Ca' Foscari
University
of Venice

Master's Degree programme

in Economia e gestione delle aziende
Curriculum: "International Management"

"Second Cycle (D.M. 270/2004)"

Final Thesis

Acceleration programmes: An analysis of start-ups development through mentoring services

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Academic Year
2017 / 2018

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Preface

This work aims to propose a solid contribution for the advancement of the academic understanding of seed-acceleration, or start-ups acceleration, by concentrating on the analysis of one of the most important services offered in accelerator's programme package, mentoring services. Mentoring seems to be one of the highest valued activities offered by accelerators, but at the same time, it has not been sufficiently discussed in the overall context of acceleration programmes by previous researchers.

To achieve this goal, chapter 1 begins with a review of the basic knowledge necessary for unacquainted readers to understand the debate that will follow in the other chapters. Discussions about the role of entrepreneurship in economic growth and recent innovation flow concepts open the chapter, followed by the description of existing models reconstructing the evolution process of novice enterprises. This last point lays the ground for a series of other definitions about entrepreneurship financial support entities, among which clarifications are needed since confusion in their distinction persists. The conclusive section is dedicated to the Geo-localization of innovation distribution, starting from an international perspective and zooming-in to European and Italian ecosystems.

Chapter 2 is structured with the intent of proposing an interesting contrast between the academic definition of seed-acceleration extracted from bibliometric analysis of the existing literature, and the state of the arts declared by active European accelerators during their yearly meeting, which took place in H-farm in 2016. The comparison should allow to underline gaps and discrepancies to be covered with future research.

In chapter 3, theoretical basis for the final qualitative analysis are laid, with the definition of entrepreneurial learning, its outcomes and constructs, among which mentoring is included. The chapter will revolve around the definition of mentoring and its constituent elements, to explain how it differs from other developmental interactions and why it is suitable for entrepreneurship support.

In conclusion, chapter 4 is dedicated to the description of methods applied, explanation of the structure and discussion of findings emerging from the qualitative based analysis of mentoring services in acceleration programmes.

Chapter 1 - Summary of contents

Introduction

The first part of this initial chapter is dedicated to the presentation of a set of theoretical concepts which must be explained and understood to properly comprehend what is going to be discussed later in this research.

Economic growth and the increasing relevance of entrepreneurship in boosting the level of growth in an economic environment are basic concepts that need to be cited in this discussion. In addition, a comparison between how innovation flow in the newly introduced definition of "open-innovation", and in previous innovation definitions, pave the way to an in-depth discussion of what innovation is and the overall perception of it.

Restricting the focus on the main topic of this thesis, entrepreneurship support entities, a definition of incubators is outlined. It is known that incubators and accelerators are still easily confused, therefore clarity is needed in the distinction between these models. One of the differences between the two is related to the stage of the enterprise evolution during which each specific entity usually intervene, for this reason, it is necessary to understand how new enterprises evolve through the study of different entrepreneurial evolution models and build a common view to be mantained until the end of our analysis.

According to the evolution stage, there are also other financial subjects who may intervene to provide support with investments or other kinds of backing. Some of these institutions are organized as both support entities and equity financing institutions.

In the second part, the distribution of innovation all over the world and the sustaining measures aimed at supporting entrepreneurship are discussed, starting from international and European top-ranked countries and gradually tightening the geographical lens up to the analysis of the Italian ecosystem.

At the end of the chapter, an overview of the Italian Start-up and Innovation environment is proposed basing on legal sources and reports produced by institutional subjects like the national institute of statistics (ISTAT), or local universities and research institutes.

1. Entrepreneurship and economic growth, an overall analysis

There have been a lot of discussion in recent years, post the 2007-2008 economic crisis and collapse of Wall Street, on how to boost development to restore the world economic growth level. In this context of general low performances for most of the strongest and developed economies in the world, successful entrepreneurial initiatives have been recognized to play a relevant role if intertwined with large corporations and supported by a certain level of GDP per capita, as underlined also by many expanded economic-growth models which build upon basic theories like Lucas' and Solow's models (Acs, 2006; Audretsch, Keilbach, & Lehmann, 2006), and began to capture a lot of attention ever since.

If we focus on which are the most successful ways to favor entrepreneurial initiative today, among the many carried on by leading economies like the United States, it is easy to end up talking about newly introduced business models like science centers, incubators, and acceleration programmes. These models, originated in the U.S., were first introduced in 2005 and since then begin to expand exponentially all over the world, Italy included.

It is important though, to underline that there are a lot of different policies, incentives and other ways of stimulating entrepreneurial initiative which are also more used and known. Being interested in technology and innovation in all its forms and willing to understand more about this phenomenon, we started to inquire into the economic perspective of these recently developed businesses and eventually decided to dedicate to this topic a deep work of research and understanding with this thesis.

More specifically, on the topic of "seed or start-ups accelerator" model with the purpose to critically analyze its objectives, composition, and profitability in the Italian North-Eastern territory. The initial efforts during our work of research on this field have been mainly dedicated to the development of a proper understanding and definition of which are the origins, peculiarities, evolution and economic profitability of start-up accelerators as defined in their academic definition. Therefore, it is fundamental to develop a deeper knowledge of what has already been written and discussed in the past and which are the grey zones, gaps and status of the existing literature. A series of structured bibliometric

researchers or "science mapping" (Rowe, 2014; Zupic & Čater, 2015) is almost mandatory to gather in a single dataset all the most relevant articles and publications dealing with the acceleration process of start-ups, entrepreneurship and support to new ventures opening the way to subsequent analysis. Moreover, the use of bibliometric methods and literature review contribute to add relevance and allow to develop an unbiased and objective opinion during the work of research because of it's systematic, transparent and reproducible process.

Before jumping into the main-conversation regarding the concept and definition of a seed-accelerator and the detailed presentation of the literature review made – in chapter 2 – there are some explanations and theoretical clarifications to be given to allow any type of audience to understand properly the analysis that will be presented later.

1.1.   Fundamental theoretical premises

First, a definition of the grounding concept of innovation and open-innovation together with the concept of "innovation funnel" will be given; after that, a distinction between entrepreneurial and corporate innovation is traced to underline the macro-context inside which this discussion will remain for the most part of this work. Once defined the general framework, some quick and clear explanations of recent changes that enabled the emergence of accelerators as a business model, which are going to re-occur throughout the chapters, are going to be explained.

1.1.1. Different concepts of innovation

Most of us, when asked to give an opinion on what innovation is, end up answering something like "novel ideas", "new inventions" or "creating something that didn't exist before" these answers are all partially true because we tend to omit a fundamental characteristic of innovation: the process. In brief, we lack an easy to remember and always-ready answer to properly depict the flow of innovation in our mind. That is why it is mandatory to spend a couple of words on this topic since it is not possible to discuss

any other subject which has a direct or indirect link with the concept of innovation, without having a clear idea of it in mind.

First of all, innovation is not static, it is a process or a flow of activities that starts with the recognition of an opportunity or an idea and ends with the introduction of a new product or service into an existing market, resulting in an expansion or, in some cases, also creation of a new market that satisfy a new demand (Freeman & Engel, 2013). The concept of innovation is obviously not new, there would be a lot to say about its economic history and the role of many historians, like J.A. Schumpeter, who played a crucial role in the distinction between invention and innovation, but this historical-based analysis goes beyond the intents of this work.

The word innovation has certainly been associated with an increasing number of other words, subjects or adjectives along human history and, for this reason, it has become transversal and cross-sector. This continuous evolution of the definition inspired a lot of different researchers and models on innovation, like the corporate innovation and entrepreneurial innovation models or the now abused "disruptive innovation" concept.

Some scholars, like George Deeb, believe that innovation is an entrepreneurial activity because mature corporations are too managerial and structured to keep up with an increasingly fast pace of change. While start-ups, on the other hand, are advantaged from the possibility to access mobile resources, to fail fast and without major damages, and benefit from newness and low inertia even if they lack execution expertise. In brief, innovation is an entrepreneurial business because of speed.

It must be recognized that many recently affirmed authors like Eric Ries, are working hard to generate a cultural, managerial and organizational transformation inside huge multinational corporations (MNCs), introducing new models, flows and ways towards the hybridization of corporations and start-ups (Ries, 2017) achieving many successes. I firmly believe that it is not possible to elaborate an unassailable theory to affirm start-ups as the most efficient innovation-machines or vice versa for corporations, as well as there are no "Blue Ocean" strategies (Chan Kim & Mauborgne, 2004) or predetermined best ways to reach success. It is instead a process of fine-tuning and contamination between the two extremes of a spectrum to reach an appropriate balance in a continuous trade-off between creativity and control.

To conclude this first part of theoretical foundations I would like to express an opinion about disruption and "disruptive innovation", a definition first introduced by Clayton M. Christensen in 1997 with his book "The innovator's dilemma" (Christensen, 1997), that links once more time: start-ups or new entrants and corporations in a more conflictive and competitive meaning.

Jill Lepore writer of "The New Yorker" underlined in 2014 how this concept of disruption has negatively affected world-economy introducing an overload of fear and anxiety for an established business, based on avoiding being disrupted by new entrants serving needs that corporations left unserved (Lepore, 2014). She continues adding a series of valid critics to the definition given by Christensen but also in this case we are jumping between two completely opposed ends of a continuum. It is true that we are living in a fast-changing era with an extremely high level of uncertainty and diversity inducing a considerable rate of mortality for new ventures, but at the same time this situation brought about the emergence of new dynamics like decreasing costs of experimentation in ICT due to the advent of cloud-computing which lowered the cost of early experiments for firms in software, internet and digital media.

This together with advances in simulation technologies and rapid prototyping lead to an experiment-driven financing process determining an increase in start-ups – for which experiments are cheaper and more discriminating – level of attractiveness. In this type of environment, it is preferred to leave experimentation to private initiatives with government policies focusing on costly and time-consuming activities. Going on with the list of changes, a shift from a consumer focus to person-specific design is currently happening together with peer to peer lending and the emergence of crowdfunding platforms, like kickstarter.com. Online platforms used to finance science and technology projects via a form of pre-purchasing.

In conclusion, it is, once more, essential not to fall under the framing process of the opinions we face daily and try to develop an own critical opinion in-between.

1.1.2. Incubator business model

Nowadays the main part of innovation-related discussions is linked to technology and digital in all its forms. This has been recently documented in a periodic analysis (yearly based) made by TAG - talentgarden, another Italian digital-innovation ecosystem born in 2011. The report is structured through a revision of all the tweets posted by the most-relevant Italian tech e-magazines on Twitter (more than 1,5 million published by millionaire.it, EconomyUp, Nova24Tech, Corriere Innovazione, Tech Economy, Startupbusiness, Tom's Hardware Italia, Startupitalia, Digitalic Magics, Wireditalia e MotherboardIT). More specifically the trend topics dealt with subjects like artificial intelligence (A.I.), data science and internet of things (I.o.T.), these are the first three innovation-related discussions on the platform according to the research (TalentGarden, 2017).

Figure 1 - TAG research trending topics according to sex
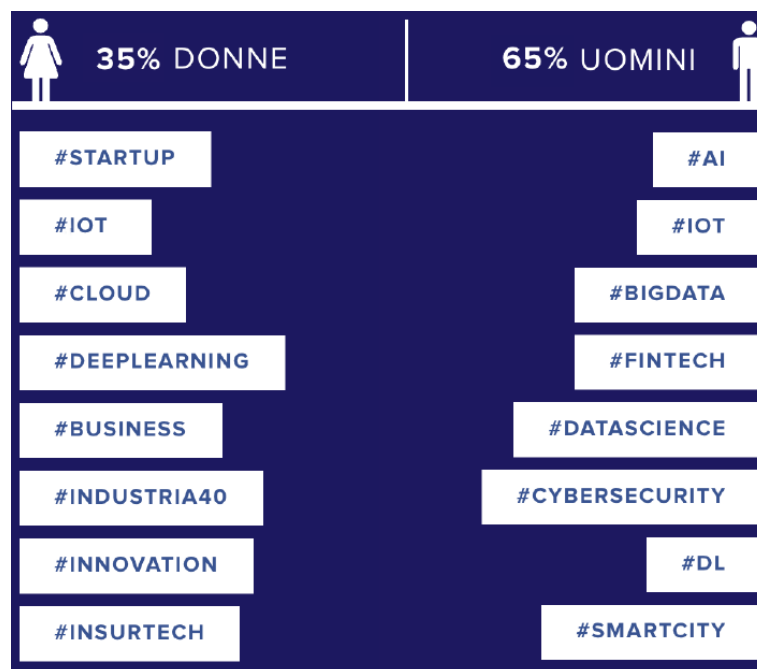
Back in 2005 all these concepts and ideas, included the one discussed previously, were far from being developed – at least not in Italy. Nevertheless, a series of other theories and

economic changes facilitated the emergence of business incubators, technology parks and innovation ecosystems all over the world. In the existing literature there are different ideologies about how business models like incubators and accelerators came to life, certain authors (Pauwels, Clarysse, Wright, & Van Hove, 2016) have theorized an evolutionary parable that starts with incubation models fostered by low experimentation costs and the need to nurture entrepreneurial initiatives and is still under evolution, others (Cohen & Hochberg, 2014) believe that incubators and accelerators are two completely different models.

During the research, we have concluded that the evolutionary perspective is the most accredited, especially basing on the empirical research and the path that most of the interviewed businesses operating in this specific market have followed.

The incubation business model is generally described as the series of support, services, and spaces offered by an entity to start-ups with the final aim of increasing the probability of success of a novice business venture, accelerate its development and augment the value of ideas. Incubation business models have evolved since their initial form and researchers have followed this evolution with a series of studies. Most of the literature on incubators is concentrated on the description of every different mechanisms and shade of the model through time (Barbero, Casillas, Wright, & Garcia, 2014).

Up to now, four main distinctions based on the type of institutional body behind incubators have been defined, ranging from: academic (universities, science parks), corporate if there is a large company trying to develop in-house incubation facilities, public initiatives to foster entrepreneurship and regional economic development, and private sector incubation based on rent-seeking and the involvement of investors. Starting from the early definition of incubation, the one given above, incubation mechanism have multiplied and new variations on the theme emerged. Apart from the basic difference between for-profit and not-for-profit, research outlined a complete evolution, up to now, depending on strategy and objectives, services offered, competitive aim (specific market sectors, start-up type, stage of the evolution and geographical reach).

Eventually, the most relevant authors on the topic agreed on four main models:

- BI, business innovation centers focused on fostering regional development;

- Universities, university incubators to facilitate the transformation of academic research and students' ideas into marketable products or services;

- Research, research incubators part of institutes aimed at giving value to research outputs;

- Standalone, based on selection and support of high-potential start-ups;

There are also a series of components or services offered that allow an enterprise to be identified as a "classic" incubator, at least four out of five must be present: 1) access to tangible resources, 2) office support (mainly services), 3) access to capital, 4) process support and 5) networking services (Carayannis & Von Zedtwitz, 2005).

All these services are structured with the final purpose of helping entrepreneurs overcome difficulties that every entrepreneur face when starting a new venture, hoping to improve its survival rate. In the case of standalone models, the services offered were also a way to exchange shares of the equity with the incoming new ventures, this was a typical clause embedded in the classic incubation contracts to bound early stages start-ups to the ecosystem, the purpose was to profit from a future sale of the incubator's participation stake in the future at a higher market value.

Keeping the dynamic evolution perspective discussed before, a recent number of studies focused on the changes of the incubator business model over time (Grimaldi & Grandi, 2005). These studies introduced the perspective of a generational sequence led by variations in the needs of start-ups together with socio-economic mutations during the years.

The first-generation incubation model was introduced in the early nineties, and it was focused on the provision of physical and financial resources to very early-stage high potential ventures. During the following decade, new models gradually added more services in the offer-package – other than office spaces and money – moving towards a broader range of intangible high value-added services.

This shift leads to the second generation with expanded services like help on evaluating market opportunities while facilitating new opportunities recognition, access to knowledge-based services, product development, access to knowledge in general, expertise and network of entrepreneurs via mentoring.

More recently, a third shift focused on knowledge-intensive business services, moved the incubator's concept almost completely away from traditional tangible and physical services that identified its first generation (i.e. rental of office spaces), and towards the recent concept of "open-innovation"

1.1.3. Open-innovation

Open-innovation is another frequently used but not always clear combination of words which is strongly context dependent and easily confused as a substitute of acceleration or incubation. If we remain in the incubation and acceleration context, open-innovation is associated with a major shift that, as we will see, caused a strong reorganization and change of traditional models.

In a broader economic definition, the open-innovation approach refers to the possible ways through which today's companies collaborate and share resources and direct knowledge (or know-how) regarding specific products and services that are increasingly being offered on the markets. In this dynamic structure, we can easily observe an increase of alliances between large groups and small businesses capable of developing competitive game-changing technologies. Among these, in the first place, also start-ups. This type of approach, so open to the outside, requires respect for a series of indispensable points in the relationships between partners, like the honesty of relationships, the non-invasiveness of the exchange of information and the design of organizational architectures allowing to take quick decisions to unexpected challenges.

A figurative example that helps a lot to understand the basic principle of open-innovation is the funnel one. The use of "funnel charts" is very common to represent the flow from a multiplicity of ideas into one concrete market proposal going through a series of steps or decisional nodes. The thing that makes this representation unique is the fact that in its 2.0

version, the funnel is not closed, it has some holes to symbolize the openness to contaminations from outside technologies, markets, and ideas.

Figure 2 - Innovation process funnel, a comparison
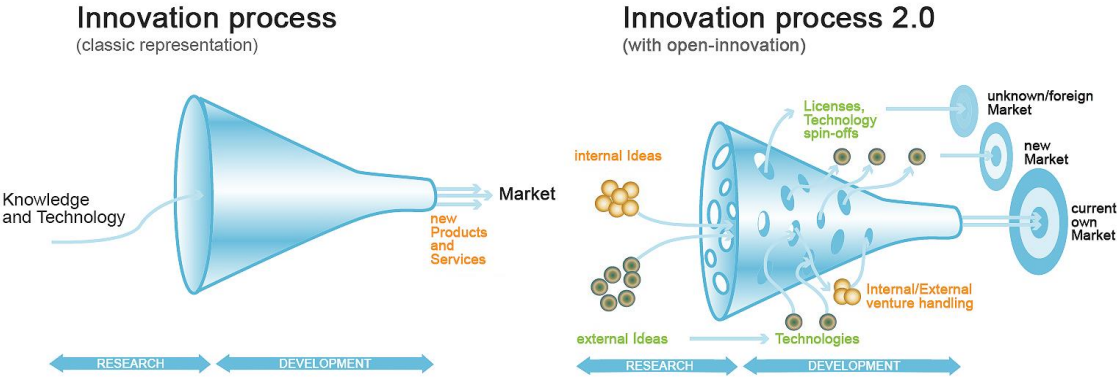
It is easy to notice the differences between the two representations above, the innovation process implementing open-innovation allows interconnections with external factors, ideas, technologies and collaboration with external ventures which might be even start-ups. This opens the way to the development of solutions diverging from the initial reference market, leading to the satisfaction of new needs or unpredicted markets. Whereas the classic innovation process is bounded and linear, resulting in new products and/or services specifically designed for a previously targeted market.

Going back to the incubation and acceleration context the introduction of open-innovation, especially in our country, contributed to the ignition of many major changes we recently assisted to, some of which have been already introduced before as far as incubators are concerned. The involvement of new stakeholders in the ecosystem, like for example corporations, universities and public-entities caused a redefinition of the services provided and a shift of the focus from start-ups only to these new stakeholders.

In conclusion, the combination of many of the factors we have touched in this brief theoretical review will help us understand and define the dynamics causing this considerable transformation, that is currently under development, to the role and definition of start-ups and start-up ecosystem and entities in many countries.

1.1.4. Start-ups and entrepreneurial evolution models

Entrepreneurship has been described from different perspectives throughout the years, but according to William B. Gatner, in order to encourage the growth of entrepreneurship it is necessary to shift the focus from what an entrepreneur is to what an entrepreneur does: *"entrepreneurship is the creation of organizations"* (Gartner, 1989, p.62) and the fundamental distinction between entrepreneurs and non-entrepreneurs is that entrepreneurs are actively involved in the creation of organizations undertaking specific behaviours and activities. Zoltan Acs' definition, coming from his experience while working for the Global Entrepreneurship Monitor (GEM), (Acs, 2006) is instead centred on the investigation about how entrepreneurship can positively influence economic growth. Acs builds on the general belief that: *"Entrepreneurs create new businesses, and new businesses, in turn, create jobs, intensify competition and may even increase productivity through technological change."* But, things are more complicated.

If inclusion in the word "entrepreneurship" is allowed for any type of self-employment, then a high level of entrepreneurial activities, exceeding a specific threshold, may mean that workers face difficulties in finding or creating conventional wage-earning jobs. In this context thus, high levels of entrepreneurship would be associated with slow economic growth and lagging development.

This fundamental distinction is what differentiate "necessity entrepreneurship" meaning that one has to become an entrepreneur because of no better options – generating no effects on economic growth – from "opportunity entrepreneurship" which is the active choice of starting a new enterprise based on opportunity recognition in an existing or totally new market – with positive economic growth consequences. The latter is the kind of environment in which we are going to develop further research.

When talking about start-ups we mean a subset of opportunity entrepreneurship, a special kind of entrepreneurial venture with specific principles according to Steve Blank's view (Blank, 2010): it is an organization designed for a continuous search of scalable and repeatable business models, with a specific goal as for example revenue, profit, developing a user base, just to mention a few. Start-ups are continuously involved in customer and agile development, iteratively testing and questioning their hypothesis and

assumptions made in the business model, which usually changes multiple times during their existence.

To reach this objective, it is crucial that all stakeholders involved share a common view of the future, incentives, and aspirations. In the start-up field entrepreneurs engaged in the creation of a new business venture are called "founders" or "creators". They face slightly different dynamics compared to standard entrepreneurs and again the major difference is induced by speed, rapidity and unpredictability of events – rapid competition, rapid market development, and continuously changing conditions.

In order to keep up with the pace and frenzy of the environment around them, a series of capital injections are vital to the subsistence of newly created innovative firms. Later, a discussion will be dedicated to all the different institutional investors from which start-ups generally collect capitals.

Another peculiarity of these type of enterprises is associated with the fact that such ventures are, mostly, "born to be sold", focused on the creation and fast escalation of liquid equity value. In simple words, entrepreneurial success, in this case, is associated with the loss of control by the original entrepreneur – or founder – in favor of a bigger company that "purchases" the novice enterprise through merger or acquisition (M&As).

As we will find out, people who invest in start-ups live in a world of time-valued money where investing in a young enterprise and selling it later at a higher value is not enough. The real deal is to make the start-up grow as fast as possible and disinvest with perfect timing. Being an entrepreneur in this context means accepting this reality and burden all the downsides, with the future perspective of a huge remuneration. Some scholars believe that there is a recurrent path followed by entrepreneurial ventures, an evolutionary journey beginning with opportunity recognition.

Depending on the degree of competitiveness and the amount of resources available to competitors in the market under analysis, the time at the entrepreneur's disposal to develop a disruptive strategy varies. Another important variable that affects the time window is the business potential of the idea. The faster the idea grows the sooner rivals will notice it and try to emulate and enter the market. Whereas a less interesting and successful business opportunity gives the possibility of a slower rate of growth.

Here we are again on the concept of rapidity required to survive, to achieve it two kinds of costs must be borne. First, more capital is needed and the most common way to obtain it is by selling shares (preferred shares) to investors during rounds of venture capital financing, initiating the process of shifting control away from the founders. To give a sense of measure, on average after the second round of investments, the investors own more than half of the voting shares, surpassing the equity threshold and obtaining explicit control over the new venture. As soon as investors are accepted into a new enterprise, the entrepreneur's spectrum of strategic choices starts to shrink considerably.

The second cost of rapid growth is, therefore, the loss of organizational importance of the founding team, with incumbents escalating to high-level management positions. With the growth of the company's organizational chart and the need for new expertise, skills, and the introduction in the organization of new professional positions, the funding team tends to be downgraded or even excluded from the company.

Growth brings with it more hierarchical levels, a more structured and rigid organization form and a higher level of formality in relationships between top-management and lower level employees. Mistakes are no more fast and bearable like they used to be during an initial trial-and-error phase, becoming instead more likely to generate fatal consequences. Some entrepreneurs may have the knowledge and ability to manage these changes from day one, however, most of the times start-ups are too busy keeping up with fast growth and therefore they fail to recognize these necessities. They can derive benefits from VCs (venture capitalists) since usually, this type of investors provides – apart from capital – also a wide range of services like assistance, social capital, a network of contacts, market access, personnel and many others.

We will now partition the financial phases of evolution of the entrepreneurial venture and discuss them in more details. During this explanation it is useful to have a graphic support, the "Start-up J Curve", one of the many curves used to depict different aspects of a venture evolution. The purpose of this discussion is to depict the natural process – without influences from intermediaries like incubators, accelerators or any other entity – and identify in a second step in which phase of the evolution different institutions may intervene.
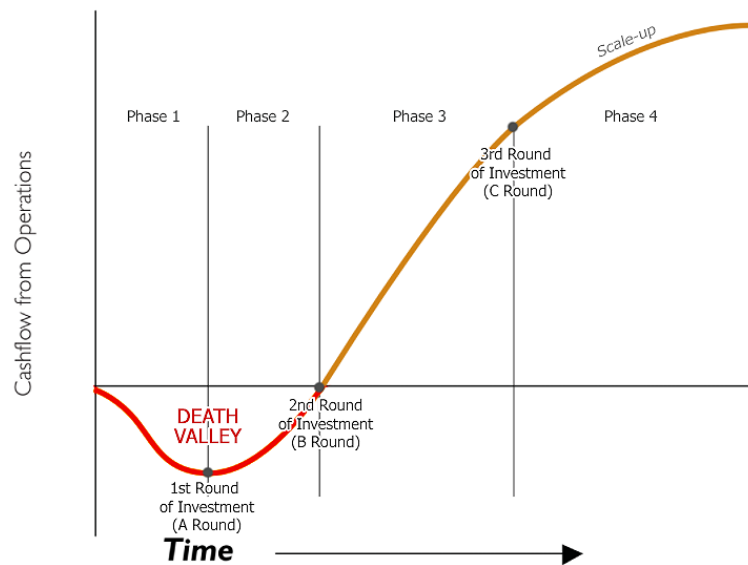
What this picture omits is a great amount of good luck and hard work on the part of entrepreneurs and investors alike, another curve: "the start-up curve" in Figure 4, captures these other variables proposing a visual representation of the typical ups and downs of the start-ups' world.

Four phases are easily observable, punctuated by a round of investment or "noticeable financial events" driving relevant changes in the managerial and organizational structure of the company.

Everything begins with a founding event – after the ideation process which as we now know, is usually represented as a funnel – where an idea is turned into entrepreneurial action by the commitment of resources made from a group of people, the team. In this initial stage, the work revolves around tasks to be done and mainly costs to burden, in the venture, there is no specific and structured organization and the main worry is to develop a promising and solid business model allowing the start-up to raise money. The research for capitals is valued by start-ups as the most time-consuming but at the same time fundamental activity for founders in this early phase, since the only assets at team's disposal are the one directly invested at the beginning, the so-called "family and friends" resources – or love money. Phase 1 ends with a first prototype of the product or service

sold to customers realizing a direct income, with the company in the depth of the "Death Valley" curve.

The second period starts when the company begins to generate some revenues directly from sales. Early adopters start to appear, and the typology of targeted customers becomes clearer. This, in turn, generates a process of fine-tuning of the product/service together with a more routinized and framed flow of activities inside the company at the expenses of fluidity. During this phase, or in certain cases also at the beginning, the start-up seeks its first official round of investment.

The so hoped participation in terms of capitals by external investors brings with it, as previously said, a series of changes at the organizational level. It is now necessary for the venture to have a proper governance structure, with a functioning board of directors organizing formal and scheduled meetings. Moreover, a complete management team must be formed – which is not always present in all start-ups – this means hiring and paying salaries to new managers who may also ask for a compensation in stocks, increasing the dilution of the founders' shares. Here is where the definitive shift takes place, from creativity and fluidity to discipline and structure imposed by entrant managers. A change necessary to drive the initial innovative and ethereal idea towards an easier and concrete market-evaluation that will probably be carried on by managers or financers speaking a language slightly different from the start-up world one.

We are referring here to the incompatibility of the languages spoken by start uppers and investors. In the former case, the start-up ecosystem, revolves around the "business model" or specifically "business model canvas" concepts (Osterwalder & Pigneur, 2010), giving less importance – at least in early stages of development – to figures and more relevance to the concrete definition of an idea and a product in all its forms. On the other side, investors are used to another language, which is the "business plan" (Sahlman, 1997), based on prospected figures, projections, percentages and indices. The debate on these two languages and how they are generating miscomprehensions and difficulties in the communication between the finance world and innovative businesses is one of a great relevance, about which it would be possible to dedicate a whole work of research.

Now the venture is on the rise, ready to welcome new investors in its second round of investments. The product is finalized, inventories are full, the number of assets is

increased, sales are increasing, new people hired, and cash flows are finally positive. Time to define a proper organizational chart with defined roles and routines. Founders and the founding-team are losing touch with their creation and the senior manager's coalition predominates in their natural habitat of discipline, hierarchy, and organization. The business may now be prepared to scale in size with the third and most relevant round of investment, going public with the Initial Public Offering (IPO) in a stock market. The entrance in the stock market and the possibility for people to invest in the company determines – in the almost totality of cases – the full shift of financial, fiduciary and management of the company to other people than the original creators, who in the worst case at this point would be millionaires.

Figure 4 - The Start-up Curve, up and downs of the world of startups
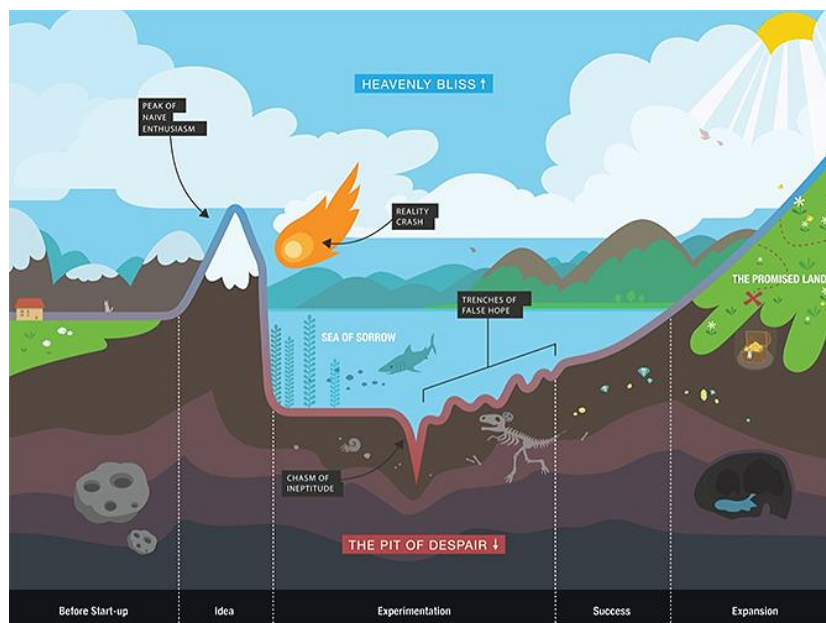
As anticipated, the use of curves and images is very common in the start-up environment. In the case of Figure 4, the flow represented is dictated by the ups and downs of the rollercoaster ride that is starting a new venture, from the idea and opportunity recognition to the expansion phase, the "promised land".

Before beginning the team enters a phase dedicated to the development of a "Start-up mindset" based on challenging conventional thinking, researching the why and what if, breaking the comfort zone and status quo of surrounding things, conquer fears of failure

and developing bravery in front of the incumbent wolves. The first peak is generated by the enthusiasm of having found the perfect idea with the team being carried away and falling in love with it, forgetting to consider the needed skills to manage it.

Reality falls from the sky like a meteorite destroying most of the initial certainties and motivations, therefore it is important to concretize ideas into products and then experiment, fine-tune, change, pivot and try again in a continuous trial-and-error fashion. Only being able to experiment, adapt and change fast it is possible to survive this segment. The company is now on its path to success, but complacency is not allowed because it is easy at this stage to lose everything, during one of the frequent fluctuations of enthusiasm.

The pace of growth is initially slow, but the outcomes of the hard work done during experimentation are beginning to show, at this point, it is fundamental to continue with innovation on a regular basis without sudden jerks or accelerations.
Only persistence, constancy and hard work lead to the promised land, even if it is never allowed to rest on your laurels, why not considering another ride?

1.1.5. A review of entrepreneurial equity financing subjects

While in the early stages, ventures tend to rely on a mixture of own, debt and equity financing – also depending on the geographical location of the start-up, in later stages and particularly high-growth-potential start-ups focus on outside equity finance sources such as venture capital (VC), corporate venture capital (CVC), angel investment, crowdfunding and/or accelerators. In the organization and definition of the existing literature in this field Drover et al. recently published a paper – to be precise in July 2017 – placing emphasis on articles published from 2004 onwards, explaining each of the categories cited above (Drover et al., 2017).

Equity investment represents a key source of capital for innovation and development. It is true that these types of investments entail a high level of risk based on a fundamental financial assumption according to which risk is associated to the variability of potential returns from investment - ROI. The higher the variability, the greater the risk. Assuming that on average investors are risk averse, investments with a greater amount of risk must

promise higher expected returns. The classic type of equity financing is characterized by the exchange of capital for a portion of company's ownership, but it is possible to distinguish different entities according to the enterprise's stage of development, the total amount invested, strategic intents and many other categorizations.

Figure 5 - Start-up J Curve, stages and investment subjects
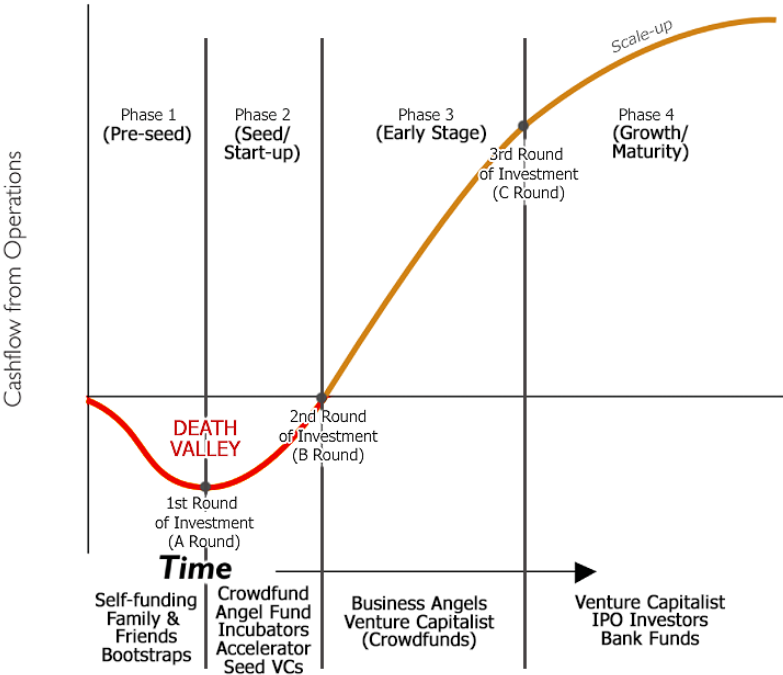
Following an order of importance:

● *Venture Capitalists* (VCs) are apt to be the most known and recognized source of equity financing – with variations from country to country – it is interesting to observe that, looking at the overall numbers, venture capitalists fund only a small quantity of start-ups but when they do so, the amount of capital invested is considerable. They usually raise funds from a set of partners like universities, pension funds and the like, seeking to provide a return to their investors via selective investments into a differentiated portfolio of innovative new ventures (Gompers & Lerner, 2000). VC firms are generally small, clustered, and they also use to keep direct links and work closely with the ventures they finance to provide a basic form of support different from the mere capital contribution. As we can see

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also in Figure 5 venture capitalists participate in almost all stages from mid-stage to late stage, with an average participation – in the USA – of 6.4 million dollars per investment (Data from NVCA - National Venture Capital Association, 2016). Since the final aim of venture capitalists is to realize a quick-return for their partners, or themselves, they tend to focus on realizing exits in a pre-established time range via acquisitions or IPOs;

● *Corporate Venture Capitalists* (CVC) are another category of financing subject through which established corporations systematically make investments in entrepreneurial ventures. The difference between VC and CVC is related to the fact that for the latter capitals are invested by a corporation directly (like Tesla or Apple). In addition, corporations – differently from venture capitalists – look for long-term returns for invested capitals and they invest in start-ups as an alternative form of revenues. This allows them to invest also in early- to mid-stage ventures (seed VCs). Corporations are also able to bring more value to a new venture in the form of complementary assets, shared knowledge, access to customers, innovation strategies and expertise;

● *Business Angels* (BA) it is a title given to individuals investing their own capital into young ventures. They are quite often former entrepreneurs or managers who seek to fund and bring some value added to investee firms mainly in their area of competence. BAs invest in a less formal way if compared to VC or CVC. Recently some of these people decided to increase their impact and importance forming angel investor groups (Kerr, Lerner, & Schoar, 2011) and by creating both online and offline platforms to evaluate and invest in potential start-ups collectively. The recent trend of Angels is driving towards a more centralized network and groups all over the world, some concrete examples are the EAF for Europe and the angel association that worked together with the government in the successful case of Israel innovation ecosystem;

● *Crowdfunding* or equity crowdfunding happens when a large number of private investors, reached using an online platform, contribute a small amount of capital in exchange for a fraction of company ownership or the right to purchase an early

version of the product, therefore becoming early-adopters. It is easy to guess that this kind of investment faced a lot of legal problems in many different countries and for this reason, this financing form is still growing and developing (especially in Italy);

● *Accelerators* are generally defined, in their officially recognized definition, as programmes designed to help batches of new and innovative ventures by providing a series of services in exchange for equity. The amount of capital provided is limited in comparison to all the other forms of investment and it is targeted to very early stage start-ups – ranging from 10 to 100k in most of the cases. Participation of entrepreneurs is gathered via offline applications in the form of interviews or even online selection processes, they apply to a limited time-frame process (on average three to six months) during which they will work hard on their concept and develop a concrete idea. The programme concludes with a "pitch day" where concepts are presented to an audience of potential investors and stakeholders.

Together all these entities represent the majority – even if not totality – of the entrepreneurial equity funding landscape up to date.

1.2.   European scenario and policies

1.2.1. Geographic distribution of innovation and the EDCi

As already pointed out the world of start-ups, incubator, accelerators and successful new enterprises collecting enormous amounts of capitals from a millionaire or even billionaire exits, is something very far from the Italian or even European – with some exceptions – ecosystem. The home-country and mainland of this culture is the United States of America, being more specific and according to the classification made by Richard Florida, author of *"The Rise of the creative class"* in 2004 (Florida, 2004), it is possible to distinguish between "Alpha Cities" and "Second Tier Cities" in the U.S and also in other countries, keeping coherence with the restricting focus process we have decided to apply in this research, we will now consider Europe and later on Italy with the purpose of clarifying which are the differences in terms of capitals orbiting around the "start-up world".

According to Florida's definition, alpha-cities are global cities which became in recent times engines of economic growth thanks to their ability to fuel innovative processes. These cities are strategic nodes in world's economy and are characterized by a series of attractive factors, like the presence of big corporations headquarters in specific high value-added sectors, advanced services, and capillary mass media coverage – you can be the most attractive country in the globe, but nobody cares if you are not able to communicate it to the outside. In these cities, the most important public and financial institutions, as well as academic and research institutes, have their headquarters. Finally, these cities have central logistic infrastructures like international airports, harbors, highways and can rely on broadband high-speed internet connections. The presence of these facilities creates the conditions to attract foreign investments (direct or indirect, greenfield or brownfield), nurturing a cumulative growth mechanism.

Another research has instead outlined the characteristics of "Second Tier Cities" (Markusen, Lee, & DiGiovanna, 1999) during the eighties and nineties, theorizing how foreign direct investment can change the growth level and economic development in a considerable way, contributing to a fairer redistribution of economic wealth.

In 2016, California Management Review issued an interesting City Innovation analysis with the contribution of Florian and Mellander, who tried to measure the concentration of high-tech innovation and entrepreneurship all over the U.S territory. Basing on the investments made in innovative start-ups it has been possible to verify that concentration in a few metropolitan areas is real, above all San Francisco Bay home of the "Silicon Valley" is the zone with the largest cluster of high-tech start-ups. In 2011 San Francisco and the Bay area attracted more than 11 billion dollars in financing collected which is more than 40% of the total amount of investments in start-ups made in the whole U.S. territory in the same year. Going on with the ranking the second metropolitan city is Boston with 3 billion dollars, followed by Los Angeles. Washington, US capital city, is in tenth position with 480 million which is approximately 4% of what have been invested in the San Francisco-Bay area.

Even without consulting the whole list it is already clear how the geography of technological innovation in the States tends to concentrate in two or three Alpha cities, but what about the rest of the country? The high concentration of richness in few places, which is a distinctive characteristic of the current economic situation, is part of a "winner takes all" market typical in highly innovative and technological sectors, that is generating an unequal development also in geographic and demographic terms.

This situation, in turn, has repercussions also in the political sphere, threatening the social cohesion of a country – no matter which country – and facilitating the emergence of populist parties and movements. Therefore, the contraposition of huge metropolitan areas and poor countries have gained increasing visibility also in the academic environment. In America, it is easy to notice accentuated differences between cities like Boston and Detroit or Flint, where citizenship must struggle with shortages of drinkable water, poverty, and bankruptcy. All these towns fall under the common description introduced by Alessandro Coppola in 2012 of "Apocalypse Town". This situation is the dark side of all these new economic models and similar differences are today common not only in America but all over the world.

The concentration of richness in the hands of a smaller and smaller portion of the population is now a fact and research show how, today, we are living in a situation which is dangerously near to the one registered in 1929 during the great depression. Among the

causes of this unequal distribution, finance and digital innovation are blamed to be the most impactful. The increasing relevance given to finance and the unclear functioning of new financial instruments for most of the population – due to misalignment of information, disengagement and absence of legislation – contributed to conveying huge amounts of money in low-regulation circuits full of grey zones. In addition, Immaterial digital products with marginal costs almost near zero, increasing value and utility directly linked to the adoption and use of a new technology, have brought to life in the global market a series of platforms which allow the concentration of huge richness in the hands of the founders, or the founder.

Again, we are describing "winners take all" situations that motivate the increasing mediatic relevance of names like Steve Jobs, Mark Zuckerberg, Jeff Bezos, Elon Musk, Sundar Pichai, and so forth (Parker, Van Alstyne, & Choudary, 2016).
The increasing number of "tech unicorns", which means digital firms with a relatively elevated level of income per employee, market value quotation over 1 billion and a disruptive business model, is another factor to be considered in the uneven distribution of economic wealth since this type of enterprises employs an amount of labour force which is twenty times lower than traditional industrial corporations.

This consideration is fundamental to understand the slightly different situation that most of the European countries are facing. Here innovation must be intertwined with different phases of the value stream and face a more industrial and manufacturing tradition. Consequently, countries like Italy or Germany opted for a less disruptive model of innovation, linked to manufacturing and industrial sectors and less aimed at creating the new digital game changer.

Nevertheless, also in Europe cities with a population of more than 500'000 inhabitants can manage to generate a higher pace of growth although the gaps with second and third tier cities remain smaller. Germany, the Netherlands, Denmark, and Sweden can be defined as the most innovative and sustainable countries in Europe thanks to a series of ad-hoc policies. For example, the city of Galway in Ireland succeeded in developing a very competitive innovative environment with a competitive entrepreneurial ecosystem based on the collaboration between universities and foreign multinational companies.

A constant flow of FDIs (foreign direct investments), the presence in the territory of American and Asian multinationals, the expansion of the local university and the process of entrepreneurial spin-offs permitted to boost the economy of this peripheral city in Ireland. There are also plenty of Italian examples. Italian manufacturing is experiencing a strong period of change where an increasing amount of innovation is required to keep up with the pace of change, and some areas of the country have started with the right steps a journey towards digital manufacturing and innovation through tradition (Buciuni, Coro', & Micelli, 2014). This process is also generating political interests and legislative activity with initiatives like "Industria 4.0" promoted by the former Italian Minister of Economic Development.

Figure 6 - EDCi, European Digital City index (nesta, 2016)

Source: EDCi website, https://digitalcityindex.eu
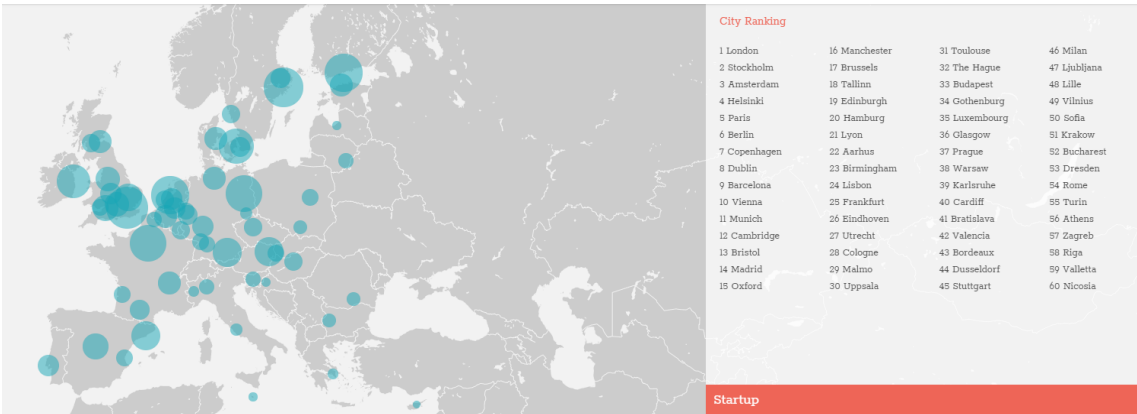
This very simple infographic rank of the most digital cities in Europe is based on data collected by Nesta, starting from October 2015. The intent was that of measuring how well different cities across Europe support start-ups and scale-ups in digital industries. The 2016 version launched in November is part of the "Global Entrepreneurship Week" (GEN) an initiative organized by the global entrepreneurship network, leveraging on the possibility to build a huge network of entrepreneurs sharing ideas, looking for mentoring, and help incentive the possibility of becoming an entrepreneur in every country of the world. Nesta is instead the innovation charity who helped to collect and elaborate data together with the European Digital Forum, a think tank led by the Lisbon Council and Nesta, in collaboration with the European Commission's Start-up Europe Initiative.

Another relevant report to be considered in this same "ranking based" fashion and adopting a larger geographical spectrum, is the "Global Start-up Ecosystem" (Startup Genome Project, 2017) part of the Start-up genome project. In this case, the purpose is to identify the most favorable ecosystems for the development of a new innovative venture in the world.

We are now going to focus on the distribution of innovation in the European scenario, since it is in this continental zone that our final research will be based, by analysing the EDCi in more details.

This specific version of the European Digital City index evaluates the attractiveness of different European cities for digital entrepreneurs. The methodology used to assess each city is not a simple count of the number of new firms or the flow of capital, but a composite measure of the various factors which are considered important by founders and young firms. Adding a deeper level of detail, the index includes all capital cities in the EU28 and thirty-two non-capital cities in the EU that are important hubs of digital entrepreneurship (60 cities in total). The index is constructed following the "ideal sequence" of steps identified by the "JRC/OECD Handbook on constructing composite indicators", starting with a "theoretical framework" based on two levels of research: 75 interviews with experts and entrepreneurs across Europe; a research of academic literature.

After this step, the index was theoretically defined with 40 relevant variables to be measured for each of the 60 countries. The second step "Source Selection & Data Gathering" focused on testing the availability of sources and gathering data, after this phase the model goes on with pure Data Checking, Processing, and Visualization. The main sources included both hard (Eurostat, World Bank, OECD, ITU) as well as newly sourced soft data. We will not be specific and explain the data manipulation flow which is described on the full report (Bannerjee, Bone, Finger, & Haley, 2016) but it is important to spend a few words on the composition of the index to be able to judge the relevance of this measure.

Figure 7 - EDCi, the composition of the index
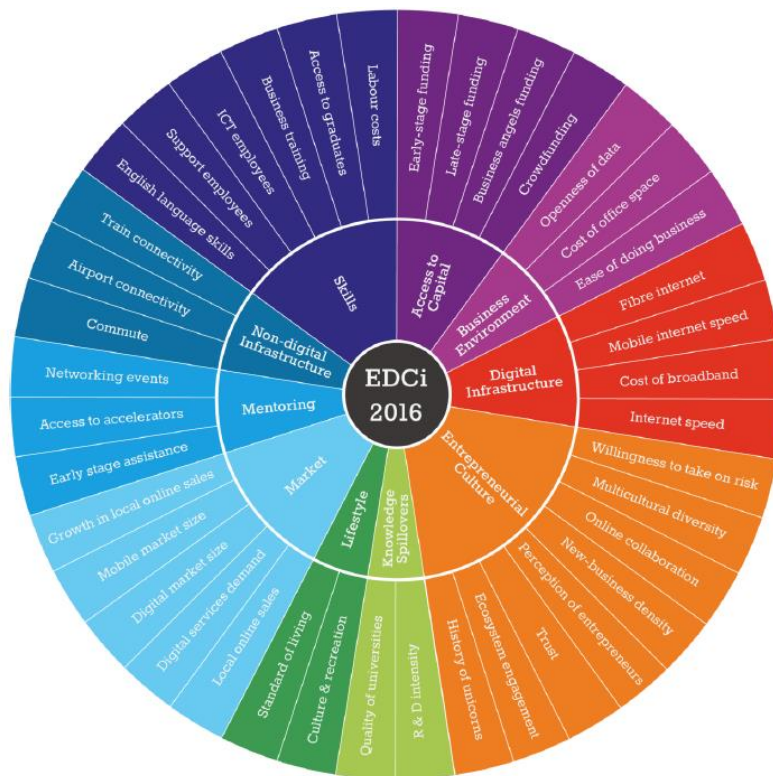
Source: EDCi construction methodology, 2016

The themes in the inner circle have been chosen to make the index as substantive and robust as possible. To do so interviews with more than 70 experts with digital expertise from across the EU and US have been conducted. These people were basically stakeholders with an in-depth knowledge of the digital entrepreneurship space through experience in industry associations, start-up support intermediaries, co-founding start-ups, and so on.

Eventually, the researchers reached a consensus view on which factors are the most important drivers of growth and creation of digital start-ups and ecosystems. The themes are:

- *Access to capital:* the amount of funding that digital start-ups have access to at various stages in their development (high weight);

- *Business environment:* extent to which the regulatory environment in a city is conducive to the growth of digital start-ups. Access to office spaces for start-ups and to public sector data (medium weight)

- *Digital infrastructure:* internet speed and penetration, both in broadband and mobile, as well as the cost of services (medium to high weight);

- *Entrepreneurial culture:* the risk tolerance of a city's residents, perceptions of an entrepreneur, the engagement of the local ecosystem, online collaboration, multiculturalism, language skills, trust and history of successful digital start-ups from the city (medium weight);

- *Knowledge spillovers:* the importance of knowledge spillovers for digital start-ups working in industries on the technological frontier, the variables measured to cover the number of research institutions and the intensity of R&D in the city (low importance but high disagreement);

- *Lifestyle:* the standard of living that digital entrepreneurs and their employees can enjoy in a city, as well as the extent to which a city offers a highly differentiated and exciting lifestyle (low importance);

- *Market:* the level of online (e-commerce) and offline (procurement) demand for the products produced by digital start-ups, both at the regional and national level (low weight for start-ups, medium for scaleups);

- *Mentoring & Managerial Assistance:* the number of networking events, accelerators and business angels (highly weighted);

- *Non-digital infrastructure:* the quality and prevalence of public transport as well as the connectedness of a city via air and rail links (low importance);

- *Skills:* the access that digital start-ups have to an appropriate talent pool, quality and abundance labor force with relevant skills (high weight).

These ten characteristics are a comprehensive set of variables to be always considered when discussing digital innovation, and as such will be explained in more details during this work. As far as the conclusive results of the EDCi analysis and data manipulation are considered, a major change emerged, the number of cities now included is higher than the previous year, this means that there are more cities with at least some digital infrastructure then there were one year ago.

The situation at the top of the ranking is unchanged. London is still the most attractive city in Europe for both start-ups and scale-ups. This is not surprising given the number of "unicorns" in UK's territory and all the new plans to ease access for new ventures to financial resources. What has changed is the gap separating the first city from the runner-up, Stockholm. This is also supported by a specific sensitivity analysis (Monte Carlo test) which demonstrated the impact of the variation in terms of ranking generated by the change of a single variable. Results show how the top and bottom rankings were the least sensitive whereas the middle cities suffered from high sensibility.

The first new entry is Bristol, joining the list in thirteenth place thanks to a strong and welcoming entrepreneurial culture and the active local business environment. The geographical divide is still relevant between North-western (UK, Germany, the Netherlands, Northern-France, Scandinavian peninsula) and South-eastern Europe (Italy included), the former being significantly visible when it comes to cultural attitude for entrepreneurship, availability of capital and financial resources, mentoring or managerial assistance, this is what we have depicted in the following image as the "European Digital Fracture".

Figure 8 - the "European Digital Fracture"
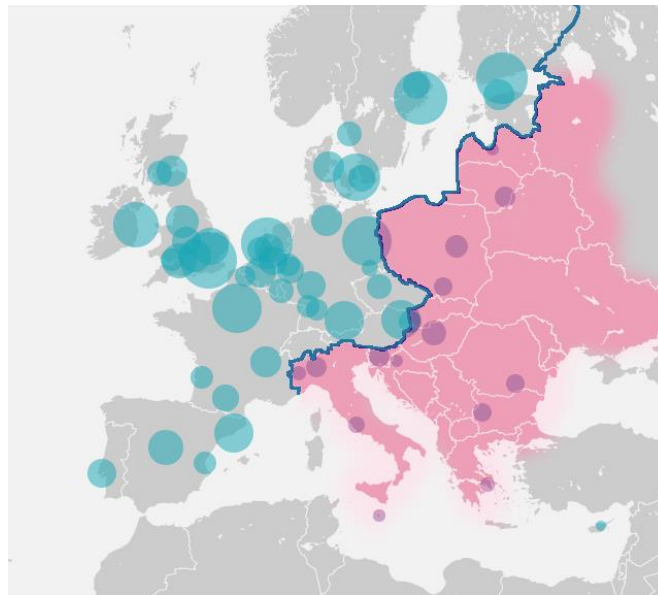
Source: Author's elaboration on EDCi website, https://digitalcityindex.eu

It is also easy to notice how cities tend to group geographically in clusters with the top 5 very competitive cities (London, Stockholm, Amsterdam, Helsinki, Paris) all North-European, a group in the middle (with Barcelona, Vienna, and Cambridge) and the rest of the bottom line where progress is necessary to fill the huge gap. This round of data collects no information about the effects of Brexit, it is necessary to wait to observe what, if any, effect Brexit has on British innovative ecosystem.

We have to say that rankings and indexes are a double-edged weapon, being provocative and aimed at attracting attention and harness the competitive spirits of who lags behind. At the same time some tend to be obsessed over ranks and comparison of who is the best among A and B. About this consideration, it is useful to remember that all indexes have a certain number of approximations, stylised assumptions, and inexact content but they – or at least some – are used to simplify complex scenarios into an easy to understand, first sight interpretable outcomes.

Moreover, in this case, there is no single and always right answer - as there is no one-best-way for start-up success. Building on this assumption, Nesta have launched an "Idea Bank" for local policymakers - a guide that collects examples from the world of initiatives supporting start-ups to provide inspiration and options to European policymakers. This is a perfect connection to the next topic about the European innovative and digital

scenario, there are a set of initiatives and European legislations - recommendations, directives, regulations, decisions or opinions - trying to ignite the spark of a more distributed and balanced entrepreneurial environment.

1.2.2. European measures for start-ups

It is important, to spend some time illustrating the initiatives and measures adopted by the European Union to foster and help entrepreneurial initiatives because it could be useful as a "handbook" or general guidelines for both entrepreneurs looking for funds and financial or governments intermediaries willing to operate in a more proactive way in the European innovation ecosystem, giving them an overview on where to find possible resources, since most of times European initiatives are easily missed or not adequately explained and disclosed.

Measures to sustain innovative start-ups have been introduced at a European level since the 2007-2013 programming period. The "Competitiveness and Innovation Framework Programme (CIP) - EU Guarantees (SMEG)" has been a measure aimed at incrementing the access to credit of small and medium enterprises, by providing warranties and capital under various forms to the financial intermediaries – and not directly to the start-ups. Even if it was generally targeted to SMEs[1] in general, this specific measure has been used from financial intermediaries also to allow the start of new ventures in different sectors, including some which are not particularly innovation intensive.

In the new programming period 2014-2020 (Horizon 2020) the European Union has incremented the measures to sustain credit addressed to SMEs, introducing new guarantee instruments, this time at the disposal of selected intermediaries. Moreover, some specifically architected instruments, aimed to start-ups only, have been launched, with the final purpose of providing equity to venture capital funds and business angel's organizations or to consent the direct access to non-refundable contribution also known as Grants. In the following table, the newly introduced measures are summarized.

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[1] According to European law, SMEs include all enterprises with less than 250 employees, with an annual turnover under 50 million euros, or assets not above 43 million euros. SMEs include micro, small and medium size enterprises.

Table 1 - European measures to sustain start-ups and innovative SMEs

GRANTS	EQUITY	GUARANTEES
SME instrument (Horizon 2020)	Single EU Equity Financial instrument (EFSI Equity instrument): • Innovfin Equity (Horizon 2020) • EFG (COSME)	Singe EU Debt Financial instrument/SME Window (EFSI): • Innovfin SME Guarantee (Horizon 2020) • Loan guarantee fund - LGF (COSME)
EIT (Horizon 2020)	European Angel Funds (EIF)	
	Pan-European Venture Capital Fund(s)-of-Funds programme (EIF)	

Grants:

As part of the "Horizon 2020" programme two measures are provided, for both innovative SMEs and Start-ups: the "SME instrument" and "EIT - European Institute of Technology" initiative. The former is a financing scheme thought for SMEs with a strong inclination towards development, growth, and internationalization willing to work on the expansion of innovations (product, service, process and business model innovation) to increase their competitivity in international markets.

This instrument is characterized by a bottom-up approach developed as follows:

1. Feasibility analysis to verify the validity of the innovation proposed, covered with a lump sum of 50000 euros. The process takes approximately six months;

2. Concept proposal to Market-Maturity, financed from 70 to 100% (ranging from 500000 to 2,5 million euros). Length of the process 12 to 24 months;

3. Commercialization, not financed, but supported in terms of training, mentorship and facilitation services to access risk-capitals.

This measure is available for all types of small and medium enterprises according to the European definition of SME as described by the European Commission. The company must have its headquarter in one of the EU 28 countries or associated countries, have some innovation process under development and willing to grow in international markets. It is curious to notice how Italian SMEs succeeded in obtaining several financed projects, ranking second in terms of several winning projects and third in the total amount financed.

The second instrument part of the Horizon 2020 programme which provides grants to start-ups is regulated by the "European Institute of Technology" with an overall budget of 2,7 billion euros in the timeframe 2014-2020. The institute, directly financed by the programme, is an independent entity aiming at the improvement of Europe's innovation capacity through support for entrepreneurial talents and new ideas. EIT promotes and finances dynamic multidisciplinary partnerships also known as KICs - Knowledge and Innovation Communities. These are enterprises gathering firms, research centers and universities allowing to develop innovative products and services in any sector. It is part of the institute tasks to outline training, entrepreneurial and innovation strategies for KICs to follow, defining the activities and contributing to the integration of knowledge. Each of the communities is a juridical entity and has its own CEO (Chief Executive Officer) to manage activities, this is an absolute novelty as far as EU initiatives are concerned. Communities are active in the whole innovation chain: training programmes, strengthening of the market research path, innovation projects, incubator activities and seed-acceleration programmes. Some acceleration programmes are currently running in the following fields: Digital, Climate change, Innovative energy, and Health.

Equity:

European equity financial instruments are managed by the European Investment Fund (EIF) and use resources provided by the European Investment Bank (EIB) or the European Fund for Strategic Investment (EFSI) the latter is an initiative started by EIB and EIF. Some of the financial instruments used are part of the COSME and Horizon 2020 programmes and the EIF decides on the actuation. It is not the investment fund that directly finances enterprises, but funds and/or organizations specialized in different areas or phases of SMEs life cycle: Technology Transfer Funds, Business Angels, Venture Capital Funds, Lower Mid-Market Funds, Mezzanine Funds. Financing is conceded after an investigation phase where a presentation of the investment proposal done by a Fund Manager is provided. Following the European Investment Plan (named "Juncker Plan" after the European Commission president-in-office since 2014) further instruments have been launched, some of which are suitable for equipping funds that invest in innovative start-ups with equity.

- the Single EU Equity Financial Instrument managed by EIF, sustains the growth, research and innovation (R&I) of European enterprises from their early-stage to growth and expansion phases. This instrument operates using other funds provided in COSME and Horizon 2020 programmes, in particular:

  - Innovfin Equity: allows EIF to provide equity financing to funds or co-investment funds, concentrating on pre-seed and seed phases of development for start-ups operating in innovative sectors covered by Horizon 2020. Under this specific measure, the European Investment Fund is investing in 45 funds, moving an overall amount between 4 and 5 billion euros. Innovfin is divided into four different products: InnovFin TT, which stands for Technology Transfer; InnovFin Business Angels (BA); InnovFin Venture Capital (VC); InnovFin Fund-of-Funds (FoF);

  - Equity Facility for Growth (EFG): part of the COSME programme, it is directed towards funds that provide risk capital and mezzanine financing, such as subordinated loans and participative loans, to companies

undergoing growth and expansion, particularly those operating at cross-border level, with the possibility of investing in funds that invest in start-up and to provide co-investment tools for business angels. The investments made with EFG are long term, which means investments in venture capital funds usually between five and fifteen years. (Panakes Fund I, in Milan is the selected financial intermediary for Italy, it is focused on life sciences and has an amount of financial support at their disposal of 6,17 million euros);

○ EAF - European Angel Fund: Is part of the initiatives promoted by EIF and it provides capital to business angels and other non-institutional investors to fund innovative enterprises. This fund helps BAs to increase their investment capacity via a co-investment in the investment they decide to do in seed, early-stage, and later stage start-ups. Angels have the highest level of autonomy in deciding and managing the investments they want to be made, EAF will support this decision with an overall budget of 280 million euros. Italy is still not included in this initiative because it requires an ad-hoc and European-checked agency to convey the flow of capitals in a clear and lawful manner. No agency resulted to be 100% appropriate to this task, so far.

○ Pan-European Venture Capital Fund(s)-of-Funds programme: The purpose of this programme is to face the lack of capital and fragmentation of VC market in Europe, attracting private funding from institutional investors in asset class all over Europe;

Guarantees:

In conclusion, regarding guarantees instruments for financial intermediaries, they are managed once more by EIF and by EFSI Agency (European Fund for Strategic Investments). The instrument, in this case, is called "Single EU Debt Financial Instrument" and it sustains the growth, research, and innovation of European enterprises. In this case, loans are used instead of equity, therefore, guarantees for financing are necessary to reduce the difficulty of SMEs in obtaining loans since most of them do not have sufficient

collaterals to be suitable for obtaining debt capital. The other available instrument is the "InnovFin SME Guarantee", which differs for the fact that it must be activated by banks, leasing companies, guarantee institutions selected by the EIF after a "due diligence" period which starts because of an expression of interest made by the company.

1.2.3. Other relevant international cases

After having extensively discussed about US and EU geographical distribution, for the sake of completeness, we want to cite two other surprising international cases regarding the countries dominating the charts on "general amount of innovation-aimed expenses" and "level of innovation growth". Being more precise, we are referring to Israel and South Korea who have reached and surpassed the level of USA and Sweden in the last five years.

Figure 9 - Country's ranking on innovation financing
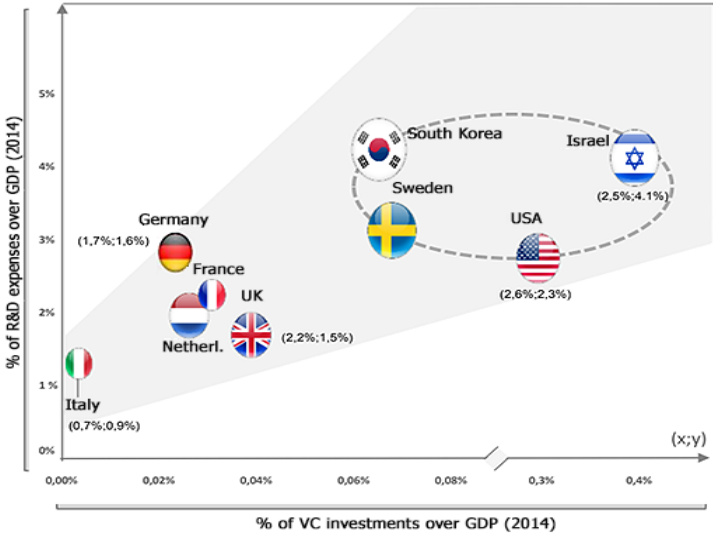
1.2.3.1. Israel

The emergence of Israel as a highly innovative city is due to both the strong military R&D expertise and education of the younger population – prepared to face complex and dangerous challenges during their mandatory military service, which make later challenges in life look smaller – together with the inflow of Foreign Direct Investments

(FDIs) attracted by the country thanks to a booming economy, excellent academic preparation for university students and strong institutional investments in innovation and entrepreneurship.

As a matter of fact, in 2006, Google set up an R&D center in the cities of Haifa and Tel Aviv, famous for having a considerable amount of international talents in computer sciences and tech engineers coming from more than seventy different countries. Today Google's center in Israel has developed most of the company's recent innovations in SE (search engine). But the tech giant was not the first company to recognize Israel's potential, in 1974 Intel had already built its first R&D plant, becoming the largest tech employer in the country and exporting a billion processors all over the world. Nowadays, more than 250 GMNCs (Global Multinational Companies) have their own Research and Development lab in Israel, eighty of which are included in Fortune 500 companies (like Facebook, Apple, Huaweii, Samsung).

Israel has, therefore, stabilized its reputation as "Start-up Nation" (Senor & Singer, 2009) starting more than ten thousand companies from 1999 to 2014. Several succeeded and became billion-dollar unicorns being bought by tech giants (e.g. Viber and Waze). It is possible to affirm that Israel clearly has an enormous impact, if compared to the size of the country, on global innovation.

The ability of such a country in turning weaknesses – lack of resources for primary or secondary industries, small geographical size, precarious political situation – into strengths has made it a point of reference for other countries with the intent of developing an innovative ecosystem. The only way for Israel was to invest in education and maximize the intellectual capacity of its people, building an economy based on knowledge and innovation-intensive born global industries (Yin, 2017). There are also many distinctive points regarding cultural and social aspects and the openness of Israelis population, but the deepening of these characteristics goes beyond the aims of this work.

1.2.3.2.   *South-Korea*

South-Korea is recognized to be the most mature ecosystem for innovation and start-ups among South-eastern and East Asian Countries which means Japan, Thailand, China,

Korea, Philippines, and Singapore. Basing on a report published in October 2016 by the Japan Research Institute (Japan Research Institute, 2016), South Korea is currently scoring the highest values on Public Sector activity in producing social enterprises law, presence in the country of specialized intermediaries (key players in the areas of human resources (HR), product and services and info), Academia and research activities and financial support programmes (grant making, mainstream financial institutions and impact investing funds).

The country offers a unique, well-defined entrepreneurial activity under the governance of a strong government's leadership imposing top-down policies. This last characteristic is also a disadvantage since top-down legislation is acting as a barrier for innovativeness and sustainability. The start-up environment in Korea is very recent, starting in 2010 with the first acceleration programme it has really taken off in the last two years with the arrival from other countries of top accelerators like SparkLabs, KSTARTUP and FT Accelerator. This, in turn, generated a boom in the number of start-ups in the local market characterized by a change in cultural behaviors of Korean younger population which began to overcome the high level of risk-aversion typical of Asian communities.

As previously said, the government itself introduced a series of initiatives to foster a more "creative economy" that favors and encourage young entrepreneurship. South-Korea boasts the higher backing per capita in the world, coming directly from the government which will issue supports into start-ups in the form of grants and similar initiatives for 3,7 billion dollars in the next three years. As it happened for Israel, this high level of innovative activities has stimulated the interest of technology giants and Google opened a Seoul campus in April 2015 where entrepreneurs can receive training, share ideas and launch new ventures.

Apart from all these positive aspects there are considerable downsides regarding the closure and risk-aversion of Korean population, the lack of a start-up and entrepreneurial culture, the preference for secure career path in local technology giants like Samsung, LG or Hyundai and low interest of these companies to invest in start-ups and, last but not least, language barriers since few people in South Korea can confidently and fluently conversate in English (De La Charlerie, 2015).

1.3.   Italian geography of innovation and start-up ecosystem

At this point, Italy is clearly running late as far as innovation is concerned, both in comparison to European countries and even more if a world scale is considered. However, in recent years innovation and start-up related topics are at the center of many legislative initiatives and entrepreneurship gained attention as an engine for economic and social development (Zahra & Wright, 2016). Therefore, a lot has been written, discussed and researched and many reports have been recently published in Italy regarding business acceleration, start-up census and characteristics, financial institutions for entrepreneurial support and many other.

In this section an overview on the Italian geographic distribution of innovation and start-up environment quantitative and qualitative characteristic will be given, building on a series of recently issued reports (AIAF - Associazione Italiana degli Analisti e Consulenti Finanziari, 2017; Firpo, 2017; Social Innovation Monitor, 2017).

1.3.1. Legal recognition of start-ups

Start-ups and certified incubators have been legally recognized in Italy for the first time in 2012 (Law n.179 of 18th October 2012; Gazzetta Ufficiale, 2013) under the official name of "innovative start-up". The law has been reviewed and changed frequently and according to the latest version – March 2015 – Innovative start-ups are limited companies, or constituted in a cooperative form, with headquarter in Italy whose shares or units representing a fraction of their capital are not listed on a regulated market or on a multi-chamber trading system.

All the following requirements must be also met:

1. Established and has been in business for no more than forty-eight months;

2. Established in Italy or in another EU country, maintaining a production site in Italy;

3. Total production value, in terms of yearly turnover, as resulting from the latest approved financial statements within six months from the end of the financial year does not have to exceed 5 million euros;

4. Does not distribute and has not distributed profits before;

5. Exclusive or predominant social purpose is the development or the production and marketing of an innovative product or service with high technological value;

6. Was not set up following an extraordinary operation such as a merger, split-up or selling-off;

In addition, the start-up must have at least one of the following requirements to demonstrate its innovative inclination:

a. Expenses in research and development equal to or higher than 15 percent of the highest value between cost and value of the innovative start-up production (turnover);

b. Employment, as employees or collaborators in any task, in a percentage equal to or greater than one-third of the total workforce of personnel holding a research doctorate degree (Ph.D.) or who is carrying out a research doctorate degree at an Italian or foreign university, or in possession of a master's degree and that has carried out, for at least three years, certified research activities at a public or private research institutes, in Italy or abroad, or, in a percentage equal to or greater than two thirds of the total workforce, of personnel with a Master's degree;

c. The Start-up is the owner or custodian or licensee of at least one industrial property related to an industrial, biotechnological invention, a topography of semiconductor product or a new variety of vegetable, or holder of the rights related to an original computer program registered at the special public register

for computer programs, provided that such rights are directly related to the corporate purpose and business activity.

The legislation defines in general innovative enterprises, including also innovative SMEs, but the definition of criterions, in this second case, is slightly different. Innovative SMEs differ from start-ups in the fact that they must have obtained the certification of the latest financial statements or consolidated financial statements, they does not have shares listed on a regulated market or on a multilateral trading facility, and finally they are not registered in the "register of innovative start-ups" (Calenda, 2017; Italian Ministry of Economic Development, 2016).

There are also some changes on the optional requirements since expenses in R&D have to be equal or higher than 3 percent of the highest between cost and value of the production, the fraction of highly-qualified employees is one fifth for doctorate holders and two thirds for master's degree holders.

1.3.2. Quantitative and qualitative overview of Italian start-ups

According to this legal definition, it is possible to map a quantitative and static picture of the distribution, sectoral activity, and periodical growth as well as the consistency and relevance of the Italian Start-up ecosystem. Starting from 2012 a continuous censorship investigation is being carried on by the Italian Ministry for Economic Development (MISE) and the updated version is publicly available to download from the web portal "startup.registroimprese.it", allowing anyone interested to access the weekly updated dataset for research purposes or simple consultation.

As reported by the latest MISE report over the last quarter of 2017, Italy counts at the end of December 8391 innovative start-ups registered to the special section of the Enterprises Registry, which means 537 more than the end of September (+6,8%). Innovative ventures represent 0,51% of the over 1,6 million limited companies in active and inactive state operating in the national territory.

The overall amount of capital subscribed is slightly higher than 423 million euros, an overall distribution of 50k per company. The sectoral distribution is more concentrated around "services" and more specifically "B2B services" with 70,9% of the registered start-ups. Inside this macro cluster, software development and IT consultancy are the most common activities (31,5%) followed by R&D activities (13,5%) and communication and info services (9%).

Other relevant sectors of activity are industry and commerce with respectively 19,2% and 4,2%. The incidence of start-ups when considering single sectors is obviously higher, but it is worth to notice how 27,8% of companies which economic activity is classified under Ateco code 2008 "R&D" is an innovative start-up. Interesting to notice also how most of the new ventures among companies for software development services are innovative new enterprises (9,7%).

Trying to propose another perspective, the Italian Institute of Statistic (ISTAT) developed a more qualitative and heterogeneous view, less related to administrative and numeric interpretations. This research named "Startup Survey" was conducted during 2016 to investigate aspects of a predominantly sociological nature such as the family, educational and professional background of the start-uppers, their entrepreneurial motivations, and strategies for acquiring the capital and knowledge necessary to start their business.

The investigation is structured around four sections regarding i) characteristic of the human capital of start-ups; ii) access to finance; iii) innovation strategies, iv) level of knowledge and satisfaction with respect to the MISE's "Startup Act". An overview of the results emerging from the first two chapters is summarized below, the full report – available for download on the website of the institute – analyses each of the four sections in detail. The survey was submitted to all the innovative ventures registered within 31st December 2015 in the special section of the Italian Enterprises registry, which means a total number of 5150 companies. CAWI (Computer Assisted Web Interviewing) – a data acquisition technique – has been used to collect answers as well as a soft mechanism for checking the consistency of the answers.

At the end of the research period (2 months), the total amount of respondents was 2250, with a final response rate of 43,7%, the analyzed sample is therefore fully representative of the entire population.

i)   The main findings emerging from the first part show how most of the workers in the Italian Start-up community are Male – 82% of the 4363 operating members in the sector – and the average age is 43 years old. Most of them have obtained a degree equal to or higher than a bachelor's degree (three-year degree), mostly in technical-engineering and economic-managerial subjects. Interesting is how most of the graduate members of innovative enterprises declares that he/she performs duties consistent with his/her course of study (88%) and how those who had previous work experiences before funding a start-up are employed in activities in line with previous jobs.

A percentage very near to the totality of the respondents (96%) declares to speak at least one language other than its mother tongue – English for the majority, followed by French and Spanish. Of those who speak two or more languages, half had some work or study experiences abroad.
Another important information comes from the "territorial rooting" or attachment to the origins, for 83% of the subjects the headquarter of the start-up is in the same area of the first working or studying experiences. Regarding familiar background, almost half of the interviewed declares to have an entrepreneur in the family (56,5% of which 40,5% is the father and 16% the mother).

Concluding this quick review of results emerging from the first section of the report, the main reason that brought founders to begin their start-up adventure is the willingness to realize an innovative product or service, followed by the ambition to run a successful and economically remunerative business. Although half of the members have declared that the launch of the start-up has not yet produced significant effects on their income. Moving on to start-ups employees, 59,4% declare to have at least one employee for a total amount of 5704 people employed, half of which have an age between 25 and 34 years old and 3 out of 4 are male. Approximately 1500 are subject to atypical contractual forms, with temporary contracts and work-for-hire as most common forms. The most diffused schooling qualification among employees is

high school diploma and the main professional areas are technology and engineering.

Another interesting information, although foreseeable, underlines how more experienced members (over 45) tend to concentrate in the areas of management consulting, while under-35s are relatively more oriented towards data processing and design.

ii)   In financial terms, three out of four start-ups – considering their recent constitution – do not have registered in- or out-flows yet. At the time of the company creation, 73.2% of the interviewed ventures mainly resorted to own resources of the founding members. This source is used by about half of start-ups, although inversely proportional to the flow of time.
Only 10% did not use this type of financing. Contrary to expectations, "family & friends" funding, which we distinguish from founders' own resources, does not appear to be a significant mean of financing among Italian start-ups since in most cases family and/or friends become members and not lenders of the company.

A minority share of companies was started with public funding, especially in southern Italy and in the start-up's early stages. The use of public finance increases for more mature companies, particularly if they are involved in R&D activities. Only 8.2% of innovative start-ups received, in the phase of the constitution, equity financing from venture capital companies, business angels or other subjects active in the financing of new entrepreneurial initiatives, and of those who have received this type of financing, they did not derive it from VC companies in the Italian territory.

Lastly, almost all the companies did not receive bank financing at the start-up stage, but access to bank credit increased considerably with the ageing process of the company's and the amount of workforce employed. Most of the start-uppers are satisfied with the sources of funding available (34.1%), the highest percentages are registered in the north of the country. On the other hand,

27.1% believe that the financial availability is completely insufficient to cover their needs.

In conclusion, it is important to underline how the recurring debate on the media, which has also emerged from the academic literature, regarding the clear contrast between forms of equity financing vs. debt capital and start-up's preference for equity funds, is not confirmed in the Italian case. Given that 65.7% of respondents say that the optimal funding they need is a mix of the two forms. However, the preferred form of financing remains that from VC companies or directly from established corporations, while only one start-up out of six would raise funds through equity crowdfunding. Paradoxical even though most companies claim to be interested in equity financing, they have not actively sought new investments from VC funds, business angels or through crowdfunding. This suggests that many Italian start-ups wish but do not pursue the solutions they declare.

1.3.3. Geographical distribution

Figure 10 - Italian Innovative Start-up census by Region, March 2018

Regione	numero Società
Abruzzo	215
Basilicata	77
Calabria	187
Campania	640
Emilia-Romagna	877
Friuli-Venezia Giulia	200
Lazio	887
Liguria	162
Lombardia	2096
Marche	360
Molise	41
Piemonte	475
Puglia	328
Sardegna	162
Sicilia	448
Toscana	393
Trentino-Alto Adige	231
Umbria	146
Valle d'Aosta	18
Veneto	801

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Source: http://startup.registroimprese.it/isin/static/startup/index.html?slideJump=32

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Analysing the geographical distribution of the phenomenon, in absolute terms, Lombardy remains by far the region where the largest number of innovative start-ups is located with 2096, equal to 23.3% of the national total. Followed by Lazio with 887 (10.3%) Emilia-Romagna with 877 (9.8%), Veneto with 801 (9%) and Campania, the first region of Southern Italy with 640 (7.4%). At the bottom of the ranking, there are Basilicata with 77, Molise with 41 and Valle d'Aosta with 18.

The region with the highest incidence of innovative start-ups in relation to the total of joint-stock companies is Trentino-Alto Adige (1.17%), Marche follows with 0.91%, Valle d'Aosta with 0.81%, Friuli Venezia-Giulia with 0.80%, and Emilia-Romagna with 0.76%. Tuscany and Lazio close the ranking with respectively 0.36% for the former and 0.30% the latter. Milan is the province where the highest number of innovative start-ups is located: at the end of 2017, this number stands at 1,370 (16.3% of the national total). The second is Rome with 716 (8.5%), Turin with 318 (3.8%), and Naples with 285 (3.4%). All the other provinces among the top ten, are in order Bologna, Padua, Bari, Trento, Modena and Salerno, all exceeding 100 units. Again, if we consider the number of innovative start-ups in relation, this time, to the number of joint-stock companies active in the province, Trieste keeps in first place, but it has been recently reached by Trento: in both provinces, there are 152 start-ups every 10 thousand limited company. Two Marche's provinces follow Ascoli Piceno, with 148, and Ancona with 111. In the fifth place, there is, surprisingly a new entry, Rovigo (109) (POR-FESR, 2015).

Regarding start-up relationship with the other players in the innovation ecosystem, in particular certified incubators, accelerators, universities and mature companies, it appears that most ventures (72.6%) have never been located in a certified incubator and/or accelerator, 21.6% of companies are part of a programme at the time of the survey and that the remaining fraction has been involved in incubation/acceleration initiatives in the past.

The incidence of the spectrum of incubators, accelerators and innovation environments that the Italian legislation only partially identifies within the law n.179 of October 2012, therefore concerns one innovative Italian start-up out of four. The distribution on the

Italian territory of this kind of entities is, therefore – as one might expect – strictly dependent on the dissemination of start-ups previously described.

Figure 11 - Italian geographic distribution of incubators and accelerators

Geographic distrubution of Incubators.

*In the research incubators and accelerators are counted together for brevity and understandability

Area	Overall Population	Analysed Sample
North-West	38,9%	40,9%
North-East	21,0%	21,6%
Centre	22,2%	20,5%
South & Islands	17,9%	17,0%
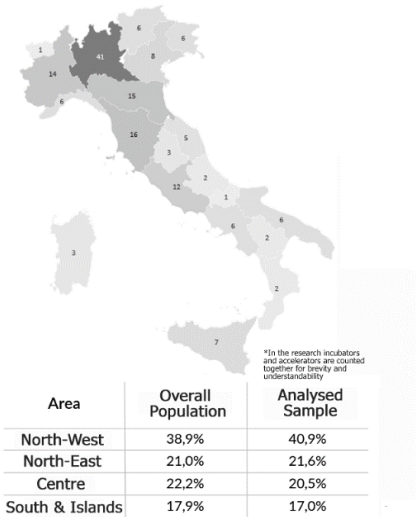
Source: Politorino & ItaliaStartUp, 2018

Chapter's summary

For sure, the theoretical premises we have discussed in this chapter are not enough to cover all the topics linked to the macro-field of innovation. Anyway, thinking about what is going to be touched in the following chapters, it was important to give an idea of newness and relevance of some topics. A lot of the models and theories we have presented in this initial overview are built upon the observation and study of concrete experiences made by novice entrepreneurs and the common points in their evolution paths. These trajectories are probably the most important dynamic to be understood, since according to them, intervention and existence of different subjects in the innovation and entrepreneurial support environment is planned.

Among all the evolutionary models, the start-up evolution process is one of a specific and extremely variable kind, where enthusiasm and focus are central and must be consistently high. For this reason, support is fundamental and entities like incubators and accelerators find in this perspective their reason of existence. One of the purposes of this section was that of accentuating the differences between accelerators and incubators. These two business models are different in many aspects such as the phase of intervention, the services they offer, the way in which they are structured, and the duration.

Observing innovation distribution in geographic terms, there are some unpredictable results. As one might expect, the USA are world-leaders, but innovation is extremely dispersed an uneven, with relevant differences from city to city. This favoured the emergence of many interesting international cases among which there are Israel and South-Korea. Europe appears to be fractured as far as innovation is concerned, with north-western countries being more suitable to foster and host innovative initiatives and south-eastern cities on the development. It must be recognized that, a lot of measures have been designed to compensate this gap and make innovation distribution more equal. Italy's legal recognition of start-ups and incubators is relatively recent while accelerators are not yet officially recognized. As expected, there are significant differences between northern and southern Italian countries, in both the number of start-ups and the number of active accelerators and incubators.

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Chapter 2 – Summary of contents

Introduction

The purpose of this chapter is to provide an overview of the academic relevance of "seed-acceleration", adopting bibliometric methods and science mapping software. This will allow us to express an objective opinion about the status of the official literature on the topic under analysis and give a comprehensive and unbiased definition of the start-ups accelerator's business model, based on the most accredited publications.

In opposition, a more detailed and concrete definition of the model and its variants emerge from reports and opinions expressed by active accelerators during the most recent annual "European accelerators summit", which took place in Portugal (Beta-i) in 2015, and Italy (H-Farm) in 2016.

The comparison between the two definitions will allow us to pinpoint discrepancies and evolutions, stressing the gap separating the current state of the sector and its academic analysis.

This section will end with an overview of the main challenges each start-up accelerator must be able to cope with to gain relevance and stand out in the growing crowd of entrepreneurship support entities.

A future perspective will also be provided about the differentiation process that is currently undergoing in the sector, with the increasing participation of a series of stakeholders who recognized the potential of this model as well as the continuous evolutions and specializations typical of those entities who are active in this environment.

2. Defining the seed-accelerator business model

As anticipated in chapter 1, we are about to begin a step by step review of the existing literature, or simply "bibliometric review", to understand the status of academic publications in the sub-field of entrepreneurship stimulation programmes assuming the specific form of start-up accelerators.

The initial months preceding the drafting and the conclusive empirical research of this work were completely dedicated to the creation of a personal knowledge and background understanding of the existing literature to date, since a synthesis of the work done by past researchers is required and sometimes imperative to advance the investigation in a particular field of study without falling in redundancy (Zupic & Čater, 2015).

Consequently, the progress of research on enterprise acceleration depends largely on a deeper knowledge and understanding of its past and a fuller grasping of its current stage which will then lead to the various future branches. To do this, an analysis of how contributions to the field have evolved is required to get an overview of the themes that have been studied and topics that have already been examined. This, in turn, allows staying ahead of the game, gaining an insight into the new trends and directions that are potentially going to develop from the existing literature.

Most of the research papers propose an initial literature review on incubation and acceleration as it was configured at the time of writing (e.g. Goswami, Mitchell, & Bhagavatula, 2017; Nanda & Rhodes-Kropf, 2015; Pauwels, Clarysse, Wright, & Van Hove, 2016; Tasic, Ángeles, & Cano, 2013). Although having fulfilled a missing part of literature these contributions are easily being surpassed by the continuous evolution of the topic which runs faster than the time required to effectively study, review and publish a full review.

Moreover, it is sentenced also by the authors themselves, that the topic of seed-accelerators is still under definition and the current level of academic contribution does not cover all the collateral questions, leaving space for further works and grey zones of understanding. Therefore, the purpose of the following analysis is that of trying to underline this difficulty in keeping up with the frenetic pace of change of the model as well as confirming or discarding some basic assumptions usually linked to this subject.

2.1. Academic literature review

2.1.1. Methodology

The literature review has been structured around four consequent rounds of research, leading to an equal number of different datasets based on English-written articles only, published up to the end of December 2017 – as articles are known to be verified and peer-reviewed before acceptance and publication, ensuring rigor in the research process thus making them capable of being considered as scientific knowledge. There are surely plenty of other sources and verified publications on the subject but, for research purposes and to respect a strict methodology, the dataset used is built only on sources gathered from the SCOPUS online database edited by Elsevier.

The general fields of research considered in all of the datasets are "management", "business", "economics", "sociology", "decisional sciences", "neurosciences" and "psychology". The choice of including collateral categories, as the last four of the list, is dictated by the intent of generating the most comprehensive set of articles as possible and to intercept any publication from unattended journals which are not typically economics or business related.

The four sessions of research differ in the choice of research keywords and time periods:

i. The first and most comprehensive group of keywords: accelerat* AND start* OR entrepren* OR ventur* OR innov*, was intended to gather results combining the word "accelerator" with either start-up, entrepreneurship, venture creation or innovation.
    This round of research resulted in 4470 matching queries of which 208 have been saved after an initial direct review of the author, based on article's title and abstract pertinence with the main field of research. Most of the discarded articles where related to neuroscientific or psychologic studies;

ii. In the second database interrogation the only keyword used was "accelerator", but a time-frame is given "2017-1976".

Additional 1109 references went through the same author's direct review which left 59 acceptable publications according to the title and abstract pertinence. In this case, many results dealt with atomic science, and mechanics;

iii. A more selective and specific round started with the third group of specifics. 167 references resulted from the concatenation of the world accelrat*, busines* and entrep* with constant fields of research;

iv. The last cycle of research brought about 212 documents answering the requirements of accelerat* + busines* + program*

A comprehensive number of nearly 6000 references from these four research cycles have been reviewed and selected basing, as previously said, on a direct analysis of title and abstract pertinence, elimination of redundancies and duplicates among the datasets, exclusion of off-topic subjects – most of which were related to neurosciences, psychology and physics (mainly, particles acceleration or physic acceleration of objects). After this overall review process, the final dataset counts 60 articles which means one article saved every hundred articles reviewed (0,01%). Data have been downloaded in a time window ranging from mid to the end of January 2018.

The remaining articles, in the final dataset, are characterized by the presence of the words "accelerator or acceleration", "start-up" or "business accelerator" in their title and/or abstract. The amount of publication will permit to outline an acceptable "science mapping" of the topic, helping define which are the areas of most interest in the "business accelerator" and "seed-accelerator" research fields. Computer software for science mapping and bibliometric analysis like VOS viewer (van Eck & Waltman, 2007, 2010; Waltman, van Eck, & Noyons, 2010) will be also used to help to clarify the outcomes of the review.

The advantages of the use of such programmes as well as the overall recognition of bibliometrics as innovative methodology have been largely discussed and welcomed (De Bakker, Groenewegen, & Den Hond, 2005) because these methods allow to avoid subjectivity, which characterizes traditional literature review, by using a qualitative

approach to describe, evaluate and observe published research thereby injecting some orderliness and transparency through reproducibility, into the review process. The outcomes produced by bibliometric analysis are mainly two: performance analysis, which means giving an outline and explanation of the dynamic flow of research and publications over time; science mapping, that allows a clear depiction in the space of a specific subject attempting to demonstrate the evolution, structure, and dynamics of scientific fields. The latter being particularly suitable in our analysis since it permits to pick a certain topic emerging from the outcome and conduct a review of that specific field of study.

To carry out a performance analysis there are several possible methods. In this case, the overall number of paper published per year and according to journals, authors, institutions, and countries will be proposed (Callon, Law, & Rip, 1986). Through this performance analysis, it is possible to quantitatively study how the literature on accelerators has evolved over time and discover the academic journals that have published the highest number of articles. Another point of view is covered by the geographic distribution of the most productive countries and institutions in seed-accelerator related subjects.

On the other hand, science mapping is structured on a co-word analysis, a data analysis method and content analysis technique used to map the evolution and structure of the literature via the co-occurrence of terms such as keywords and subject headings in the dataset. This will allow us to trace the thematic areas of interest inside the analysed research field.

2.1.2. Performance analysis

Traditionally, when analyzing the time-flow of publications it is recommended to consider three aspects: quantity, quality, and structure (Cadavid Higuita, Awad, Cardona, & Jaime, 2012). Where quantity refers to the number of articles published in the field of research in a specific time window, quality is a measure of the impact generated by the articles and it is usually calculated as the number of citations received, while structure refers to the existing links between authors and work produced (co-authorship, co-citation). In the following tables, quantity and quality are considered, leaving out structural measures as

the datasets downloaded from SCOPUS do not include parameters upon which it is possible to derive structural metrics.

2.1.2.1. Yearly publication output

Table 2 and its trend representation in Figure 12 show the number of publications per year on accelerator business model subjects that were published in journals from 2004 to the end of 2017. No publication has been found prior to 2004 and, as we can see from the chart, also between 2006 and 2009. This is congruent with the historical world-economic scenario, first articles on the "accelerator business model" begin to appear after the Google effect and dot.com boom, ended in 2001, bringing about the first definition of accelerators as the evolution of incubation ecosystems.

After these early publications, it is possible to observe a stop in coincidence with the world economic crisis. A couple of years later, with the advent of internet 2.0 and the beginning of current trends and technology-based concepts, the interest in the subject began to grow again until it reached its historical maximum in 2017.

Table 2 - Yearly output of articles 2004-2017

Year	N. of articles	% (n.)	Citation count
2017	23	38,33%	9
2016	11	18,33%	40
2015	5	8,33%	10
2014	10	16,67%	29
2013	3	5,00%	12
2012	1	1,67%	19
2011	3	5,00%	70

2010	2	3,33%	18
2009	0	0,00%	0
2008	0	0,00%	0
2007	0	0,00%	0
2006	0	0,00%	0
2005	1	1,67%	95
2004	1	1,67%	2

It is easy to notice that, there is a single article in 2005 collecting 95 citations (Carayannis & Von Zedtwitz, 2005), an in-depth analysis of this reference evidenced how it has been recognized as one of the fundamental publications for both the incubation and subsequently also acceleration business models, more specifically four recent articles published in 2018, 2017 and 2016 included in the "seed-accelerator" sub-field make direct reference to Carayannis' research.

The research is focused on entrepreneurship, and its role as the heart of a sustainable, organic growth for both developed but also developing countries. Authors' suggest that this may be more so in less developed economies where incubators – and accelerators as a natural consequence – can help bridge knowledge, digital, socio-political and cultural divides. The article also gives a very detailed definition of what incubation is and how it helps to decrease investment and entrepreneurial risks at the same time, in the context of the emerging definition of "knowledge economy". Main purpose of the whole publication is to propose an overarching incubator model, one that can synthetize all the elements and best practices emanating from other case studies and building on earlier publications.

Figure 12 - Yearly output of articles 2004-2017
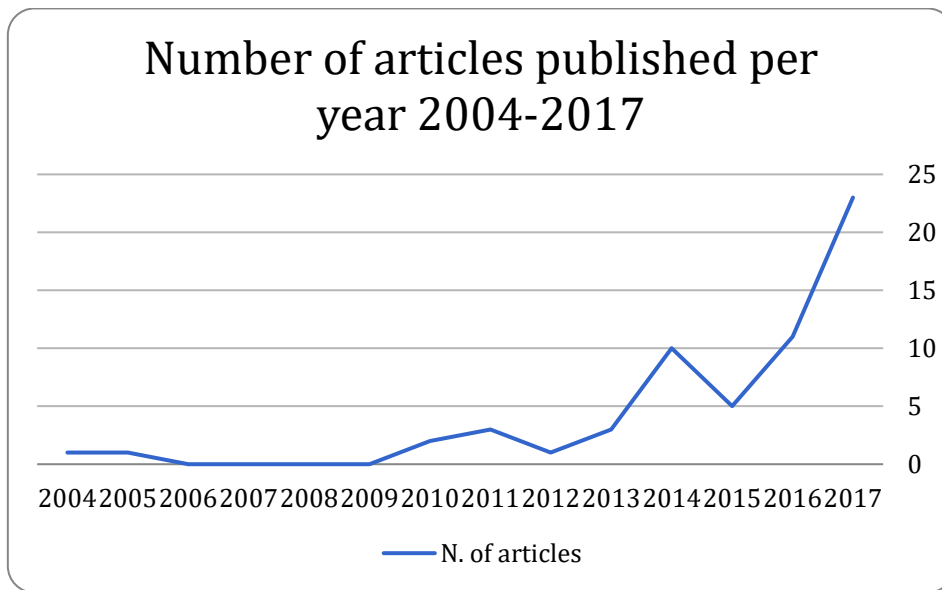
2.1.2.2. Most productive journals

Table 3 shows the list of the top 10 journals for number of publications. The outcome of this analysis evidenced a high level of dispersion, with a total number of 54 journals involved. The majority are entrepreneurship, business or management related with a few exceptions involving a range of science-related journals (medicine, space and healthcare journals are among the journals considered because of some case studies explaining the presence of space and healthcare science parks, incubators and accelerators).

However, the first 10 positions are occupied by technology, entrepreneurship, education & training and management journals with "Technovation" coming first with 3 articles (scoring 3.49 on SCOPUS CiteScore 2016[2]), followed by "Academy of Entrepreneurship Journal" (CiteScore 0.10), "European Journal of Innovation Management" (CiteScore 2.19), "International Journal of Entrepreneurial Behaviour and Research" (CiteScore 2.05) and "Journal of International Entrepreneurship" (CiteScore 1.80) all with 2 articles each.

The most active academic journals that have been cited are placed on a medium-low scale of relevance, if compared to the magazine with the highest "SCOPUS CiteScore" in the

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[2] SCOPUS CiteScore is an index calculated as the ratio between the number of total citation in 2016 and the number of articles published in 2016.

categories "Economics, Econometrics and Finance" together with "Business, Management and Accounting" which marks a CiteScore level of 11.96 ("Academy of Management Annals").

This underlines how the topic is increasingly relevant in the entrepreneurial and managerial world, as confirmed also by the recent elevate number of articles and the increasing number of acceleration-facilities started all over the world (Hochberg, 2016), but this importance in market terms, is not mirrored by researchers and publications from highly rated journals.

Table 3 - List of top 10 most productive journals (out of 54)

Name of Journal	N. of articles	%	Citation count
Technovation	3	5,00%	120
Academy of Entrepreneurship Journal	2	3,33%	0
European Journal of Innovation Management	2	3,33%	0
International Journal of Entrepreneurial Behaviour and Research	2	3,33%	3
Journal of International Entrepreneurship	2	3,33%	7
Energy Economics	1	1,67%	42
International Small Business Journal	1	1,67%	20
Business Horizons	1	1,67%	6
California Management Review	1	1,67%	13
Education and Training	1	1,67%	0

2.1.2.3.   Most productive countries

The number of total institutions with active publications in this field is 101, located in 25 countries. Only 9 countries produced more than 3 articles, with the USA predictably in the first place (26) by far if compared to the second country, the United Kingdom (8).

Considering influence, the situation in the first places changes with Switzerland immediately after the USA and the UK in third place. It is, however, worthy to note that due to the phenomenon of co-authorship, an article may be assigned to more than one country, therefore, causing the sum of papers to be more than the total number of articles in the dataset. Moreover, after having investigated the causes, we can affirm that the large amount of citations collected by Switzerland is due to collaborations with US institutions which have received a significant number of citations.

Table 4 - List of top 10 most productive countries (out of 25)

Country	N. of articles	%	Citation count
USA	26	32,10%	197
UK	8	9,88%	33
Germany	5	6,17%	21
France	4	4,94%	10
Spain	4	4,94%	14
Russia	4	4,94%	5
Switzerland	3	3,70%	98
Italy	3	3,70%	8
South Korea	3	3,70%	0
Australia	2	2,47%	0

Figure 13 - VOSviewer representation of countries clustering
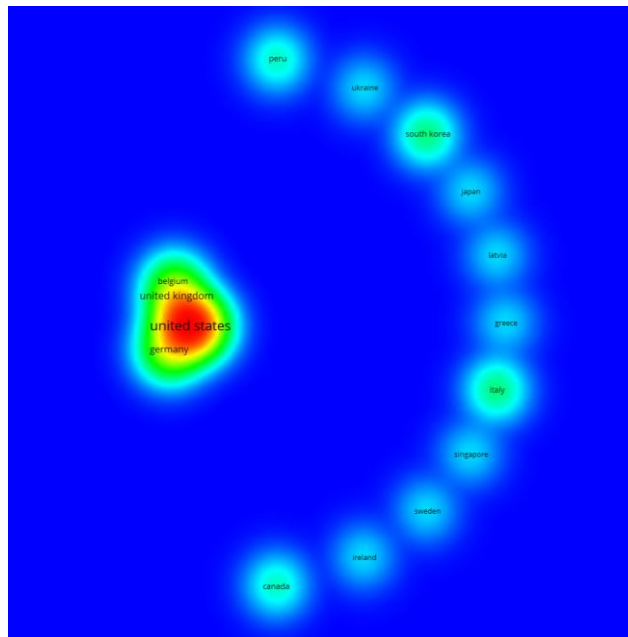
Figure 13 is the depiction of the dispersion of countries as elaborated by VOSviewer. It is easy to notice that the publications of most countries are independent and isolated one from another, the relevance in terms of number of articles produced is variable and expressed in different color intensity (green/azure as low importance, red as high).

The cluster on the left side of the figure is based on interconnections, co-authorships, and collaborations that the USA accomplished with other countries' institutions, most of which are European. Being more specific United States collaborated directly with researchers and articles with UK, France, Switzerland, Spain, Australia, China, Russian Federation and Finland, and this explains the formation of the cluster. On the other

hand, there are no direct collaborations between US and Germany, the Netherlands, Belgium and Norway in the analyzed dataset.

2.1.2.4. Most productive institutions

With regards to the performance of institutions, Table 5 shows the first 10 institutions by number of articles produced. All institutions in the top 10 are Universities or Business

Schools and among the overall 101 institutions, a few exceptions are registered like "Energy Parks" a few companies (like Airbus and Allianz X) and banks (Bank of Japan). The institution that produced the highest number of papers was The George Washington University in Washington, USA with 4 articles which are also the first in terms of collective number of citations.

Table 5 - List of top 10 most productive institutions (out of 101)

Institution	N. of articles	%	Citation count
The George Washington University, United States	4	3,54%	97
University of California San Diego, United States	3	2,65%	15
American University, United States	2	1,77%	0
IESE Business School, Spain	2	1,77%	13
Imperial College Business School, United Kingdom	2	1,77%	19
Kookmin University, South Korea	2	1,77%	0
Stanford University, United States	2	1,77%	55
University of Colorado, United States	2	1,77%	7
University of Ghent, Belgium	2	1,77%	23
University of New South Wales, Australia	1	0,88%	0

2.1.2.5. Most productive authors

As observed in the analysis of articles published per journal, according to this dataset also authors are dispersed and various. Out of 60 articles 131 authors are involved with only

three of them (Carayannis E., Hwangbo Y. and Wright M.) appearing in two different publications. In the top 10, there are also some influential authors publishing an article in the field of start-up acceleration and receiving some attention in terms of citations, like for example Audretsch D.B., Busenitz L., Fayolle A. and Acs Z.J.

Table 6 - List of top 10 most prolific authors (out of 131)

Name	N. of articles	%	Citation count
Carayannis E.	2	1,5%	96
Hwangbo Y.	2	1,5%	0
Wright M.	2	1,5%	19
Acs Z.J.	1	0,7%	0
Adomdza G.K.	1	0,7%	1
Audretsch D.B.	1	0,7%	20
Busenitz L.	1	0,7%	2
Clarysse B.	1	0,7%	18
Fayolle A.	1	0,7%	7
Siegel D.S.	1	0,7%	1

In conclusion, the performance analysis based on the set of references under investigation shows an increase in the number of publications in the sub-field of "seed- or start-up acceleration" in recent years with the highest value registered at the end of 2017.

Countries and institutions participation as well shows something predictable, with the United States of America as a most productive country, followed by European leading economies (UK, Germany) as affirmed in the reports discussed earlier in Chapter 1.

It is in the remaining parts of the analysis – most productive journals and authors – that an unexpected finding emerges. According to the data, this topic is not sufficiently covered

by a relevant and influent number of journals and authors, therefore scoring low in both cases and showing a high level of dispersion and lack of a common view.

We can conclude that, as many authors frequently affirm (Cohen & Hochberg, 2014; Fehder & Hochberg, 2014; Pauwels et al., 2016; Tasic et al., 2013), the proliferation of accelerators – and reports on accelerators – is clearly evident with worldwide estimates of more than 3000 entrepreneurship support programmes in existence but research on the role, efficacy, structure, evolution, and profitability of these programmes has been limited and scant. There is a need for additional relevant academic research and publications exploring the effects of such initiatives on regional ecosystems evolution and entrepreneurial activity.

2.1.3. Science mapping

As anticipated this section is aimed at creating a visual representation of the most used words in the dataset. VOSviewer is a software that allows creating a co-word representation, the program is capable of self-analyzing the number of times each word appears in a given database. This allows, in turn, to understand the thematic areas in the field under research and try to predict the potential directions the discipline is likely to take in the future. Following the specifics used by previously made analysis (Volberda, Foss, & Lyles, 2010) only word appearing 6 or more times in the title or abstract of the 60 articles will be considered. This process brought to a total number of 38 words after correcting for spelling variations and typos. Running the software, a clustering is returned as output with four different areas.

Table 7 shows each of the clusters and their corresponding attributed name. For instance, the words accelerator, development, ecosystem, knowledge, opportunity, research, result, entrepreneurship and incubator constitute a cluster named as "Macro environment".

In Figure 14 it is possible to see the VOSviewer network visualization map. The three fundamental criterions to be considered to properly read the map are Density, represented by the variable diameter of circles and showing the most recurrent words; Colours, giving an initial immediate distinction between clusters; Distance, the distance

between two circles in the map indicates the degree of relatedness of the items. It is possible to observe how keywords belonging to different clusters appear close to one another. This means that most publications deal not only with issues pertaining to a single cluster but touch different topics across clusters.

Table 7 - Co-words identified using clustering analysis

Cluster	Categories	Co-words
Cluster 1 (green)	Macro environment	Accelerator, development, research, knowledge, entrepreneurship, ecosystem, opportunity, creation, incubator, result
Cluster 2 (blue)	Corporate	Firm, start-up, strategy, industry, business, company, challenge, business model, technology
Cluster 3 (red)	Entrepreneurship characteristics	Entrepreneur, innovation, process, practice, purpose, finding, start-up, role, model, study, originality value, author
Cluster 4 (yellow)	Methods	Case study, analysis, case, framework, growth, university

Figure 14 - Network visualization of keywords

Cluster 1 has been named "macro environment" because it summons a series of general terms properly describing the main topics linked to this research field, the word "accelerator" is the most present in the whole dataset and, according to the distance with other terms, it has been frequently associated with "growth", "development", "knowledge" and "entrepreneurship".

Cluster 2 is more corporate-centric, gathering terms like "start-up", "industry", "business model" and "strategy". The presence of this cluster confirms the economic and strategic focus of the seed-acceleration business model as well as the subject and objectives of the services offered by accelerators, i.e. start-ups' support.

Cluster 3 goes deeper on specific peculiarities of entrepreneurship. Emphasising that "purposes", "process" and "practice" are important themes of being an entrepreneur aimed at the creation of "value" and "originality".

Cluster 4 is instead related to methods used in the articles considered in our database. Interesting to notice how a considerable number of papers are based on "case studies", "case analysis", and "frameworks". This means that empirical evidence and the analysis of concrete cases is recurrent in the existing literature.

2.2.   Academic definition of seed-accelerator

Start-up acceleration is a recent phenomenon and it can be considered as a sub-category in the macro context of entrepreneurship. As discovered in the previous section the topic is not yet fully covered and comprehended from an academic point of view. The existing literature provides an abundance of definitions, but few in-depth researches of the impact, efficiency and operational aspects associated with business accelerators.

In general, accelerators as well as incubators' mission is that of providing support to entrepreneurs in the creation and initial phases of a new venture, since it is generally known that this practice is an uncertain and complicated endeavour during which entrepreneurs will surely need, at a specific time, help from the external environment (Smith & Hannigan, 2014). These entities provide entrepreneurs with specific resources and/or services intended to increase their chances of survival and at the same time decreasing the level of risk which is normally embedded in the process of starting a new company (Clarysse, Wright, & Hove, 2015).

There are a series of circumstances and happenings that brought about this new business model: the dot.com bubble in 2000 along with the reduction of costs necessary to initiate a new company and experiment new products and services, mostly if online-based, have both significantly eased the process. Moreover, there has been a considerable deviation towards an increasing number of angel investments compared to the previous dominance of venture capitalists – even if this is true for certain countries only. The sum of all these conditions have prepared the ground for the growth of – what is in the most accredited vision – a new generation of start-up incubation programmes: the seed-accelerators (Clarysse & Yusubova, 2014; Cohen & Hochberg, 2014; Dempwolf, Auer, & D'Ippolito, 2014; D. J. Miller & Acs, 2017; P. Miller & Bound, 2011).

"Accelerators are business entities that make seed-stage investments in promising companies in exchange for equity as part of a fixed-term, cohort-based program, including mentorship and educational components, that culminate in a public pitch event or demo day" – (Cohen & Hochberg, 2014, p.4).

It is broadly acknowledged in the start-up community that the first accelerator, Y Combinator, was created in 2005 by Paul Graham, a former entrepreneur who decided to become a business angel, located both in Boston and San Francisco's Silicon Valley. The second one, Tech Stars, was founded two years later in 2007 by Brad Feld and David Cohen in Boulder. These two institutions are the publicly recognized benchmarks in the seed-acceleration industry, even if there are records of minor hybrid "incubation-acceleration" programmes founded even earlier (like H-Farm) (Salido, Sabas, & Freixas, 2013). In the decade between 2005 and 2015, accelerators and similar programmes expanded exponentially and not only in the US. Data registered in 2016 by F6S[3], report over 790 active acceleration programmes in Europe and 379'000 entrepreneurs involved all over the world. As can be seen in the chart below, there has been a worldwide increase in the number of accelerators, from 194 in 2012 to 793 in 2015, which means +308% in 3 years.

Figure 15 - Worldwide number of accelerators

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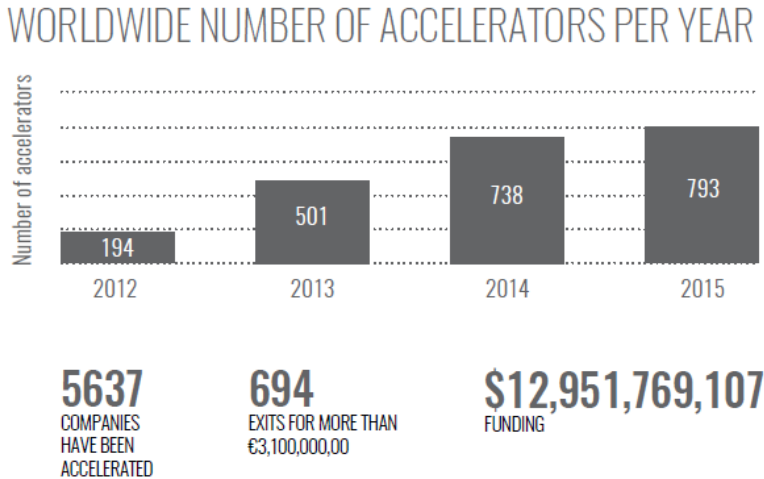
[3] F6S network is the world's largest platform for founders, enabling interaction with investors, accelerators, incubators, products, tools, talent exchange to grow together.

Miller and Bound have been among the first authors to delineate a general layout defining the main characteristics of accelerators, this initial description has been reviewed and adapted by many other researchers (Radojevich-Kelley & Hoffman, 2012), until Pauwels, Clarysse, Wright and Van Hove structured a clear model in 2015 as part of their work named "Understanding a new generation incubation model: The accelerator" that has become today a generally accepted framework, which will be discussed in the next section.

Before concentrating our attention on accelerators, there are some distinctive points representing and distinguishing the business model of start-ups accelerators from incubators (Barrehag et al., 2012), specifically the presence of:

- An application process (or "call") that in the first accelerators was open to all yet very competitive;
- Pre-seed investment (between 10'000 and 50'000) in exchange for equity;
- Team focused and not lone founders;
- Time-bounded, 3 to 6 months where teams are put under high pressure, pressing rhythms of work and intense mentoring;
- Cohort batches, meaning groups or classes supported altogether rather than individually;
- Demo day, Pitch day or Investor day at the end of the programme.

Figure 16 - Differences between accelerators, incubators, and angels

	Accelerators	Incubators	Angel Investors
Duration	3 months	1-5 yrs	Ongoing
Cohorts	Yes	No	No
Business model	Investment; non-profit	Rent; non-profit	Investment
Selection frequency	Competitive, cyclical	Non competitive	Competitive, ongoing
Venture stage	Early	Early, or late	Early
Education offered	Seminars	Ad hoc, hr/legal	None
Venture location	Usually on-site	On-site	Off-site
Mentorship	Intense, by self and others	Minimal, tactical	As needed, by investor

Source: (Cohen & Hochberg, 2014)

Dee et al. (Dee, Gill, Weinberg, & McTavish, 2015) introduced a view positioning accelerators among other start-up support entities – see Chapter 1.1.2. Considering their business model and the stage in which they intervene some researchers also place them among the equity financing institutions (Kim & Wagman, 2012). At this point, it is becoming easy to get lost inside the world of backing start-up along their journey and it is even easier to miss the difference between incubators and accelerators (Isabelle, 2013). The most-known programmes falling into the "Start-up Support" category are: Accelerators, Coworking spaces, Active-seed, Start-up competitions, Incubators, Courses and Start-up weekends. All these activities are framed around the offering of networks and business support, workspace and access to finance. But they differ in two characteristics: the way in which they make money and the phase in the start-up journey they target. Figure 17 helps a better understanding of each support programme, their phase of intervention, and revenue peculiarities.

For example, accelerator's key source of revenue is equity, but there are other possible revenue streams like participation fees, the percentage of earnings to be recognized to the accelerator or sponsorships to the program. On the other hand, incubator's main revenues are generated by the rental of spaces, catering and events and external private or public investments in the incubator.

Figure 17 - Typology of Start-up Support Programmes
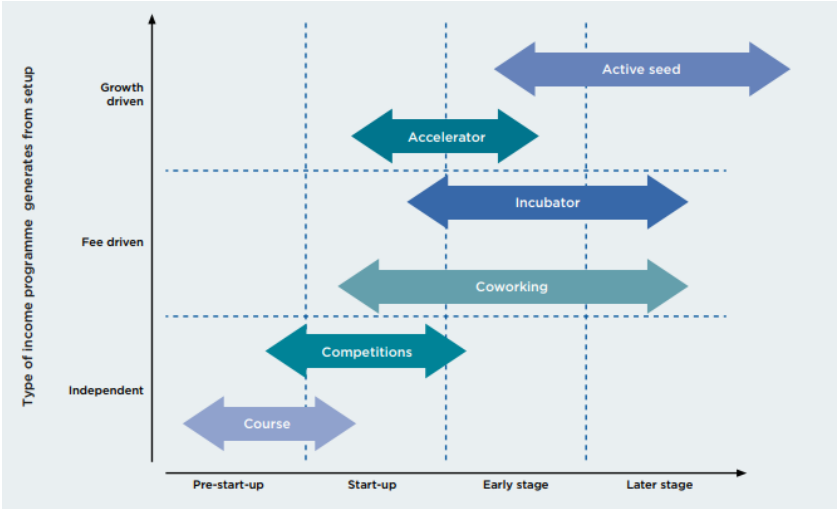
Source: Dee et al. (2015: 22)

Incubators' business model is very similar to a service provider, which establishes a long-lasting relationship with a start-up (on average 4 years, from early to later stage) based on the provision of services like office spaces at an affordable rent, housing, education, IT and software, networking and many others. The services are ad hoc for each start-up, the selection is not competitive, and it is required for the venture to be on-site for most of the time. Some of these assistances are replicated also by accelerators but the way in which accelerator's work is completely different.

A basic component for seed-acceleration is competition, programs are highly competitive starting from the selection process. Each programme has its own selection methods, most of which are based on universities' graduate courses process. The whole system is based on intensity and restricted times during the development of the program because it is believed that time restrictions generate a boost in the evolution process. Start-ups are also subjected to intense mentoring and usually focus each month on a specific part of the product or service development (e.g. business model, customer target definition, marketing, product development).

2.2.1. Model characteristics and specializations

The increase in the number of acceleration programmes, as delineated in previous pages, led to a large differentiation of the model with the launch of distinct accelerators with multiple scopes and depth of action, all over the world (Birdsall, Jones, Lee, Somerset, & Takaki, 2013). This, in turn, caused an increased difficulty in reaching a univocal definition.

In this confusing context, the work of Pauwels, Clarysse, Wright, and Hove cited in the previous section became a focal reference for all researchers and experts in this field. This group of researchers defined five fundamental components or design elements that it is possible to identify in every acceleration programme: strategic focus, programme package, funding, selection process and alumni service.

- *Strategic focus* refers to the scopes and objectives of the programme itself. These can be distinguished in: the objective, private and for-profit or not-for-profit and supported by investors (which may be private, public or large corporations); the focus, ranging from generic to specific in many areas (e.g. industry or stage of intervention); the geographic range, from local to international;

- *Programme package* intended as the aggregate of all the social network components and educational activities that take place during an acceleration round. It is in this section that programmes need to work to be attractive and competitive for start-ups. The package usually comprehends:
    - Limited time frame – on average 3 months – dedicated to the definition and refinement of a minimum viable product (MVP) and an efficient and effective communication of the business model;
    - A pre-determined educational program to be followed by all selected start-ups, covering all the relevant subjects for the development and subsistence of the start-up (e.g. finance, marketing, logistics, legal, HR);
    - Events, workshops with experts, inspiring talks, conferences;
    - Mentoring, in a structured – usually weekly – feedback session with experienced professionals, former entrepreneurs, angles or other direct investors in the venture. The goal is to provide guidelines and network opportunities to the start-up hoping to create mutual trust with stakeholders.
    - Open office spaces, designed to facilitate the peer-to-peer exchange of ideas, collaboration while indirectly stimulating peer-pressure and competitiveness.
    - Final pitch day, a milestone of all acceleration paths, which symbolized the graduation of the start-up to the market.

- *Funding*, of the accelerator itself by shareholders like private investors (angels, VCs), large corporations and public authorities (universities, regional economic development agencies). All these subjects invest in accelerators with the hope of obtaining significant returns form the exit or IPO of start-ups in the portfolio. Therefore, accelerators are seen by investors as financial intermediaries

decreasing risks and shrinking costs of scouting that they should otherwise face if investing independently in new ventures – a form of alternative investment;

- *Selection process*, commonly start-ups are made by teams willing to create high-growth ventures, but the access to acceleration programmes is typically restricted by a highly selective admission process. Selections can be organized online or as an interview where the team and idea are evaluated. The former being particularly important since the idea will be subject to changes and upheavals during the process and the components of the team should be able to keep up with these happenings. There are no common written rules on how to structure selection processes, hence each accelerator is free to establish their own process;

- *Alumni*, in parallel to the mentoring activities during the programmes the participation of graduated start-ups is frequently expected. The possibility to contact and have the direct testimony of people who have already completed the programme is part of the acceleration process since it gives the possibility to expand networks, test hypothesis, and increase new participants' motivation.

Basing on this core-elements and the same empirical methodology used by the original authors, many other researchers tried to define new typologies and sub-categories of accelerators, adding relevant and recurrent characteristics observed during qualitative research and interviews carried on in specific areas of the world and with targeted programmes. This is a relevant recent trend of evolution for the business acceleration industry.

Early accelerators were based on broad and general programmes, without a specific focus on a category of targeted start-ups. Initial programmes were usually aimed at digital businesses and open to all candidates with lower standards in the selection process. However, in recent years a new trend is emerging whereby acceleration programs began to specialize.

Today, acceleration programs are focusing on specific stages of the start-up evolution along with a specific industry or technology. This means that innovation is opening the way to a larger spectrum of sectors in which acceleration can be applied, detaching from

tech-based start-ups. It is nowadays common to hear that start-ups are searched in the food sector, Fintech, Blockchain, tourism, manufacturing, healthcare which in some cases are not typically tech or innovation-intensive industries. This latter type of specialization is labeled as "vertical or industry specialization" while the former – according to the stage of start-up evolution – is "horizontal or lifecycle specialization".

Horizontal specialization can be branched in "Idea Stage" which is the focus or "pre-accelerators" targeting university graduates or people at their first entrepreneurial experience. The targets are start-ups in the pre-seed stage, that means between idea recognition and market validation. In this early phase programmes are shorter (1 to 8 weeks), mentors have a more didactic role helping teams to develop ideas. The final demo-day assumes a different purpose of "final idea validation", teams are not pitching for their investors but in front of their judges, mentors or even general public.

"Early stage" is the second macro-area of horizontal differentiation, in this case, start-ups have already launched an official product or service and are focusing on the acquisition of customers to sell their product and reach the breakeven cash flows to cover expenses. This is the stage of evolution in which first-mover accelerators tend to concentrate (i.e. Y Combinator, Tech Stars, Beta-i), it can be also defined as "generic acceleration". The time frame for these programmes is longer, with an average of 3 months, mentors are more experienced, and the final purpose of the project is generating investments during the final pitch.

Finally, "Later stage" refers to start-ups with a fine-tuned product, a successful market penetration, positive cash flows and an already established base of investors seeking for an IPO or another relevant financial event to sell their participation in the venture. Accelerators in this stage (like Microsoft Ventures and Coca Cola's the bridge) are backed or even directly launched by MNCs creating a relationship between large corporations and start-ups. This kind of expertise exchange allows start-ups to leverage on corporation's vast experience and partnerships to create concrete events that will hopefully lead to the expected relevant financial actions.

2.2.1.1.   Vertical specializations

There are many differentiating characteristics behind the generation of accelerators' typologies. According to the latest "European Accelerator Summit" – part of the ATLANTA project, an initiative funded by the European Commission – that took place in H-Farm's headquarters in 2016 and previously in Beta-I, Lisbon in 2015 (European Accelerator Summit, 2015) gathering opinions and comments from more than 40 European accelerators, it is possible to distinguish five core categories of acceleration makers, currently operating in the sector:

- *Private investment funds*; are in the active search of potential fruitful investments for their fund. To profit from this type of business model, start-ups participating in this type of accelerators will give up a percentage of their equity – in a clause embedded in the acceleration contract – in exchange for services, networks, know-how and general growth opportunities. The acceleration programmes run by these organizations act as a way to receive deep insight about the participating start-ups allowing them to stay in close contact and influence the development of ventures in the most profitable direction. Usually, investors are coupled directly with start-ups in the programme, under the role of mentors so that they can understand better the dynamics of the team and the business before investing in it. Specialization in a specific sector or industry is common for this typology of accelerators. The most symbolic example of this category is Y-Combinator, selecting and directly interviewing two batches of start-ups each year. Selected

  Figure 18 - Y-Combinator, USA

  companies are asked a 7% equity share in exchange for seed money, advice and connections.

- *Community builder*; is a category born in the aftermath of the recent world economic crisis which has left a mark on many of the first accelerators who started operations after 2005 and before 2008 – especially in Europe. The main goal was to reinvent the economy, empowering the whole population with a "can-do"

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entrepreneurial attitude. Often non-profit and sometimes even under the form of associations, these accelerators worked on boosting the entrepreneurial attitude on their local community. The most used tools to spread this way of thinking was through meetings, conferences, hackathons, talks and other similar initiatives. The growth of these communities led them to choose an innovative business model, with some eventually starting co-working spaces businesses and some other

Figure 19 - Beta-i, Lisbon

experimenting with the first acceleration programs. With the advent of "open-innovation", these types of accelerators are diverging towards corporations as potential clients, involving MNCs directly in their programs and reorganizing the work in function of the company's requests. (H-farm is part of this category).

- *Corporate*; recently developed in the acceleration business, from the "open-innovation" wave. Corporations entered the start-up acceleration industry looking for innovative solutions to acquire (products, services, business models, technology), new methodologies to apply – work "the start-up way", (Ries, 2017) – or as a marketing strategy to appear innovative through brand associations. In some cases, the reason is simpler and related to investment opportunities, since the acceleration model permits to validate a company prior to the formal acquisition, therefore becoming a way to decrease risks and make "safer bets". This typology is the one generating more interest and discussion since it is believed that MNCs and TNCs are crucial for the growth of the start-up ecosystem worldwide

Figure 20 - Wayra, latin america

because of the expertise, customer base, market knowledge and networks they have already developed, and can put at the disposal of the ecosystem.

- *Government*; European, national and local governments are all active actors in the acceleration business. As discussed in chapter 1, at European level there are many different programmes aimed at the diffusion of entrepreneurship and innovation. The government can either directly support accelerators that are already active or alternatively, create their own accelerator within an existing environment of a specific location. The government supported, or pure government owned

accelerators are different from all the other categories for the simple reason that the funding mission is not the generation of profit or fruitful investments, but the reduction of unemployment, economic growth, the diffusion of innovation and territorial development of backward areas.

Figure 21 - Start-up Chile

- *University*: the interest of universities in acceleration programmes is linked to the necessity to transform know-how and research into concrete businesses, and the seed-accelerator model offers a fast and effective method to do so. Moreover, educating students to entrepreneurship has once more become important to stimulate economic growth. The sum of the two advantages makes acceleration worth a try for universities as it may become an attractive factor for the whole system. The extent and purposes of accelerators inside universities vary considerably from mere skills teaching courses to proper innovation and ventures generator and it is subject to the willing of the organization. The interesting component of uni-accelerators is students, serving both as participant and source of staff for the programme itself. A critical point in this category is the political nature of the university. There have been some documented case studies of public universities struggling in the launch and maintenance of acceleration programmes because of limitations due to sluggish procedures and operational slowness. On the other hand, public universities have the advantage of working with a zero-sum mentality.

Figure 22 - StartX, Stanford

In conclusion, the variety of forms and composition of acceleration programmes appears to be much greater and wider than the academic description given at the beginning of this section. Once more, an incongruence between the academic literature and effective state of the arts is demonstrated with the former being obsolete and the latter evolving continuously at an unsustainable pace for the academic research, not allowing a structured and detailed analysis of the phenomenon to last long before becoming obsolete.

2.2.2. Common challenges, perspectives, and future evolutions

During both 2015 and 2016 editions of the European Accelerators Summit, participants have been interviewed or involved in brainstorming sessions and focus groups to expose the challenges, key-activities and potential future perspectives of the industry. On average, 45 active European accelerators participated to the meetings and the result of their work has exposed a series of challenges which are crucial and commonly faced by accelerators, given their position as an intermediation center, carrying multiple stakeholders' interests.

The capability to attract promising start-ups and ability to select them properly is part of the core competencies and values of each accelerator, but this is contingent to the number of applications received. The challenge here is "how to stimulate application and influence the quality of the local ecosystem?". The purposes of the scouting process are the same of universities or schools, whose interest is to attract top-quality participants capable of profiting at best from the opportunities offered by the organization and increasing the probabilities of generating a success-story to be included in the alumni community, eventually contributing to the popularity and credibility of the accelerator. Challenges arise from the uncontrollable – or not directly controllable – environmental factors influencing this process like the ecosystem's level of maturity, the number of active start-ups or the presence of other accelerators operating in the same area or even worldwide since the start-up market is known to be internationally open.

Another important aspect to be considered, playing a role also in the quality of start-ups attracted, is the level and celebrity of the mentors involved during the acceleration process. Mentorship is a crucial component in the growth and evolution of a novice enterprise and it is believed to be one of the most efficient ways to accelerate growth in the entrepreneurial learning dynamics. Especially, if start-ups are the subject of mentoring since their surrounding ecosystem is characterized by completely new business models, a continuous trial and error experimentation and the absence of references during their evolution path. Start-ups need to be helped by experienced professionals like former entrepreneurs, managers, innovation experts and a series of other experts in their sector of reference. For this reason, the accelerator's network of

mentors is another essential asset, and one of the biggest value provided to start-ups. A more comprehensive analysis of mentoring dynamics, functioning, and relevance for the seed-acceleration industry will be addressed in the next chapter.

Financial sustainability is still under discussion for the acceleration business model. For this reason, most of the future directions that the model is undertaking are dictated by the necessity of finding an economically sustainable business continuity, not relying completely on occasional successful start-ups or unpredictable external financing. A frequent scenario sees organizations in this industry following a fine-tuning process and leaving or reinterpreting their own acceleration model after a short period of time due to low profitability, as it has been for 500 startups. The seed-accelerator created by this early stage venture fund in 2010 was based on the germinal definition of acceleration, with a fixed investment of 150'000 dollars in exchange for a 6% equity share of the start-up. After several acceleration cycles, 500 startups developed alternative programmes designed for other accelerators on "how to build an accelerator" and for corporations named "corporate unlocked", as well as a longer and later-stage "DistroDojo" program for companies in the scale-up phase. This is just an example of the diversification strategy that is currently undergoing throughout the whole sector, bringing us to the discussion of the future trends.

For many of the reasons we have discussed in this chapter, the acceleration sector is experiencing, once more, a process of change. The proliferation of acceleration programmes increased competitiveness and the increasing relevance of the model, stimulated the interest of the other economic players, above all corporations and governments, which are now convinced of the potential of these initiatives. Now, knowing it is difficult to imagine how accelerators are going to develop even in a restricted time range, we will describe the actual paths that a couple of first-movers have already undertaken to generate increasing cash flows and raise capital.

The contribution of corporations is an important part of this transformation. Accelerators struggling to find sustainable business models or simply willing to increase their growth rate are giving more and more relevance to corporate stakeholders. There are two possible ways to see corporations inside programmes: as part of the ecosystem and therefore as a source of networking activities, and additional funds to scale-up; as

customers to satisfy with ad-hoc services like scouting, learning, and business validation. As a matter of fact, if we observe the relationship from the point of view of companies, accelerators are valid gatekeepers to start-ups. For these reasons, the role of corporation inside acceleration programmes is likely to increase in a win-win relationship for both entities. Corporations have little time to dedicate directly to start-ups but on the other hand, most of them have innovation-related problems to solve. Accelerators have developed a structured and effective framework to help solve these problems. The accelerator-corporation advisory relationship can assume different forms, starting from simple sponsorship to proper mentoring, where the company lends knowledge to start-ups through an acceleration program. Another possibility as we have already discussed, are company-owned accelerators like "the bridge" by Coca-Cola or Microsoft's "Microsoft Ventures".

Continuous verticalization is another emerging trend, originating from the necessity of accelerators to differentiate themselves from the competitors. As start-ups are leaving the tech and digital ecosystem to approach other sectors like manufacturing, agri-food, finance and IOT also accelerators recognize the potential of alternative and more specialized industries. Interestingly, the restricted focus of these programmes is giving good results, as it permits start-ups to receive a more deep and tailored help by the accelerator via its network and mentors. This is the case of "industrio", an Italian

Figure 23 - Industrio, Italy

accelerator based in Rovereto, who helps hardware only start-ups in developing their final product starting from a prototype or a PoC – Proof of Concept.

Attention is being shifted to scale-ups as a natural consequence of former successful start-ups reaching maturity. The risk is to concentrate all the resources to support and incentive start-ups and then abandon any sustaining mechanism when they reach the peak of their development, believing that they are going to make it alone. Contrariwise, at a later stage venture must deal with new challenges that have more to do with creating commercial opportunities and build a proper organization. Accelerators for scale-ups are not common as their smaller-scale relatives and are also completely different, a higher level of professionalism is required with different support and mentorship. It is expected that the next years will see an increase and diversification of these services.

Universities are gaining a spotlight position in this field as well. There is a specific segment of the industry in which universities may play a fundamental role, which is pre-acceleration and idea generation. This helps with the promotion and incentive of entrepreneurship and with the number of active start-ups in the market. This segment of the process is the least profitable from an economic point of view, therefore pure accelerators – mainly if investment funds or corporate – are considering stopping these activities, although they recognize the necessity for the whole ecosystem of going on with them. And here is where to opportunity for universities lies.

An increasing number of universities are looking at entrepreneurship as a factor of differentiation in their market, seeking to encourage student's entrepreneurial spirit. In addition, part of the core business of universities matches the need for "talent-scouting" on the side of the students and mentoring – associated in this case with the professor's figure. Another facilitating factor for uni-accelerators is the presence of pre-existing facilities and infrastructures to be used.

Having the reach to students, educational set-up, resources and a clear purpose, the university-accelerator binomial has all the right characteristics for developing a sustainable and successful pre-acceleration programme.

Chapter's summary

The initial literature review has demonstrated how seed-acceleration is not supported by sufficient research and analysis in the academic sphere. On the contrary, there is a clear documented increase in the number of entrepreneurial acceleration facilities founded all over the world, therefore nurturing the economic interest in the topic and the relevance of the whole market.

Further research in this field may, for example, investigate the causes of the gap between academic and economic relevance using a structured methodology. We assume that one possible cause is the difficulty in keeping up with the continuous evolution of this business model. This is the reason why an updated definition is proposed, relying on the opinions expressed by sector's insiders.

In this chapter, it is also possible to learn how accelerators are not only different from start-up incubation facilities, but also extremely complex and diversified. The distinctions cited, which are based on purposes and stakeholders' participation in the business model, are not a static and exhaustive categorization of all the variances of the seed-accelerator business model, but it allows to give an idea of the variety of forms an accelerator can assume.

Among the activities and services offered, accelerators must excel in some crucial ones like attraction, selection, and training of excellent start-up and mentors. Moreover, the increasingly crowded sector is naturally generating competitiveness in certain countries and accelerators must evolve to adapt and stand out from the crowd.

This situation stimulated an increasing interest, as well as an almost complete validation of the model, which is generating concrete interventions from a growing number of stakeholders like MNCs, Banks, and Universities, as well as another major change is currently disrupting the whole industry, once more.

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Chapter 3 - Summary of contents

Introduction

The intent of this third chapter is to clarify the role of mentors, discussing who they are, their previous experiences and competencies, and what they do to help entrepreneurs, according to the definitions given by the most relevant papers and articles in the field. It is important for us not only to consider the traditional definition of entrepreneurial mentoring but also to build an overall comprehension of what has already been researched in this field.

The chapter begins with an explanation of the overall concept of entrepreneurial learning. This is useful to understand and build a point of view on the big picture inside which mentoring relationships develop, what characterizes entrepreneurial learning, and which are the learning levels to be reached to generate relevant changes in entrepreneurs' mindsets. A distinction of entrepreneurs based on their previous managerial and career experiences is useful in this sense to understand how learning dynamics are not fixed and linear but influenced by a complex set of changing factors.

The main purpose of this section is to define mentoring and its elemental structure, looking further into this specific developmental relationship and trying to cover all its distinctive features. To this end, we will discuss about the learning outcomes stimulated by mentoring, propose a review of the definitions of mentoring available in the existing literature, and explain the forms in which mentoring happens. Moreover, a deepening on how this specific construct differs from other developmental interactions like tutoring, coaching and traditional learning – which is possible to be encountered in the context of an acceleration programme – is considered.

Lastly, a discussion about the already published research on mentoring early-stage ventures and inexperienced entrepreneurs previously conducted by other scholars is proposed, allowing us to understand which perspectives to keep in consideration to build upon the existing literature and advance a meaningful contribution to the research in the specific field of mentoring services in start-ups acceleration programmes.

3. Mentoring, learning outcomes and entrepreneurial support

Among the various services offered by acceleration programmes, mentoring is certainly recognized as one of the most valuable, according to start-ups' opinions. Through mentoring relationships, start-ups can actively build knowledge on specific subjects and obtain support from experienced professionals. Entrepreneurship is a continuous learning process based on experiences and personal development, in this context mentorship becomes a topic of extreme interest, especially if seen from the perspective of learning dynamics.

During the analysis and research made for the first part of this work, and also thanks to the working experiences in a university "active learning" programme, I realized that a deeper discussion about entrepreneurial learning dynamics, more precisely mentoring, not only would be a way to refine and consolidate the lessons learned from my direct experiences but it may also result in a relevant contribution to the academic research about the recent evolutions of entrepreneurial learning. This brought me to begin an investigation on the relevance of this topic, looking for the most-cited academic publications and direct witnesses from people operating in innovation and seed-acceleration activities. In the latter case, two active Italian professionals in the sector – Alessandro Rimassa, co-founder, and CEO of TAG Innovation School and Paolo Cuniberti executive chairman of H-Farm ventures s.p.a. and private Business Angel – gently answered my questions, both confirming the importance and value of the topic.

Rimassa pointed out how *"Tutoring and coaching are not fundamental and are strictly dependant on the choices made by the entrepreneur. Mentoring instead, is the key to foster the development of new businesses. It is not a common activity in Italy, and it is not used as much as it should be. I always wonder who has the responsibility to oversee the promotion and development of mentorship initiatives, but I still do not have a sure answer. For sure, a structured mentorship programme can help the start and steady growth of a lot of enterprises".* (notes from interview, 19.02.2018)

While Cuniberti's opinion is more connected to the Italian culture yet recognizing the role played by mentors and universities: *"Surely the role of the mentor is an important one. As H-farm we have grasped it very soon and this is the reason that brought us to develop a*

university level course which is basically a structured mentoring programme. In my opinion Universities in this field are fundamental. In Italy, there are not so many programmes of this kind, and I bet we will soon see some early-stage initiatives in this sense. A very important intent of these initiatives, especially for Italy, is the breaking of a culture based on paternalism and "do-it-yourself" mentality". (notes from interview, 20.02.2018)

3.1. Entrepreneurial learning and its complexity

The image of the entrepreneur has historically suffered from a series of stereotypes, as most people's first thought is of a business person responsible for generating artistic or social capital and financial wealth. This simplistic way of representing the entrepreneur as an egoistic businessman (and not businesswoman) driven by profit, is still part of many cultures even though Thompson's research in 1999 clearly demonstrated how entrepreneurs can be found in a multitude of contexts, not just business. (Thompson, 1999)

Thence, different kinds of entrepreneur undergo slightly different evolution paths, learning dynamics, operational behaviors and purposes. For this reason, it is believed that the most important decision in entrepreneurship is the choice of the business to set up (Robshaw, 2001). Yet entrepreneurs tend to underestimate this aspect. Moreover, this diversity in their way of evolving, former experiences and capabilities of the entrepreneur, and mixed order of experiencing critical phases, underline how the relevance of "success stories", manuals or predetermined strategies may easily fall under the pressure of criticism.

Nevertheless, entrepreneur's learning dynamics clearly lay on common traits like "learning from past experiences", experiential learning, learning while and by doing, trial and errors, learning cycles, and so forth. Entrepreneurial learning ergo the *"continuous process that facilitates the development of necessary knowledge for being effective in starting up and managing new ventures"* (Politis, 2005) is part of the general meaning of learning, about which, although there would seem to be a line of consensus on the definition and meaning, the literature express an immense diversity of viewpoints.

According to Politis, a fundamental distinction exists between "entrepreneurial experience", or the direct observation and participation in events generating new ventures, and "entrepreneurial knowledge", which is the resulting wisdom from the experience of being an active entrepreneur. The author's proposal is based on the dimensions of experiential learning – acquisition and transformation – introduced for the first time by Kolb in 1984 and cited by most of the active scholars in this field (A. Y. Kolb & Kolb, 2005). This perspective relies on the concepts of continuous learning process and accumulation of knowledge of the entrepreneur via personal experiences transformation.

Particularly relevant is the contribution of Burgoyne and Hodgson in 1983 and Argyris and Schon in 1978 reviewed by Fiol and Lyles in 1985, who defined different "levels of learning" adopting a phenomenological approach while studying "natural" learning within managerial frameworks (Burgoyne & Hodgson, 1983; Fiol & Lyles, 1985). The understanding of the differentiation among learning levels is preparatory to the empirical analysis that will be proposed in the final section of this work. Learning manifests itself in variable intensity, describing different ways in which people learn. The authors identified three levels:

- Level 1, or the assimilation of information having immediate utility but no long-term or developmental implications, also referred to as repetitive, rote or surface learning. Learning at this level is usually associated with routinized tasks and single-loop learning[4]. The individual is basically not changed by level 1 learning, experiencing no significant personal betterments or increased awareness;

- Level 2, concern assimilation of something transferable from a current situation to another one in the future, in this case, the learner has "*changed his conception about a particular aspect of his view of the world in general: the aspect being, however, situation-specific*" (Burgoyne & Hodgson, 1983; p.394). Anyway, level 2 learning like level 1, is a form of "single-loop learning";

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[4] Single loop-learning: is described as the modification of the actions made by people or organizations, according to the differences between what is expected and the reached outcomes after a specific situation or process is completed. (Argyris & Schon, 1978)

- Level 3, stimulates essential change, encouraging to reflection and questioning established assumptions and ways of doing on a specific topic but also values and perceptions that drive individual behaviors. The impact is stronger and not situation specific, leading to a deeper change in the way of seeing things, self-awareness and personal understanding. Level 3 learning is a form of "double-loop learning", which means learning how to learn and changing the underlying assumptions or actions that generated the problem.

Level 3 learning is, of course, the most profound and influent form of understanding yet very complicate and difficult to be induced. Contrarywise, there is a diverse range of learning processes within level 2 learning which are commonly associated with entrepreneurial or managerial learning, such as experiential learning or learning by doing, problem-solving, learning "how to", and reflective learning. While dealing with any of these typologies of emergent learning, entrepreneurs or managers typically draw from their background consciousness, therefore it is necessary to influence and stimulate a change in their previous learning background to have an impact on the magnitude of their learning.

About the importance of background experiences of entrepreneurs and learning in entrepreneurial contexts, the ability of the entrepreneur to recognize potential opportunities and act promptly while at the same time trying to overcome obstacles in organization and management process of their venture is fundamental (Shepherd, Douglas, & Shanley, 2000).

As we know, academic studies and real-world happenings are frequently misaligned, and the process of learning happens in a much more confused and faster manner, with simultaneous activities, several concurrent projects, and different stages of development. However, it is unquestionable that the origin of a new entrepreneurial activity is centered upon the capability of the entrepreneur to recognize an opportunity when it appears and before it is too late, making this ability essential in the endowment of a prepared entrepreneur. What makes the difference between a good and an unprepared entrepreneur, in this case, is the "entrepreneurial mindset" developed with previous start-up experiences and previous career trajectories (Carroll & Mosakowski, 1987). Opportunity recognition is then influenced by the amount of information at the disposal

of the subject, hence the information load that influences his/her ability to recognize opportunities, and the cognitive structures allowing to link opportunities and potential outcomes and act accordingly.

From this assumption, it is easy to understand that having a lot of information without a pre-developed knowledge base is useless, as well as the contrary.

Later on, while discussing mentorship, we will learn how entrepreneurs can deal with the compensation and balancing of the shortage of information or cognitive ability, through the support of external sources of knowledge (Shane, 2003).

Previous experience and learning have positive effects also on another complexity factor intervening in the entrepreneurial dynamics, namely "liability of newness" (Freeman, Carroll, & Hannan, 1983).

Trying to translate this concept in simple words, we can say that it entails the capability of coping with extremely unforeseeable and continuously changing environments as well as being able to master newly discovered innovations in multiple fields. For sure, "liability of newness" has a role in the causes associated with the high rate of mortality of new ventures, together with inadequate funding and lack of experience in managing business operations and execution, about which we have discussed in chapters 1 and 2.

3.1.1. Differences in entrepreneurs' level of experience

Now that the complex, accidental and occasional perspectives of the entrepreneurial learning process have been introduced, it should also be easier to grasp how the attempt to build a structured academic understanding of this process is a challenging and ambitious objective. Numerous scholars have already tried to make sense and propose a structured view of how people learn, obtaining scarce results.

Over time, researchers have experimented many different methodologies and approaches to make solid research in the field of entrepreneurial learning, until one emerged for its ability to focus more effectively than others on the process in a way that is comprehendible for both the scholar and the entrepreneur. We are talking about the

critical incident technique – the origins, advantages, and limitations of which will be discussed in more details at the end of this section.

Here, a research applying this methodology, carried out by Jason Cope and Gerald Watts (Cope & Watts, 2000), is reviewed in order to facilitate the understanding of the mechanism applied, since it will be also used in the final qualitative research of this thesis. This work also proposes a categorization of start-ups' entrepreneurs according to their experience in the sector and previous management or business experiences in general terms.

Critical moments in the history of a business are important happenings offering an access point to understand and study entrepreneurial learning. In addition, the technique lays a common ground upon which academics and entrepreneurs can discuss in a colloquial yet research sensible fashion. For a SME to grow, adaptation and change are mandatory along its life-cycle and we have already discussed how entrepreneurs learn and transform their behaviors and way of thinking in completely different ways according to the experiences they face during this process and its crises.

An important perspective that we have analyzed in this first part of the chapter is that, although each business is unique, there is a component of theorists – also known as life-cycle scholars – supporting the view of similar growth challenges faced by enterprises. Moreover, according to their view, founders or teams' skills follow a predictable pattern of evolution while going through the stages of their business life-cycle. This theory is still under definition and its validation suffers from many real cases' opposition. The relevant thing to notice is that by applying this methodology the primary focus is shifted towards the growth process of SMEs instead of the effects generated on the learning of the entrepreneur.

Back to the stimulation of level 3 learning in entrepreneurs, which means helping them learn how to learn, the problem lies in the fact that traditional learning approaches – the one we are used to in schools, universities, master or classes in general – do not adequately satisfy the learning needs of an entrepreneur. What really makes the difference is the transition towards critical periods along the growth of the business. For this reason, needs and learning outcomes differ according to the phase of organizational

development, taking us back, once more, to the importance of entrepreneurial evolutionary models and the necessity to provide tailor-made education and training.

This is particularly true in early stages of development *"where much of an entrepreneur's learning by doing takes place"* (Cope & Watts, 2000, p.109)*. The first thing to do in this sense – that is usually given for granted – is to help start-ups build a sense of self-awareness, supporting them in the recognition and analysis of where they are in the development path, what they really need to continue their advancement in terms of skills, which actions are important and must be taken, which opportunities to accept or avoid, and so forth. It is fundamental to work on a more grass-roots level, almost psychological, making it clear that opportunities, and the capability of exploiting them, are completely up to the founder, or the team, behind an enterprise. In many cases, failure or growth-related problems originate from errors made by the entrepreneur on the correct visualization of their situation before taking action, because they lack the self-control necessary to make a step back from their idea and think before deciding.

In their work, Cope and Watts tried to develop a contribution to the field of entrepreneurial learning with a series of interviews to mentees. The selection of the subjects to be interviewed is based on a four-section matrix, allowing them to differentiate the typologies of possible start-up entrepreneurs under analysis. For their research they built a sample satisfying their need of consulting the largest number of entrepreneurs possible, with varying levels of knowledge and experiences, to propose a representative portion of the population.

Figure 24 - Four-way typology of start-up entrepreneurs

Source: (Cope & Watts, 2000, p.111)

They interviewed a total of six entrepreneurs matching the filters they have established for the four categories outlined in the matrix above. Involving young "innocents" at the start of their entrepreneurial career, "Confident entrants" or middle-aged entrepreneurs entering a new entrepreneurial career path after some experiences in the same industry or other work experiences, "Knowledgeable improvisers" older than young start-uppers in the middle of their working career in a specific sector, and "Veterans" i.e. experienced entrepreneurs with previous entrepreneurial experiences, moving into post-career activities.

These people were subjected to process-oriented interview sessions with the purpose of intercepting critical incidents in the development history of their firms, exploring their background experiences prior to the beginning of the start-up and what motivated them to begin this experience.

Jumping to conclusions, some interesting findings emerged from this analysis. First, critical incidents acted as a booster of the entrepreneurial learning process, contributing to the growth of self-awareness and changes in perceptions, what have been identified at the beginning of this chapter as level 3 learning. At the same time, the highly emotional load which is peculiar to such happenings contribute to the development of a confusing "attribution of causality". This may impact the cause-effect association of the incident and affect subjects' memory. A final discovery supports the entrepreneurial life-cycle view since certain types of critical incidents are connected to specific developmental stages and are common for more than one case. For example, the shift from purely entrepreneurial to a professional and managerial organizational structure when entering the scale-up stage or the difficulty in gaining customers' acceptance in the iterative process towards a viable product.

Considering all the dynamics and distinctions we have proposed above, it seems clear that the complexity and challenges posed by the decision of starting an entrepreneurial activity easily end up causing problems, or incidents, during the development of the idea. For this reason, a lot has been discussed and much have been recently made to facilitate and support entrepreneurial ventures, their creation and growth, with the purpose of easing this difficult and traumatic process.

Third-parties with an interest in this field – Banks, Universities, Public or Private institutions, MNCs – started to investigate on how to structure a support programme aimed at helping smooth the transitions of a start-up through the various stage of development, making it more pleasant and efficient. More than this, what is it possible to do in terms of specific assistance for entrepreneurs facing critical incidents, and how can third-parties help them overcome or even anticipate a potential crisis in the future?

Mentoring is certainly one of the ways, a dynamic assistance service which is highly valued by novice entrepreneurs. Before entering details, it is necessary to premise that practicing mentoring is not so simplistic and immediate as some organizations believe, it requires a specific knowledge of methods and procedures as well as attitude for both sides of the relationship. Managers believe that experience and years of activity in a specific sector are sufficient to be classified as a mentor, and this is completely wrong. In previous pages we have defined a minimum part of the general notions a mentor be keen on to deliver a meaningful support to entrepreneurs through critical phases as well as facilitating third level, double-loop, learning. On the other hand, entrepreneurs must be prepared and willing to experience a process of change and self-awareness, accepting critics and having clear pre-established expectations of what they want to obtain from this support.

There is an aspect to be remarked to conclude this introduction, one that accentuates the role of experiential learning. Despite the impact that mentorship relationship may have for a less harmful development of start-ups, the learning potential of "learning by doing" and the intrinsic power of making mistakes remain a fundamental aspect of the whole entrepreneurial learning package and must not be undervalued.

3.2.   Mentoring, definition and basic structure

The etymological origin of the word mentoring is associated with Homer's Odyssey. Mentor was the name of the person delegated to assist Odysseus's son, Telemachus, while he was on his epic voyage. He oversaw the education and development of the child's personality in the adult world. Likewise, today's mentors are people with specific expertise willing to give back part of their experiences over a younger person, who might take advantage of their support (St-Jean & Audet, 2009).

Mentoring is much more complex than one might expect, thus we will now untangle its variations, structure, and differences from other forms of entrepreneurial support, such as coaching, tutoring or apprenticeship. Entrepreneurial mentoring is based on a relationship between an experienced entrepreneur or professional figure – the mentor – and a novice entrepreneur – the mentee – for the sake of fostering the personal and professional development of the latter (St-Jean, 2011; St-Jean & Audet, 2009, 2012).

Few researchers have carried on exhaustive studies about positive and negative effects of entrepreneurial mentoring through direct-interviews to mentees. One of the first of this kind, conducted by Deakins et alia (Deakins, Graham, Sullivan, & Whittam, 1998), outlined the benefits of undertaking mentoring relationships. Among the other positive aspects, mentoring generated increased abilities to manage and achieve goals, initiate learning processes, contribute to the transformation of the business and its capability to generate a higher turnover, create jobs and consequently gaining more profits. There are also a series of other studies on a superficial level, involving different entrepreneurial categories like for example women-entrepreneurship (McGregor & Tweed, 2002; Sullivan, 2000).

Heterogeneous forms of mentoring can be found depending on contexts, with changing outcomes and roles according to the surrounding environment and purposes of the mentorship relation. The focus of this work will be on mentoring aimed at supporting early-stage entrepreneurs through their process of evolution and change, providing help from experts and assistance in developing self-awareness, recognizing problems or even anticipating potential critical situations, and help entrepreneurs fill their knowledge gap in key-topics regarding entrepreneurship.

To do so we must clarify and explain how mentors work and how mentorship happens, in which phase of evolution mentorship is more valuable and what makes mentoring different and unique from other support methods.

3.2.1. Learning outcomes of mentoring relationships

Studies specifically conducted within the mentoring sphere cast an overall and superficial view of the process and the learning methods applied, but little is known about how entrepreneurs learn and what they learn specifically. This specific intent was at the core of the research made by Etienne St-Jean, one of the most productive authors in the entrepreneurial mentoring filed of research. He investigated about the specific learning forms occurring in a mentoring relationship with the purpose of identifying direct cause-effect connections between methods used and learning outcomes. (St-Jean & Audet, 2012)

The methodology used in this research, to understand the themes related to learning outcomes, was based on the collection of data via focus groups. The information gathered allowed to design a questionnaire submitted, in a second step of the empirical research, to a sample of people who participated in entrepreneurial mentorship programmes. The intent was that of finding evidence about the presence of the learning dynamics described by Kraiger et al (Kraiger, Ford, & Salas, 1993).

Figure 25 – A classification scheme of learning outcomes
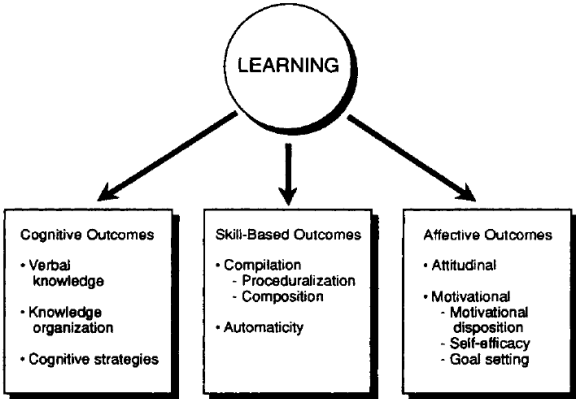
Source: (Kraiger et al., 1993)

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According to the authors, Cognitive knowledge – defined by other authors as "career functions" – is divided into three categories: verbal knowledge, knowledge organization (mental models) and cognitive strategies (ways of accessing and applying knowledge more rapidly). The order of presentation is not casual but chronological with respect to how changes in people happen when they are subject to training. Verbal knowledge is, therefore, the most sensitive and can be stimulated by low-level learning processes.

Skill-based learning outcomes concern the development of technical skills, goal orientation, and linking of learning behaviors in a hierarchical manner. This can be observed when people are asked to perform actions they have discussed or learned about, and results in the execution of procedural tasks faster and with fewer errors.

Affectively based – or psychosocial – learning refers to attitudes, behaviors, and motivations affecting performances. More broadly it entails all practices which may be influenced or changed by external factors, like training or advertising, that are relevant to the objectives of the programme under analysis. In addition, affective learning collects also all the learning outcomes which are neither skill based nor cognitive.

Some interesting conclusion emerges after the analysis of responses generated by the questionnaire. As far as cognitive learning is concerned, mentees generally show an increase in their level of verbal knowledge in management related topics. This is mainly because mentors can help them simply by sharing information according to their area of competence. Most of the times, this knowledge is of general nature, in subjects like finance, marketing or product development. Information of this kind may be useful for early-stage entrepreneurs, fostering the development of managerial competencies they lack. Frequently the help given by mentors pertained financial management, as for example the realization of forecasted financial statements. Alternatively, discussions with mentors helped the development of a clearer vision or permitted a higher level of focus towards specific objectives.

Meetings with mentors gave entrepreneurs the opportunity to spend some quality time, outside the frenetic pace of their daily activities, take a step back and reflect on the possible evolutions of the business. Taking some time to reflect is not only necessary to clear the entrepreneur's mind but it also helps to develop their vision and find new perspectives to explore – like for example new market possibilities for a specific product.

A common answer given by entrepreneurs engaged in mentoring when asked to explain more about the role played by their mentor is: "He/She helped us enlarge our perspective, starting from our idea and opening new doors we could not even imagine on our own".

What mentorship did not help improving is the learning of new skills. As previously said, the advancement of skill-based learning relates to direct actions, involving physical movement, like learning how to run a bike. Mentors, on the other hand, are usually generalists and not technical specialists, making it explicit that no such learning is achieved through these kinds of relationships. There are few registered cases in the mentoring field of research where mentee declared to have learned new skills, and if they did, it was because of co-working sessions involving both the mentee and mentor at the same time.

Affective learning is the second area of development for mentees, after cognitive-based learning. The mentorship experience helped most of the interviewed entrepreneurs to develop their self-image, becoming aware of what he/she is and would like to become. Mentors act like professional reference figures to use as evidence or inspiration for mentees, allowing them the opportunity to stand on the shoulder of giants. Furthermore, the presence of a reference person helps start-ups to overcome isolation which is typical of the early-stage venture, the new entrepreneur often feels alone and in need of someone to whom he can speak about his problems. Psychological support is part of the duties associated with the role of mentors, helping reassure and support entrepreneurs during the evolution of his/her business. As already said in previous sections, self-confidence and motivation are crucial in the start-up ecosystems, and the presence of a mentor appears to affect the resilience of entrepreneurs by increasing motivation during crisis periods. There is a whole stream of references pertaining to the psychological study of mentoring practices, the discussion of which is far beyond the purposes of this research.

In conclusion, it is evident how only two of the three typologies of learning outlined by Kraiger et al.'s taxonomy, can be stimulated during a mentorship programme: cognitive- and affective-based learning. Hence, mentors' selection is usually based on their business experience and career backgrounds, as these are believed to be reliable indicators for mentoring capabilities. It must be clear that mentoring is not comparable to traditional courses or training attended by people to master a specific technique. Mentoring support

is conceived as a tool to reduce new ventures mortality rather than making them learn new techniques.

Another point of view sees the mentee-mentor relationship as a form of consultation and know-how exchange on how to effectively operate a business (Cull, 2006), allowing mentors to be considered as the most useful source of external advisement for novice entrepreneurs. The opportunity of sharing knowledge and lived past is surely one of the main benefits of entrepreneurial mentoring (Wikholm, Henningson, & Hultman, 2005), giving mentee a competitive advantage if compared to their non-mentee colleagues.

Figure 26 - Learning cycle representation
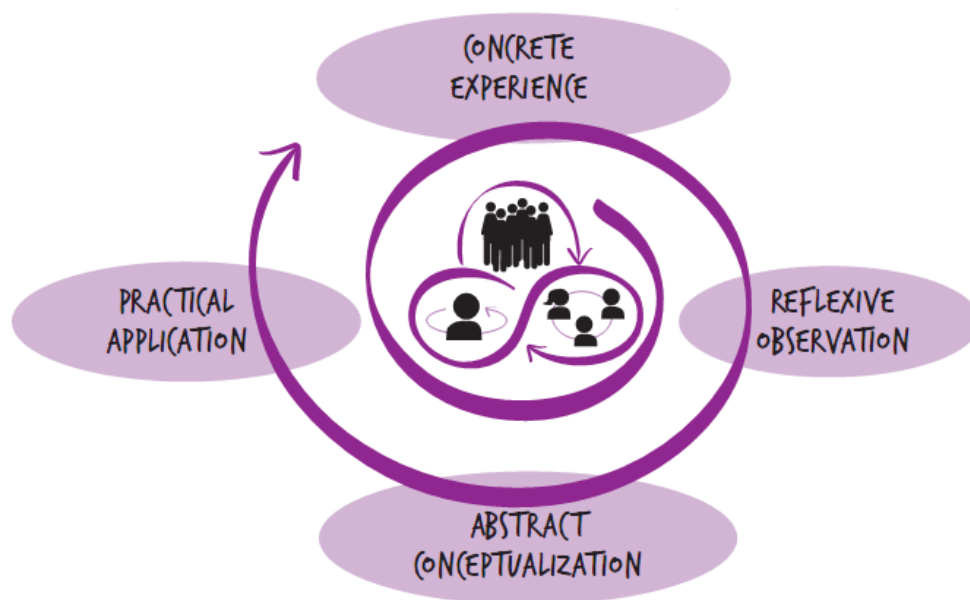
Source: (D. A. Kolb, 1976)

What we think is important to comprehend is that the role of mentoring and the effective interventions of mentors in their assistance to entrepreneurs – according to the definition of traditional mentoring – is based on helping them grow and develop without being directly involved in daily activities. Mentors must help them to learn and reflect on their situation rather than imposing prescribed solution or "if I were in you, I would have done" suggestions. They are not private consultants, but people applying a "help me help you" philosophy, and supporting entrepreneurs in their trial and error, cyclical learning process.

3.2.2. Mentoring dynamics and differences with other forms of interaction

Instead of repeating what previously proposed in Chapter 2 when analyzing the existing literature on seed-accelerators to extrapolate an academic definition, this time we will build a more restricted view of mentoring basing on a literature-review contribution which has been already proposed by D'Abate et al. (D'Abate, Eddy, & Tannenbaum, 2003).

There are many different support models which may contribute to the development and learning of entrepreneurs, all of which can be classified under the definition of "interactions for development". A common peculiarity of these reciprocal actions is that they involve two or more people with the final goal of stimulating professional learning or any other kind of personal led development. Confusion arises when trying to distinguish between each of the possible forms ranging from apprenticeship, action learning, coaching, tutoring and mentoring. All these relationships are distinguishable in many terms as for example their duration (brief or long-term), the number of parties involved or typology of learning outcomes – as we have already discussed. An increasing amount of interest and attention have been dedicated by consultants, researchers and active practitioners to the study of learning relationships and their use to enhance career development, personal growth and initiate learning cycles. Much has been discussed regarding the benefits and potentiality of these processes, but the field lacks a more structured and clear conceptual organization to align further and vertical comprehension of each interaction typology.

Published literature as well as public opinions, expressed via mass-media or new-media, often fails to find a common line of understanding about what mentoring is and how it differs from the other interactions. This misalignment was noticed for the first time in 1988 when William Gray observed how mentoring was easily confused with coaching (Gray, 1988). This is due to a large number of varying descriptions of the same construct from author to author. Deeper is the level of analysis and grater are the differences that it is possible to detect among concurring definitions. Some scholars have argued that mentoring and coaching are the same, some others suggest differentiation under specific aspects. Confirming once more that a great amount of conceptual confusion exists in this research field.

The work of D'Abate, Eddy, and Tannenbaum tries to advance the discussion bringing clarity to these distinctions. Their intent was that of generating an overarching framework that would quickly allow to understand similarities and differences among the various definitions given in the existing literature. In doing so, they have used existing descriptions to create a static classification of how support interactions are defined.

In their original work, they have considered thirteen different types of interaction satisfying the general requirement of *"interconnections between two or more people with the intention of development"* (D'Abate et al., 2003; p.362)*,* that are: tutoring, traditional mentoring, peer mentoring, multiple mentors, informal mentoring, group mentoring, structured mentoring, distance mentoring, action learning, coaching, executive coaching, peer coaching and apprenticeship. Given the variety of forms, the risk of contributing to the creation of more confusion was high, for this reason, authors wanted to simplify the classification as much as possible and use a methodology allowing them to work on the existing literature without bringing about an additional layer of complexity.

The use of nomological networks approach and a detailed review of the existing definitions used by other authors in the literature for each of the interactions above, allowed them to reach the goal of constructing a framework to facilitate the comprehension of each construct and make distinctions among different models.

First of all, they have defined a more detailed taxonomy to create a common ground of classification among all the interaction possibilities. This permitted to compare them and clarify their meaning, under a common frame of reference. Starting from the subjects involved in the relationship, they have defined with the term "developer" the person who provides his expertise (mentor, coach, master or tutor), and "learner" who receives the development (mentee, apprentice, tutee, protégé). For what concerns the interactions' characteristics, after having reviewed a set of 182 sources, authors agreed on an overall number of 23 single criteria, grouped in 6 categories, used to distinguish each kind of relationship:

1. *Participant demographics:* age, level of knowledge or career experience of the developer in relation to the learner;

2. *Characteristics of the interaction:* duration, regularity of meetings, means of communication used, and span of the relationship (number of people involved);

3. *Organizational settings:* hierarchical difference among the parties (horizontal or vertical), line of reporting, and the location of the participants (internal or external);

4. *Interaction's purpose:* Object specificity and goal of development, Time frame within which such target must be achieved, definition of the person or people who benefit from the development;

5. *Degree of rigidity:* level of formality (informal or programmatic), presence of a third-party who takes care of the organization (like a member of staff in an acceleration programme), choice of participating (free vs mandatory), matching process, previous preparation or support during the interaction, final evaluation and official termination;

6. *Behaviors:* expressed by the developer to stimulate the learning, which may assume emotional-related forms, career or growth progression of the learner, e.g. goal setting, modeling, observing, providing feedback, sharing information, counseling, encouraging/supporting, introducing, socializing, and so on.

The qualitative literature review that followed this phase, was carried on by a group of experienced researchers with a high level of detail. Articles were selected only from pertinent journals like "Journal of Applied Psychology, Personnel Psychology, Journal of Applied Social Psychology, Academy of Management Review, Academy of Management Journal, Journal of Vocational Behaviour, Journal of Management and Human Resource Development Quarterly". In addition, other Journals, books, conferences reports, websites and press articles have been considered and analyzed. The total amount of descriptions gathered in the research is 227 taken from 182 sources.

At the same time, a group of researchers took care of the coding process, establishing a coding schema and reviewing all the definitions to identify common elements and

overlaps. When a construct was in line with one of the previously listed characteristics a "1" was attributed to that specific criterion, with attention to repetitions or paraphrased sentences within the same source.

Figure 27 – Nomological Network illustrating the meaning of a construct

Categories	Characteristics	Coding Options	Action Learning	Apprenticeship	Coaching	Distance Mentoring	Executive Coaching	Formal or Structured Mentoring	Group Mentoring	Informal or Unstructured Mentoring	Multiple Mentors or Developers	Peer Coaching	Peer Mentoring	Traditional or Classic Mentoring	Tutoring
Behaviors exhibited	Learning related	Collaborating	C	D	D	D	D					C	D	D	C
		Directing		D	D		D			D				D	D
		Goal setting	D	D	C	D	C	C		D		C	D	D	
		Helping on assignments		D				D		D		D	D	D	
		Modeling	D	D	D			D	B	C	D	D	D	C	C
		Observing		D	D		D	D				B	D	D	
		Problem solving	A	D	D	D	D	D	D			C		D	
		Providing practical application	A	B	C	D		D	C	C	D	C	D	D	D
		Providing feedback	C	D	C	C	C	D	C	D	D	A	D	D	C
		Sharing information	C	D		C	D	D	C	D	D	D	D	D	
		Teaching	A	B	B	C	C	D	B	D	D	C	C	D	A
	Emotional support related	Affirming				D		D	D	D	D		D	D	
		Aiding	C	D	D	D	C	D	C	D	B	B	C	D	B
		Befriending				D	D	D	C	D	D	C	C	D	C
		Calming			D	D		D	C	D				D	
		Confidence building	D	D	D	D		D	D	D	D	D	D	D	
		Counseling		C	D	C	D	D	B	C	B		C	B	D
		Encouraging	C		D	D		D	D	D	D	D	D	D	
		Supporting	D	D	D	D	D	C	A	C	B	C	B	B	C
	Career progression related	Advocating				D			C	C	B	B		C	C
		Introducing				D			D	B	C	C		C	C
		Sheltering							D	D	C			D	C
		Socializing		D	D	D			C	C	D	D	D	D	D
		Total number of descriptions	14	11	21	9	11	21	7	16	9	9	14	79	6

NOTE: Letters indicate the percentage of descriptions that suggest characteristics are related to a construct's meaning. A = 76%-100%; B = 51%-75%; C = 26%-50%; D = 1%-25%.

Source: (D'Abate et al., 2003, p.374, Table 4 "Behaviours exhibited")

Figure 27 shows one of the three resulting matrices after the whole process. For each of the interaction constructs listed vertically on the x-axis, there is a corresponding criterion and a score from A to D, representing the percentage of recurrence of that specific characteristic in the reviewed definitions.

The codification and ranking process allows us to compare in a reliable manner different constructs, clarifying, for example, the difference between coaching and mentoring. Focusing our attention on A, B or C characteristics of these two typologies of interaction in the three matrices, it appears clear that there are some clear differences between the two. Mentoring has a general object of development, while coaching is usually associated with a specific skill or area of improvement. The time frame is also different, short-term for coaching and mostly long-term in mentoring relationships. In addition, traditional

mentoring is associated with modeling, supporting, introducing, advocating, counseling and sheltering as main behaviors of developers. While coaching is more aimed at goal setting, providing feedback, teaching and providing practical application. It is possible to conclude that there are enough unique characteristics to suggest that coaching and mentoring are not the same.

Anyway, in a broader sense, what this research demonstrated is a lack of consistency in construct descriptions. This is proved by the presence of many level C and D ratings in the resulting matrices. Meaning that researchers often refer to different characteristics when describing the same construct. In addition, descriptions sometimes are explicitly contradicting one another, in some cases, experts used two conflicting characteristics to describe a common construct – like for example saying that coaching has both specific and general objectives.

As we have learned these developmental dynamics are important to the process of learning and growth of individuals and the success of their businesses, it is crucial for those who wants to propose a contribution, to advance some research exploring cause-and-effect relationships happening during the process. It is also fundamental to develop, prior to begin such a research, a proper understanding of the specific construct under analysis by providing concrete examples and considering a restricted focus on few characteristics at a time to improve the validity of that specific process.

Being aware of this lack of concreteness, the qualitative research carried on during the final part of this work wants to be a way to propose an evidence-based reflection on the validity and potential improvement of mentoring developmental interconnections.

3.2.3. Mentoring early-stage ventures and young entrepreneurs

In the best of all possible worlds, entrepreneurial mentoring is able to support entrepreneurs in the development of the specific skills they need, at every time of their career path, receiving support as and when they experience a critical situation. Of course, this kind of tailor-made education, training and mentoring is very complex and dependent on a lot of different variables like the availability of a very large number of mentors, being

able to offer at any time a portfolio of diversified experiences and competencies in different sectors. It is clear that such an all-inclusive service is almost impossible to be realized as it would require unsustainable costs and plenty of organizational issues.

A view that has proved to be useful for the definition of a more restricted categorization and to the design of an ad-hoc service, is once more related to the "life-cycle approach" we have encountered many times throughout all this work. Under this perspective challenges and managerial necessities, faced by businesses as they mature, become clearer and distributed over time. An example, which is at the core of the literature in life-cycle theories, is the Churchill-Lewis model (Lewis & Churchill, 1983), a representation of the distinctive and predictable evolution phases – or stages – typically encountered by a Small enterprise during its growth process. A distinctive feature of the model, specified by the authors, is that phases do not necessarily happen sequentially.

Figure 28 – Management factors and the stages
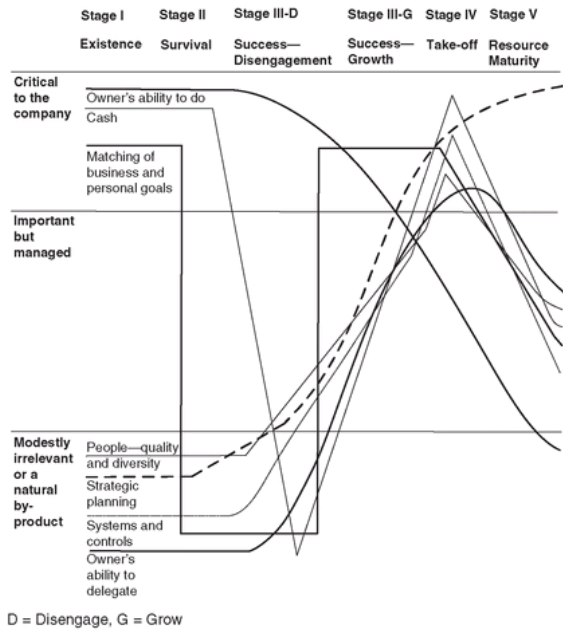
In the representation above we can observe how, as a business moves from one stage to the next, the relevance of managerial factors to be mastered changes. The graph is sectioned horizontally and moving from the bottom to the top, three levels of importance

are defined: modestly irrelevant or a natural by-product, important but managed and critical to the company.

Considering only the phases which are pertinent to our research, we can exclude the last two stages, "take-off" and "resource maturity", as these are associated with the scale-up phase, while "existence" and "survival" are key phases of early-stage start-ups. If the intent is to support entrepreneurial development through the initial phases of existence then we have to be sure, basing on this theoretical assumptions, that entrepreneurial learning is facilitated in the critical areas. In the "existence" phase key management competencies are mainly related to the increase of managers' knowledge on subjects like business administration, communication, vision and time management. Financial management is also fundamental, especially when entering the "survival" stage. As a consequence of the increase in the necessity of financial funds, also communication and marketing capabilities become central.

The point is that the moment at which these specific knowledge are required, is likely to differ from case to case and it is strictly dependent to the evolution curve of each entrepreneur. Another element generating criticism is related to the linearity and sequentiality of the model, which excludes part of the atypical cases not following the predetermined evolutionary track. Here is where mentoring flexibility assumes relevance. The ability of mentors to identify specific needs required by the entrepreneur and act accordingly, may be an effective answer to these critics. Even though mentorship relationships offer a valid solution, there are a number of other important factors affecting its proficiency, which we need to take into consideration. These are directly proportional to the stretching of the time-frame considered, and the characteristics of entrepreneurs including their cultural traits and local context.

According to Stephen Gibb, it is in the early phases of evolution that much of the learning and development of a business takes place (Gibb, 1994). This vision is supported by most of the scholars in this filed, suggesting that support for new start entrepreneurs should be provided on a mentoring basis (Deakins & Freel, 1998; Deakins et al., 1998). We firmly agree with the point raised by these research and believe that the use of mentoring in early-stage start-up acceleration programmes can make a positive difference and generate benefits on new ventures creation, their growth and survival rate. Unfortunately,

little has been told and researched on such a specific scenario, and our contribution wants to be a first attempt at the advancement and fine-tuning process of mentoring services in this specific sector.

Anyway, there are some already proved, although general, mentoring benefits for early-stage ventures. In the face of the high death rate of start-ups and if the purpose is to convert already existing ventures into established businesses and not stimulating more entrepreneurial action, intervention at the pre-start and start-up stages can generate large benefits. Many scholars sustain that the problems are not related to when interventions should happen but how. Yet, case studies proposed in many countries, underline as early-stage intervention have an overall greater impact on the reduction of failures and critical incidents (Gravells, 2006; Ting, Feng, & Qin, 2017). Therefore, there appears to be theoretical foundations for suggesting that mentoring relationships should take place in the early stage learning and development of new entrepreneurs.

Considering entrepreneur's experience, as we have discussed at the beginning of this chapter, entrepreneurs can be distinguished on the basis of their managerial and career expertise. Needless to say that "innocents" are those who, more than any other, will benefit from mentoring support. Having little more than a bright idea and motivation to succeed, they need to be helped from experienced professionals. However, what it is missing – again – is an in-depth understanding of the relationships' nature and the impact this has on young person's and novice entrepreneurs.

A relevant contribution in the field of young entrepreneurs' mentoring is the one proposed by John Cull (Cull, 2006). He proposed a qualitative study of the mentor-client relationship within a couple of business programmes in Canada and Scotland. Purpose of the analysis was to identify the key aspects of the relationships between the organization, mentors and young entrepreneurs, and what concurs to the creation of a positive and productive result. Among his findings and proposals, he introduced a view of the dynamics intercurring during discussions between mentor and mentee, named after the concepts of "pushing" and "pulling", where pulling is the process through which mentors try stimulating interaction and reciprocal help with the intent of helping mentees basing on their issues while pushing is the ability of the mentor to stimulate initiatives out of

nowhere, proposing creative ideas, challenges, new perspectives or any other stimulation of thinking and wisdom.

What emerges from this research is that not only there is a need for different approaches applied by mentors at specific key stages of the relationship – start, mid and end-point – but organizations would also benefit from a structured operational approach through the whole process. On the other hand, case studies show no doubt on the benefits for young entrepreneurs and how mentoring can lead to growing confidence and both personal and professional success.

Chapter's summary

This chapter is the last restriction of focus before the introduction of empirical evidences, therefore its purpose is to lay an initial level of definition about mentoring in broad terms, contribute to understand more about what has already been covered by previous scholars and which are the most-relevant research on this topic. The critical aspects, and mainly contradictions, underlined by other authors' opinions and discussed in this section will be considered in our contribution as a benchmark for the advancement of the understanding of these phenomena, which as we have seen is still under definition.

Entrepreneurial learning is a complex, cross-disciplinary field of research that gathers multiple perspectives, like for example psychology, economics, management and behavioural sciences. Leaving out what is far beyond the focus and intents of this thesis, at the beginning of this section a discussion on the ways in which entrepreneurs learn is developed in more details, introducing the concepts of learning by doing, trial and errors, learning cycle and learning levels. While studying these concepts, and the overarching definition of entrepreneurial learning, we realized how – also in this context – there was a recurrent way of thinking connected to the business evolution models described in chapter 1.

However, entrepreneurs' way of learning has some peculiarities if compared to the traditional and widespread concept of learning. The knowledge of the entrepreneur is based on prior-experiences and therefore needs to be stimulated by a deeper level of learning, named as level three learning according to Fiol and Lyles. In addition, entrepreneurs' capabilities and knowledge luggage are not equally distributed and the distinction between good and bad entrepreneurs depends also on information availability, opportunity recognition and liability of newness.

Here is where an important contradiction between two schools of thought emerged from the revision of the literature, which relates to the fact that, although each business is unique, there is a component of theorists – known as life-cycle scholars – supporting the view of similar growth challenges faced by different enterprises. Moreover, according to this view, founders or teams' skills tend to follow an equally predictable pattern of evolution while going through the stages of their business life-cycle. This way of thinking

suggests that entrepreneurs evolve together with their business, following predictable evolution-curves.

On the opposite side, some other scholars argue that there are a lot of critical points in the evolution of an enterprise, and variables to be considered are too many to allow the development of consistent predictions. These two points of view are fundamental also for our upcoming research. One thing seems to be sure, the starting point is not always equal, and entrepreneurs are different from one another, they might have had previous experiences with other start-ups or as a professional or be at their first entrepreneurial adventure.

Going on with the restriction of our focus, we have dedicated the second-half of the chapter to the definition of mentoring and its learning outcomes, understanding how it does not contribute to the learning of new skills but rather stimulate other typologies of learning like cognitive or affective knowledge. This is one the peculiarities of mentoring relationships distinguishing it from other developmental interactions.

In the distinction between developmental interactions, previous research has underlined a good amount of confusion. Mentorship is said to be different from other developmental interactions, even though – so far – no common definition has been defined, resulting in researchers describing similar dynamics using different expressions. This situation leads to the difficulty in distinguishing mentoring relationships from other kind of forms like tutoring, coaching or apprenticeship.

The last relevant perspective is one of a very specific kind which is raised by the focus of our research on seed-accelerators. In fact, in the sampling process we have considered only entrepreneurs who experienced mentorship as part of acceleration programmes. For this reason, it was mandatory to investigate further into the existing research about mentoring early-stage ventures and young entrepreneurs. In doing so we have obtained both confirmations and warnings. On one side, other authors confirm that in early-stage phases of entrepreneurial evolution teams and founders are more prone to need external help, especially if the entrepreneur is at his/her first experiences. On the other side mentoring in this context appears as extremely uneven and diversified in forms, thus contributing to generate lack of clarity and conflicting views.

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Chapter 4 - Summary of contents

4. A Qualitative analysis of mentoring in acceleration programmes

4.1. Introduction

The choice to propose an analysis of mentoring services in the context of acceleration programmes arises from the author's willingness to develop a deeper understanding of seed-accelerations programmes and start-ups ecosystems, given the increasing number of initiatives that has been registered all over the world in recent times and the demonstration from past research of the importance recognized to institutions such as accelerators, incubators, universities and government agencies – IUG – in creating connections among various actors in a confined ecosystem (Etzkowitz, 2008).

After an initial phase of immersion into the taxonomy and categorization of start-up's assistance entities and driven by both curiosity and the need to establish defined limits upon which to base a concrete research process, we eventually decide to structure a qualitative research to understand the impact of mentoring relationship happening between start-ups and experienced professionals during these programmes, based on direct interviews with both parties involved.

The focus of our research will be on the following question:

- *Does mentoring services bolster the development of start-ups within acceleration programs?*

We envision the possibility of giving an answer to this question, based on experiences of diversified subjects who participated in different programmes, stimulating a reflection about what they expected before the participation and what they have obtained after the conclusion of the programme.

Being aware of the need, confirmed by numerous call for papers about this specific subject, to develop further research for the academic advancement of the macro-field of entrepreneurship and micro-topic of seed-acceleration, and wanted to make an active

contribution to it. Many other authors have already underlined the necessity to advance more research about this business model, going beyond its simple definition and deepening the comprehension of every single aspect (Hochberg, 2016; Tasic, Ángeles, & Cano, 2013), suggesting the development of future works investigating on the core elements having a strong influence on their overall results.

Accelerators emerged and developed in recent years, becoming substantial players in the early stage entrepreneurial ecosystem. It is therefore important to understand the role and level of efficacy of such programmes since they may prove to be useful not only from an academic and research perspective but also to practitioners and policymakers.

The benefit practitioners can derive from such an investigation may contribute to the overall wealth of the local entrepreneurial economy given the relevance and impact of entrepreneurial activity for economic growth (Haltiwanger, Jarmin, & Miranda, 2013). They may benefit from the analysis made by an impartial third party on what is currently happening, which are the flaws, imperfections, and criticalities resulting from a direct research on the field, generating opportunities to pivot and fine-tune the service they offer to answer the expectations and needs of start-ups in a better way.

Mentoring is one of the services which are often highly valued by start-ups participating in acceleration programmes, as confirmed by Susan G. Cohen *"Mentorship is also frequently cited as a valuable aspect of accelerator programs"* (Cohen & Hochberg, 2014, p.12) and it is also a common service, part of the "programme package", according to the design lens proposed by Charlotte Pauwels et al. (Pauwels, Clarysse, Wright, & Van Hove, 2016). This allows to rely on a common basis, linking different acceleration programmes, to be furtherly defined and understood.

4.1.1. Research purposes

What we wanted to capture is the sincerest opinion directly from who had previous experiences in one or more programmes – mostly in Northern Italy, as a start-up or as a mentor.

Another important feature to us, which played a significant role on the definition of our research questions – due to our personal backgrounds and without departing from the managerial and business' strategy framework on which this thesis is based – is to maintain a business-centered design. It was fundamental to have in mind, as our target readers, professionals who are involved in acceleration activities and design a work of research which may stimulate their interest and participation allowing, in turn, to gain relevance through practitioners' validation.

More than this, in the spirit of cross-contamination between different fields of research, we did not want to overlook the entrepreneurial learning perspective which is of utmost importance in this context. That is why chapter 3 is completely dedicated to the understanding of how entrepreneurs learn and why the early stage is the best stage to impact the learning process of a new venture's team. The idea of including this collateral view, which is far from the background studies of the writer, is triggered by observations made during a collaboration in a university program called "Contamination Lab". The grounding intent of the programme is to stimulate students' entrepreneurial mindset, as well as their knowledge about concrete business cases and learning models. Particularly interesting was the opportunity to apply and monitor the development of learning methods and developmental constructs – such as design thinking, business model canvas, Lego serious play and many others – which are typically adopted in the context of entrepreneurial support programmes.

On the other hand, it was impossible in the time-frame of six months, to take into consideration every single aspect influencing the accelerator's ecosystem. The complexity of its business model gathers a dense maze of interests, and the brokerage position covered by accelerators opens the way to a plethora of possible dynamics to be analyzed. Therefore, it has been clear from the beginning, that it was necessary to choose and concentrate our efforts not only in the definition of the analyzed area of interest but also on which theoretical perspectives to keep into account.

To achieve the goal of giving a structured answer to our research question, we have purposely structured a series of 10 direct interviews to start-uppers in different phases of their business development, working on the realization of a diversified set of projects – both software and hardware, to collect the largest amount possible of opinions.

Furthermore, 5 mentors have also been interviewed following an ad-hoc questionnaire designed to understand how they organize and structure their work with start-ups and what they believe is of utmost relevance for the development of a new enterprise. The inclusion of both sides' opinion gives a more complete perspective as well as higher relevance and reliability to our research.

The research process and structural methodology applied is inspired by previous works following the grounded theory method for qualitative data analysis, like in Goswami's "Accelerator expertise: Understanding the intermediary role of accelerators in the development of the Bangalore entrepreneurial ecosystems" (Goswami, Mitchell, & Bhagavatula, 2017). Though in our case, the object under analysis is more specific, defined and static.

4.2. Methods

Before entering the details about how we have structured our data collection and data analysis, we will discuss in this section the existing methodologies applied and other inspirations influencing our research process.

First, a description is given of Flanagan's "critical incident technique" which has proved to be an efficient inspiration for structuring our interview and data collection strategy, thus we will briefly explain more about the origins of this interviewing technique and show more extensively, how it permitted to create an effective interview pattern in our managerial context.

Then, grounded theory and the characteristics of evidence and experience-based concepts (Glaser, Strauss, & Paul, 2010), are explained. This rigorous mechanism to reach theoretical relevance from qualitative based data is very useful for this analysis and helped us define a theoretical structure starting from raw concepts and interviewer's opinions. The Gioia methodology (Gioia et al., 2013) is probably one of the most known data processing and management modus operandi, which perfectly matches the characteristics of this analysis, allowing to reach meaning from a batch of unorganized data.

4.2.1. Critical incident technique

The first step to consider, is how to collect observations, information and data i.e. how to extrapolate raw materials for our research. Having a methodological lens to work on the refinement of data is useless without a considerable amount of materials to work on, and methodology is equally important in the preliminary step of collecting opinions and structuring interviews.

Looking for a structured technique, to be consistent with the rigor of grounded theory processes and Gioia methodology, we have taken inspiration from the "critical incident technique". General John Flanagan introduced this technique during the second world war and published his official transcription a few years after its conclusion (Flanagan, 1954).

He applied his experience as a psychologist to interview American fighter pilots after a bombing or extremely dangerous recognition missions. The structure of interviews was focused on critical happenings that have occurred during these missions, he was interested in understanding how pilots behaved when facing critical decisions, how they felt and what brought them to take each specific decision. With the answers and data collected he managed to build an optimal and efficient "bombing routine", generating an increase in successful missions and eventually deciding to develop a general framework of his methodology when the war ended.

What has emerged years after the publication of his research is the fit of the methodology with almost all process related research. Plenty of management scholars who were developing process-based research decided to apply his technique to structure their interviewing framework, obtaining positive results. It is the possibility to rely on a semi-structured set for qualitative observation of people behavior, that played an important role in the diffusion of this practices. The critical incident technique allows catching specific moments impacting the personal and professional learning of individuals, making it the perfect tool to analyze learning by doing contexts (Serrat, 2010).

The observation of critical incidents or critical phases, provide the researcher with a personal perspective collected directly from the people involved, facilitating his/her understanding of issues and obstacles those people faced, illuminating the way in which they succeeded in solving problems and improving their routines.

Incidents are therefore the perfect generator of level 3 learning, stimulating reflection – reflective cycle, (Gibbs, 1998) – and introspective thinking. According to the methodology, interviews are structured in a versatile and open-ended way, with semi-structured questions to be followed leaving space for ad-hoc questions and different insights for each interview, this permits to apply it effectively in varied situations.
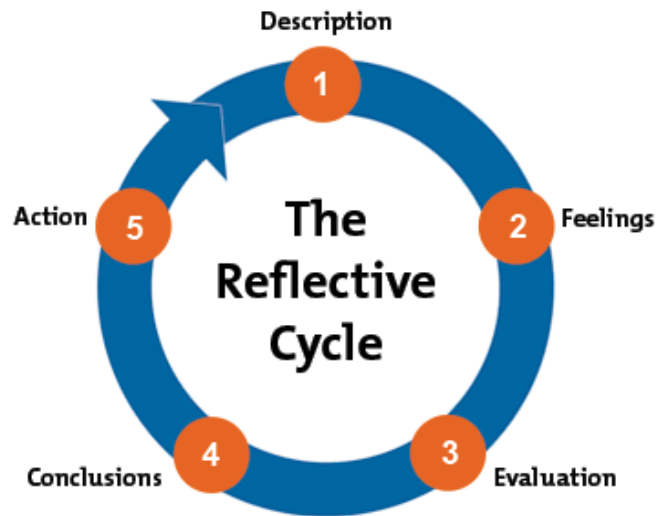
For these reasons we are firmly convinced that this methodology suits perfectly our research context and purposes because in the complex and uneven seed-accelerators' framework, we believe, critical incidents are the triggering element for boosting start-ups growth, and what our research wants to achieve is the induction of a reflective process of practitioners, hoping that this will lead them to an improvement of the status-quo.

4.2.2. Grounded theory

One of the most known scholar who has immersed himself more the once in researches based on grounded theory methods, Denny Gioia, declared in an interview that he gave to projectscrib.org: *"I do not start with a theoretical framework because that's instantly putting the blinders on. I start with a research question. … The research question has to be in a form that helps you make sense of your experience without coloring that interpretation of experience."* (Klein & Klein, 2013), one of the peculiarities of this research approach is the presumed level of semi-ignorance or suspension of belief in the wisdom gained from the prior theoretical review. Grounded theorists sustain that the initial phase of data collection and interviews must be free from prior theoretical sensemaking or preordained understanding, otherwise the process will suffer from, what research theorists call,

confirmation bias. Because knowing the literature too early puts blinders on, bringing the researcher to concentrate only on what confirms his/her beliefs.

Moved from the same need of developing and unbiased exploration we have started to work on our research. Gioia used the adjective "Hermeneutic", which comes from the Greek figure of "Hermes", the messenger of the gods, to express in a figurative and almost role-playing manner his position as reporter of messages coming directly from the informants. Looking back to our experience, while writing this report ex-post, we can describe the process as "Holistic". That means we really immersed ourselves into the interview process, having in mind nothing but the willingness to develop a meaningful contribution, and following the flow of information and natural happenings. Only after having reached a satisfying number of interviews, we have collected all the data at our disposal and worked on the transformation and aggregation of raw data into a more structured model.

The main difficulty about conducting a qualitative based analysis is how to connect this kind of practices in a way that is suitable for an academic research process. Here is where the study and concept of "grounded theory" came to help. Denny Gioia himself has contributed to the explication of grounded theory with his own rigorous mechanism, based on the process of sense making from qualitative research, namely the "Gioia Methodology" (Gioia, Corley, & Hamilton, 2013).

Grounded theorists work on the collection of qualitative data to develop theoretical analyses from the beginning of a project, they must be able to learn what occurs in the environment around them while they are researching and join participants to understand and observe their feelings and opinions. A great extent of open-minded approach and observational capabilities are required since data are derived from researchers' observations, interactions, and the produced reports and materials, thus through the study of empirical events and experiences.

What distinguishes grounded theory from other qualitative research approaches is the presence of a pre-established set of guidelines allowing the advantage of knowing how to proceed and keep a structured and continuous focus on objectives. More accurately, all grounded theorists begin their research with a study of early data, a first refinement, separation, synthesis, and sort of raw data through qualitative coding. Coding in this field

is intended as the association of labels to segments of data to give an immediate idea about what that ensemble of citations and memos is about. This helps to reduce the amount of information via a clustering process without losing a detailed representation of what has emerged during interviews.

This clustering procedure continues until categories, and the relationships among them, provide a satisfying conceptual reproduction of the studied experience. Through comparisons and gathering of additional data, the developed model can be checked and refined until the process culminates in a "grounded theory" or an abstract theoretical understanding of the research field (Charmaz, 2006).

4.2.2.1. Gioia Method

One of the downsides of qualitative research, or any research method based on the direct self-collection of data, is the challenging task to build credible interpretations and convince the audience that what is proposed and analyzed is not made up but plausible and originated by a time-consuming work of research.

Dennis A. Gioia, being an active scholar and one of the most prominent supporters of qualitative research, decided to propose his own recipe, about how to bring "qualitative rigor" to the conduct and presentation of inductive research (Gioia et al., 2013).

It is common, for researchers, to design and execute theory development starting with an analysis of precepts, previous works, and traditional scientific methods. This progressive way of doing carries an evident paradox, affirming that to discover new knowledge one must build on what already exists. This is more a refining process of already existing ideas, and it is clear how it may result inappropriate if the purpose is to foster the development of completely new views, not encouraging originality. As Gioia stated: *"Advances in knowledge that are too strongly rooted in what we already know delimit what we can know"* (Gioia et al., 2013, p.16).

The purpose of the Gioia method, differently from other research techniques, is not to immediately reach a construct which is formulated and therefore measurable but to allow

consequentiality and step-by-step development of a concept, capturing qualities and describing or explaining a phenomenon of theoretical interest. Concepts are used as precursors to constructs, which is comparable to the relationship existing between prototypes and final products. In brief, this method is an iterative process built on human experiences and expressed in terms which are possible to be comprehended by both people and scientific theorists.

Figure 30 – Gioia method data structure
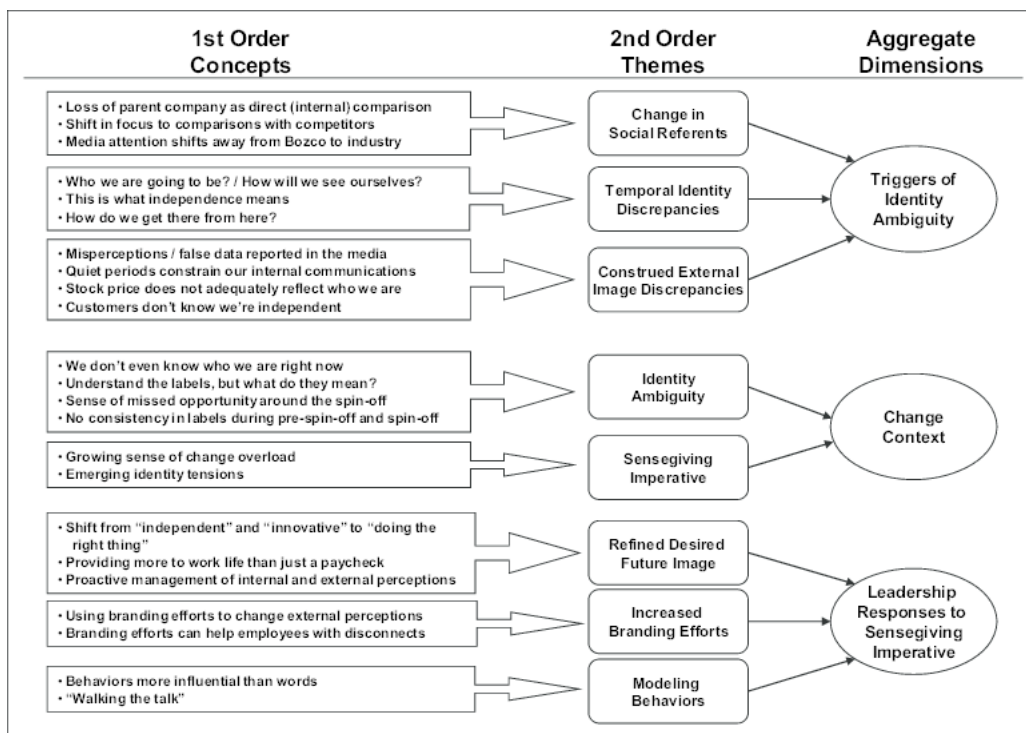
The method implies some basic assumptions on both external and internal level, like the social construction of the organizational world and the concept of "knowledgeable agents", meaning that not only organizations are based on social interactions among people, but those people know what they are trying to do and can explain it. It is also assumed that the researchers who decided to apply this method are knowledgeable as well and capable of figuring out patterns and connections in the data.

As it is possible to observe in Figure 30, the presentation of research findings happens in a way that shows connections, emerging concepts, and the resulting grounded theory. The development of such a model originates from the need of a way to show the execution of

data gathering and analysis in a systematic way, with a clear explanation, to create a presentation that reveals the care dedicated in the data acquisition process but also in the analysis of those data. This is achieved with the distinction between "1st order" and "2nd order" steps of analysis.

The concluding refinement required by the procedure is the capability of stepping from a static picture, which is the data structure, to a more dynamic representation of the phenomenon, i.e. a grounded theory. The resulting grounded theory model is expected to be one that can show the dynamic relationships among emergent concepts explaining the phenomenon under analysis and clarify the important data-to-theory connections found during the 2nd order level of analysis. The intent is to allow readers to look at the theoretical model and immediately grasp essential concepts and themes contained in the data structure with a dynamic perspective among those concepts.

4.3. Data collection

The critical incident technique, briefly described in the previous section, has successfully been applied, in the last twenty years, in a large variety of social sciences disciplines, becoming a well-proven qualitative based approach to data collection. As we have explained, the analysis of critical incidents enables the researcher to find similarities, differences and learn more about the underlining patterns, understanding how and why people engage in an activity and which are their expectations.

To structure our data collection procedure, we have followed the initial three steps of Flanagan's original five steps process. We also derived inspiration and useful advice, before starting our own research, from a series of other studies applying the same methodology in different fields and contexts (Cope & Watts, 2000; Gremler, 2004; Serrat, 2010). We are now going to explain in detail each of the steps:

1. *Establishing the general aim:*

    Which means to establish the overall context of our research, define the activity to be studied, and clarify its aim. This initial step wants to be a support for the definition of our research questions and provide a common direction for the final steps of analysis and findings. This is particularly useful to maintain a constant focus during the process of determining research's objectives, regardless of the number of people participating in the process. Part of Flanagan's recommendation includes the suggestion to consult experts and practitioners active in the field, to ensure that the defined purpose is interesting, useful.

    In relation to our research, we have set as core activity of the study, mentoring services for start-ups in the context of acceleration programmes. Consequently, we have consulted four experts in the field – A. Rimassa, P. Cuniberti, P. Privitera, B. Pennino – looking for validation. Moreover, we have dedicated a brief literature review, as we have done for seed-acceleration, to determine whether the topic already had extensive references and information in the existing literature. The feed-backs we obtained were all positive, and some of the practitioners also contributed with their own view, criticalities and suggestions – some of which are

reported at the beginning of chapter 3, or simply asked to have a copy of our analysis, once concluded.

Responses permitted to formulate our general aim and context:

The aim of understanding how mentoring services are structured and what influences their efficiency in boosting the acceleration process of novice ventures during seed-acceleration programmes.

2. *Establish plans and specification:*

In this phase, the focus moves on the development of a plan to decide how to intercept and capture critical incidents. Flanagan's model lays down four focal points to structure an effective plan: situation, relevance, extent, and observers. We have summarized our plan in Table 8.

Table 8 - Data collection plan and specifications

Activity	Direct one-to-one semi-structured interview with startuppers and mentors who recently participated, or took part in the past, in acceleration programmes offered by northern Italy certified incubators or accelerators.
Aim of the activity	Gather information, develop understanding, widen experience, collect evidence, adopt critical perspectives, build knowledge about the dynamics of these relationships.
Situation	Where: Northern Italy certified incubators and accelerators, local mentor institutions and local university spin-offs. Who: Start-ups, Mentors and acceleration programmes' staff. What: Discussion about their opinion, experiences, and

	criticalities emerged during the participation to these initiatives or generally in their mentoring relationships.
Relevance – Critical incidents & Critical behaviors	Understand and deepen the discussion about the structure of mentoring relationships – If any – aimed at discovering any type of problem arising during mentoring. Faults, deficiencies or unsatisfied expectations witnessed by the involved parties.
Extent	All aspects and influences are going to be considered since they are potentially capable of generating a positive or negative effect. (Behavioural, cognitive, affective, cultural and linguistic)
Observers	Sole researcher, ensuring consistency in data collection, with the assistance of two experienced supervisors with a record of past academic publications.

3. *Collecting data:*

Collecting critical incidents that relate to the activity and description, as stated in point 2. According to the methodology's author, the preferred means for data collection are individual interviews or direct observations because they allow immediacy. We propose in this research a small variation in the interviewing process from traditional behavior centered CIT standards, inspired by the work of Huge et al (Hughes, Williamson, & Lloyd, 2007). The interviews are designed to be broader and based on a holistic understanding of mentoring relationships and structure. This allowed us to include not only the point of view raised by start-ups but also the other side of the coin, mentors, in favor of a more concrete and debated perspective.

The interviews were semi-structured and conversational, with a view to encouraging the interviewee to speak freely about his/her experiences. We have

used a set list of both open and Y/N questions as an interview guide but did not always address them in sequence. In the initial stages of the interview, to develop confidence and provide context, we usually started asking about start-ups business model, their evolution path, and relationship with support entities. Next, we divert the conversation on topics of interest for our research, asking subjects to recall their previous experience in acceleration programmes. Most of the times they eventually mention, directly or in an indirect way, mentors giving us the opportunity to ask more about it. To intercept critical incidents, we invite interviewees to reflect on at least two difficulties or positive outcomes of the acceleration process. All the subsequent questions where than strictly related to this experience and therefore differ according to the interview.

Table 9 – Figures and details of data collection

Participants	10 start-ups who have had ≥ 1 experience in acceleration programmes, 5 mentors actively involved in start-up support, 4 members of staff involved in acceleration programmes organization.	
Data collection activities	Semi-structured interviews. Dicrect observation of acceleration programmes.	
Interview reference questions	*Start-ups*	*Mentors*
	Initial conversation about the start-up's business model	Initial conversation about previous experiences as a mentor
	Have you ever participated in acceleration programmes? *What do you think about these initiatives?* *Which are the criticalities and what left you disappointed?* *Have you ever been engaged in mentoring relationships during these programmes?*	*Why becoming a mentor?* *How do you structure your work with start-ups? (Methods, meetings, topics)* *Which are the competencies you bring them?* *What is difficult about being a mentor?*

	How were these relationships managed? *What did you expect from these programmes? Have you gained it?* *Can you name three critical moments you have experienced in the development of your enterprise?* *Who helped you overcome or achieve these moments?*	*In your experience, what do start-ups need?* *Which are the common mistakes you frequently encounter in start-ups?* *What do you think about acceleration programmes?*
Observations	We have been invited and had the opportunity to observe directly specific phases – like deal line-ups and demo days – of acceleration programmes organized by H-farm, Intesa San Paolo, and Unicredit. During these moments, we were also allowed to ask questions and interview participants.	

4.4. Data Analysis

4.4.1. Data open coding

After the completion of all the programmed interviews, we began to work on the data collected applying a step-by-step data coding process. Coding processes are variable and usually not defined in detail by none of the methods cited in this chapter, because the process of finding a meaning from data is extremely personal and variable, according to the reviewer's personality and mindset.

In this section, we will explain the details of how we have proceeded to transform our interviews into compact and organized data, without losing any of the concepts expressed.

- Each of the interviews had been live-recorded and transcribed (in Italian or English) within a time-span of maximum 12 hours after the conclusion of the interview. This allowed to keep a certain level of focus on the interview and collect not only what emerged from the recordings but also body-language, personal impressions of the interviewer and any other kind of observation under the form of memos and footnotes;

- Transcriptions have been printed and reviewed on paper after all interviews were concluded, conducting an initial check and a deeper immersion into raw data. Review through reading helped us reconstruct initial interviews which happened 2 or 3 months before the conclusion of this work, underline the fundamental points and reconstruct meaning;

- During this first review, we concentrated on the most important blocks of information and relevant sentences without being too selective and keeping everything in its original format;

- An excel dataset has been built reporting all the 285 relevant citations. In this phase, we started to use color scales to facilitate comprehension and distinguish the source of the interview. This is a merely organizational procedure based on

transforming and aggregating what seemed to be relevant for our research. We have also submitted the resulting dataset to the attention of our supervisors;

- We then coded each sentence in briefer and clearer small citations in English. trying not to lose any important meaning – reducing lost in translation. This is an initial level of coding to enable a more compact and immediate visualization of the whole dataset;

- It was necessary, at this point, to bring back a defined track of research and work on the reduction of concepts differentiating between on topic and off topic citations according to our research question and objective. Redundant concepts have been aggregated into one "concept with relevance", when possible. This procedure brought the number of concepts from 285 to 189 (-96);

- Level 1 concept clustering, structured basing on the example in Figure 30, has been complex and messy since it was the first time we really worked on trying to make sense out of our data. In the end, during one of the attempts an initial overall framework of the final data structure, which will be presented later, emerged. This was for us a confirmation about the consistency of the data collected and it allowed to bring an initial degree of organization in our analysis. Citations could now be divided according to the elements composing a traditional mentoring relationship – e.g. the involved parties: mentors and start-up, and the peculiarities describing the mentoring relationship intervening among the two;

- Nevertheless, the framework was still not enough detailed and too simplistic. Therefore, we continued working on the fine tuning of the clusters created, simplifying and reducing the number of concepts, with the intent of distributing them in a way that could make sense not only for us but also for an unacquainted reader; Working on printed paper hanging on the wall, resulted to be very useful also in this stage. The visual impact and possibility to use colors, arrows and move clusters around in a physic space proved to be an effective method to work with data and structure a meaning out of them, eventually resulting in the final integrative model.

4.4.2. Data structure and resulting model

At the end of the coding process, we managed to give a final structure to the set of unorganized data collected. What it was important for us to be stressed in the description of the process, is how the outcome obtained is the result of multiple rounds of analysis and understanding of the data we have gathered, with the only purpose of creating an overall framework and a clear representation able to summarise, to a uniformed audience, all the important findings raised during our qualitative research.

In the next pages we will explain how we have worked on reconstructing meaning from data, starting from the series of level 2 concepts obtained from the initial open coding and aggregating concepts into meaningful explanations – or aggregate dimensions. First, we introduce the final integrative model and, starting from that, each of the elements will be described and explained.

Theoretical and practical implications and comparisons with the existing literature touched in previous chapters will be considered in the conclusive "discussions" section, maintaining a *"willing suspension of belief"* (Gioia et al., 2013, p.21) to avoid biases driven by prior hypothesis and favor an easier understanding of the data structure. This permits our research process to maintain an "inductive" form – rather than "abductive" reasoning based on data and existing theory.

Resulting model:

Figure 31 - Mentoring in acceleration programmes integrative model
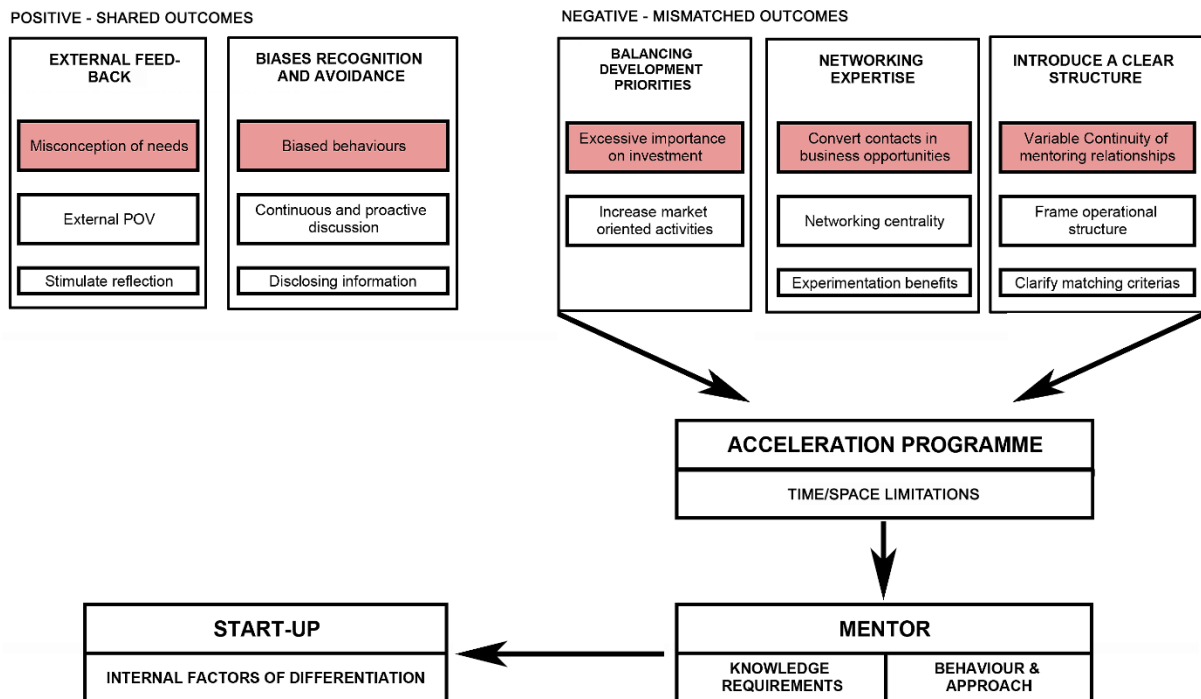
Figure 31 shows the resulting model from the combination of *mentoring outcomes* and the limitations induced by *structural elements* and their influence on negative outcomes, which are going to be described in detail in the next paragraphs. The structure adopted wants to generate a clearer understanding of mentoring dynamics in the context of acceleration programmes by defining its constituent elements, activities performed and contextual limitations.

Starting from the top, the model reassumes five outcomes generated by mentoring activities and emerging from our research, which have been encountered across all the analysed cases. These outcomes are also distinguished according to their positive or negative impact on expectations, problems and criticalities, underlined in red on the model, witnessed by start-ups during interviews when asked to mention incidents they faced while they were engaged in mentoring relationships.

Consequently, a set of fundamental limitations imposed by the context under analysis – acceleration programmes – and the chain reactions or bottleneck generated by these constraints to the subjects involved in mentoring – i.e. start-ups and mentors – are outlined. These are defined by specific traits about the abovementioned subjects and are

expressed respectively by time and space limitations, knowledge and behavioural requirements and internal differentiating factors, having a direct influence on the effectiveness of mentoring activities.

4.4.2.1. Mentoring emerging outcomes

Our greatest efforts during this research have been dedicated to the analysis of what happens between mentors and mentees – start-ups in our case – and which are the outcomes generated by mentoring to increase the chances of boosting the development of the mentee.

Discussions with start-ups, mentors and accelerator's managers have brought to our attention both positive and negative outcomes, giving us the possibility to gather insights regarding start-ups expectations, issues and obstacles arising during a mentoring contact which may slow their development, as well as activities performed by mentors to overcome these problems and their effectiveness.

External feed-back:

Table 10 - Mentoring data structure 1, External feed-back

LEVEL 1	LEVEL 2	AGGREGATE
Start-ups should know better what they want, only than you can effectivly choose your mentor Start-ups do not know or have a naive conception of their primary needs Start-ups must develop a self-understanding and self-analysis of their needs and motivation Start-ups should think in advance of their expectations and what they want to achieve from mentoring Withouth knowing your purposes and expectations it is almost impossible to make the most of these activities	MISCONCEPTION OF NEEDS	EXTERNAL FEED-BACKS
The value added of having an external supervisor Mentors bring an external p.o.v. and useful feed-backs Mentoring and external source of advise are important for start-ups Mentoring offers the possibility to welcome an external feed-back and change accordingly	EXTERNAL POV	
Mentors should incorage reflection Mentors should bring a cause-effect perspective Help start-ups to reason and rationalize on their situation and evolution phase After having comprehended, Mentors can propose an alternative need prioritization Mentors should stimulate a profund reasoning in strat-ups, help them understand what they want and how	STIMULATE REFLECTION	

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Being a start-up the translation of an innovative idea into a real organization by a restricted group of people, there is a higher probability, within this group, to rely on naïve credos and self-serving conceptions leading to plan and pursue distorted needs. Start-uppers recognized that before the beginning of acceleration they had no clear vision of their expectations, goals to achieve or primary needs. There are multiple ways to counterbalance and hinder this effect, we have named "*misconception of needs*", one of this is mentoring.

Mentoring proved to be particularly helpful to solve this problem by allowing the team to rely on an *external point of view,* which means to "*welcome an external feed-back and change needs accordingly*", with mentors *stimulating self-awareness and* facilitating *reflective reasoning*. Many entrepreneurs pointed out how the possibility to rely on the opinion of an external subject helped them to step back and *"perform an introspective reasoning process, rationalize their situation, evolution phase and position in the overall ecosystem"*. This is a necessary step to understand *"what we want and how to pursue our objectives"*.

Biases recognition and avoidance:

Table 11 - Mentoring data structure 2, Biases recognition and avoidance

LEVEL 1	LEVEL 2	AGGREGATE
We failed picking mentors and looking for confirmation instead of searching for complementation Start-ups should not fall in love with their idea and continue questioning assumptions Start-ups should avoid imported recipes for success	BIASED BEHAVIOURS	BIASES RECOGNITION AND AVOIDANCE
Secrecy and nda are important to allow safety and security Start-ups lack of trusts and abuse of nda Mentoring relationships are built upon complete trust and share Italian start-ups are unwilling to disclose information	DISCLOSING INFORMATION	
Mentors should never stop to ask, review and give feed-backs Mentors should always ask the start-ups needs Mentors must pose annoying but crucial questions At the beginning Mentors should make start-up speak and listen to understand Mentors should engage start-ups in constructive discussions	CONTINUOUS AND PROACTIVE DISCUSSION	

Similarly, inside the mechanism of team's reasoning, it is frequently possible to observe how biases abound and can proliferate generating not only needs misconceptions and

self-serving behaviours – *"start-ups falling in love with their idea"* – but also other common cognitive biases like confirmation, framing, or availability heuristic.

Table 11 shows how mentoring services successfully helped start-ups *recognize biases and avoid them* through *continuous and proactive discussion* flowing both ways, from mentors to start-ups and vice versa. Mentors are required to *"always ask about start-ups needs"* and *"pose annoying but crucial questions",* only in this way they can *"listen to understand, review and warn"* start-ups about the consequences and the flaws in their reasoning.

Discussion may however be hindered by non-disclosure agreements (nda), in fact we have collected conflicting opinions about *secrecy* and the common practice of asking external consultants to sign and nda at the beginning of mentoring relationships. This "*lack of trust and abuse of ndas*" can potentially inhibit the impact that a free and honest discussion generate, acting like a filter.

Balancing development priorities:

Table 12 - Mentoring data structure 3, Balancing development priorities

LEVEL 1	LEVEL 2	AGGREGATE
Mentors help in this programme was focused only on investment and pitch Mentors focus on preparation to face investors but not on how to concretize Most of mentors focus on investment and contacts with investors for many start-ups it is not useful Extensive focus on the investment side only We found useful to work on how to speak to investors, engage them and win attention	EXCESSIVE IMPORTANCE ON INVESTMENT	BALANCING DEVELOPMENT PRIORITIES
There should be more attention for market connections Mentors should be more efficient in helping start-ups to overcome barriers in approaching the targeted market More attention should be given to product development, market launch, pilot tests and product-market fit activities Mentors proved to be fundamental in the enlargement of our targeted markets	INCREASE MARKET ORIENTED ACTIVITIES	

Although entrepreneurs recognize the benefits of relying on an external reference person, facilitating discussion and biases recognition they allege an imbalance in the activities performed with their mentors. Start-ups observed how mentors' activity were most of the times limited to investment related topics, like pitching or how to gain investors interest. As reported by many entrepreneurs *"Mentors' help was mainly focused on investment and pitch preparation",* even if they know that finance is useless without an appropriate

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development of the product or a strategy for market entry, especially for early-stage start-ups without a *clear market segment* to attack or an *undeveloped product.*

This third outcome underlines a mismatch which is linked to a *conflict of development priorities* stemming from observation of start-ups expectations and mentoring behaviours.

This is the first emerging mismatch attributable to the environmental characteristics we have briefly outlined at the beginning of this section. So far, we have observed how start-ups need to be facilitated in the recognition of their primary needs and how mentors should help them avoid these situations by encouraging a continuous questioning of assumptions and critical observation rather than nourishing wrong beliefs with a "give them what they want" mentality.

Networking expertise:

Table 13 - Mentoring data structure 4, Networking expertise

LEVEL 1	LEVEL 2	AGGREGATE
We managed to establish concrete contacts thanks to our mentor There is a clear problem of contacts conversion into concrete deals We have met profesionals and initiated contacts that will certainly concretize in the near future Many startuppers do not know how to transform contact into concrete opportuities	CONVERT CONTACTS IN BUSINESS OPPORTUNITIES	NETWORKING EXPERTISE
Start-ups have to recognize and face problmes, experiment solutions and exercise A start-up need to have a safe playground to experiment and try new things Start-ups will benefit from the possibility to experiment concretely new possibilities and fail in a protected zone	EXPERIMENTATION BENEFITS	
Networking should be more important Using social media as a networking tool Most of activities performed are centered around networking and investment collection Enterprises must take care of their social side	NETWORKING CENTRALITY	

Networking is probably one of the core activities performed by mentors during acceleration programmes to stimulate deal flow and *create potential business opportunities* for start-ups. However, what our analysis shows is a *very low conversion rate of contacts into concrete business opportunities.* A restricted number of entrepreneurs declared to have *"established concrete contacts thanks to the help of mentors",* but the majority outlined how *"there is a clear problem of contacts conversion into concrete deals",*

complaining about being connected to contacts which were useless or completely wrong for their business.

Mentors, who are supposed to rely on an existing pre-established network of contacts built during their previous experiences, act with the assistance of acceleration programmes managers, as intermediaries who facilitate the creation of links for start-ups' development, but, despite the centrality attributed to this activity, there are some criticalities related to the effective translation of networking into real business.

Introduce a clear structure:

Table 14 - Mentoring data structure 5, Introduce a clear structure

LEVEL 1	LEVEL 2	AGGREGATE
Continuous mentoring support is one of the key to increase success Mentoring relationships during acceleration programmes tend to continue after the conclusion No follow-up or continuation of relationship after the end of the programme Relationships with mentors did not lasted after the conclusion of the programme	VARIABLE CONTINUITY OF MENTORING RELATIONSHIP	INTRODUCE A CLEAR STRUCTURE
Relationships with mentors did not followed a pre-determined schedule A more structured relationship scheme with mentors will probably increase the overal duration Mentors changed according to the subject and results to be achieved	FRAME OPERATIONAL STRUCTURE	
Criteria for start-up - mentor matching are not clear No specific matching, start-ups could ask for a specific meeting with a mentor Mentor - Start-up fit is important but there are too many variables to consider even for a statistical model	CLARIFY MATCHING CRITERIAS	

In conclusion, we have observed how the durations of mentoring relationships are extremely variable, ranging from a simple meeting with "*no follow-up or continuation of the relationship*" to several years of consultancy even after the conclusion of the programme. In most of the cases, start-ups argued that *"the relationship did not follow a specific schedule or mechanism"* and suggested that *"a more structured relationship scheme with mentors would have probably increased the overall duration of the contact".* The absence of specific criterions regulating the operational and information exchanges between start-ups and their mentors or, in case of programmes with multiple mentors, unclear *"criterions for start-up - mentor matching"* adversely affect mentoring.

Thus, the *lack of a defined mentoring structure* seems to be another mismatch on mentor – protégé relations, influencing the continuation of the relationship during and after the conclusion of the acceleration programme. Despite the efforts made by organizers to

facilitate matching, with some programmes – like Unicredit Start Lab – offering particularly structured "Mentors day" and meetings, there seems to be neither defined criterions for matching nor a mechanism to ease subsequent contacts through time.

What happened, in many cases is that entrepreneurs, who are granted the possibility to choose freely from a limited range of mentors, failed in making the most out of this opportunity by choosing an inappropriate mentor or having a brief meeting and not keeping touch with mentors they selected.

So, although it is recognized that *"continuous mentoring support is one of the keys to increase success"* for start-ups, there seems to be no mechanism to encourage or at least increase the duration and continuity of mentoring, which often left unregulated and end up generating poor results.

4.4.2.2.   Structural elements influencing start-ups – mentor relationship

At this point we started wondering about the reasons behind the mismatches leading to start-ups dissatisfaction on the outcomes obtained. A further review of the data collected helped us notice some limitations and flaws coming from the peculiar structural elements composing the overall macro context of acceleration programmes.

Acceleration programmes limitations:

Table 15 - Acceleration programme limitations data structure

LEVEL 1	LEVEL 2	AGGREGATE
We can not afford to waste time in unfruitful relationships Time restriction in acceleration programmes is a limit for mentors In acceleration programmes, Start-ups and mentors can not afford time-waste and must clarify needs immediately The period of time we spent with mentors was very short	TIME CONSTRAINTS	PHYSIC LIMITATION
Start-ups do not have to be limited in their discovery Start-up's freedom of movement and discovery, take advantage of every showcase possible Start-ups should not be force to stay in one place Acceleration programmes organizers insist on the frequent attendance and presence	SPACE CONSTRAINT	

Acceleration programmes, as contextual element of our analysis, pose a set of very specific and stringent limitations which in turn contribute to enlarge criticalities and modify mentoring in a more restricted and atypical form. These constraints are evident also to our interviewees, since both mentors and start-ups have pointed out a series of flaws or downsides regarding acceleration programmes which have, in turn, an influence also on mentoring relationships happening in this overall scenario.

Acceleration programmes are characterized by *spatial and temporal limitations*, with the former referring to the limit imposed on start-ups' freedom of movement while attending these initiatives, and the latter to the limited duration of acceleration programmes.

By limiting start-ups freedom of movement, acceleration programmes are also inhibiting their possibilities to discover and get in touch with other external mentors therefore restricting the range of possible reference figures to the alternatives offered by each programme. For this reason, it is important, for both start-ups and acceleration programme managers, to understand how to distinguish good and bad mentors' according to their knowledge and approach.

Time constraints on the other hand, directly influence both the level of detail of activities mentors can perform inside accelerators programmes and the possibility to structure a defined and consistent modus operandi. The restricted amount of time and high pace of workflow during these programmes leaves very short time-spans to mentoring, and this impose another limitation on possible activities and a second distortion element.

Distinguishing good and bad mentors:

Table 16 - Mentors competences data structure

LEVEL 1	LEVEL 2	AGGREGATE
Mentors competences should be useful for product/service development Our mentor probably lack vertical competences in our specific sector The more developed the start-up, the more vertical competences mentors must have to brign a relevant contribution Mentors should have vertical specialization	MISSING VERTICAL SPECIALIZATION	KNOWLEDGE REQUIREMENTS
Mentors helped us with decisions about offers, financing rounds, market expansion Mentors helped us to clarify our BMC, structure an effective pitch, develop traction and involve people Mentors general competences (entrepreneurial forms, business model, business plan) Mentors should be able to indentify and make problem emerge	HARD SKILLS	
Particularly useful in critical situations (fear, uncertainty, anxiety) Mentors psychological competences (intecept down periods) Soft skills are very important for mentors (empathy, motivation) Mentors should be empatic and service-minded	SOFT SKILLS	
Mentors must have personal, profesional and sectoral capabilities Mentors should do their best to bring their prior personal experience at the service of the start-up Mentors were all professionals, former entrepreneurs or managers Mentors and other players in innovative ecosystem should put their endowments at start-ups disposal	PRIOR EXPERTISE	
Most mentors put their ego before their willingness to help Ego vs humble balance, both the extremes comprimse a mentoring relationship Some mentors in acceleration programmes are there for personal interests and not to help start-ups Mentors in private accelerators pursue different goals as compared to mentors in university accelerators Mentors should not show-off or be egocentric but simply useful	PERSONAL INTEREST	BEHAVIOUR & APPROACH
Mentors are authoritative, not autoritarian (like Managers) Mentors have a reasoned and not istinctive approach Mentors should be more honest and less indulgent Critiques should be funded on facts and not personal beliefs and credos Our mentor is very good at stimulating action	BEHAVIOURAL TRAITS	
Mentors do not substitute the entrepreneur, start-ups have to be prepared and work at home Mentors do not take decisions Mentors do not take decisions for start-ups In the end, it is up to the start-up to take the best from mentoring relationships	AVOID SUBSTITUTION	
Mentors difficult trade-off between remaining detached but developing deep knowledge of the start-up Mentors should immerse theirselves in the start-up Mentors must meet their start-ups regularly in a longer time span Mentors degree of interest and participation is wide	BALANCED IMMERSION	

As previously said, spatial limitation imposed by acceleration influence the outcomes of mentoring services also by limiting the range of possible mentors involved in the programme. The impact mentors can have in start-ups development is associated with their level of competences and knowledge, as well as their approach.

During the research we have been able to collect a list of *knowledge requirements* distinguishing good and bad mentors which directly influence the efficiency of a mentoring relationship, these requirements can be furtherly divided into: specific *hard*

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skills – like knowledge of business model canvas, effective pitching expertise, entrepreneurial forms, problem and opportunities recognition; *soft skills*, mainly related to empathy, motivation and ability to intercept difficult periods; general mentor's *prior expertise* in a certain field, a profession or as a former entrepreneur. What, instead, has been identified as difficult to be found but at the same time relevant for start-ups, especially later-stage, is the presence of mentors who possess strong *vertical competencies* in a specific field or market sector.

On the other hand, along with competencies, also mentors' behaviours generate an impact on the relationship and is preferred to follow some specific qualities. Here some critical approaches are summarized regarding the capability to *balance immersion* into the start-up sphere without *substituting the entrepreneurs*' decisional position, the necessity to *set aside ego and personal interest* and apply an *honest, reasoned and authoritative*, rather than authoritarian *approach,* with the only purpose of serving and favoring start-ups' growth.

Start-ups' differentiation factors:

Table 17 - Start-ups diversity data structure

LEVEL 1	LEVEL 2		AGGREGATE
Biodiversity inside start-ups team (cultural, competences, behaviours) Most of times teams do not develop self criticism, mentors should instead open their eyes Start-up team evaluation is a differentiation factor Mentors must evaluate the team and support accordingly	TEAM COMPOSITION		
Mentoring is particulary useful for early-stage start-ups At early stages we really benefited from learning services about managerial and economic topics In early stages we lacked of basic knowledge and had to compensate Useful in early stages but results are not proportionate to efforts Young entrepreneurs frequently lack competences to be an entrepreneur	EARLY STAGE	DEVELOPMENT PHASE	INTERNAL FACTORS OF DIFFERENTIATION
Assistance for scale-ups is almost absent As later stage start-up we did not benefited a lot from mentoring support Being a mid stage we found some mentoring activities redundant At this level of evolution we do not need technical or competency help, we have to work on our product and customers	LATER STAGE		
Hardware start-ups follow a different evolution curve and time Start-ups are all different, needs change according to start-ups Start-ups needs are different according to their core business Differentiation of start-ups at the same level of development should be clearer	BUSINESS MODEL TYPOLOGY		

Table 17 summarizes the aggregate dimensions focused only on start-ups characteristics to be kept in consideration by mentors during mentoring relationships. It is easy to observe how start-ups are characterized by a variety of diversification levels, we have

summarized as "*start-ups' internal factors of differentiation"*, going from the start-ups' stage of development, requiring a different approach according to later or early stage start-ups, its business model configuration – ranging from software or service based to process or hardware innovations, just to mention a few possibilities – and teams biodiversity of members.

This, in turn, suggests that mentoring relationships are influenced by many different dynamics regarding start-ups internal characteristics (*stage of development, team composition, and business model typology*) which should be crystal clear to mentors when dealing with start-ups, and are instead not always considered due to time constraints.

For Mentors, having a previous knowledge about these differences plays an important role to achieve an equally differentiated and effective mentoring programme outcome – suggesting that in mentoring, one size does not fit it all. From the foregoing, it seems that mentoring can potentially be sub segmented in smaller variations according to the distinctive traits of subjects involved. Assuming different configurations if: the start-up involved is at its early or later stages of development – with a higher impact in the former case; the start-up deals with product or other kinds of innovation; the start-up is composed by a well-balanced team or not. That is why we have decided to keep start-ups differentiation factor as a separate block of characteristics impacting mentoring efficiency.

4.5.   Discussion

The main purposes of this research are: (a) Uncover the criticalities related to mentoring relationships in acceleration programmes, (b) show how mentors act to impact these issues, (c) help guide future research by building an initial layer of understanding about this specific practice.

This analysis constitutes an attempt to move a first step towards a more detailed understanding of entrepreneurial learning dynamics and developmental interactions in the overall context of acceleration programmes. To reach this purpose, the methodologies applied and described in the first half of this chapter allowed us to explore in an active way, even though maintaining impartiality and detachment, how mentoring dynamics in this specific context differ from other types of learning interactions or even from traditional mentoring according to the taxonomy of D'Abate et al. (D'Abate, Eddy, & Tannenbaum, 2003), understand the causes generating these variations and comprehend which are the activates performed, their limitations and negative outcomes influencing the role of mentors as external subjects whose goal is to favour the growth and sustain the development of start-ups.

Our findings demonstrate how mentoring in acceleration programmes assumes a peculiar configuration dictated by the necessity to satisfy entrepreneurs' needs while at the same time respecting limitations posed by the overall seed-acceleration ecosystem. Mentors, in their available slots, try to sustain start-ups through a combination of activities aimed at stimulating self-awareness, avoid biased behaviours, pursue achievable objectives and milestones, create connections and try to facilitate the continuation of the relationship during and after the conclusion of the programme.

As it appears clearly also from the initial part of our analysis, the activities performed by mentors can help entrepreneurs develop self-understanding and clarify the role and positioning of the start-up in their surrounding ecosystem. This is demonstrated by the strong presence of conceptual and behavioural related interventions outlined in the model, and the complete absence of skills, or knowledge-based outcomes. However, according to start-ups witnesses, these may not always lead to the expected positive outcomes.

The type of outcomes encountered are in line with the taxonomy of learning dynamics described by Kreiger et al. (Kraiger, Ford, & Salas, 1993) and furtherly researched by Etienne St-Jean, who is the most active scholar in this field, whereby mentoring learning outcomes are mainly related to cognitive- and affective-based learning, more specifically knowledge organization, cognitive strategies, attitudinal and motivational outcomes.

This in turn is coherent with the capability of mentors to stimulate reflection and foster a deeper level of learning in line with Kolb's learning cycle (Kolb, 1976), which details have been discussed in chapter 3 and resumed at the beginning of this chapter. It is indisputable that mentors are, when they satisfy specific characteristics, capable of stimulating a level of learning which is beyond learning by doing, reaching level 3 learning, encouraging reflection and questioning established assumptions, ways of doing, values and perceptions driving entrepreneurs' behaviours.

However, this research shows also some inconsistencies with previously discussed theoretical definitions as well as limitations imposed by the structural elements involved. As in the case of D'Abate et al. (D'Abate et al., 2003) whose analysis of entrepreneurial learning typologies have underlined how mentoring differs from other constructs – coaching above the others – mainly because of its generic objectives and medium to long time frame. This perspective partly contradicts the characteristics of the mentoring construct emerging from our research, proving that the type of support offered to start-ups participating in acceleration programmes is something different from what is generally defined as mentoring.

The causes of this deviation from what has been studied in the past, are to be attributed to the peculiarities of the context considered. Constraints imposed by acceleration programmes' business model, described in the previous paragraph, are strong and cause a series of chain reactions linked to mentors' capabilities and their effectiveness in helping start-ups, thus making the adaptation of mentoring dynamics harder.

This confirms what have emerged during chapter 3, while discussing about mentoring and the huge amount of dynamics and conflicting views to be considered in such an uncertain context as entrepreneurship, opening a link to a common strategic trade-off stressing the necessity to balance efficiency and effectiveness, deliberate planning and emergent strategies, causation and effectuation (Sarasvathy, 2001). The continuous

research for efficiency carried on by acceleration programmes and their promise of a shortcut for a safer and top-down growth through mentoring advices for early stage start-ups, frequently ends up limiting entrepreneurial development rather than accelerating it, by protecting entrepreneurs from mistakes, failures and all the positive aspects of learning coming from experiences and practical "doing" rather than planning and purposely setting goals.

As a matter of fact, a significant number of relevant authors have set themselves as promoters of a more bottom-up and free discovery view. One that balances trial and errors, experimentation, serendipitous discovery, embracing uncertainty and unstructured environments with deliberate business planning, market research and goal setting.

More specifically, authors like: Saras D. Sarasvathy (Sarasvathy, 2001) who succeeded in structuring a model pitting effectuation and causation and describing how entrepreneurs can create new opportunities acting and interacting freely with the external environments, being aware an exerting direct control on their means without any spatial limitation; Robert Chia (Chia & Holt, 2006), introducing a view of strategy as "wayfinding" and unintentionally emerging from practical coping and acting without intentional planning or scheduled milestones which impose a "building" view of the world; Daniel Hjorth, who linked entrepreneurship and spatial concepts describing entrepreneurship as *"the tactical invention of new practices, changing our styles of living, the cultural acts of disclosing new worlds"* (Hjorth, 2004, p.418), this description creates a breaking point widening the managerial "role, control, tactics and strategy" meaning associated with entrepreneurship since the 80s, with the concept of *"space for play, invention and actualization, actuated by movements toward future creation"*.

The underlying difficulty behind the limitations raised by our qualitative analysis is therefore linked to the predominance of a managerial and control conception of entrepreneurship, limiting the advantages related to serendipitous discovery of start-ups while attending support programmes.

Mentoring services, in turn, on one hand suffer from the contextual limitations imposed by entrepreneurship support entities, like accelerators, and on the other hand contribute

to nurture this standardized view by being too normalized in comparison to the extreme heterogeneity and uniqueness of entrepreneurship.

Accelerators should therefore work on their ability to grasp these concepts and translate it in a reconfiguration of their model, balancing controlled and uncontrolled periods where start-ups are left free to experience what learned and take back consequences, in a way that helps to avoid a restricted and outdated view of entrepreneurship as a continuous research of an efficient managerial strategy.

4.5.1. Theoretical and practical implications

Previous studies, some of which have been discussed in chapter 3, have already explored the role of the entrepreneur's educator and have advanced our understanding with respect to effective techniques and developmental interactions applied to favour the creation or support the development of entrepreneurs (Kuratko, 2005). Nonetheless, a limited set of researches have addressed the role of those who observe and support the entrepreneur while the star-up grows, e.g. mentors or coaches (St-Jean & Audet, 2012).

A very brief research about mentoring bibliography shows that, so far, little has been researched about mentoring services offered by acceleration programmes. While there are some references discussing mentoring practices in other contexts, like: mentoring at work, to help employees during their career development or mentoring young generations and university students to ease their search for a meaning and purpose in life.

Our contribution wants to be an answer to the increasing request of analysis focusing on mentors, coaches and agents supporting emerging ventures and coming from recent studies criticizing or questioning the effectiveness of business incubators, accelerators and acceleration programmes.

We are also aware, as said at the beginning of this chapter, of the need to develop further research for the academic advancement of the macro-field of entrepreneurship and micro-topic of seed-acceleration, proved by the large number of call for papers made by universities and research institutes, and wanted to make an active contribution to it.

This analysis stands out from the crowd of investigations proposed in the field of entrepreneurship and entrepreneurial development models, for its specificity, since it builds on existing previous knowledge about seed-acceleration and mixes it with the qualitative analysis of a very specific service, such as mentoring.

Recent emphasis on entrepreneurship and the positive effects it can bring to the overall economy – see chapter 1 paragraph 1.1 – stimulated also the interest of universities and other higher education institutions who would benefit from research in this field since they are, similarly to accelerators, suffering the pressure of criticism about the front-line role they should cover in fostering new generations' entrepreneurial mindset.

Moreover, we envision the possibility of helping practitioners who are dedicating their daily efforts to the refinement and improvement of start-ups support services and acceleration programmes by proposing an external hermeneutic view point coming from the interpretations of start-ups and mentors' opinion, through this qualitative based analysis.

4.5.2. Conclusion: further research and limitations

All studies are limited in some ways, and this study makes no exception. Thus, in this final section we want to acknowledge limitations dictated by both the characteristics of our analysis and the methods applied. Some proposition for future studies of mentoring entrepreneurs, based on the evidence gathered, are associated to each of the limitations.

Although this research relies on opinions collected from who is directly involved in these kind of activities, to satisfy the requirements of the question posed, it is not possible to consider the findings as generally confirmed from a statistical point of view. To this purpose, further similar analysis is needed to enlarge the range of opinions coming from other contexts, thereby engaging a larger sample. Future researches may consider proposing a statistical based structured analysis of the variables arising from this work.

Furthermore, this research has involved start-ups, mentors and accelerators professionals fitting the research question from a theoretical point of view and allowing

to raise some observations, identify factors of differentiation and issues about the activity under analysis. What a larger number of participants would also permit, is the consideration of more specific contingent characteristics of the subjects involved. Future works may be able to distinguish them following more specific contextual factors like accelerator typology, start-up characteristics and mentors' qualities outlined in this study.

In conclusion, time limitations played a role also in the design of this work. The best way to evaluate effects and try to define a process model of mentoring relationships in acceleration programmes is by direct observation and assessment of start-ups before, during and after mentoring support. Clearly, such an analysis will require a considerable time-span as well as the employment of a greater number of researchers.

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Overall summary of chapters

It is time, in this brief recap, to take stock of the work done and discuss the overall and most important findings outlined during this whole analysis, about which a more detailed summary is provided at the end of each chapter.

In chapter 1 we have exposed the prior knowledge of theoretical concepts underpinning this whole research like the increasing relevance attributed to entrepreneurship in fostering economic growth, innovative enterprises' development stages and how support entities are able to find their specific intervention timing. This is just one of the differences between accelerators and other start-ups support institutions, which are distinguished also according to the services offered and their business model. At the end of the chapter it is also possible to observe how innovation is unequally distributed all over the world, with huge differences from country to country. At European level there are visible discrepancies dividing north-western innovative Europe from south-eastern countries which are lagging behind, Italy included. An in-depth analysis is dedicated to Italian geography of innovation, showing how innovation and innovative new enterprises, which have been officially introduced in the national legal system in relatively recent times, tend to concentrate in northern countries, are experiencing a steady growth in numbers but still suffer from difficulties in connecting and communicating with the local financial system.

With the literature review performed in chapter 2, it is possible to grasp how seed-acceleration, from an academic point of view, is still under definition and not covered by sufficient research, with several authors trying to stimulate a greater effort to reach a broader understanding of the topic. On the other hand, practitioners are dedicating their daily work to the refinement, optimization and adaptation of a service which is recently receiving greater attention from media, governments and universities. A possibility for future research may be to investigate on the reasons behind this gap and the issues inhibiting the alignment of theory and practise.

Before diving into the final qualitative analysis, it was appropriate to review the existing literature on entrepreneurial learning and mentoring, to clarify the current definition of mentoring and have a benchmark for comparisons. Chapter 3 permitted to understand

more about previous researches on this topic, the subjects involved, and outcomes stimulated. Starting with an overview of entrepreneurial learning and the specificities of how entrepreneurs experience learning, a connection with entrepreneurs' evolution discussed in chapter 1 emerged, suggesting that entrepreneurs evolve together with their businesses and following predictable evolution-curves. On the other hand, some scholars argue that entrepreneurship is influenced by many different variables and it is farfetched to think that a model can effectively capture it all. The second half of the chapter is dedicated to developmental interactions and mentoring general definition, since no previous studies analysing mentoring in acceleration programmes has been found. It appears that mentoring is different from the other types of interactions because of the outcomes stimulated, its duration and structural variation, this in turn generates difficulty in reaching a generally agreed taxonomy of mentoring.

During the qualitative research performed, both confirmation and discrepancies with the findings emerging from chapter 3 have arisen. The model presented in chapter 4 demonstrates how on one side the distinctive characteristics pertaining to the outcomes generated, structural elements and subjects involved by mentoring are in line with the definitions existing in literature. On the other side, mentoring services in the overall context of acceleration programmes assume peculiar characteristics distinguishing them from the generic mentoring concept. Investigating the possible causes behind these differences it has been showed how time and space constraints stemming from accelerator's business model affect mentoring leading to a unique variation. Constraints, in turn, generate limitations – or bottlenecks – on subjects involved in the relationships and especially on mentors' capability to effectively support start-ups development. In conclusion, this continuous research for efficiency and top-down stimulated growth of start-ups pursued by accelerators and entrepreneurship support entities opens a link to a well-known strategic trade-off stressing the necessity to balance efficiency and effectiveness, deliberate planning and emergent strategies, causation and effectuation.