wrong*". He has to be "*intrinsically contrarian*" (Isenberg, 2011a). The entrepreneur must be based on "non-conformism", not to be marked by "metathesiophobia", fear of the future (Cooke, 2019, p. 2), nor simply to believe in the fundamental revolution that ecosystems would bring, even if the entrepreneur, is often presented as being "*schizophrenic, paranoid*" (Martinaud, 2017, p. 296). He is no longer the "*solitary Schumpeterian economic superman*" entrepreneur (Stam and Spigel, 2016), as far as he never was, despite the mythical versions of the genius "*in his garage, his idea and a good book*", in particular that of Kawasaki (2015, 2004) tells us a chronicler!, but inserted in contexts that are marked by temporal, spatial, social, organizational and market dimensions. The entrepreneur must be "*as a collaborative, co-operative, subsidized, supported, needy and collectively-minded member of an "ecosystem" than a cowboy smoking a Marlboro*" (Cooke, 2019, p. 3).

In his "*Sympathetic Critique*", Stam (2015) questions the concept and the profound nature of the "*ambitious entrepreneur*" who intends to be his own boss and pursue his own development, but not only: he wants to bring innovations, to produce new products while returning to Schumpeter's theory for which the creation of new value is at the center of his project. One of the novelties of the entrepreneurial spirit and the ambitious entrepreneur is less the attention paid to quantity (new firms and own employment) than that aimed at quality, by the attention to the entrepreneurial spirit on growth and innovation. One of the consequences will be the need to rethink support policies, particularly from the authorities and during market failures. In these cases, the role of the entrepreneur remains a black box that should be removed. To lift these sails, Stam (2015) encourages to work under what he calls the approach of the entrepreneurial ecosystem (EEA).

From the outset, he recognizes that the use of the notion of ecosystem derives from interpretations related to biology, the center of this logic being "*the interactions of living organisms with their physical environment*" (p. 1761), but that these references should not be "*too literal*": it was or could have been a useful metaphor and a transition to a more specific and appropriate reflection: "*the EE concept emphasizes that entrepreneurship takes place in a community of interdependent actors*"; apparently nothing new.

### **1.2.2. Nature or nurture (Isenberg, 2011)**

"*I am frequently asked if entrepreneurs are born entrepreneurs or made and the same question can be applied to entrepreneurial ecosystems ; they are usually the result of an intelligent evolution that blends the invisible hand of markets and deliberate helping hand of public leadership*" (Isenberg, 2011b). There is no spontaneous generation any more than a



production totally realized by public interventions leading notably Isenberg (2011a) to conceive "*the strategy of the entrepreneurial ecosystem as a new paradigm for economic policy*". Acs *et al.* (2014) rethink national systems of innovation through "*national systems of entrepreneurship*". Isenberg could have added another question: are ecosystems born or become it anywhere? The answer is clear and we have shown, at the scale of the Bordeaux metropolis, that start-ups were linked to spatial DNA, especially metropolitan (Gaussier and Lacour, 2017). They are not in the cloud even though they rely heavily on social networks, digital advances and artificial intelligence (Stam, 2015, Stam and Spigel, 2016). Moreover, "*The French Tech win the regions*" and the big cities want to seduce the start-ups at all costs by relying on the quality of their centers, urban life, and transport (Le Monde 21.11 .2017).

## **2. Metropolitan anchorages of start-up ecosystems**

It is not enough to say that "*the metropolitan environment can be considered as an ecosystem*" (Encyclopedia Univesalis) and that this urban environment - ecosystem must be conceived and managed in an "*increasingly ecological*" way.

### **2.1. Start-up: the domains and the law of small numbers**

If we know the role and the place of the Silicon Valley, both by the lightning and global success of some companies and success stories taken and theorized by the academic literature, success that we would like to generalize and reproduce at the infinite and everywhere, we recognize today limits and the weight of singular conditions that cannot be reproduced everywhere. The entrepreneurial ecosystem is "*a set of interdependent actors and coordinated factors in such a way that they enable productive entrepreneurship within a particular territory. [...] Current work is underdeveloped focusing more on superficial generalizations based on successful case studies like Silicon Valley, Boulder (Colorado), rather than on rigorous social science research*" (Stam and Spigel, 2016).

The six domains of EE retained by Isenberg (2010): politics, finance, culture, support, human capital, markets, do not all necessarily exist at the same time, in the same places and their joints can take many forms: potential partners can ignore each other, competitions exist, and everyone wants to have his incubator, tutelary umbrella...

### **2.2. The allied concepts**

The ecosystem of start-ups cannot ignore the allied concepts of Stam and Spigel, industrial districts, clusters, innovation systems, competitiveness clusters, some of which participate in the ecosystems of start-ups and for others are of another nature, linked to public

authorities, to the classifications and to the labeled recognitions. Isenberg has four features that define the Entrepreneurship Ecosystem. First, *"every entrepreneur is unique,"* and if each ecosystem uses the six domains, *"it is the result of hundreds of interacting elements in a particularly complex and idiosyncratic way."* He emphasizes caution in seeking *"specific and generic causes"* and the weight and the importance of what he calls *"the law of small numbers"* which *"inflames the imagination of the public and inspires imitators"* (Isenberg, 2010). Finally, he explains the functioning of the six areas and considers that the ecosystem should become *"relatively self-sustaining"* and the influence of public policies be reduced. This is to assume that all start-ups are succeeding...

Isenberg (2010) as an *"entrepreneur, academic, venture capitalist, angel investor and government advisor"* prescribes guides to create an entrepreneurial ecosystem and to lead public policies. Especially to build the EE on local conditions, to involve the private sector from the beginning, to support high-potential start-ups whose *"majority is not based on technology"* (but how to detect high potential?), to be rigorous on financing and *"facing with the rigors of markets"*, avoiding the complication of clusters and *"let them grow organically"*. The EE then becomes an object in the hands of the public policies while they are also the actors of.

### **2.3. Spatial personal and placental DNAs**

We suggested (Gaussier and Lacour, 2017) an exploratory definition of the ecosystem of start-ups: a set of companies centered on disruptive ideas and practices that are rooted in favorable and privileged territorial environments, and participating in changes in conceptualization, production and marketing of products and services. Voluntarily, we do not talk about size or status, but about domains or families (Voluntarily, we do not talk about size or status, but about domains or families (CN finds the usual notions of industry stream, sectors). We would say today that these favorable and privileged territorial environments are essentially but not exclusively metropolitan.

Spigel (2015, in Stam and Spigel, 2016) defines the entrepreneurial ecosystem as *"the combinations of social, political, economic, cultural [to which we add technological, organizational, and reticular] elements within a region that support the development and growth of innovative start-ups and encourage nascent entrepreneurs and other actors to take risks of starting, funding and otherwise assisting high-risk ventures."* However, the attention and the fashion for EEs are not *"guarantees of the profundity of the concept"*, nor they are *"ready-made"* answers to conceptual, theoretical and empirical questions (Stam, 2015, p. 1764, Stam and Spigel, 2016, p. 8). Admittedly, we do not have clear and standardized definitions of the very notion of the start-up (CN, 2019) and the *Startupper* from Bordeaux proves it, the start-ups themselves encounter difficulties defining themselves as such and it is even more difficult to know their numbers at a given time and to follow

them over time. The danger is of another nature with the risk of tautology: "*EAs are systems that produce successful entrepreneurship and where there are successful companies one can say that there is a good EE!*" With the risk for the public actors entering into tautology and building ad hoc an EE.

The papers of Stam (2015) and Stam and Spigel (2016) are close to our concerns in that they "sympathetically question EE links and regional policy" (Stam, 2015) and propose in the literature a broader vision of what could be an EE spatialized paradigm. Stam (2015, p. 1764) shows the importance to be given to the specific institutional and territorial context: "*from a geographical point of view it can be a city, a region, a country*" without ignoring other types "*less clearly spatially defined as sectors or corporations*". He takes from Feld (2012) the nine attributes of a successful start-up community and from the World Economic Forum (2013) the eight pillars of EE and their components. It leads to a synthesis based on structural and systemic conditions and outputs, the value creation (Stam and Spigel, 2016, p. 10).

#### **2.4. The solar, solitary and united entrepreneur**

From these approaches five strong elements seem to stand out:

- The EEA is fundamentally about the entrepreneur and not about the business. Spatial DNAs are better to know than the business and industrial economies (Stam and Spigel, 2016, p. 3); to be interested in the personal conditions, the stories of start-ups and entrepreneurs, not to remain outside their worlds, not only to work on objectified components like patents. Entrepreneurs are the "*central players (leaders) in the creation of the system and in keeping the system healthy*" (ibid, p. 5).

- The fundamental and personal role of the entrepreneur, and especially the one who creates and carries the start-up, must be better known, indeed "*who better than the start-up to talk about the start-up?*", much more than the academic world. Alvedalen and Boschma (2017) draw up an inventory of the works carried out, the fields largely plowed and the remaining fallows. Following Stam and Spigel (2016), this need should not ignore "*high network density, many connecting events, and large companies collaborating with local start-ups and access to all kind of relevant resources (talent, services, capital), with an enabling role of government at the background*" (ibid, p. 6).

The latter are more and more attentive to start-ups and put in place multiple support modalities. The Bordeaux Metropolis for example in its "*roadmap*" wants to know the expectations and needs of start-ups by listening to them so that "*there are no holes in the racket*" (following the formula of the Metropolis). CN (2019, p. 90) speaks of "*links [of which] all must be good*", especially when it comes to aid and financing, when start-ups ask for simplified, less bureaucratic protocols, lightened and specific devices or ask for only one

unique and known administrative correspondent who would ensure the internal dispatching within the institution.

It is often the weakest link that will determine the effectiveness of this ecosystem, "*the strength of weak links*" following Granovetter. Bordeaux Métropole is interested in the digital ecosystem of start-ups while CN (2019) explicitly thinks of social innovation (p. 13). To these components internal to the metropolis, there are external components such as the media echo that is now the Consumer Electronic Show in Las Vegas. The Regions send start-ups by selecting them at the start and preparing them: a major change in 2019 as previously, the ministers and regional presidents made the trip to give a positive image of the "*French digital ecosystem*" and of the "*start-up nation*" (Fagot in *Le Monde*, 9.1.2019).

- The focus is on the entrepreneur and the disruptive start-up more than on larger companies or even established or slowly growing SMEs: return again to the Schumpeterian entrepreneur (Schumpeter Mark 1, 1934, or Schumpeter mark 2, 1942) related to innovation. In their survey, Block, Fisch and van Praag (2017) describe different approaches and meanings of innovation: innovative entrepreneurship, innovative entrepreneurs, innovation outcomes (the model figure 1), innovative users, innovation as a signal to obtain resources for innovative entrepreneurship, innovative behavior of start-ups, innovative ventures...

- Start-ups are not only "*smaller versions of big firms and international companies*" but we should understand them as "*unique organizational units with different capacities and resources, even if they are often more constraints, start-ups are 'not like other companies'*"(CN, 2019, p. 90), if only by their burning rate. However, they are strong, non-exclusive components of metropolitan EE.

- If all the companies, corporates and start-ups, are supposed to be interested in the innovation, the knowledge and the intelligence as the AI, they do it in a different way concerning in particular the modes of production, of transfer, application and their links to products and markets. If knowledge becomes the heart of many processes, the EA shows that one must "*analyze the intelligence on the process itself*" and not only see how the economy and technology of knowledge fit into the construction applications or the marketing of a product and a service.

- There is no mechanically spontaneous generation of recognition of a start-up ecosystem. We must abandon the idea of a paradigm fallen from the sky. Stam and Spigel (2016) emphasize the importance of local and territorial contexts and the need to take into account the "*environments external to the business world*": go back inside the black box and open it to the multiple contexts, the "*hundreds of reasons*" cited above by Isenberg (2011). They recognized the importance of the predecessors of the EEA and in particular the Marshallian industrial districts and those of the third Italy, the clusters, the systems of innovation, they could have added the innovative environments. The environment is "*a space that generates*

*knowledge*" (Cusinato, 2018, p. XXIX). But they know and acknowledge the essential contributions of this work in particular in two essential figures; one that summarizes the fundamentals of these allied concepts and the other that shows the differences and similarities.

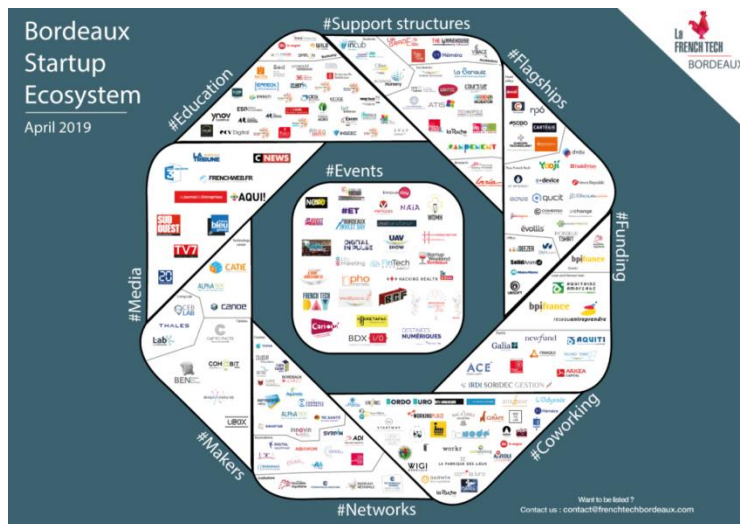
### **3. The metropolitan ecosystem, biotope of the ecosystem of start-ups**

Using the term ecosystem is not neutral, it is "*a way of seeing our environment*" (Abbadie, Encyclopædia Universalis), to go beyond the simple characterization of the elements of the system to "*understand the organization and the behavior that emerge from 'an assemblage of living beings and non-living objects'*". It is not only a question of identifying the biotic processes (the interactions of the living on the living) of abiotic processes (physicochemical elements, non-living, influencing the environment), but also of accessing "*the internal logic of the ecosystem, the main principles governing its structure and evolution, the rules of hierarchy of its components and processes.*" The ecology of ecosystems thus provides an interesting framework for analyzing how to better understand and understand start-ups in ecosystem.

#### **3.1. The use of ecology to understand the functioning of the ecosystem of start-ups**

This is not a simple stylized exercise, but by analogy, understanding and discussing the functioning of start-ups in the metropolitan ecosystem(s). It is not a question of only proposing images of these ecosystems: there are many on the internet of which we could discuss the graphic codes, the schemas that show groups of start-ups by type of financing, of activity, of actors, who aim to present, to classify to better orient, without for all that seeing there relations, interactions in the vocabulary of the ecosystem.

As if, between the traditional hierarchical culture of the company and the horizontal management needed to serve the agility claimed by start-up companies, there was no need, nor need to formalize interrelations that would remain too fixed in a world where we must constantly adapt. The times of ecological ecosystems seem here too long, too slow to meet the incessant injunctions of innovation, to better ride the wave of innovation or even disrupt in the sense of Christensen. We understand cartographies, the use of metaplans and modular graphics that ultimately claim a start-up ecosystem in design and project mode. This is evidenced, among other things, by the cartography of the Bordeaux ecosystem of start-ups carried out by the French Tech team and presented below.



<https://www.frenchtechbordeaux.com/mise-a-jour-de-notre-cartographie-mars-2019/>

The scale of analysis also calls for discussions: the Bordeaux area and the populations of companies, institutions, financiers and landlords question the perimeter as if the place, the location fixed the economic impacts, in terms of job creation, 'companies or value, while networks, headquarters, flags and flagship products register, feed and feed at other scales, wider than that of the Bordeaux territory. The all-encompassing cartography would then no longer allow anything to be seen or given anything to see.

### 3.1.1. The ecological metaphor incorporates ecosystem codes

Starting with the actors: elephants, gazelles, mice (Birch, 1979) to invoke respectively the large groups of more than 500 employees, listed on the stock exchange and job-destroyers in the United States of the late 70s, facing the SME development, with 20 to 500 employees with high growth and job creation and very small companies with fewer than 20 employees who do not grow up (Cooke 2019); or in France, the "racing gazelles" which are most often "fund gazelles" (Picard, 2006). The illustrated world of start-ups also refers to the dynamics of mythical or real species: today few gazelles are unicorns (Ailen Lee), unlisted but valued over a billion dollars, while many others are cockroaches (K. Fake), made less attractive by slower growth, but much more resilient in the long term because they are articulated on smaller projects and more traditional economic models of profitability.

The ecosystem borrows from the bestiary of ecology to point out characteristic features imaged to the point that territories are now defined as gazelles. Acs and Mueller (2008) highlight the issue of "gazelle regions" to confirm and illustrate that start-ups do not locate anywhere. From a study of US metropolitan areas from 1989 to 2002, they show that the effects on employment depend on the regional characteristics of the location of the start-up: it would be located in large cities at highly competitive environment, characterized by sectoral diversity (Acs et al., 2007) and a high level of creative capital, made up of the three T

of Florida's thesis (2002), Talent, Technology and Tolerance. The "gazelle regions", large and diversified metropolitan areas, would then concentrate start-ups offering "*fertile ground*" to increase their probability of survival, an economic environment that is very favorable to their development and to the capitalization over time of their effects on the employment (CN, 2019).

### **3.1.2. Ecological metaphor also through interactions**

It mobilizes in a fairly basic way prey - predator relations to give examples of coevolution and to apprehend the demography of companies. Large groups, without necessarily innovating, absorb the gazelles to offer new products or services: "*Cisco thus eats more than 10 companies a year and all big companies have set up offices to identify promising targets*" (Zimmern and Ifrap, 2009). Moore's business ecosystem designates competitive and cooperative relationships, articulated respectively in the individual interest and common interest, of cooperation between systems of actors: it is "*a modular arrangement of firms sharing a community of destiny*". It is a question of a dynamic system of interactions of multiple nature like arrangements, partnerships, articulated around a center, the pivot firm, leader, which builds with its near and peripheral network "*a most collaborative path possible around a strategic intention allowing as many people as possible to join the project*" (Gueguen, Torres, 2004).

Koenig (2012), who is very critical of the use of the ecological metaphor, proposes to get rid of it: why spin the metaphor when we do not mean to refer to the environment in which these communities of interests unfold or when we seek more to understand the modalities of control than of coevolution? This reasoning leads him to revisit the concept of business ecosystem to propose a typology of business ecosystems according to their degree of heterogeneity, articulated on the position-linkage relationship: the degree of control of key resources (decentralized or centralized) and the mode of interdependence (reciprocal, grouped). He thus distinguishes four types of business ecosystems: Nike-type supply systems, platforms such as Amazon Web Services, Sematech-type destiny communities and expansion communities such as open source. By questioning the interaction and the dynamics of the systems, the entrepreneurial ecosystem would like to emancipate itself from the territorial dimension, whereas its spatial anchoring since the works of Marshall, Becattini and Porter questions always the forms of networking with districts, clusters and innovation systems (Daidj, 2011, Assens and Esminger, 2015) and giving way to the entrepreneurial ecosystem approach that is at the center of the analysis, as it has been noted above: the entrepreneur rather than the firm (Stam and Spigel, 2016).

### 3.2. Revisiting the ecosystem of start-ups with the discontinuity of scales

At the end of the 20th century, ecology knew a conceptual evolution that questions and enriches the approach of entrepreneurial ecosystems developed by analogy with Moore's work. Indeed, the structure of the ecosystem previously thought to be linear and continuous, for many nonlinear and discontinuous processes and variables.

#### 3.2.1. Scales discontinuity, anchoring and interlocking

Nash *et al.* (2014) point out that ecosystems are strongly influenced by biotic and abiotic processes that operate at different spatial and temporal scales, contributing to the observation of discontinuities in processes, structure, habitat forms and resources. Based on the theory of systems (Simon, 1962), they emphasize that the structure of an ecosystem results from processes that operate at different spatial and temporal scales. Taking the example of aquatic ecosystems, they show that the discontinuous and hierarchical structure of the resources of a reef ecosystem, from individual branches of coral colonies to multi-reef scales, is similar to a distribution by discontinuous aggregation, of size of the body of fish: species of similar sizes of fish operate at similar scales and are distinguished from other species sizes that operate at other scales. As yesterday we defined a system by a set of elements, which themselves can be systems, an ecosystem is both specific and linked to other ecosystems that we give to see. The figure proposed in their article is reproduced below.

**Habitat scale:** discontinuous hierarchy of resources and habitat structure - habitat perception scale - Aggregation of species by habitat type and representation

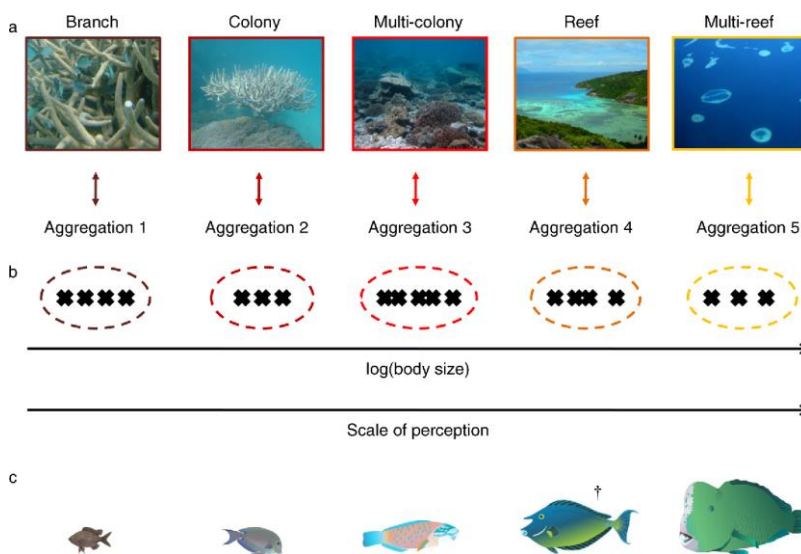


FIG. Relationship between scales of habitat structure and discontinuities in body size distributions. (a) Discontinuous hierarchy of scale for structure and resources within a reef ecosystem, from the individual branches of coral colonies to multi-reef scales. (b) A discontinuous fish body size



*distribution. Crosses represent individual species; aggregations (dashed circles) of similarly sized species operate at similar scales, and are separated from neighboring aggregations by discontinuities. Body size correlates with scale of perception, such that larger species operate over larger scales. (c) Representative species from each of the five aggregations. For example, the blue spine unicornfish (with dagger symbol) is a member of aggregation 4, and perceives and interacts with its habitat at the reef scale.*

*The multi-reef image is courtesy of James Oliver (<http://www.reefbase.org>); fish vector graphics are courtesy of, from right to left, Tracey Saxby, Joanna Woerner, Joanna Woerner, Christine Thurber, and Tracey Saxby (Integration and Application Network, <http://ian.umces.edu/imagelibrary/>).*

Source: Nash et al. (2014), "Discontinuities, cross-scale patterns, and the organization of ecosystems", *Ecology*, 95(3), 654-667.

The size of the body thus appears in correlation with the scale of perception and functioning in its habitat. This way of conceiving and showing the ecosystem opens interesting perspectives for the analysis of the entrepreneurial and metropolitan ecosystem of start-ups. The entrepreneur at the center of the entrepreneurial ecosystem could fit into different scales and modes of operation depending on the size of the company and its environment.

There are also three related questions that are posed in contemporary literature:

- The definition of an entrepreneurial environment and a regional ecosystem of start-ups as modeled by Krajcik and Formanec (2015), by identifying the major characteristic relationships of a start-up in its environment.
- The difficulty mentioned by Sussan and Acs (2017) about the digital entrepreneurial ecosystem, to identify the biotic and abiotic components and the functioning of this complex socio-economic community.
- Taking into account the time and dynamics of the system by going beyond the question of the fundamental components of the entrepreneurial ecosystem to question their relative importance over time in an evolutionary approach. Mack and Mayer (2016) question the extent to which history, culture and the institutional setting impact the entrepreneurial ecosystem and question the missing ingredients in a Phoenix EE study.

### **3.2. Three research issues**

**Proposal 1.** The size of enterprises is an element of aggregation and perception of the habitat of the entrepreneurial ecosystem. Gazelles with 20 to 500 jobs, for example, show the difficulty of identifying their modes of operation.

The question of scale change, the "scale-up" is also directly posed. In France, it would be limited by the fragmentation of the European markets which do not constitute homogeneous economic spaces making it possible to take advantage of the effects of networks: the real utility of a product or a technique depends on the quantity of its users. Effects of networks that are instead capitalized in the United States and China (Economic Alternatives, 2019, 67). To reach the critical size to take advantage of network effects, French start-ups would be forced to sell to large foreign groups.

Few start-ups, moreover, become unicorns worth more than a billion dollars. These are start-ups that are growing very fast and attracting significant external investment. There are 3 unicorns in France (Blablacar, OVH and Doctolib) plus Ivalua in May 2019 against 300 in the world divided mainly between the United States (48%) and Asia (36%), with only 16% on the European continent in 2018 (GP Bullhound study, 2018, British investment bank). The image of cockroaches, on the other hand, clearly shows the challenge associated with the aggregation of specific species: they would operate on different bases, a less risky model than that of unicorns.

**Figure 1:** the start-up and specific personal and spatial DNAs (database surveyed) with the need to rotate, learn and constantly deploy new trades to adapt and change models.

**Figure 2:** the operation of the start-up according to the means at its disposal rather than objectives within the framework of an established model that the company gives itself. Competition is played out according to the stock of resources at a given scale, the interest of capitalizing them.

**Proposal 2.** Some companies are dependent on the development of other companies. The development of start-ups is not necessarily associated with outsourcing the risk taking of large companies, but the need for large companies to build a pool of resources needed to adapt to their own scale.

**Figure 1.** Large companies outsource certain research and development tasks, for example, to reduce wage costs, the taking of risk: a good management reflex that allows them to stay on the recruitment and management of their employer brand.

**Figure 2.** Big business relies on a set of start-ups to find ideas and solutions. Cluster companies can enter this kind of logic.

**Proposal 3.** Institutional actors show ecosystems to facilitate functioning in ecosystems. They testify to their attention in many forms, incubators, nurseries, financing advice, spaces and dedicated policies ... But they do it with their own organizational logics, temporal which constitute as many ecosystems which apparently live in the same waters, which share partly

common concerns but retain their own determinations and goals. The aquatic metaphor, the fish, testifies that it is still possible to swim together in the same marine currents.

**Figure 1.** Organizing the ecosystem and its development: portage of gazelles (funding: BPIFrance, the public investment bank to the regions that cultivate all their local incubators, via the research tax credit or the brand new Fund for Innovation (Economic Alternatives, 2019, p66)

**Figure 2.** Interclustering and the blue ocean that opens up new strategic spaces and auto-organization phenomena.

## References

Acs Z. J., Armington C., Zhang T., 2007, The Determinants of New-firm Survival across Regional Economies: The Role of Human Capital Stock and Knowledge Spillover, *Papers in Regional Science*, 86, 367-91.

Acs Z. J., Mueller P., 2008, Employment effects of business dynamics: Mice, Gazelles and Elephants, *Small Business Economy*, 30, 85-100.

Acs Z., Autio E., Szerb L., 2014, National systems of Entrepreneurship: Measurement issues and policy implications, *Research policy* 43, 3, 476-494.

Alvedalen J., Boschma R., 2017, A critical review of entrepreneurial ecosystems research: towards a future research agenda, *European Planning Studies*, vol. 25, n°6.

Assens C., Ensminger J., 2015, Une typologie des écosystèmes d'affaires: de la confiance territoriale aux plateformes sur internet, ANDESE, *Vie et sciences de l'entreprise*, 2(200), 77-98.

Birch D. L., 1981, Who creates jobs?, *The Public Interest*, 65, 3-14.

Block J., Fisch C., van Praag M., 2017, The Schumpeterian entrepreneur: a review of the empirical evidence on the antecedents, behaviour and consequences of innovative entrepreneurship, *Industry and innovation*, vol. 24, issue 1.

CESER Normandie, 2019, L'écosystème de la French Tech en Normandie: quelle création de valeur(s), rapport.

Christensen C., Raynor M., McDonald R., 2015, What is Disruptive Innovation?, *Harvard Business Review*.

Cooke P., 2019, Responsible Research and Innovation? From FinTech's "flash crash" at Cermak to Digitech's Willow Campus and Quayside, *European Planning Studies*.

Cooke P., 2019, World Turned Upside Down: Entrepreneurial Decline, Its reluctant Myths and Troubling Realities, *Journal of Open innovation*, 5.

Couture M.M., Albert M.N., 2016, Entrepreneuriat et complexité, 3<sup>ème</sup> congrès international francophone en entrepreneuriat et PME.

Cusinato A., Philippopoulos-Mihalopoulos A., drs., 2016, *Knowledge-Milieus in Europe, Firms, Cities, Territories*, Springer.

Daidj N., 2011, Les écosystèmes d'affaires : une nouvelle forme d'organisation en réseau ?, *Management Prospective Ed., Management et avenir*, 6(46), 105-130.

De Groot R., Wilson M., Boumans R., 2002, A typology for the classification, description and valuation of ecosystem functions, goods and services, *Ecological economics*, 41, 393-408.

Duvigneaud P., 1974, *La synthèse écologique*, Doin, 296 p.

Gaussier N., Lacour C., 2015, L'arrivée de la LGV SEA à Bordeaux : points de vue des acteurs économiques, *Rapport OSE LISEA, Synthèse p.3-16*, septembre.

Gaussier N., Lacour C., 2017, « Un écosystème sur la vague? L'arrivée de la LGV à Bordeaux et l'écosystème start-up », *Cahiers du GREThA*, n°2017-19.

Grimm N., Baker L., Hope D., 2003, An Ecosystem Approach to Understand Cities : Familiar Foundations and Uncharted Frontiers, chap. 7 in Berkowitz A., Nilon C., Hollweg K (eds) 2003, *Understanding urban ecosystems: A new frontier for Science and Education*, Springer.

Guegen G., Torrès O., 2004, « La dynamique concurrentielle des écosystèmes d'affaires : Linux contre Microsoft », *Revue française de gestion*, 30(148), 227-248.

Isenberg D., 2010, How to Start an Entrepreneurial Revolution, *Harvard Business review*.

Isenberg D., 2011a, The entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurship; Babson Global

Isenberg D., 2011b, Introducing the Entrepreneurship Ecosystem: Four Defining Characteristics, Babson Global.

Kawasaki G., 2004, *Art start 2.0. The Time tested, Battle-Hardened Guide for Anyone starting Anything*, Portfolio.

Kawasaki G., 2015, *L'art de se lancer 2.0. Le guide tout terrain pour tout entrepreneur*, Diateno.

Koenig G., 2012, Le concept d'écosystème d'affaires revisité, *M@n@gement*, 15(2), 208-224.

Kumar, P., 2010, The Economics of Ecosystems and Biodiversity: ecological and economic foundations, coll. TEEB - The Economics of Ecosystems and Biodiversity, 456 p.

Likens G., 1992, *The Ecosystem Approach: its Use and Abuse*, Excellence in Ecology, Book 3, Ecology Institute, Oldendorf.

Martinaud B., 2017, *Start-up. Précis à l'usage de ceux qui veulent changer le monde... et parfois y réussissent*, Pearson.

Moore J.F., 1993, *Predators and Prey: A New Ecology of Competition*, *Harvard Business Review*, 71(3), 75-86.

Nash *et al.*, 2014, *Discontinuities, cross-scale patterns, and the organization of ecosystems*, *Ecology*, 95(3), 654-667.

Parks S., Gowdy J., 2013, *What have economists learned about valuing nature? A Review Essay*, *Ecosystem Services*, 3.

Rondel C., 2008, *la complexité des relations d'une ville avec son environnement*, *Ecosystème urbain*, *Synergiz*.

Schafran A., 2018, *The Road to Resegregation. Northern California and the Failure of Politics*, University of California Press.

Silberzahn P., 2014, *Effectuation : Les principes de l'entrepreneuriat pour tous*, Pearson.

Stam E., Spigel B., 2016, *Entrepreneurial ecosystems*, University School of Economics, Utrecht, Paper Series, 13.

Storper M., Kemeny T., Osman T., 2015, *The Rise and Fall of urban economies: Lessons from San Francisco and Los Angeles*, Stanford University Press.

Vallat P., 2017, *Pour en finir avec le mythe de 'l'innovation disruptive' »*, Comitans.

Verstraete T., Fayolle A., 2004, *Quatre paradigmes pour cerner le domaine de recherche en entrepreneuriat*, 7<sup>ème</sup> congrès CIFE-PME.

Villette M., Vuillermont C., 2007, *Portrait de l'homme d'affaires en prédateur*, La Découverte Poche, Essais n°242.

Annex:

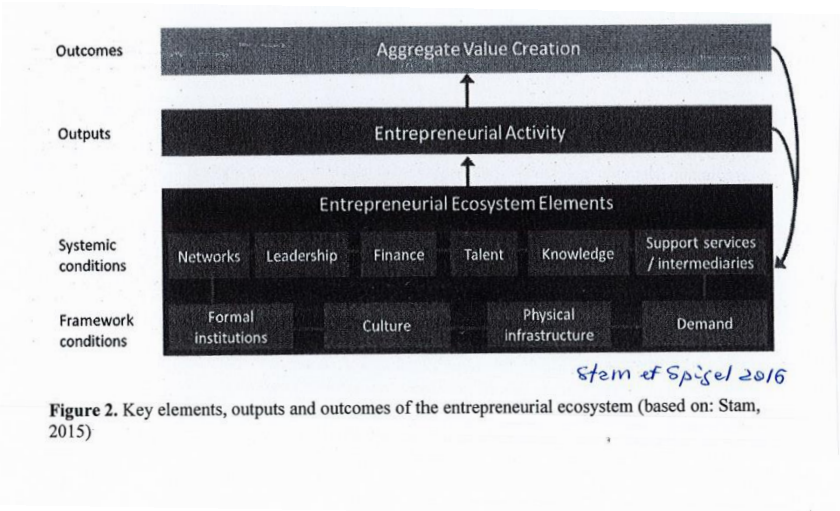
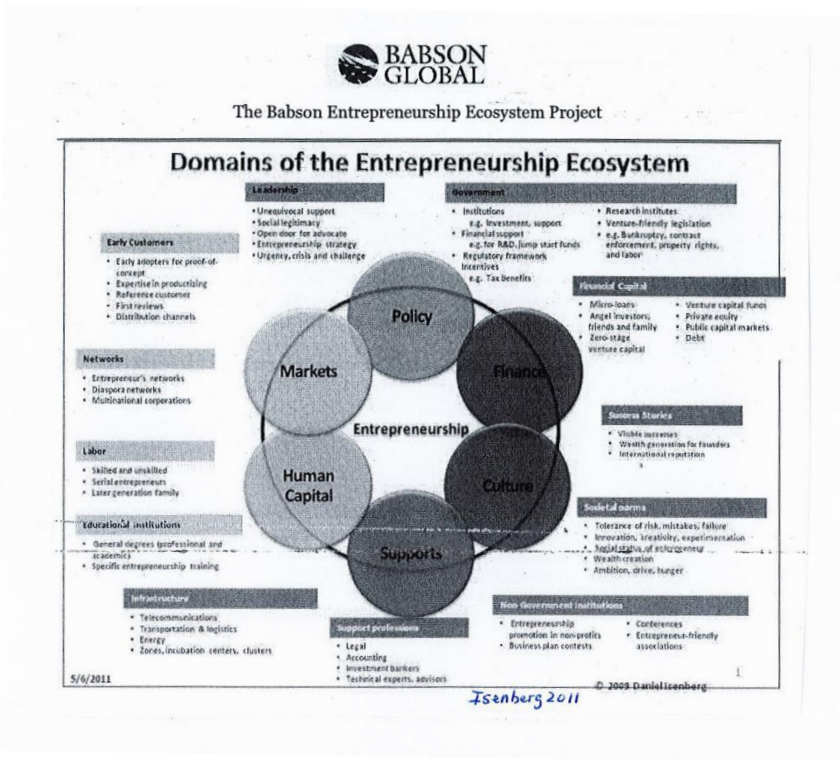


Figure 2. Key elements, outputs and outcomes of the entrepreneurial ecosystem (based on: Stam, 2015)

**Table 1.** Nine attributes of a successful start-up community

| Attribute        | Description   |
|------------------|---|
| Leadership       | Strong group of entrepreneurs who are visible, accessible and committed to the region being a great place to start and grow a company   |
| Intermediaries   | Many well-respected mentors and advisors giving back across all stages, sectors, demographics and geographies as well as a solid presence of effective, visible, well-integrated accelerators and incubators  |
| Network density  | Deep, well-connected community of start-ups and entrepreneurs along with engaged and visible investors, advisors, mentors and supporters. Optimally, these people and organizations cut across sectors, demographics and culture engagement. Everyone must be willing to give back to his community |
| Government       | Strong government support for and understanding of start-ups to economic growth. Additionally, supportive policies should be in place covering economic development, tax and investment vehicles  |
| Talent           | Broad, deep talent pool for all levels of employees in all sectors and areas of expertise. Universities are an excellent resource for start-up talent and should be well connected to community   |
| Support services | Professional services (legal, accounting, real estate, insurance and consulting) are integrated, accessible, effective and appropriately priced   |
| Engagement       | Large number of events for entrepreneurs and community to connect, with highly visible and authentic participants (e.g. meet-ups, pitch days, start-up weekends, boot camps, hackathons and competitions)   |
| Companies        | Large companies that are the anchor of a city should create specific departments and programmes to encourage cooperation with high-growth start-ups   |
| Capital          | Strong, dense and supportive community of venture capitalists, angels, seed investors and other forms of financing should be available, visible and accessible across sectors, demographics and geography   |

Source: Feld (2012, pp. 186–187).

Stm 2015

**Table 2.** Entrepreneurial ecosystem pillars and their components

| Pillar                            | Components  |
|-----------------------------------|---|
| Accessible markets                | Domestic market: large/medium/small companies as customers and governments as customer<br>Foreign market: large/medium/small companies as customers and governments as customer     |
| Human capital/workforce           | Management talent, technical talent, entrepreneurial company experience, outsourcing availability and access to immigrant workforce   |
| Funding & finance                 | Friends and family, angel investors, private equity, venture capital and access to debt   |
| Support systems/mentors           | Mentors/advisors, professional services, incubators/accelerators and networks of entrepreneurial peers  |
| Government & regulatory framework | Ease of starting a business, tax incentives, business-friendly legislation/policies, access to basic infrastructure, access to telecommunications/broadband and access to transport |
| Education & training              | Available workforce with pre-university education, available workforce with university education and those with entrepreneurship-specific training                                  |
| Major universities as catalysts   | Promoting a culture of respect for entrepreneurship, playing a key role in idea-formation for new companies and playing a key role in providing graduates to new companies          |
| Cultural support                  | Tolerance for risk and failure, preference for self-employment, success stories/role models, research culture, positive image of entrepreneurship and celebration of innovation     |

Source: World Economic Forum (2013, pp. 6–7).

Stm 2015