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The role of the entrepreneur's social ties in the different stages of growth of an innovative startup

Eight case studies in the food industry

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To my family, my support and my strength.

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INTRODUCTION

The agri-food industry has always been considered less technological than other sectors, as it is rooted in traditional methods of intervention and rigid structures of resources management. In this sector, it is not easy to create and implement innovative solutions but how can innovation break into the agri-food industry?

An answer may be through innovative start-ups. Innovative start-ups are primary actors promoting innovation processes. I selected them for my research to investigate how they develop themselves in slow-paced contexts and to deepen the role of founders' social networks in their processes of evolution.

Therefore, I started analyzing the trends in the food industry in Chapter One to understand what are the main dynamics, areas of intervention and investment present in the fod sector. Agriculture 4.0, blockchain, cloud systems, QR codes and smart objects are concepts that are increasingly playing a crucial role in the worldwide and Italian agri-food scenario. After I had delineated the innovative evolutions in this landscape, I analyzed the start-up entity in Chapter Two, by identifying their lifecycle steps, their structure, the strategies they usually adopt, the actors with which they interact (e.g. incubators, accelerators, universities, venture capitalists, business angels and large firms) and the positive and negative factors influencing their growth. Besides, in Chapter Three I explored the interplay between start-ups' growth and their ways of connecting to the external environement thanks to founders' ties. As we will see, start-ups are poor in resources by nature, and this encourages them to exploit every single channel of interaction and communication they have to gain further assets and capital to accelerate their growth pace. That is why in this typology of ventures, entrepreneurs' social networks are more important than in any other business typology. Strong and weak ties, heterophilic and homophilic ties, formal and informal ties: different types of relations with different rules, dynamics and resources conveyed.

To answer my research question, I selected eight innovative startups in the region of Veneto and I explored the way entrepreneurs have orchestrated their networking ties to boost their evolution. Through the collection of available documentation (e.g. websites, videos, social media, press, Linkedin) and semi-structured interviews, I firstly identified startups key events and secondly I detected what kind of contribution and effect social networks have had on them. Thanks to a qualitative method of analysis, I deepened the mechanisms of actions and decisions of founders to answer to my research question.

1 - NEW EVOLUTIONS IN THE FOOD INDUSTRY

Agriculture plays a crucial role in every country's economy, as it represents a powerful hub of resources and has a relevant impact on GDP growth of Western economies. Food sector is relevant both for its economic contribution, but also for the importance in the future perspectives of planet Earth. Globalization, global warming, climate change and fuel-based economies are threatening the preservation of livelihood resources. However, it has also a negative impact on sustainability, when it comes to intensive farming, in which the use of chemical substances leads to soil degradation and pollution of inland waters.

Further, it is important to underline the transformation happening at the level of consumers food experience both in terms of purchase and consumption. Their increasing attention toward food quality and safety raised the threshold of the parameters required.

1.1 Food domain challenges

As one might see, the current food capacity of planet Earth is not sufficient (Figure 1). The horizontal axis shows the ecological footprint[1], which has an increasing trend; the vertical axis shows the food demand. Currently, the food demand in comparison to our planet's capacity is not sufficient (the ecological footprint is twice the planet's capacity) and a perpendicular shift is necessary, as increasing food demand will request an ecological print that the planet will not be capable of providing in the future. Therefore, the challenge is to satisfy the augmenting *food demand*, respecting the ecological print by finding solutions to more than doubling agri-food production.

Studies have demonstrated that food demand is expected to increase because of the rapidly growth of urban areas and it is predicted to grow by 60% and by 2050 it will presumably reach values between 59% and 98%. At the same time, global population will turn from 7 billion into 9,2 billion inhabitants (Bellini, Osservatori, 2018).

To satisfy this need, by 2020 global agricultural production should grow by 70% and it will not be possible to merely cultivate fields through intensification methods or the utilization of other agricultural resources (FAO, 2019).

[1]The ecological footprint measures human demand on nature: the quantity of nature it takes to support people or an economy.

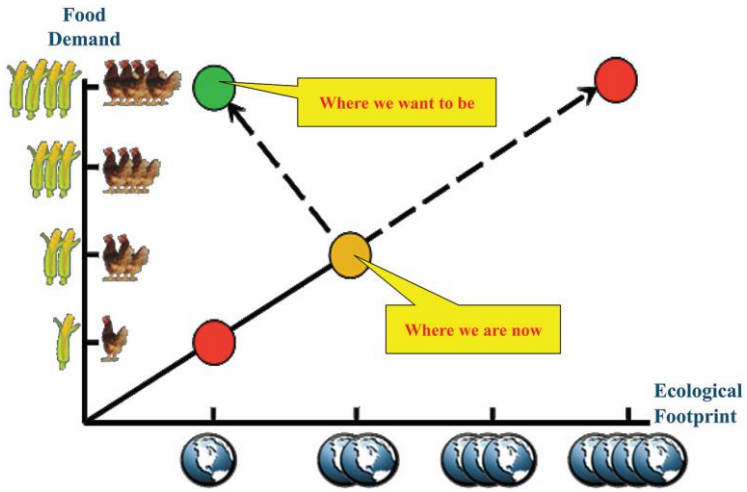

Figure 1: Food demand vs ecological footprint (Sundmaeker et al., 2012)

Agriculture seems to be the main supervisor and victim as well of the global warming: it is the primary source of livelihood, but in the same time, it erodes precious resources. For instance, it produces greenhouse gas emissions because of intensive farming systems, contributing to 24% of total harmful emissions produced globally (IPCC, 2014). Besides, the creation of new fields coming from deforestation produces carbon dioxide. Agriculture is then the principal source of water consumption and pollution, as it deploys fertilizers and manure that have a relevant impact on lakes, rivers and ecosystems balance. It accelerates even the loss of biodiversity because of deforestation, threatening natural flora and fauna. What it is necessary to understand is that current business models and harvesting systems are not proper to actual environment conditions (FAO, 2019).

Food demand is not the single challenge that agri-food industry has to face. *Food safety* is an issue that nowadays covers a fundamental role: consumers are more expert, interested and sensitive to products' matters. They want to know the product's origin, its production process, its supply chain and the working conditions that have been imposed. Internet and the growing economic wealth of countries have encouraged this trend that is rooted in the "modern consumer's perception". In fact, consumers are more aware of the relation between food consumption and allergies, diseases and obesity.

In Italy, for example, the "methanol case" has definitely changed how much consumers pay attention to food provenance and production methods. In March 1986, twenty-three people died or had serious damages (e.g. loss of sight), because of the introduction of methanol or methyl alcohol in wine. A decision that was due to the intention to increase the alcoholic content. Since then, in the wine and in the food industry, in general, a shift in the degree of customers' interest happened: from a quantity-based offer, there has been a direction towards quality and value.

In addition to the challenges firms have to face, there are even more concerns about sustainability: both in terms of customers' desire and in terms of environmental preservation. One-third of food produced for human consumption is lost or wasted globally and the CO2 emissions must be reduced to protect biodiversity and control climate change (FAO, 2011).

Further, counterfeiting emerges to be an additional challenge to food sector players. The value of counterfeit and pirated goods imported in Italy in 2016 is equal to 12.4 billion euros, which represents 4% of Italian imports of genuine goods. The top exporting countries are China and Hong Kong (China). 16% of goods imported to Italy were food products, lagging behind the first threatened sector, which is fashion (OECD, 2018).

A correlated phenomenon is Italian sounding. It refers to the foreign products that simulate to be Italian by using names, geographical attributes or trademarks that recall Italian country. This problem has emerged with the increasing "Made in Italy" brand importance, as it is associated to quality, expertise and excellence, which is why it has become something to emulate and replicate to obtain profit.

The turnover of Italian sounding threat was equal to 90 billion euros globally in 2017 (Assocamerestero, 2020). In 2018, over 100 billion euros were estimated as Italian sounding turnover in the food sector, with an increase by +70% in the last decade (Coldiretti, 2018).

As one might observe, a multiplicity of challenges threatens food industry and Italian food industry especially. The increasing demand of food and at the same time its inability to answer to it. Further, the amout of information available for consumers and their increasing attention to food ingredients and safety have transformed the scenario in which agri-food firms play. Therefore, agri-food firms are evolving to new management systems, adopting innovative and digital solutions in their supply chains.

1.2 Evolutions of Food supply chains: from upstream to downstream changes

The agri-food industry is striving not to fall behind to continuous challenges brought from market evolutions. New industry requests, new parameters and threats coming from the global market have led to changes in their supply chains. For instance, new disruptive technologies to ensure traceability, to guarantee the optimization of resources (e.g. fertilizers, water) and sustainability are being adopted, or the possibility of exploiting the collection of data to take more informed decisions.

1.2.1 One of the driving forces behind the evolution: IT and digital tools

Some of these new market evolutions and requests find solution in disruptive technologies. When it comes to agri-food industry transformation, we can talk about *smart food economy*. «The smart food economy assumes the intense use of information and communication technologies and innovative digital solutions [..] for complex planning and management of food production and distribution processes» (Kosior, 2018).

This cutting-edge aspect gives birth to the "digital twin paradigm", where processes, systems and networks have a reflection (twin) in a virtual world (Uhlmann, 2017). It leverages the intangible dimension of structures around a potential or finished product, analyzing components at the micro level initially, ending with the final consideration of the complete structure at a macro level (Grieves & Vickers, 2017).

A massive collection of data and information during processes is grouped and categorized to give a concrete representation of what is going on and what has happened within supply chains. The introduction of these new digital technologies deserves attention: the volume of investments was about 6.8 billion dollars in 2017. Usa at first place, followed by China, Germany, India and the United Kingdom. Europe invested approximately a billion dollars and it is augmenting its digital process reaching a share of 30% on total investments (Bellini, Agridata, 2019).

The realization of a smart food system is based on four essential elements: *Internet of Things*, *Big Data*, *Cloud computing* and *blockchain*.

IoT are objects that are connected to Internet and merge the real world with the virtual one, aiming at finding solutions that enable monitoring and control of mechanisms and the transfer of information to support decisions real time. IoT may contribute to the augmentation of coordination between the nodes of the supply chain, but also can mitigate the demand-supply gap, reducing waste and monitoring food processing to respect food safety regulations.

IoT collect and store *large amount of data*. In fact, the introduction of these digital technologies (robots, sensors, drones) has made possible the collection of large amounts of data, not only in terms of quantity, but in terms of variety and speed. Traditional structured data are collected in addition to *unstructured data*, such as images, videos, signals, text files; partially structured and hybrid data, geo-localization data, multimedia data, residual data and social media data (Mayer-Schonberger & Cukier, 2013). For this reason, nowadays we talk about a *data-driven approach*, because information resources are multiplying, as well as tools to exploit them.

Agricultural firms usually answer to environment and conditions changes slowly; this may affect the effectiveness of reactions. That is why data evaluation and processing needs to be *real time*, so that they may provide the possibility of reacting to events quickly, in a more reactive and accurate manner.

The extraction of powerful information to support decisions is the result of a process of transformation, categorization, modeling and visualization of data that is more and more complex, but thanks to *Big Data analytics* and innovative tools like cloud computing, artificial intelligence and automation, it is now easier to enhance the speed between data collection and exploitation (Kosior, 2018).

Big data content provides a series of advantages (Mikalef, Pappas, Krogstie, & Giannakos, 2017):

- a broader spectrum of insight into production processes;
- finding correlations and new relations between variables and facts;
- increasing production efficiency;
- improving products quality;
- ability of forecasting supply and individual demand of products;
- traceability;
- anticipating failures and breakdowns of machinery;
- improving product lifecycle management;
- limiting waste;
- estimating the impact of daily production on financial results.

All of these benefits can be achieved if Big data analytics goes with *Cloud computing*. It represents one of the most important and powerful systems to which firms are paying attention nowadays. Cloud computing may be defined as a tool enabling to access to a set of resources, which are capable of elaborating information, such as networks, servers and data stores easily and rapidly. Cloud computing entails to create a more flexible system on demand, which may be expanded dynamically according to firms needs. Besides, it ensured the collection and the elaboration of huge amounts of non-structured data automatically (Secchi & Rossi, 2018).

Blockchain, as well, is an innovative and transversal tool that may be applied over the entire supply chain. Supply chains are traditionally structured and organized, involving a multiplicity of operators with specific and different tasks. The values of this tool can be resumed in four terms: security, transparency, immutability and approval. It is a safe register based on precise

and unbreakable rules; it is transparent because information is accessible to every participant, so that the relationship between producer and consumer is not characterized by the so-called information asymmetries. Furthermore, it is a "democratic" tool, as participants must approve all changes and it is immutable because what enters the blockchain cannot be modified in an arbitrary manner: it is incorruptible (Gavatorta, 2019).

The main characteristics that a blockchain operating in the agri-food industry should have are:

- easiness of application;
- flexibility;
- access to data allowed to qualified operators;
- interconnection with other blockchain;
- possibility of acquiring information from official databases.

1.2.2 Agriculture 4.0: the new digital farming approach

The most important and crucial phase in the development of an agri-food supply chain is farming. The introduction of modern machinery, automation systems and ICTs on the supply chain is reshaping totally the way an agri-food enterprise works, not only because new technologies are able to make the enterprise more productive, efficient and competitive, but also because there are some changes happening outside the supply chain. For example, new requirements in terms of sustainability and customers' purchase trends.

It is possible to talk, then, about "Agri-food 4.0". Obviously, this issue is directly related to the new concept of "Industry 4.0", where production processes, logistics and distribution are managed and regulated in a digitalized system that relies on the tools mentioned in the previous paragraph: IoT, Big Data and Cloud computing (Santucci, Martinez, & Vlad-Calcic, 2012).

Agri-food 4.0 relies on several elements: cyber-physical systems and precision technologies like smart sensors, drones, robots, intelligent greenhouses, wireless sensor networks and vertical farms (Yahna, 2018). In this context, the enterprise is not only a *sensing and smart enterprise* (S^2 enterprise) with receptive skills and flexibility, able to detect events, collect data and monitor internal and external changes. It is also *sustainable* in its actions to optimize processes, minimize environmental impact and the waste of resources. The identification of the new concept of the sensing, smart and sustainable enterprise is called *S^3 enterprise* (Mauricio-Moreno, Miranda, Chavarrìa, Ramirez-Cadena, & Molina, 2015).

The so-called precision farming and smart farming (or Internet of Farming) have been gradually modifying the way agri-food enterprises organize themselves.

Precision farming (or precision agriculture) is about monitoring, controlling and regulating management processes of a soil. It is characterized by the utilization of basic sensors: drivers able to carry out data collection, from so-called *field record files*, in a precise and targeted way and transform it into digital data. In fact, aerial mages are taken by drones (georeferencing), which provide useful information about fields, for example unwanted plants, diseases and crop quantity. It is possible to monitor temperature, vehicles movement, air quality and humidity.

According to a study of the European Commission about farm machinery, between 70% and 80% of agricultural equipment sold contains components of Precision Agriculture (PA). The business involves 4.500 manufacturers, implementing 450 different farming machinery solutions for an annual turnover of €26 billion (European Commission, 2017). However, according to OnFarm (a connected farm IoT provider) the amount of data farms will produce by 2050 will be equal to €4.1 million (European Commission, 2017).

Smart farming**,** instead, goes beyond the concept of Precision Farming. It is not only the precise measurement and control of a set of variables related to farming processes. It focuses on the collection of data and its application in a smart way. The sensors ability to collect data about an object and give information about one of its variables (e.g. temperature, movement, ..) is implemented and transformed into an element, entering a more complex system and being uploaded in a cloud platform to let complex farming systems start (Newman, 2018). Thanks to the usage of these field robots and smart sensors is possible to collect data about weather, humidity rate, the condition of soil and plants, terrain, fertilizers quantity, resource usage for example, and this is collected, processed and evaluated through AI systems (Giesler, 2018). After that, since these devices are cloud-controlled, it is possible to regulate precisely and efficiently the quantity of treatments, fertilizers, pesticides and the removal of individual weeds. This virtual system turns real when DSS (Decision Support Systems) provide farmers with elements useful to take decisions.

Precise control electronics enable the communication among agricultural machines as they access field-record files. The revolutionary aspect is that farmers can manage the whole system through online platforms and agricultural apps: it is an interconnected system where data and operations are accessible real-time.

Figure 2 shows the mechanism of smart farming.

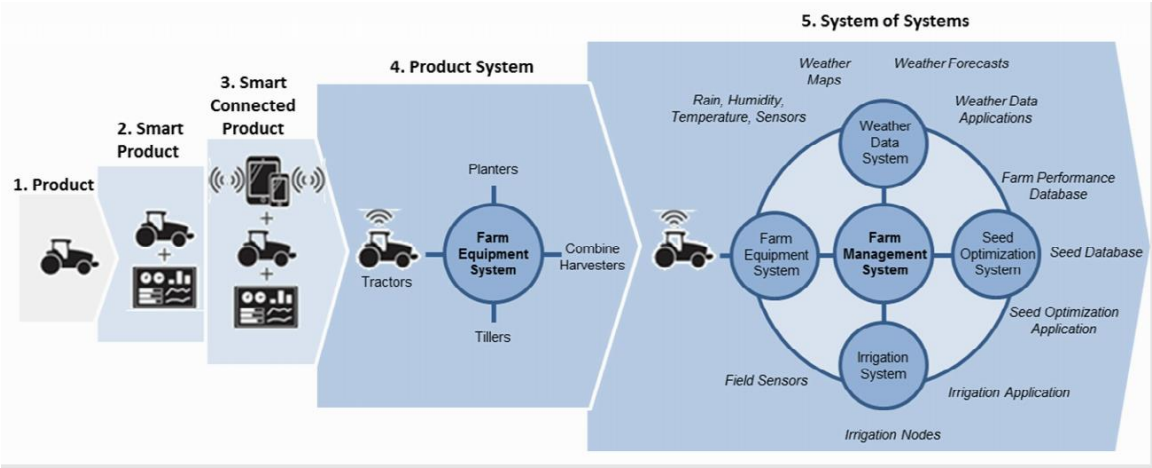

Figure 2. Agriculture 4.0. (Zambon, Cecchini, Egidi, Saporito, & Colantoni, 2019)

In conclusion, Agri-food 4.0" enables a series of benefits that may be divided with respect to their social, environmental and economic impact (Miranda, Ponce, Molina, & Wright, 2019):

ECONOMIC	ENVIRONMENTAL	SOCIAL
• Agri-food networks • Higher profits • Agricultural employment • Monitoring of production output • Better food quality • Optimization of use of resources	• Clean energies • Lower ecological impact • Loss of genetic diversity • Reuse of resources • Reduction in emissions • Reduction in waste (fertilizers, pesticides, water) • Facing overuse of water and damage to hydrological systems • Monitoring of field conditions	• Food safety • Health impact • Cost-saving • Livability • Use of local resources • Local and regional institutional actors • Improvement of working conditions • Traceability • Transparency

Table 1. Benefits of Agrifood 4.0. (Miranda et al., 2019)

IoT together with other devices entail new levels of operational control and executing planning and enable a series of connections with other external subjects. When new actors are involved in the supply chain, the business ecosystem becomes more complex (European Commission, 2017). But this opportunity to communicate and exchange powerful information, thanks also to other systems like the blockchain, cloud platforms and Big Data analytics, give additional features on the transactions occuring between producers and manufacturers. All these aspects enter a virtual system that is visible to all the players and participants of the network. In this way, consumers as well will be part of the supply chain.

1.2.3 Smart packaging: the tool to convert a passive product into an active information carrier

To manage and control food quality, it is possible to talk about *smart packaging*. Smart packaging materials are substances or materials that have the function of controlling the conditions of packed food or their surrounding environment. Smart packaging may also consist in an inexpensive label printed on primary packaging, like trays, pouches, bottles or shipping containers, which contribute to provide precious information among actors throughout the supply chain. These sensors control temperature, humidity, light, ethylene, chemical contaminants, pH, and give an alert whenever the presence of these variables is too much or too little. Through oxygen scavengers it possible for example prevent colour change, growth of microbes and eliminate flavors and odors, but the majority of applied sensors are applied to make clear the causes of quality problems or damages afterwards (Yam, 2009).

Besides, RFID[2] and bar codes represent the most used product identification systems. The management and the analysis of data collected through these tools can be processed by a Management system and, thus, it is possible to track a product, by memorizing in each TAG all the data linked to its production/distribution history (Qualivita Foundation, 2018).

Further, QR Code and Datamatrix represent two mechanisms that can be used to convey information. QR Code is a matrix bi-dimensional bar code, composed by black modules placed in a white squared scheme. Datamatrix, as well, is a matrix bi-dimensional bar code, composed by black and white cells or modules within a rectangular or squared scheme. In this technology, information consists of text or raw data and it is suited to professional tracking or alimentation databases. These technologies are able to identify origin and the steps in the supply chain of a product (Qualivita Foundation, 2018).

The disruptive technology that is rapidly spreading even is the *blockchain*. Thanks to a QR code or a Datamatrix, the blockchain is able to identify all the product life cycle within the supply chain in a quickly and cost-effective way.

The advantages of the blockchain are transparency and responsibility, the possibility of monitoring the best practices, origins and integrity of manufacture (Qualivita Foundation, 2018).

[2] RFID is a technology based on three components: TAG, Reader and Management system. The identification of the product happens through the radiofrequency, memorizing autonomously data and information via TAG and Reader. The TAG is an electronic component based on a microchip connected to a satellite. If the tag is passive, when it is near a Reader, emitting a radio transmission, the TAG's microchip turns on and answers back transmitting information that it holds. When the TAG is active, a battery allows sending/receiving information even without the induction process generated by a Reader.

All these tools, associated to IoT, ensure logistics systems more control and traceability, but at the same time enable the monitoring of food quality by supply chain actors, as well as final consumers. As in the case of IPNLF (an international organization operating in the fish industry), where it implemented the blockchain system within the cooperation of a startup named "Blockchain Provenance" in order to track the whole supply chain of tuna fish (Bellini, Osservatori, 2018). The project involved eight firms, which joined actively the supply chain in the phases of production and distribution. The final goal was providing security about origins and social sustainability across two Indonesian fish providers. Before this change, anglers collected data about their activities and products through paper or Excel files, then sent them to firms responsible for processing and distribution, but this method did not ensure the observance of environmental and food safety regulations. Indeed, blockchain method provided a series of advantages:

- Simplification of data collection, by reducing waste of time;
- Improvement of data quality;
- Reduction of data duplication;
- New levels of warranty about data reliability;
- Enhancement of commercial opportunities, by creating a new relationship of trust between producers and consumers, since the latter can access information easily and rapidly by scanning a QrCode.

1.2.4 The new Food experience

Final consumers' behavior has remarkably evolved over years. New technologies and the globalization, together with social and demographic changes, have been influencing the food sector and its dynamics (Meyer et al., 2002). The scandals food companies have been exposed to, has boosted consumers' mistrust and the need for transparency. Transparency does not consist only in the communication of the product's characteristics, but a concrete proof about products' origins, supply chain, actors involved and ingredients to produce the final product is required. The aim is in fact creating awareness on the aspects consumers are interested in, such as safety, quality and environmental, social and ethical issues. Consumers, in fact, are orienting their purchases towards companies that are investing in these policies and are showing to be more sensitive.

In Italy, for instance the attention towards healthy and environmental-friendly products is increasing, especially for organic industry.

The role of the Internet is fundamental in this issue: it is rapidly changing the communication between consumers and businesses, where the latter are leading more consumer-centered policies. In fact, the consumption patterns are changing: 5,1 billion people out of 7,6 are mobile users, who actively search information of what they see and consume; over 4 billion people search on the Net and 3,2 billion people are active social media members (Qualivita, 2019). In fact, the easiness with which customers have access to information, reviews and feedbacks about products and brands is reshaping the configuration of competition. Thanks to tablets and mobile apps, companies can leverage digital channels to enhance communication strategies to decrease the gap between them and consumers.

Consumers are actively searching for details about ingredients and nutritional values to discover the quality and healthiness of the product. They expect to know if products contain allergens, OGM and if they are produced respecting work conditions. Producers should change their policies then, paying attention the several criteria: production, origins of raw materials and distribution. Their need to know what they are going to consume creates a sharing vision, where data must be accessible through websites optimized for mobile use and smart labels (Zanotti, 2019).

Traceability as well results to be a relevant matter for consumers. It is not only important to supply chain actors, but it is becoming an influencing factor also for consumers' decisions. Traceability does not mean only rebuild the product journey from upstream to downstream, but it means to identify the history beyond a product and therefore, be able to recognize the values it brings.

For this reason, consumers play active roles. This phenomenon mirrors Augmented Reality (AR) and Mobile Augmented Reality (MAR): through smartphones it is possible to involve consumers not only in an informational process, but also in a "vivid" experience (Penco & Profumo, 2019). RFID, QR code and blockchain are again main characters. They provide an answer to the need for a larger amount of information required by final consumers and enable the creation of transparency and food safety. Consumers can scan Qrcodes printed on the packaging, be connected rapidly to a website or a Youtube video in order to gain information about the product: its origin, its journey and its authenticity overall.

Besides, through AR and MAR the distance between consumer and the brand shortens, creating a major level of interactivity not only in terms of the utilitarian value (information about the product) but also in terms of the hedonistic value. By offering consumers an experience and the chance of sharing it with their social networks, agri-food firms may enhance the social value of

the product. If a firm is capable of integrating social elements with Augmented Reality tools, it improves the solidity of the link between the brand and other markets, and consequently, the attractiveness of the product itself. Augmented Reality conveyed through smartphones may help consumers to take more conscious choices: both at the purchase and at the consumption phase (Penco & Profumo, 2019).

Consumers' needs for authenticity creates a benefit even for the producer that can better fight counterfeited products. In fact, countries like Italy, which are leaders in some industries, such as fashion, agri-food and luxury, are victims of phenomenon like Italian sounding and counterfeiting. The former is bound to products that try to imitate Italian brands or geographical denominations like cities or regions (for instance "Ferrari Rocher" produced in China, "Parmesan Cheese" produced in the United States) but this is not actionable. The latter concerns illegal acts due to the violation of a registered trademark, a denomination of origin (DOP, IGP), a logo, a product design or copyright or the imitation of the product itself. This phenomenon is legally challengeable and actionable (Federalimentare, 2016).

In the end of 2018, the economic value of "Fake products" in the agri-food amounted to over 100 billion euros, with an increase by +70% in the last decade (Coldiretti, 2018). QrCodes, Rfid and Blockchain can make the difference. By scanning codes on the packaging, it is possible to verify its authenticity. In this area, some apps tapped the market: "Trust your wine", "Wine blockchain EY" and "Foodchain". Three digital solutions that allow consumers to verify the product they want to buy through QrCodes and blockchain. Other firms undertook other strategies, fox example printing an alphanumeric code on the product: the consumer can access to the website of the producer, enter the code and examine the whole journey of the product "from-field-to-fork". Tuscany Oil DOP is one of those adopting this strategy: it wants to ensure that customers can properly verify the quality of oil bottles, appreciate their value and pay the benefit that it encompasses.

These technologies are being used even to replace the *payment phase*. Retailers are increasingly considering the digitalization of payments transforming it into an intangible system; in fact, they are adopting *smart shelves.* It means that the customer has to read the "smart label" through QrCode or NFC, pay and then get out from the shop without stopping at cash desks. The phenomenon has already started with Amazon, the empire of online logistics and distribution.

The final aim is not only making the purchase more rapid and easier, yet making the shopping experience more immersive (Oldani, 2019).

Other trends that food sector is living are e-commerce and food-delivery phenomena. The increasing impact of digital technologies has been creating, on the one hand, higher levels of information among customers; on the other hand, it has enabled to enhance the interaction between firms (or restaurants) and final customers, boosting the former to review their business models and the latter to develop new purchase behaviors. The traditional retail has moved to online tools (like apps, websites and social media) enabling people to buy online with no necessity to go to the physical store. Further, beyond e-commerce, another concept has emerged: the food-delivery. Food delivery represents a service that facilitates the food purchase. Buying food through the use of a website or an app and receiving it in the desired place has boosted easiness of consumption and, for restaurants, an access to many more potential customers. This change in food consumption has spread globally. In China, for instance, more than one fifth of the population has used food-delivery applications (Cho et al., 2019); in Korea the number of food-delivery apps has greatly increased moving from 870,000 apps in 2013 to 25 million in 2018 (Joins, 2019). The concrete impact of these phenomena confirms again the relevance of digitalization in the way firms do business and in the way customers interact with them.

As it is possible to see, the innovation elements in the food sector are reshaping the way we know products, the way we buy products and the way we consume them. Internet has made possible a series of actions that consumers can execute to minimize the information asymmetry that has always characterized the relationship between producers and customers.
Firms must exploit the increasing digital predisposition of customers; they should reorganize their assets and optimize the communication touchpoints that could enhance their brand image and perception. Hence, the development of the Internet and mobile communication have boosted processes of innovations, leveraging the capacity to acquire, store and archive large amount of data and exploiting it to support decisions and processes regulation. This has revolutionized business models and organization combining the different effects and obtaining a disruptive impact, with respect to not only firms' structure, but also their approach across the supply chain, the actors involved in it and external stakeholders, such as customers.

Firms who will be ready and flexible to adopt new digital technologies in the production and distribution fields and who will change their approach to consumers will be part of the expected expansion of 15 billion euros for the next three years (2019-2021). It is necessary to lead changes in particular aspects. First, adopting a consumer-centric vision may encourage a growth in revenues by 22-25% for those who have led policies in this direction. Second, creating

synergies among actors involved in the innovation process may boost an increase in revenues by 36%, especially for those who have invested in strategic collaborations or have started strategic business reorganizations. Finally, enhancing a constant strategic communication about firms' values and quality will turn into an augmentation in revenues by 40%, multiplying business opportunities (Deloitte, 2018).

1.3 The Italian food economy between huge potentials and slow-paced digitalization

When analyzing current trends, it is remarkable that food enterprises are giving a valuable contribution to Italian GDP: the production value represents more than 17% of the total Italian GDP (year 2017) and the export value corresponds to 68% on the total (EY, 2017). This data relies on qualitative and quantitative researches led on 8.000 international consumers among twenty-seven countries worldwide that can access Italian products. According to this report (EY, 2017), food industry is one of the most powerful Italian industries together with fashion and tourism. 73% of international consumers link "food" when thinking of Italy. Considering the sample studied by an EY study (2017), only 32% of consumers are aware of "Made in Italy" brand, but 65% state to be strongly interested in understanding the product origins and its peculiarities. In conclusion, foreign consumers have a tendency to know something more about the Italian product, not only the label, but its story as well. In contrast to this aspect, only 42% of Italian firms know what consumers want and this is a consequence of a wrong perception of "Made in Italy" brand abroad. This brought Italian firms to invest incorrectly in technologies and not to give the suited attention and interest to this target group, which is actually the most profitable growth driver. 75% of Italian firms adopted CRM systems to collect information about customers; only 48% bought tools to track the whole supply chain and only 23% manage in an accurate manner and at a "local" level their communication strategies (EY, 2017).

In Italy, the number of firms involved in the agri-food industry is about 8.300, reaching a revenue of approximately 125 billion euros and a number of employees that overcomes 340.000. In the arch of time between 2012 and 2016, the industry turnover increased by 22% (Deloitte, 2018).

When comparing Italy to other European countries, it is remarkable that Italy arrives first in terms of food purchase, overcoming France, Germany and Spain. Italy shows € 2.428 spent per year per capita in 2018 with respect to France (€ 2.353), Germany (€ 2.019) and Spain (€1.817).

For what concerns food purchases incidence on general expenses, again Italy shows relevant data: 19% of expenses are bound to food; Spain comes first with 20% of food expenses; France follows with 18%; Germany and United Kingdom come after with respectively 14% and 12% (OECD, 2019).

Agri-food industry, as emerged in an Istat study (2018), is under the average of other sectors' investments. Approximately 64% of firms declared to have done investments in 2017, 3 percentage points less than the average (Istat, 2018). Considering that Italy's strength relies significantly even on this sector and its trend is continuously growing although the recession period, investments and innovation processes are necessary to tap into new markets and improve firms' competitiveness. Differently from food industry, beverage industry is instead showing a more attention on digital technologies to cut production costs and apply more modern and state-of-the-art production processes.

The wine industry, instead, is an important market in the Italian landscape. It has begun a growth path for several years, contributing to strengthen Made in Italy quality and reputation worldwide. The production value has grown by 4,5% in 2017 with respect to the growth rate of 3,8% of the previous year. Data reflects a reduced amount in terms of the harvest volumes, but with higher prices. Besides, the amount of wine volumes in the first three months of the year were +8% than the volume in the same arch of time in 2018. Almost 4,9 million hectoliters were shipped abroad (ISMEA, 2019).

The sector certifies resilience and a general growth due to export overall, which focuses on a strategy that leverages quality and values. With its 1 billion exported bottles in 2015, it results to be a well-structured and mature industry, traditionally configured but ready to face global competition.

The study carried out in the wine sector (Cisco, 2017) demonstrated positive trends toward innovative strategies. It was realized via a structured survey starting from key factors emerged from the industry mapping. The wine sector is a good sample, as it has a homogeneous setting within the Italian domain and firms composing this scenario show integrated supply chains: from grape production to bottling operations, to distribution and sale of the product. The trend of innovation investments resut to be quite positive, even though there is not an immediate and stable approach to digital technologies. Besides, the structural characteristic of the wine scenario is the fragmentation. In fact, the majority of Italian firms' turnover lies between 10 and 25 million euros (Bonfante, 2019).

E-commerce and food-delivery represent two phenomena that are pushing firms toward exploring new ways of reaching final customers leveraging digital solutions. Two tools that are revolutionizing the product's purchase and consumption. In Italy food delivery market has gained a positive pace as well, reaching an increase by 56% in 2019, creating an economic value equal to € 566 million (Simone, 2019). E-commerce as well has resulted to grow dramaticallty over years: in 2018 the turnover of food e-commerce was equal to € 1.16 billion (2,8% on the total e-commerce, whose revenue has reached € 41.5 billion (Casaleggio Associati, 2019).

As one might observe, food industry demonstrates a valuable importance in the Italian economy and although new policies and technologies are transforming the Italian agri-food scenario, the current situation is not thriving, with respect to other countries' perspectives in innovation investments. Actually only 1% of Italian crops are managed with digital systems for instance (Bellini, Agridata, 2019). The weaknesses of infrastructures and the lack of integrated supply chains do not enable the orchestration of resources and the optimization of production processes. In fact, according to a report written by the Digital Transformation Institute, in collaboration with Cisco Italia (2017), an overall picture about the phenomenon is missing and this makes difficult to spread the awareness about the opportunities of technology throughout the industry, and the urgency to exploit them to be competitive globally.

A first disadvantage of Italian agricultural firms is the *average dimension*, which is estimated as 12 hectares of extension in Italy. They are a lot smaller than other European countries average, in fact, the average UAA (Utilized Agricultural Area)[3] of Germany and France is about 59 hectares and Spain follows with its 24 hectares average. In the period of time between 2014 and 2016, Italian total UAA, equal to 12 million hectares, was 25% lower than Germany's, half of Spain's and 45% lower than France UAA. Although these negative indicators, Italy achieved good results in terms of added value (€ 30 million with respect to France, Germany € 25,55 million and Spain € 25,50 million) and export, but in order to strengthen the positive development it is necessary to stop the reduction of UAA, favor competitiveness by boosting the digitalization processes and promoting the generational turnover (CSConfagricoltura, 2017). Firm dimension has increasingly begun a relevant factor in the competitive area, especially with respect to two elements: technological innovation, which represents a facilitator in market penetration activities and changes in the competitive landscape (Josefy, Kuban, R.D.,

[3] UAA is the total area taken up by arable land, permanent grassland, permanent crops and kitchen gardens used by the holding, regardless of the type of tenure or of whether it is used as a part of common land.

& Hitt, 2015). These two variables are linked to social and institutional factors, and the global connotation of the market, because the firm can survive if it is capable of adapting itself to external variations.

The creation of strategic synergies between several actors in the same supply chain is a strong opportunity: putting together a set of skills and know-how overcomes the potential result that is achievable individually. In fact, small and medium-sized firms do not have often the sufficient financial resources to invest in digital technologies.

It is relevant to underline that 38% of Italian farmers are over 65 years old, in comparison with the younger Spain (30%), France (13%) and Germany (5%) (CSConfagricoltura, 2017). This indicator shows a remarkable signal representing the lack of a generational turnover, which limits open-mindedness to innovation processes.

Limited knowledge emerges as another problem facing innovation proceses. The increasing amount of qualitative and quantitative data to be processed and converted into information to be capable of take decisions rapidly, even real-time, is delineating new levels of independence. Operators need to be more autonomous in their actions, without asking to their organizational managers, so they should have specific executive and management skills, as they are responsible for taking some operating decisions, relying on a correct interpretation of the data provided by machines (Secchi & Rossi, 2018). In fact, one of the main reason why Italy stands behind is the lack of technical personnel capable of implementing innovation processes. Comparing the number of Italian students enrolled in ITS (Technical Higher Education) institutes and those of other European countries the difference is relevant: 10,000 in Italy compared with 760,000 in Germany, 530,000 in France and 400,000 in Spain. In 2018, other incentives were in the pipeline, with the aim of training 20,000 ITS students by the year 2020 and reaching the amount of 100,000 students (Peschiera, 2018).

In the agri-food industry, it is more likely that a qualification in agricultural studies pushes to major chances of adopting Agriculture 4.0 solutions, rather than other degrees.

In Lombardia (Northern region in Italy), in the analyzed sample those farmers adopting digital solutions have a degree in 57% of cases and in 64% of cases they have a degree in the agrifood area. In Piemonte (Northern-East Italian region), 42% of farmers are graduated and it gets to 56% of cases if the qualification is about agriculture. In Emilia Romagna (central region), 50% of graduated individuals operates in the agricultural field and rises until 80% of cases if they have a qualification in agricultural studies. In Veneto, otherwise, the percentage is smaller: 47% of cases are graduated subjects, but only 29% with a specialized degree in agriculture (Bellini, 2019).

1.4 Investments' allocation in Italian food industry among incumbent firms and startups

In Italy, investments in innovation are present mostly within the industrial sector, where large firms have larger funds to invest and more developed R&D activities that may produce new solutions.

Actually, the food industry is facing an evolution. The pushing characteristics are not only related to the growth rate. Just considering Italy, the industrial agri-food production has augmented by +1,1%, while total revenue has increased by +2%, reaching an amount of 140 billion euros. The export amounts to 33 billion euros, with a positive balance of over 1 billion (Federalimentare, 2019).

According to a report about agricultural activities published by the Smart Agrifood Observatory (research laboratory of the School of Management of Politecnico of Milan), in collaboration with RISE Lab (Research & Innovation for Smart Enterprises) of University of Brescia, the growth of Italian digital innovation is between € 370 million and € 470 million with a positive progression of +270% between 2017 and 2018 (Bellini, Agridata, 2019).

The Italian positive expansion mirrors a global increase in investments in agriculture 4.0 that amounts to $ 7 billion, almost twice the value of 2017. Europe plays a remarkable role in this evolution, representing 30% of total investments, equal to € 1,9 billion. In this scenario, Italian investments reach 19% of European ones and 5% of global investments.

The market growth comes consequently from an increase of technological offer, provided by more than 110 providers, both incumbents and new entrants. The offer is oriented to products and solutions that deal with precision farming, with a crucial role played by Internet of Things. These elements are present amounting to 44% of total offer, enabling data collection activities and analysis for Agriculture 4.0, existing in 71% of solutions. Connected and digital vehicles and equipment, working in Cloud, are becoming increasingly present, but they have not become structural part of agricultural activities yet, reaching respectively 21% and 6% of total cases.

As we can outline in the Figure below, firms are more oriented to Precision Agriculture than Internet of Farming. In fact it amounts to 14% of technologies provided, as an average between "Machinery integration" (2%), "Resources management" (16%) and "Activities management" (15%) (Bellini, Agridata, 2019).

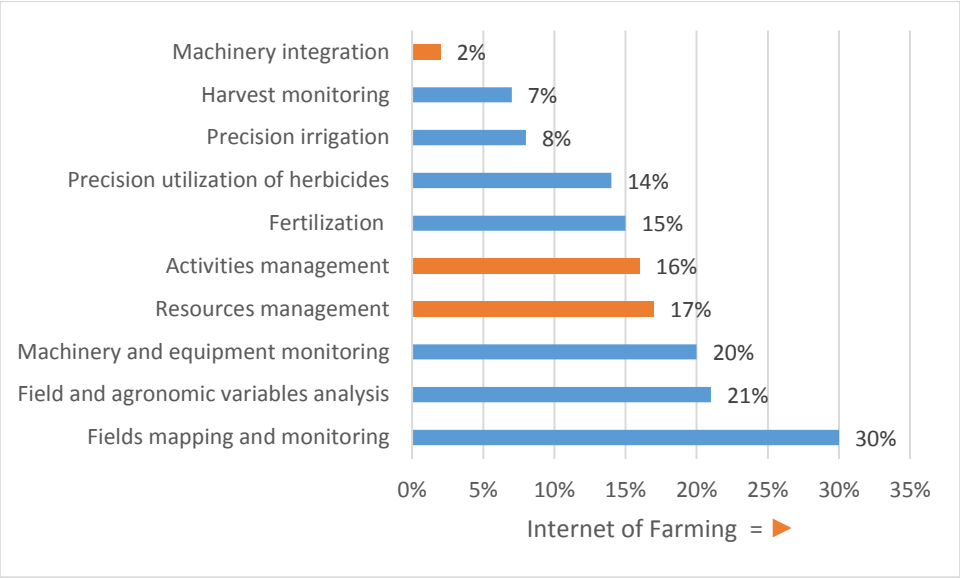

Figure 3. Technological offer for Agriculture 4.0. (Bellini, Agridata, 2019)

The overview presented by the Smart Agrifood Observatory in 2019 mapped 110 Italian firms, including both incumbents (74% of total cases) and startups (26% of total cases).

Among the 110 firms, 49% works in the supply of cutting-edge solutions based on Internet of Things and robotics. Besides, 22% of solutions focus on agridata and provide data analysis solutions. In the 16% of the sample, there has been an introduction of precision field equipment; 7% focuses on electronic components and tools and 3% offers innovative tools to work on fields.

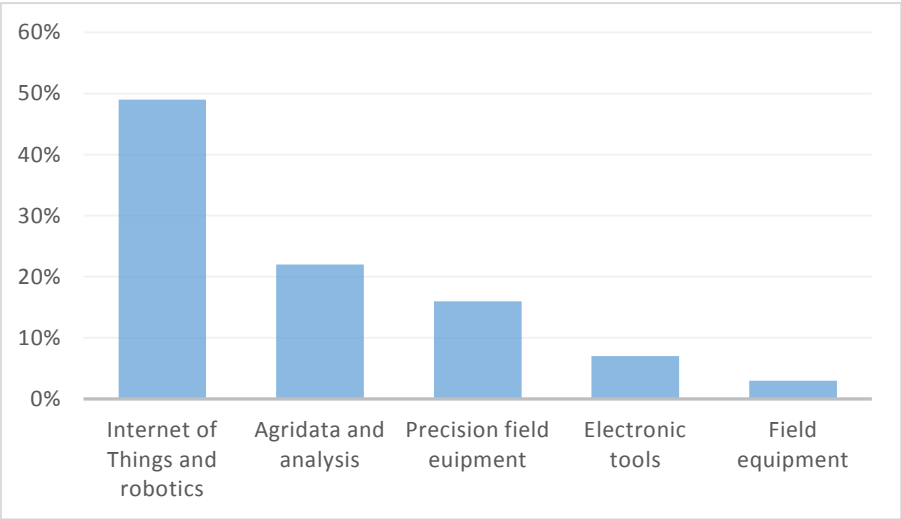

Figure 4. Fields of application of advanced solutions. (Bellini, Agridata, 2019)

53% of solutions are not oriented to specific areas, of which usage may be general and flexible according the different needs of users, while 24% refers specifically to cereals sector, 24% focuses on fruit and vegetable industry, 16% operates in the wine compartment.

Further, a focus on Agriculture 4.0: Precision Agriculture especially, as Internet of farming is growing slowly. These new practices are applied by 55% of agri-food firms involved in the analysis.

The way of exploiting the potential of disruptive technology is different: firms prefer mostly traditional technologic solutions where human contribution is essential, rather than autonomous technologies to transform data into digital information (Figure 5).

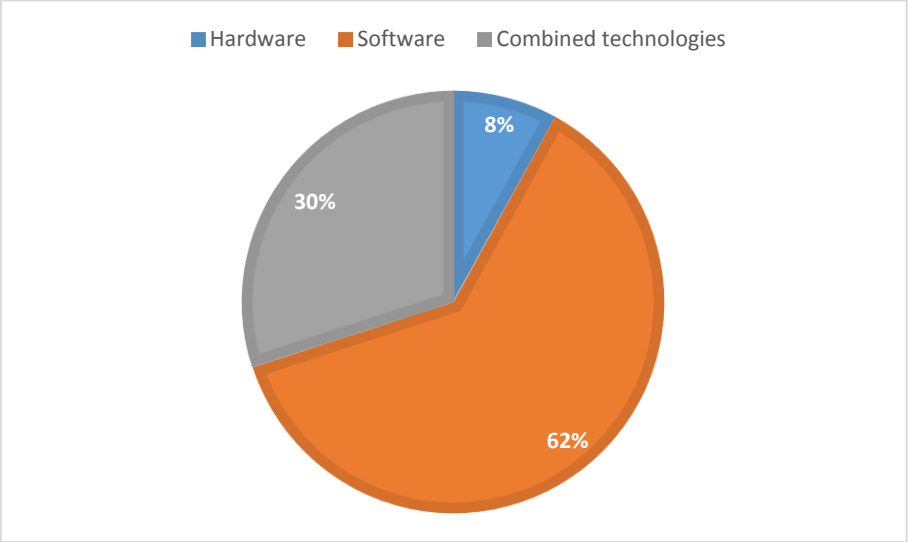

Figure 5. Technologies typology in food traceability. (Bellini, Agridata,2019)

New consumers' requests and public policies boost agri-food industry towards *traceability* criteria and food quality. Those firms that had adopted digital solutions affirm they have reached positive results: 38% declared to have improved their production processes effectiveness, 32% saw their efficiency improved (Bellini, Agridata, 2019).

Besides, the analysis of the Smart Agrifood Observatory went further considering a sample of 1.467 agri-food Italian firms in 2018 (Bellini, Agridata, 2019). The feedback has been positive: there is a high sensitivity towards digitalization and innovation. 85% of the sample declared to be aware of the importance of digital innovation in this industry; 55% is concretely setting up this transformation. The reasons that convinced firms to start the digital process are the increase in the production volumes and the control and the reduction of costs.

The sensitivity toward the value of data is increasing, but it is still not a priority. 45% of firms have been investing in digital solutions for five years, strengthening their skills, knowledge and

strategic perspectives. The sample represents an entrepreneurial power that is rather “young”, with an average age range between 30 and 40, having a university degree; even though the study did not underline any correlation between age and academic qualification in the choice of setting up a digital transformation.
Further, 65% of firms over 100 hectares have adopted digital solutions, while 25% of firms under 10 hectares. This element confirms the crucial aspect of dimension: the more a firm is large and has more funds, the more it is likely that it will invest in new technologies (Bellini, Agridata, 2019).

Start-ups role is essential in every country economy and development, especially in contexts where crisis threatens prosperity and growth. In developed economies, like Italy for instance, a remarkable component of GDP and employment is linked to the evolution of new businesses. Kauffman Foundation underlined that 40% of USA GDP in 2010 was generated by enterprises with less than 30 years of activity and that, between 1980 and 2005, almost all jobs were results of enterprises, being on board less than 5 years. Deutsche Bank, as well, carried out a research where the incidence of venture capitals investments in startups equal to 0,1% corresponded to an increase in GDP by 0,3 percentage points (Digital360, 2012).
The most burgeoning industry where it is likely that new businesses will surge is the digital one, which means ICT technologies. This field is taking a positive pace currently.

In the agri-food sector, start-ups are asked to play a determinant role. On the one hand, they are main characters in the development of new products and services, on the other hand they are promoting innovation under different levels, being supported by processes of Open Innovation, especially in the processing industry. According to the Italian Smart Agrifood Observatory (Bellini, 2019)[4], start-up are real hubs, able to outline new business models and develop innovative solutions and products. The start-up ecosystem is definitely essential to map and underline future perspectives of Smart Agrifood and Agriculture 4.0. The research led by the Observatory in 2018 analyzed all the innovation and digitalization-oriented firms in the agri-food industry both in Italy and worldwide.

A positive trend had been outlined: there are positive numbers considering both the quantity of start-up involved and the typology of products and services offered. Smart Agrifood

[4] Bellini, M. (2019, February 9). "Significato, esempi e applicazioni pratiche". Retrieved from Internet4things: https://www.internet4things.it/iot-library/internet-of-things-gli-ambiti-applicativi-in-italia/

Observatory carried out an inventory of all start-ups between 2011 and 2017, identifying 481 new international enterprises (Bellini, 2019)[5].

In this group, Italy is well represented with a percentage of 11%, but with an average amount of financing sources that is a lot lower than other international start-ups. The analysis pointed up three valuable numbers:

- Italian startups are 44 out of 481;
- international startups financed at the level of the supply chain are 182 out of 481;
- startups leveraging the e-commerce field are 218 out of 481.

As we can see in Figure 6, solutions proposed by international startups leverage different technologies: software platforms, Big data and IoT especially.

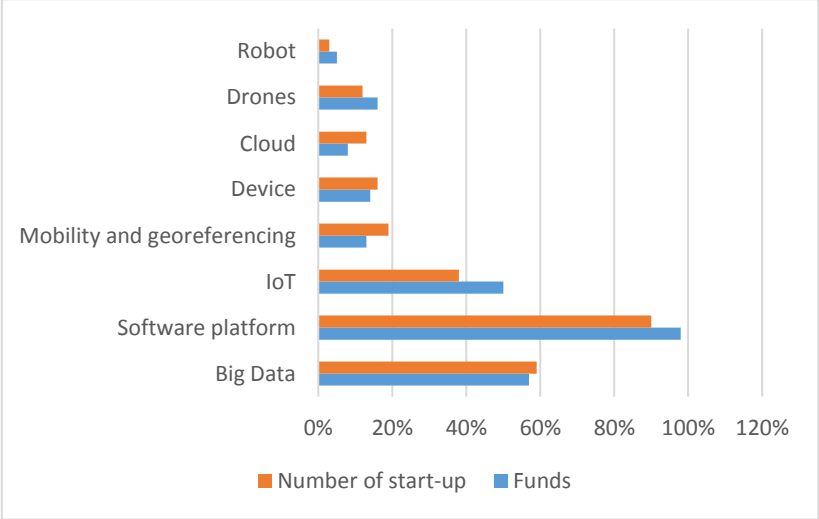

Figure 6. Technologies adopted in innovative solutions proposed by international start-ups. (Bellini, 2018)

Mapping the trend of the start-ups, the most relevant areas that startups are tapping into with their solutions are: food quality and sustainability; the usage of Big Data analytics both for planning production and exploring consumers' preferences; the development and integration of solutions regarding Precision Agriculture (PA); IoT applications, sensors and wearable devices. Besides, about 50% of start-ups analyzed by the Smart Agrifood Observatory (Bellini, 2019)[6] has implemented solutions for e-commerce, receiving funds for $ 2,7 billion.

There are four main principal categories regarding agri-food sector: e-commerce, constituted by solutions bound to the direct sale of products to final consumers; food delivery, e.g.

[5] Bellini, M. (2019, February 9). "Significato, esempi e applicazioni pratiche". Retrieved from Internet4things: https://www.internet4things.it/iot-library/internet-of-things-gli-ambiti-applicativi-in-italia/

[6] Ibid.

platforms realized to aggregate and integrate firms offer, supporting ordering and delivering. Besides, B2B solutions for sale of input and raw materials to manufacturing firms; and aggregators, which correspond to those subjects that favor the information exchange between all the actors of the supply chain.

The distribution of start-ups with respect to their operating area is shown below in Figure 7:

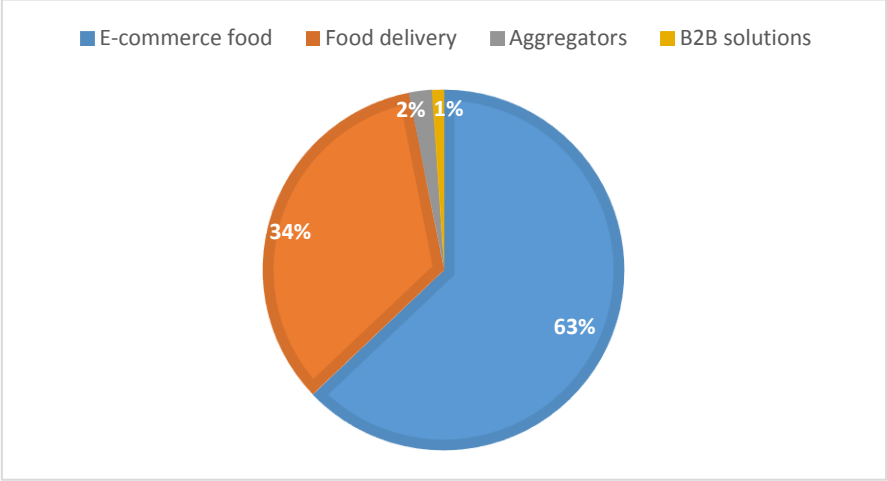

Figure 7. Operating areas of start-ups. (Bellini, 2018)

As we can see, food delivery and e-commerce solutions are the most targeted operating areas by start-ups. 63% of Italian start-ups are involved in e-commerce solutions, 34% is involved in food delivery projects, only 1% is bound to B2B solutions and 2% has invested in devices enabling the creation of interconnected supply chain.

Another study of the Smart Agrifood Observatory analyzed the trends of startups in 2018 (Bellini, 2019)[7].

A thousand startups have been analyzed: 98 Italian startups, operating actively in the agri-food sector, created between 2012 and 2018.

Observing Italian startups, the region with the largest number of startups involved in Smart Agrifood study is Lombardy, with 53% of total funds received. Subsequently, 17% of total startups are part of Emilia Romagna and they received 7% of total funds: a remarkable discrepancy. Figure 8 shows the variety in technologies implemented by these 98 Italian startups (a solution may be composed by different technologies).

[7] Bellini, M. (2019, February 9). "Significato, esempi e applicazioni pratiche". Retrieved from Internet4things: https://www.internet4things.it/iot-library/internet-of-things-gli-ambiti-applicativi-in-italia/

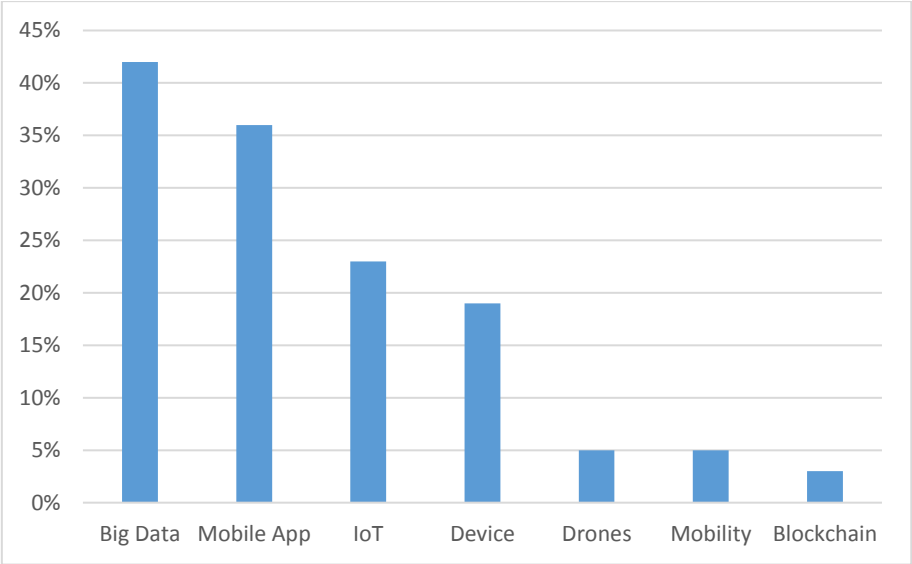

Figure 8. Digital tools among innovative startups. (Bellini, "Scienze e applicazioni pratiche"2019)

As shown above, 42% of start-ups exploit Big Data but using it in two different ways:

- Real time analysis: 16% of startups exploit Big Data analytics to monitor real-time crops humidity and temperature, weather conditions, water and air pollution level;
- Simulations and predictive analysis: 4% of startups using Big Data can exploit agro-meteorological services to predict crop growth and forecast demand; create predictive analysis models to plan agronomic interventions ensuring food quality.

Distinguishing the different areas of action of the 98 Italian startups, Figure 9 shows that e-commerce (70% Food delivery, 20% Ecommerce Food, 10% Other) and Agricolture 4.0 are the most interesting areas. Considering investments, 67% of total funds (€ 25.3 million) are bound to e-commerce startups and even though the number of startups involved in Agriculture 4.0 is high, they have received only 7% of total funds. 15% has been allocated to food quality theme, 9% to sustainability and 4% to traceability.

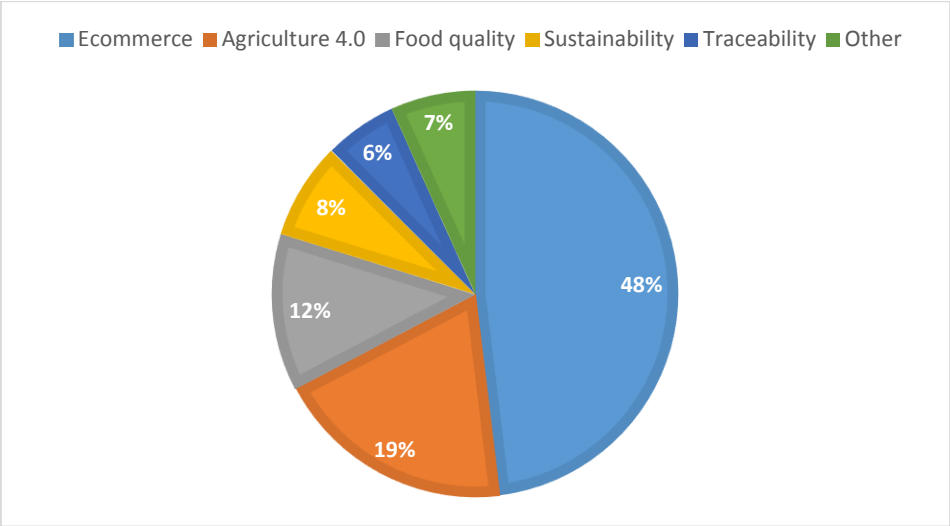

Figure 9. Investments' allocation to different fields of food sector (Bellini, "Scienze e applicazioni pratiche" 2019)

Among the 20 startups operating in the scope of Agriculture 4.0, open platforms have been developed in order to enable the integration of systems and data to provide farmers with efficient models to support their operating decisions. Their solutions touch different elements as shown in Figure 10 (Bellini, 2019)[8].

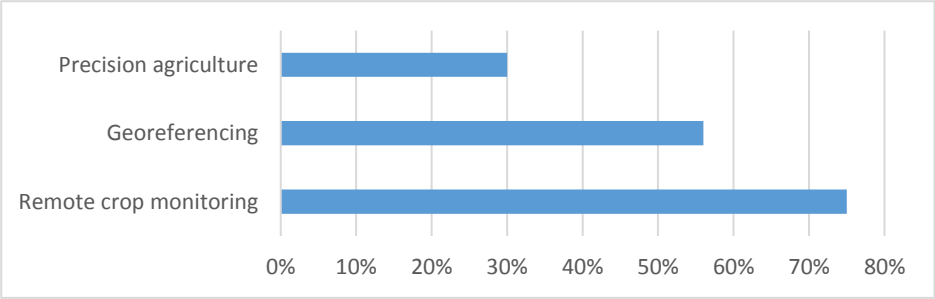

Figure 10. Agriculture 4.0 and its areas of intervention (Bellini, "Scienze e applicazioni pratiche" 2019)

Regarding the food processing industry in which 20% of Italian startups are involved in, innovation concerns monitoring and controlling systems of fields and traceability with respect to data management across the whole supply chain through the blockchain. 50% of solutions about traceability exploit the blockchain technology.

[8] Bellini, M. (2019, February 9). "Significato, esempi e applicazioni pratiche". Retrieved from Internet4things: https://www.internet4things.it/iot-library/internet-of-things-gli-ambiti-applicativi-in-italia/

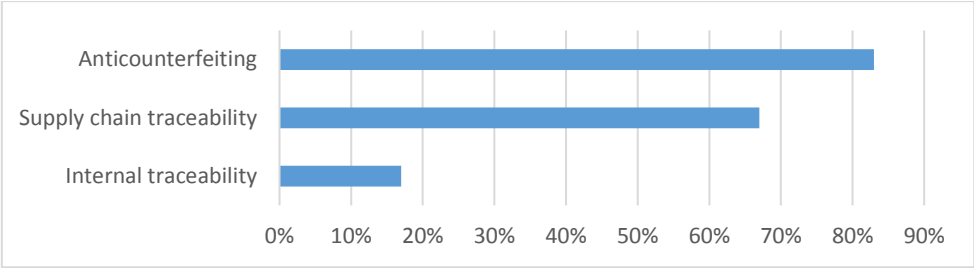

Figure 11. Agriculture 4.0 and its areas of intervention (Bellini, "Scienze e applicazioni pratiche", 2019)

If we identify the category in which these startups are involved, we will see that the wine sector is proportionally the most financed. Fruit and vegetable industry, agriculture and agri-food are areas of action for startups, but the allocation of funds is higher in agriculture and fruit and vegetable sector (Figure 12).

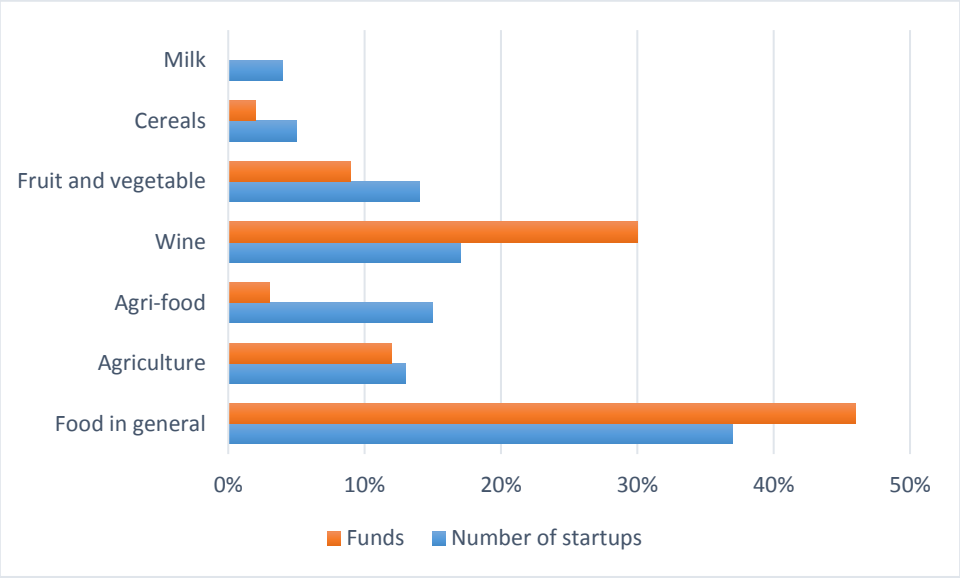

Figure 12. Allocation of funds and startups direction. (Bellini, "Scienze e applicazioni pratiche", 2019)

As it is necessary to follow startups direction to understand in which areas next changes will happen, it is possible to define some conclusions. Firstly, more than half of Italian startups are focusing on creating e-commerce solutions, especially for final customers and food delivery. Secondly, agriculture 4.0 is emerging especially with the aim of reducing costs and optimizing resources, so by proposing Big Data analytics, mobile apps to monitor production processes and take actions real-time, exploiting technologies like IoT, sensors and drones. Besides, blockchain is tapping into the industry, and startups that are implementing this technology want to face counterfeiting and ensure the traceability of the whole supply chain.

1.5 Public policies in support of the innovation processes of food industry

Innovation processes should be boosted by public policies that make available funds to support firms' investments. Especially in the agrifood and agricultural sector, firms need a push: they are more sensitive to external conditions, as they must deal with variables they cannot control. Indeed, public policies are necessary to protect the competitiveness of this industry, by supporting sustainability, environmental-friendly harvesting systems and ensuring them the suitable opportunities to compete with foreign markets.

There are some structural characteristics of the primary sector. First, agri-food firms supply is quite rigid because it depends on natural factors: weather conditions like drought, flood and storms have an impact on the volume of production, so the offer is variable and does not ensure a profit. Besides, the farmer has a low bargaining power both upstream and downstream, as seed suppliers are multinational organizations and he/she is a price-taker. This means that as he offers a homogeneous product, he/she cannot request higher prices than competitors.

The gap between consumer demand and farmers supply is relevant, as they are not able to control and shape their supply rapidly according to demand changes. They have not the tools to overcome the information asymmetry existing between them, so it happens that they produce more than it is necessary or lower than requested (Trevisan, 2000).

On the one hand, foreign products from poorer countries cost less because of the lack of respect toward working conditions, raw materials' origins and safety regulations, so they access Italian market with predatory prices; on the other hand, firms must survive with their small dimension that does not enable the deployment of significant machinery.

All these factors show how important it is to provide agri-food with relevant funds and supporting policies to help them being more competitive and more reactive to market changes.

1.5.1 Common Agricultural Policy (CAP)

For all these reasons, in 1957 Europe had created the *Common Agricultural Policy* (CAP) to realize a favorable market for all the Member States. Launched in 1962, it is a partnership between Europe and its farmers and agri-food firms. It aims at supporting farmers' activities, by ensuring them a stable supply of agricultural products, reasonable life conditions, by protecting environment and sustainability of natural resources and by supporting the maintenance of rural areas (in Figure 13 the areas of investment are shown).

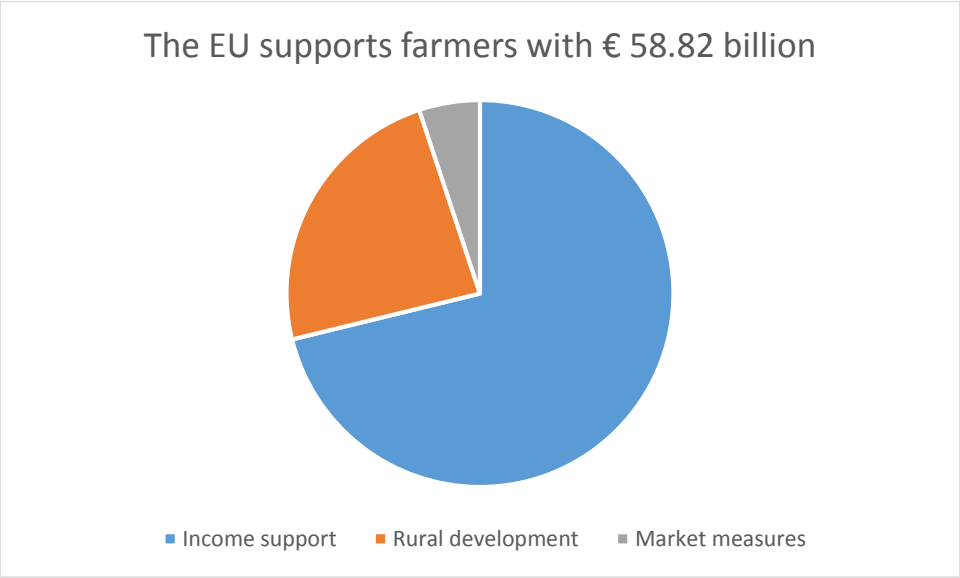

Figure 13. European Union and farmers' support. (European Commission, 2019)

CAP involves all the countries of the European Union. It is the most relevant expenditure of the European budget and delivers € 60 billion per year with respect to the total EU budget that is equal to € 160 billion (European Commission, 2019).

Two European funds contribute to the realization of the CAP: the European Agricultural Fund (EAGF) supports agriculture through direct funds; the European Agricultural Fund for Rural Development (EAFRD) provides funds for rural areas development.

CAP 2014-2020 objectives have been identified under three areas (European Commission, 2013):

- *economic goal*, including food safety and quality matters. It monitors the declining rate of productivity growth, price volatility, the weakness of the role of farmers within supply chain both upstream and downstream;
- *environmental goal*, with respect to sustainability, climate changes and biodiversity themes;
- *territorial goal*, considering rural areas' demographic, economic and social developments including relocation of businesses and depopulation.

With respect to previous years, environmental and social aspects have become more important in this reform. Through the achievement of these specific goals, it is possible to attain the three more general objectives of CAP 2014-2020 reform: *viable food production*, *sustainability* and

climate actions. Through these interventions, CAP can ensure the realization of a more competitive sector, thanks to higher quality products and approaches that are more effective.
On 1st June 2018, the European Commission introduced legislative modifications on the common agricultural policy (CAP) beyond 2020. The modifications would turn the CAP into a more responsive and flexible financial system to face current and future challenges. The principal themes would be the generational turnover, sustainability and food safety; in the same time, the goal would continue to be supporting the competitiveness of the agricultural industry (European Commission, 2018).
Nowadays, Italy is the fourth country in Europe in terms of amount of funds received for agriculture. It lags behind France, Germany and Spain (Cappellini, 2018).

The CAP 2021-2027 will both encourage investments in research and development in innovation and will enable farmers and rural communities to benefit from it.
Besides, it will create stronger *agricultural knowledge and innovation systems* (AKIS) to boost projects of digital transformation and disruptive systems of business reorganization. The creation of a national innovation ecosystem and an efficient network of actors reaching the same aim will ensure a more rapid process of innovation, by optimizing resources.
There are four main groups of actions involved in this AKIS project:

1. strengthening links between research and practice;
2. enhancing all farm advisory services and intensifying their interconnection within the AKIS;
3. stimulating innovation through countries and themes;
4. financing the digital transition within the agricultural sector.

Besides, Horizon Europe program, which is one of the biggest centers of Research and Innovation in Europe, whose aim is to tap into market with discoveries and breakthrough solutions, will receive €10 billion for research and innovation in food, agriculture, rural development and bio-economy (European Commission, 2018).

1.5.2 National plan "Industry 4.0" and RDP

Since innovation is a process that does not work alone, it is possible that its development phases accelerate if there is a geographical concentration of activities. By exploiting relationships with other firms and with a region's network infrastructure, it is possible to convey, flare up and strengthen knowledge (Fagerberg, Mowery, & Nelson, 2005). For this reason, funds that sustain

geographical concentration of innovation help both the individual firm and the systemic innovation constellation.

In this issue, Italian agri-food firms receive regional funds, which support their activities. The RDP (Rural Development Program) is a position paper that every region produces in order to receive financial funds that European Union makes available.

Its validity lasts seven years and two main cornerstones compose it: *Priorities* and *Focus areas* (specific goals) that are achieved through *specific Measures*.

Those who can have access to these funds are farmers, agri-food and forestry operators, entrepreneurs acting in rural areas, public institutions, local partnerships, training and counselling service providers. The available funds of the RDP 2014-2020 are bound to the modernization of rural areas, the improvement of firms' competitiveness, the reduction of the gap between occupation opportunities and services, environmental sustainability and the protection of rural landscape.

Three institutional entities provide these funds: EAFRD (European Agricultural Fund for Rural Development), the Italian government and the single region (PSR , 2014).

The general goal that EAFRD wants to achieve in the arch of time between 2014 and 2020 can be summed up in three aims: the improvement of the competitiveness of rural sector, the sustainability of natural resources and the achievement of a balanced rural environment in terms of work conditions and social communities. It matches the vision of RDP in supporting agriculture and rural areas.

Through RDP, firms can benefit new regulations provided by the National Plan Industry 4.0. This plan is contained in the Budget Law 2017, approved on 7th December 2016 by the Senate. The primary goal has been providing more funds for research, development and innovation, both on startup, SMEs and firms to keep up with the Forth Industrial Revolution. Besides, it wants to strengthen and increase qualification studies, by augmenting the number of university students (reaching 200.000) and the numbers of managers specialized in 4.0 technologies-related fields (reaching 3.000). It seeks to augment also the number of students enrolled in technical studies specialized in 4.0 fields, the aim is to achieve an increase by +100% (MISE, 2017). In the agri-food industry it envisages:

- access to funds to purchase 4.0 technologies by exploiting hyper-depreciation at 250% and super-depreciation;
- renewal and extension of development contracts. The expected investments are equal to € 3,6 billion with a prevalence in the agri-food industry (21%), automotive (17%), mechanics (15%), tourism (11%) and healthcare (10%);

- empowerment of agricultural and agri-food research and innovation through Crea[9];
- investments to favor the access to ultra-broadband;
- minimizing the Guarantee Fund Ismea[10] for agricultural firms, by exploiting another Guarantee Fund made available by MISE[11], with the aim of improving the access to credit for firms.

In 2018, the outcome was positive: there was an increase in instrumental assets by +11,6%, the number of firm investing in R&D augmented, €3,5 billion were invested in public investments in ultra-broadband; besides, the amount guaranteed by the Guarantee Fund grew by +10,7% (Della Mura, 2018).

[9] It is the Italian Council for Agricultural Research and Economy that consists of 12 research centers, whose aim is to monitor agri-food systems evolutions.
[10] It is governed by the decree of the 22nd of March in 2011 of Mipaaf (Italian Ministry of Agricultural and Forestry Policies). The aim of the fund is favoring the access of credit to agricultural firms, through the removal of the spread and the reduction of regulatory capital of banks.
[11] MISE is the acronym of the Italian Ministry of Economic Development.

2 - THE START-UP ENTITY: DEVELOPMENT STRATEGIES IN INNOVATIVE CONTEXTS

Start-ups represent those actors playing a crucial role in the advance of innovation processes, in the production of new technological evolutions and in the supply of disruptive solutions for the market. Hence, in this dissertation I will focus on the way founders of innovative startups exploit their social structures, interact with the external environment and external actors to face obstacles during their processes of growth and development. Innovative startups have high rates of failure, as they must face a multiplicity of obstacles that inhibit their survival in the market. The lack of resources is one of the main problem linked to the development of a new venture, hence founders are likely to act actively and dynamically within the context they are living in to search for new partners. Large firms and institutional actors such as universities and public institutions are examples of actors with which startups may collaborate to validate their presence in the market. In fact, the reason why startups are created is not only related to the willingness of an entrepreneur to build a venture that will survive over time, but it relies on the intention of selling the startup when it finds a satisfying feedback from the market or it consists of an extremely disruptive product. In the following paragraphs, I will delineate the distinctive traits of startups and their strategies of interaction and development in the competitive scenario.

2.1 Startup's life cycle and finance dynamics

Startup configuration has been studied over time by several researchers and its peculiarities may be summed in three words: *scalability*, *rapid growth* and *innovativeness*. It is a temporary organization operating in an innovation-centric environment, whose aim is growing fast, maximizing the invested resources in the shortest time (from 3 to 5 years) (Blank & Dorf, 2012). The startup's life may take two paths: success or failure. It is extremely difficult to predict its destiny: will it overcome its early-stage to turn into a scaling-up firm? Will it be acquired by an incumbent firm? Or will it perish if its product turns out to be not interesting for the market or if its strategy is not effective enough?

As experience, maturity and information increase, startups' alternatives and needs change.

The role of information is fundamental in investment matters, since the more the firm manifests its assets, strengths and market opportunities, the more it attracts investors. In fact, the reason of limited access to finance of newly born ventures lies in their *informational opacity*. Unlike large firms, whose information about contracts, suppliers and customers is rather explicit, startups' economic and financial elements are not easily to be acquired. This discourages the

trust and the acknowledgement of quality and potential of new ventures, which are determinant to attract investors. Intermediaries in this case help startups to convey their value and to reduce informational obstacles, as they accurately conduct the activities of screening, contracting and monitoring. They screen potential markets in terms of potential customers and threats; besides, starting from the information they have collected, they establish contract terms and variables. Finally, they monitor the relationship with financial entities, like banks and venture capitalists, assessing compliance and financial conditions (Berger & Udell, 1998).

As size, age and information availability of the startup increase, there is a corresponding augmentation in the number of financial alternatives that are accessible for the firm. In fact, a startup's life cycle is linked inextricably to its financing system. Startups' lifecycle may be described under different aspects, but the provision of financial resources boosts the growth pace of the firm and its competitive opportunities. That is why it is possible to talk about the "financial growth cycle paradigm" (Berger & Udell, 1998). Figure 14 shows a graphical rappresentation.

Pre-seed stage

At the time of the ideation, which is called *pre-seed stage***,** entrepreneurs are still delineating the starting idea, beginning from a problem, either a tacit or explicit, yet unsatisfied need of the market, analyzing and assessing a multiplicity of scenarios and options (Marmer, et al., 2011). Here, entrepreneurs assess their opportunities, the feasibility of the idea, studying the context, which involves competitors, potential customers' needs and entry barriers (Keating & McLoughlin, 2010). In this step, entrepreneurs begin calculating the financial resources they need to develop their business. At first, generally, startups' funds consist of those provided by entrepreneurs themselves, their primary partners, family and friends: it is called *initial insider finance* (also known as FFF Capital, "Family", "Friends" and "Fools"[12]). In the very first stage of the startup foundation, initial insider finance is usually the primary possibility startups may rely on, because of their informational opacity, they cannot access external funds if first they haven't shown their potential.

After that, entrepreneurs start converting their ideas into business, validating idea with respect to market. They need managerial and technical resources, which they can obtain cooperating

[12] This term refers to the primary capital that startups may leverage to develop their business idea and R&D. Entrepreneurs are obviously the first investing capital in their activities, their families and friends come after, they believe in the business idea of the entrepreneur and are likely to purchase an ownership interest in the business venture. Fools, instead, are those individuals who are not professional investors and decide to lend or purchase in the seed venture. The term "fool" refers to the high risk of investing or lending in a seed venture, which has not an own consolidated business yet.

with incubators, Technology Transfer Offices (TTOs) and business centers to strengthen the business idea (Passaro, Quinto, & Antonio, 2016).

Seed stage

Besides, they delineate a draft of the business plan (where the content and the characteristics of the entrepreneurial project are outlined), so it is possible to attract and convince *angel investors* (also known as *business angels*) to believe in their idea: this is the *seed stage* and the capital that is provided is called *seed capital*.

Angel finance is not an intermediated finance market: differently from venture finance, it consists of individuals who directly invest in companies through equity contracts (Berger & Udell, 1998).

Initial insider finance may be even relevant in this phase because it may contribute to the initial phase of production, by contributing to realize a conception of the *minimum viable product*. In these two steps of pre-seeding and seeding, startup is still a cell that is laying the groundwork for development.

Other actors who can contribute to its development are *incubators, public institutions* and *crowdfunding platforms.*

Early stage/ Start-up

At this step, the product's characteristics are refined and the startup enters the early stage of the lifecycle. In this phase, the startup enters the market and starts potentially recording the first incomes. Entrepreneurs begin to identify the necessary tangible and intangible sources and, in the mean time, they consolidate the technological and commercial development. The entrepreneur can access to *equity finance*: *venture capital*. Differently from angel finance, venture capitals come usually later when the product/service obtains a feedback from the market, so that the investment in the startup may be properly justified. Venture capitals sometimes may invest in startups even though the product is not ready, but this happens when product development costs are very high (*e.g.* clinical trials in biotechnology industry).

In addition, the entrepreneur may search for other financial options, such as crowdfunding, but also accelerators, which can provide both physical, technical and managerial resources, beyond precious contacts and strategic partners' identification (Keating & McLoughlin, 2010).

Scaling-up stage/Growth phase

The firm is self-sustainable and scalable in the market, the product generates an invoice, through which the entrepreneur can carry out predictions about the future of his/her business. The entrepreneurs should have developed good managerial skills to let the firm gain momentum (Ensley, Carland, & Carland, 2000).

As informational opacity decreases and profitability increases, other financing alternatives emerge. It is the growth stage of the life cycle. Banks come out as additional investors when the balance sheet of the startup achieves a stability and reflects valuable tangible business assets.

The chance of choosing *debt* or *equity finance* entails a relevant decision in terms of control and risk management: debt finance means keeping ownership and control of the firm, while equity finance entails minimizing the risk, by sharing it with less risk-adverse investors (Berger & Udell, 1998).

Maturity stage/Exit

At the final stage, which is the maturity stage, the startup has taken off, transforming itself into a stable venture, which may rely on *public equity* and *debt market*. In this phase many events may occur. Entrepreneurs may choose to sell the venture; they may regain their ventures and become the unique owners, if they had received equity finance (*buyback*); they may sell some shares to third parties but keeping some of them (*secondary sale*) or it may happen that investors withdraw their investments if the startup is close to failure (*write-off*) (Berger & Udell, 1998).

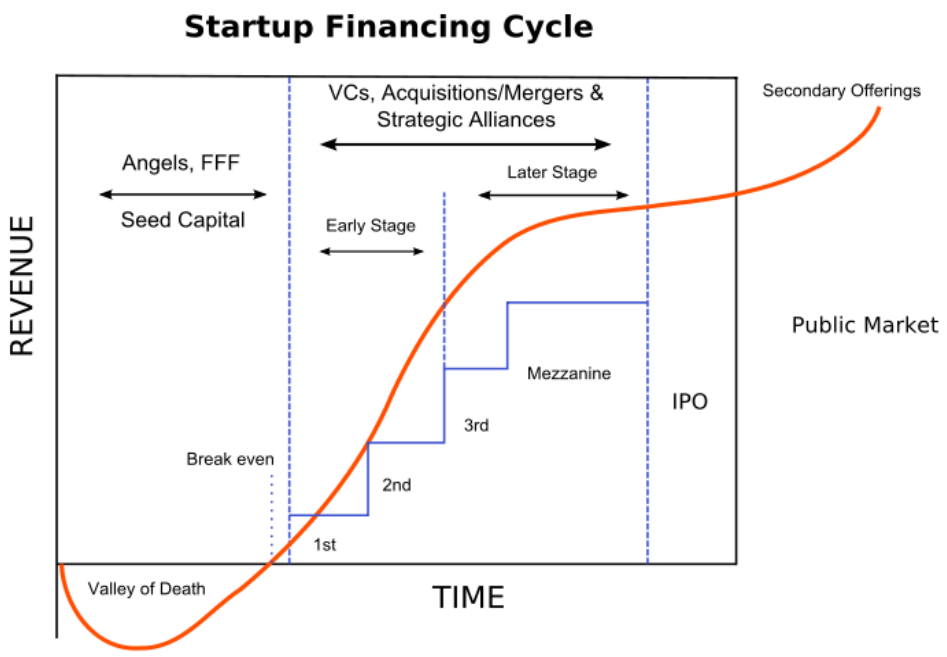

Figure 14. The startup financing cycle. (Source: netvalley.com)

2.2 Startups and strategic networks

In the lifecycle of a start-up, from its birth to its maturity (or failure), the natural excursus of its life embeds the connection to the external environment. The external environment feeds the new innovative venture and the latter feeds the surrounding context as well by creating innovation. The mutual influence that these entities carry out on each other is possible through the establishment and the activation of ties.

Networks are bridges that connect entrepreneurs to other actors. Actors may interact with new realities through a personal or professional relation. In fact, entrepreneurs may involve their family and friends in the entrepreneurial project, or individuals with whom they have tied a close professional contact. Differently, they may interact at an organizational level with some entities like public institutions (e.g. universities), venture capitalists, business angels, incubators and accelerators in an unplanned manner or on purpose, but they may leverage their personal social networks to have higher degrees of visibility and credibility to enter in contact with these established subjects.

In the following paragraphs, we will see the strategic ties having an impact on innovative startups' conformation, strategic orientation and business performance. Ties that concretely offer opportunities, technical competences, financial or strategic resources, access to social

networks, which may provide fertile partnerships, collaboration chances or support, by strengthening the credibility and reputation of newly born ventures.

2.2.1 Accelerators and incubators: supporters in the first stages of an innovative start-up lifecycle

Two realities that entrepreneurs of innovative startups may exploit in the first stages of their life cycle to gain support and benefits are *business accelerators* or *incubators*.

Business incubators are regarded as promoters of new businesses. They consist in organizations that supply entrepreneurs of new innovative ventures with office space and primary services at suitable costs. Their primary aim is to encourage and feed the emergence of newly born ventures. These recent entities are entrepreneur-oriented, as they analyze the business project of entrepreneurs who are willing to set up an own business, they evaluate the background, the context, the potential and entrepreneurs' needs to identify proper initiatives. Four areas of intervention of business incubators are identified (Campbell, Kendrick and Samuelson, 1985): 1) needs identification; 2) selection and controlled application of new venture's services; 3) financial assistance; 4) availability of incubator's network. Five steps in giving structure and favor commercialization are: 1) previewing; 2) incubating; 3) prototyping and showing results; 4) fostering and 5) assisting (Jolly, 1997).

Literature detects three incubator typologies: *non-profit incubators* are often regionally based and their role is to boost economic development; *university-associated incubators* aim at coming up with new technologies, transfer them and stimulate research and development; *for-profit incubators* that are thought for repaying incubator operators with a financial outcome (Campbell & Allen, 1987).

Studies have shown that incubators offer generally social channels to access necessary resources and both technical and strategic know-how to face a growth process (Lee & Osteryoung, 2004). They are active in multiple social networks from which they carry out constant interactions with market players to study target markets, isolate specific trends of purchase and consumption and establish new social ties and partnerships. Hence, they supervise the chances entrepreneurs may be interested in to provide contacts of key individuals or entities to access complex networks. Hence, incubators are expected to supply entrepreneurs with a wider range of services and support, such as start-up advice, but especially access to specific financial dynamics (business angels, risk capital, low-interest or easy-term loans), and relations to agencies and authorities as well as to the labor market, among other aspects (Rice, 2002).

The possibility of entering in contact with multiple individuals and organizations enables a series of opportunities: recruiting staff members, exchanging business experiences, contacts and information between incubator's tenants, creating partnerships to tap into the market with a significant support and exchanging competencies, especially when they receive advice from specialists. The context of the business incubator is rich of stimuli and interactions, making it a fertile terrain in which startups may grow. It is a symbiotic environment, where innovative entities enter in contact and contaminate positively with each other with new ideas, advice and different perspectives (Hansen, Chesbrough, Nohria & Sull, 2000).

Business incubators embed networks that may be divided into two categories: internal and external. Both categories help equally entrepreneurs in discovering and tapping into fruitful networks. Internal networks make it available resource combination limiting affordability and availability barriers by favoring the mutual exchange of resources. Besides, through internal networks incubators offer another service, which is networking with other tenant ventures. This opportunity actualizes in partnerships, joint ventures, collaborations or basic information exchanges, equally relevant for a startup, which is by birth resource-constrained (Lyons, T.S., 2002).

External networks, instead, are bridges to secure agreements with important actors, such as large firms and strategic operators in the sector. Besides, they involve business providers as well as experienced experts and tutors to support newly born enterprises with advice and support. Another benefit consists in being part of an ensemble of actors where it is possible to gain potential clients, by showing mature skills and expertise (Lyons, 2002).

Ebbers (2013) states that it is possible to distinguish two different behaviors in exploiting networks. Incubated firms' entrepreneurs may tie relations for personal desire and for the expectations to receive a benefit, or *tertius iungens* orientation, which refers to tie formation that entrepreneurs favor between unconnected individuals in their network in order to enable an exchange of benefits, of which they are not necessarily an integral part (Obstfeld, 2005).

Some studies have analyzed how incubated firms can influence each other. Geographical proximity, economies of scale and fertile exchanges between these ventures are effects of joining incubated networks, where it is possible to subcontract and buy goods (Campbell, 1989). The so-called *networked incubators* represent a recent evolution of incubators, where managers of business incubators tie relations with other business incubators to enhance the creation of partnerships (Bøllingtoft, 2012; Hansen, 2000). Their function is facilitating group dynamics but entrepreneurial spirit overall. Some studies have pointed out how proximity is not a key factor to give birth to successful relations, but it influences the frequency of interactions.

However, some authors are in contrast with this concept, arguing that incubator managers hardly connect incubated firms to key subjects (Honig & Karlsson, 2007) and if it happens, it does not produce tangible outcomes (Rice, 2002).

If top down dynamics provide no benefits for tenant firms, fruitful mechanisms happen from a bottom up perspective. Entrepreneurs of incubated firms interact with each other, enabling cross-fertilization processes. Their priorities are not usually related to learning new technical skills, rather acquiring other tenant companies' competencies. This happens to facilitate and accelerate growth processes and to secure contracts with external actors but with major stability (Bøllingtoft, 2012).

Some studies found that these ties are weak since they are reduced as an exchange of information instead of effective collaboration agreements (Tötterman & Sten, 2005). The cause has been identified as the fear of opportunistic behaviors of their networking partners, hence, the willingness to preserve their ideas and the valuable investors (campeb & Marlow, 2007).

New ventures' expectations may be resumed in some points: technical resources, exposure, financial resources, network, human resource, state resource, business assistance, management team. The positive contamination occurring in these kinds of organization favors the offsetting of the lack of knowledge and competencies of a single entrepreneur, by integrating that one of business incubators' experts or tenant companies' (Tello, Yi Yang & Latham, 2012).

Successful relations happen when firms identify in other firms a sort of compatibility ad complementarity to create mutual competitive advantages (Morgan and Hunt, 1999). When a venture's resources and skills match perfectly those ones of another venture, complementarity encourages exchanges and, hence, chances to be more competitive (Hunt, Arnett, and Madhavaram 2006). These types of relations are precious for novice entrepreneurs, because they may access and benefit quickly from these interactions, without searching for resources externally where the degree of uncertainty is higher.

To be valuable, ties within the incubator should be reliable and trustworthy: there must be an inclination toward positive and mutual outcomes in order to make them more stable and stem opportunistic behaviors (Anderson & Natus, 1990). Trust is in fact the principal driver of commitment. Shared values, communication and cooperation play at the same degree a crucial role in the positive performance of interactions. The more tenant companies share same values, perspectives and behaviors, the more they commit in the relationship (Morgan & Hunt, 1994).

As we can see, business incubators provide newly born venture with some tools to favor the emergence of their business. Similarly, do accelerators.

Accelerators are a recent phenomenon, but that is increasingly expanding. They emerged in the early 2000s as an answer to the growing number of startups (Isabelle, 2013) and are regarded as an evolution of business incubators (Pauwels, Clarysse, Wright & Van Hove, 2016).

Literature distinguishes two accelerators' types: *private* and *corporate accelerators* (Kanbach and Stubner, 2016). The former are programs that provide advice and assistance to startups toward their stable formation; the latter enable large firms to enter in contact with startups to gain new knowledge, ideas and technologies.

Accelerators, which is also called seed accelerators, startup accelerators or business accelerators refer to programs, with a limited duration, usually a few months, that provide novice entrepreneurs with key tools to make their businesses take off (Cohen & Hochberg, 2014). The activities carried out by accelerators are similar to those done by incubators, but the latter provides amounts of pre-seed and seed capital in exchange for equity, a higher numbers of "mentors", business experts in startup foundation and development and favor connections to potential venture capitalists or business angels (Isabelle, 2013). They help entrepreneurs in accessing early stage entrepreneurship, which means doing a step further after the conception of the initial business idea (Aldrich & Yang, 2012).

Differently from incubators, they are developed in shorter periods and are generally for-profit entities, as they have to deal with the financial expectation of their sponsors (Knopp, 2012).

During accelerators prgrams there is an involvement of serial or successful entrepreneurs, lawyers, experts and angel investors or venture capitalists, which take part of the learning process formation.

Funding capital is one of the first benefit that tenant startups may tap into, as in the first stages of idea conception and business model drawing, startups need financial resources to cover costs of experimentation, emerging during the permanence in the acceleration program. Through different investment models, accelerators may allocate sums of money in this phase. Some of them invest a little in the beginning of the process, and larger sums when the project is in the pipeline (Cohen & Hochberg, 2014).

Mentorship is one of the first concrete support provided to startups. It refers to the supply of technical, social, strategic feedback and advice by analyzing market dynamics and hence, validating or rejecting the product or service projected. This advice may be provided by either internal experts and specialists (members of the accelerator program) or internal and external mentors (external entrepreneurs, lawyers, experienced presidents of specific sectors' associations). Beyond mentoring, accelerators draw shared program of formal education or project tailored educational programs for the single startup in relation to the business idea and

its designing demands. This formation process is expected to give novice entrepreneurs skills and competencies to run their businesses and face administrative, organizational or strategic obstacles in having partnerships with other subjects (e.g. venture capitalists, large firms, universities) (Cohen & Hochberg, 2014).

Furthermore, business accelerators offer a series of activities that drive rapid progress and growth through intensive educational learning (e.g. design-thinking activities and learning-by-doing processes) (Stayton & Mangematin, 2018). The same context of mutual "positive contamination" is possible to be exploited in accelerator programs. Even though incubators are more social-networking oriented organizations, favoring relations between tenant firms, within accelerators, social networking is oriented to external actors, such as venture capitalists, angel investors and corporate ventures. Top down mentoring and formation is the priority in this kind of spaces. This does not mean that interactions occurring within incubators are less important, but the crucial interactions happening with relevant actors that may contribute financially and via agreements may make the venture take off.

2.2.2 Venture capitalists and business angels: powerful networks with key resorces

Financial resources are extremely relevant for the success of a start-up. They are not sufficient, but they are necessary to feed a new business and make it grow (Hellmann and Puri, 2000). Newly born ventures are subject to a financial gap, as they deal continuously with the obstacle of resources' shortage. At the beginning of the start-up life cycle, family and friends' savings represent the first source of capital. As alternative, entrepreneurs finance themselves through early product developments' income: this is called *bootstrapping*. Bootstrapping is entrepreneurship in its purest form (Lahm & Harold, 2005). It embeds the process of creation carried out by entrepreneurs to turn their business idea into something real, involving a series of activities to attract actors in their entrepreneurial project to receive resources without borrowing them. After demonstrating the product feasibility and the validity of data supporting the profitability of the venture, angel investors may enter in the lifecycle of the start-up and provide funds.

After having attracted individuals or business angels, entrepreneurs may present the business idea and a solid business plan, usually when the product is ready to access the market, to *venture capital funds* or *corporate venture capital funds* (Wetzel, 1983).

According to some authors, the difference between angel investors and venture capital funds is that the former are larger source of risk capital. They operate in informal financial market where there is no institutional regulation and for this reason, these subjects are difficult to be analyzed

and studied, whereas venture capital operate in formal markets in which their movements are clearer (Wetzel, 1981).

How do these actors play a role in the growth of a start-up?

Over time the conception that venture capital funds intervene after angels investors have been discarded. VCs are having more and more attention on early stages of new ventures (Dutta & Folta, 2016) and they make investment decisions step by step: they make limited investment in early stages startup, and evaluate the possibility of investing again on the start-up's performance once the business is taking off. In this way, VCs may assess entrepreneurs' skills to make their business work out over time (Zhang, 2007). Angel investors, on the other hand, are investing larger sums in later stages (Hellman & Thiele, 2015). VCs boost new ventures' growth by building around them credibility and reducing obstacles related to informational asymmetry. They may support actively or not new ventures, but usually they support them as their success becomes fruitful even for them. VCs provide startups with contacts, by facilitating their access to some of their networks, by using their contacts to spread a solid credibility around the new venture and by providing chances to find partners and human capital, which represent crucial factors for a startup's growth (Bertoni *et al.*, 2011). The diffusion of credibility happens also indirectly. When well-known VCs invest in a start-up, there is a positive attraction that encourage other VCs to consider the idea of investing in it as well. The well-known *halo effect*, as mentioned before.

Besides, as VCs usually are composed by financial and strategic experts, they support entrepreneurs in strategies, by providing managerial knowledge and supporting entrepreneurs in taking decisions according to new market evolutions that they accurately and constantly monitor (Sorenson & Stuart, 2001).

Angel investors embody typically ex-entrepreneurs or executives who have large sums to invest and thanks to their managerial capabilities, experience, personal contacts and reputation may positively foster startups' growth (Wong et al., 2009). Angels intervene in the startup's development process professionalizing their aspects: they invest their managerial knowledge beyond financial funds and this happens more frequently amongst angel groups rather than individual angels (Sohl, 2012). Similarly to VCs, angel investors support new venture by providing contacts, encouraging the approach with strategic partners and human capital, embodied by managers and executives able to accelerate the pace of development (Dutta & Folta, 2016). Usually the link that is built between entrepreneurs and angel investors is based on the trustworthiness that entrepreneurs are able to convey. Their conviction, passion and active behavior in searching for new inputs and resources is one of the keys that attract angel

investors' investment decision. This reflects a difference in the relationship created with entrepreneurs, as VCs rely more on factual data, statistical and financial aspects and future prospects of the new venture, evaluating its validity, rather than the entrepreneur's determination and belief (Prowse, 1998). On the other hand, angel investors carry out more accurate screening processes about business settings to invest with the proper assumptions (May, 2002).

In the process of deal-screening done on start-ups, the past experience of entrepreneurs has emerged to be important for the decision of investment. Even though there are also other aspects evaluated in the choice (e.g. market trends, competitors, product characteristics, business model), aspects strictly related to entrepreneurs themselves such as networks of contracts, skills, expertise and reputation play a positive role in venture capitalists' decisions. In fact, venture capitalists usually prefer to finance entrepreneurs who have covered important roles in previous ventures (e.g. managers or executives) as they should have developed high levels of managerial experience, also because their record of accomplishment is avalaible and if they show a demonstrated motivation (Wright, Robbie, & Ennew, 1997). Further, VCs result to consider positively experienced entrepreneurs, because they are likely to have more strategic networks to exploit and, hence, easier access to financial actors, beyond the entrepreneurial capabilities to face constant challenges (Zhang, 2007). On the contrary, scarce motivation, low propension to face hard work and risky challenges and previous success/failure represent elements that obstacle entrepreneurs to gain necessary resources. In addition, an aspect that is monitored and evaluated by VCs to decide to finance or not entrepreneurs is the existence of common direct or indirect social connections between them. Mutual social ties between VCs and entrepreneur on the one hand enable a rapid and easier transfer of information to reduce informational opacity. In fact, VCs have to decide when and how much invest in the new venture and to understand it, they must collect as much information as they can. Hence, more informal connections result to be addional opportunities for entrepreneurs to gain funds. On the other hand, VCs exploit common social ties in order to have a more global vision of entrepreneur's behaviors, decisions and actions in the same social network to understand if he/she are worth and if they will eventually have opportunistic or unfair behaviors (Shane and Cable, 2002).
Building direct ties with VCs enable entrepreneurs to translate the relation into less formal situations and be evaluated before the investment decision, as the relation is more trustworthy, more fluent and with fewer obstacles. Conversely, the existence of indirect ties (e.g. a common friend) facilitate the transfer of information between entrepreneurs and investors, acting as

referral for entrepreneurs. Shane and Cable (2002) show that ties to VCs indeed enhance the chance of receiving funds. Similarly, the creation of linkages between entrepreneurs and angel investors results to be a key factor in the success of the relation: trust relations enhance the quality of communication between actors and translates itself into positive venture performance (Bammens & Collawaert, 2014).

2.2.3 Universities: main promoters of innovation

Universities have been identified as one of the main actors in the processes of innovation, useful in producing innovation that is transferred from the academic scenario to industry contexts. Universities carry out research, which is a crucial component of innovation, especially in technological innovation. They represent hubs of knowledge that work at international, national and regional level exchanging information and precious results, which are consequently transferred to the business level thanks to the support and intervention of public policies that boost the linkage between these two realities. Universities are promoters of innovation for their research and enter in contact with other realities and newly born startups opeating in the industry, or they carry out actively and directly innovation projects. They carry out activities that researchers name *third mission*, which represents their inclination in translating their studies into concrete outcomes for social and economic development through collaborations, patents and spin-offs (Boh *et al.*, 2015). In this case, as the connection between universities and entrepreneurial contexts has become always more crucial to boost competitiveness and growth of a national economy, over the past ten years there has been a higher level of integration, and more specifically, a major interest of the university institution to tap into entrepreneurial world. This approach has lead to the concept "entrepreneurial university" (Branscomb *et al*., 1999).
Universities need resources, like any other venture, to analyze market changes and technological evolutions, to carry out breakthrough that may be concretely realized to give birth to innovative solutions (Cohen *et al.*, 1998). University Spin-Offs are new academic startups, created outside the university and operating in its name or created within universities, whose formation and diversities may depend on several factors. The geographical location emerges to be crucial for innovation diffusion, as it is linked to knowledge transfer and spill-over and it moves easily between near actors (Jaffe, 1989; Krugman, 1991, Feldman, 1999). Besides, it depends on universities' characteristics: the more researchers' skills and funds allocated to universities by public or local governments, the more the potential of success of new startups (Locket & Wright, 2005). Further, even the local and social environment influences the creation

of spin-offs, *i.e.* the efficiency of infrastructure, the pace of growth of local economy, the presence of regional ecosystems and the participation of incubators (Shane, 2003).

USOs are not comparable to traditional high-tech startups, as their background, their starting point and their goals differ. First of all, USOs are originated in an academic context, hence a non-commercial context, whereas many high-tech startups derive from incumbent firms that transfer the knowledge about product and processes of innovation that many academic researchers could lack (Vohora et al., 2004). Further, the stakeholders that are attracted in the business project of a USO may have different conflicting goals that threaten the constant development of a startup (Boardman & Ponomariov; 2009).

In this matter, universities have created Techology Transfer Officecs (TTOs) which are specific offices that convert into economic value the results of research and contribute to the creation of spin-offs, conceived as ‘‘new companies founded to exploit a piece of intellectual property created in an academic institution” (Shane 2004, p. 4). This occurs because TTOs are able to give structure to the environment surrounding new academic firms (Siegel & Wright, 2005).

One way in which startups are created in the academic field is through USOs, as mentioned before. However, universities may play a role even in the support of external entrepreneurial projects, such as *innovative startups*, which encourage technology transfer from the university to the real economy (Boh et al., 2015). One of the important themes that link universities and startups is the local knowledge spillover, which emerges to be relevant in the formation of innovation. There is a positive correlation between the geographical proximity between the firm and a university so that the reduction in costs to access external knowledge. The university spillover is a positive externality in terms of research and scientific outcomes that are accessible as well as the number of graduates who act as knowledge bringers (Calcagnini *et al.*, 2014). Some types of research demonstrate a preference of firms to place themselves near these entities, especially when it comes to industrial innovation and applied R&D (Mansfield, 1995). The concept of spillover is not only related to knowledge transfer but it is associated to the spillover of power, reputation, credibility and richness of the institution from which startups may extract benefits (Lin, 2003). Universities are institutional actors that represent a valuable asset in the economic growth, as they educate prominent students and professors, whose value, skills and reputation attract public and private funds. Increasing political and institutional power correspond to major abilities to attract human resources and major investments in research activities. Firms drawing up partnerhips with these entities may gain advantages through a halo

effect,[13] by having more opportunities, accessing additional resources and sharing part of their reputation.

Dealing with scientists and universities enables entrepreneurs to reduce the time of resources' acquisition and have access to a multiplicity of external networks. According to Crane (1969), there is positive relationship between the number of social ties scientists have and the productivity of their research; at the same way, firms with many social ties have more opportunities to be more innovative (Cooke *et al.*, 2005). In fact, becoming part of a university's network and be neighboring to its activities, entails that the new firm may be included in more open and fruitful networks (i.e. the regional ecosystem). Besides, it may be boosted by public policies, that are connected horizontally and vertically with other actors and enables startups to absorb new scientific knowledge to keep up with market evolutions and innovations (Murray, 2004). Universities may extract benefits from the interaction as well, as they possess high theoretical knowledge about new technologies, but they lack sometimes the product development capabilities and managerial experience. The relation between startups and universities result to be dynamic, as networking activities between them may foster their mutual growth (Hite & Hesterly, 2001).

2.2.4 Large firms and startups

Firms are naturally inclined to absorb and spread stimuli within an interconnected environment, which indirectly transforms them and makes them more reactive. There are firms, which are more structured and hierarchically configured, that have difficulties in approaching positively these impulses, trying to face the surrounding "system" that has no fixed rules and conformation. The external setting sometimes threathens their stability and organization, by overthrowing the structures and the functioning modalities they are used to.

However, other firms positively encourage the development of both horizontal and vertical relationships with other actors. Firms guided by entrepreneurs who are ready of changing the way they orchestrate resources and the way interpret the business environment; in many cases, these ones are startups.

If across these explicit and implicit channels information and knowledge flow, we can talk about *innovation*, and if they way firms approach innovation is open, we can talk about "open innovation" (Varaldo, Scarrà, & Remondino, 2016).

[13] The halo effect represents a cognitive bias where the positive impression toward one actor pours over an adjacent actor. There is an indirect positive influence.

The term “open innovation” was conied by Henry W. Chesbrough[14] analyzing the way firms generate ideas and bring them to the market (Chesbrough, 2003).

Over time, a remarkable shift on the management of R&D activities and internal assets has happened. At first, firms and especially large firms played internal R&D activities, leveraging their own assets and high-specialized team of researchers to carry out discoveries and get to market first than their competitors. They relied on their own labs, testing and prototyping new products or technologies, facing other market players by controlling their intellectual property (IP). Then, profits coming from their discoveries are reinvested in internal R&D (Chesbrough, Vanhaverbeke, & West, 2006). This way of setting up research and discoveries was called: *Closed model of Innovation*, showed in Figure 15 (Chesbrough, 2003). Chesbrough identified this model in the organization of Bell Laboratories[15], the research organization that was acquired by Lucent Technologies. Even though, it was perhaps one of the most powerful innovation centers, Lucent Technologies did not win the battle against Cisco Systems[16] in the telecommunications equipment market. The reason was that the two companies innovated differently: Lucent Technologies invested large sums in Bell Labs for new discoveries about materials, solutions and systems, where the research centre worked with a vertical “research-innovation chain”, with a large part of standard and applied researches prior to experimentations and prototypes. On the contrary, Cisco acquired knowledge from the outside, by partnering and networking with many actors and investing as well in startups with high potentials. In this way, Cisco won the battle for the innovation leadership (Chesbrough, 2011).

[14] Henry W. Chesbrough has been executive Director of the Centre for Open Innovation at the Haas School of Business at UC Berkeley and Professor at Harvard Business School in Boston. His research explores themes about technology, economics and innovation. With his book “Open Innovation: The New Imperative for creating and profiting from technology” (2003), he was awarded as one of the top 50 innovation leaders in 2003.

[15] First known as Bell Laboratories AT&T, Bell Laboratories is nowadays a research center that belongs to Nokia Group.

[16] Cisco Systems Inc. is a MNE, operating worldwide, which offers networking and telecommunication products.

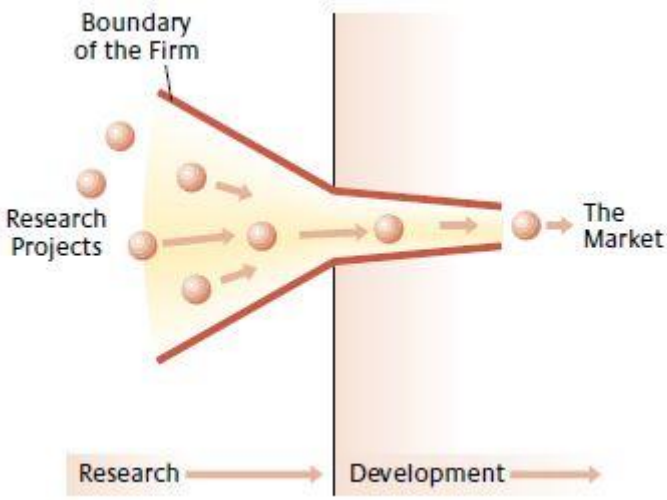

Figure 15. The Closed Innovation Model. (Chesbrough, 2013)

The exclusive control that companies like Lucent technologies and Bell Labs carried out on the research process was considered necessary to protect and enhance the competitiveness of the business, but it reduced the possibilities to grow. The opening and internationalization of knowledge-based exchanges has enabled increasing possibilities of offshoring[17] acquisitions of information of that kind.

In addition, a large part of the innovative processes relies on cross-sectorial knowledge: it means that the value of information takes shape when linked to other notions developed outside the single entity. Furthermore, in an international context, where product innovations' lifecycle is shorter and stakeholders assess the ability of managers in terms of short-term results, large firms prefer to invest only in those chain's links that do not require high degree of uncertainty and delayed rates of return.

Other problems have overthrown the closed model, for instance, the dramatic rise in the number of knowledge workers who left projects for other ones, making it more difficult to protect ideas and discoveries. Private venture capital played a role in this matter as well, making it possible for scientists and engineers to start their own startups. These elements, toward the end of the 20th century, brought to the definition of a new paradigm of innovation: the "*open innovation model*" (Figure 16) (Chesbrough, 2003).

In this model, the business boundaries are permeable to let innovation and ideas flow more rapidy and easily. In fact, in this approach, the business develops its own ideas and commercialize them to generate value for the company, or it acquires them from other firms in

[17] Offshoring consists of locating a process of the supply chain of a business in another country (*e.g.* R&D, manufacturing, accounting).

the surrounding environment. Besides, this new model relies on the possibility that firms have to exploit either internal or external technology sources and absorb other new technologies at various stages during the process of innovation. The way projects go to market is, as well, relevant to talk about *open innovation*, in fact they may go to market through spin-off venture companies and outlicensing, or directly through firms' sales channels. IBM, Procter & Gamble and Intel have been all examples of firms adopting this approach.

Another difference between the closed and the open model is the exploitation of "false positives". In the previous model, "bad" ideas were trashed and only the "good" ones were implemented and commercialized in the market; in the new model, "bad" ideas do not exist: even though a project does not seem to be promising, it may be transformed and improved if the company is able to combine it with external elements (Chesbrough, 2003).

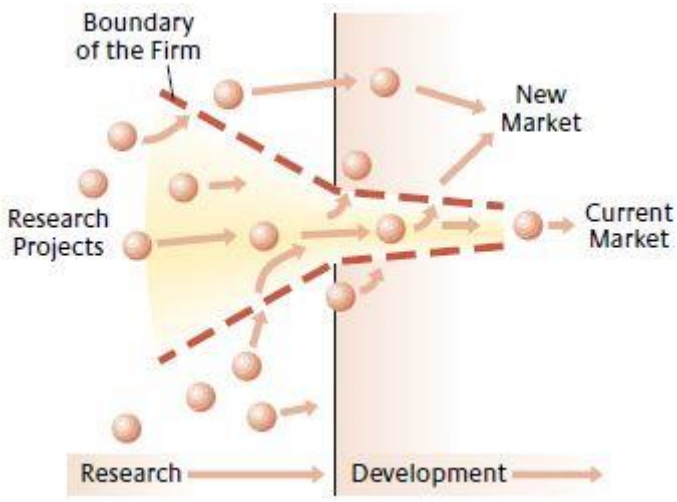

Figure 16. The Open Innovation Model. (Chesbrough, 2013)

According to Chesbrough (2003), nowadays outside knowledge is as worth as in-house R&D and companies must be capable of exploiting these knowledge-based sources and adopt proper business models to implement them.

Large Italian firms, excluding some exceptions, are late in terms of developing innovative processes following the "Open Innovation model", even though this approach could radically change the Italian ecosystem and offset the gap between Italy and other countries, especially the emerging ones (Varaldo, Scarrà, & Remondino, 2016).

In this breaking point, the role played by innovative startups is essential, especially for those created as spin-off of universities and research centres. In this case, startups are active players

in the process of activation and stimulation of effective interactions with high-tech companies, especially those having large amounts of resources to invest.

Startups and large firms have two different approaches to face Open Innovation. Yet, they must have a high degree of specialized skills and creative abilities to carry out innovative activities. The accumulation of this kind of capital in medium-sized and large firms well merges with physical capital (production, logistics and commercial structures) and financial capital, while in startups human capital is often the only one resource.

The consequence for large firms is that the launch of new high-tech products generates in return, in successful cases, the financial capital to reward the investment, letting the business model of the company unchanged. In the case of startups, instead, the product innovation matches the whole project on which the business is based on. The investment made by the startup does not come from their own financial resources, as they usually do not benefit from previous profits. On the other hand, startups that are able to get to the scaling-up phase[18] need to find funds to modify and adapt their initial business model. The transformation of the business model in the "young" startup is a natural mechanism that stems from the free discretion and authonomy of the entrepreneur. In large firms, on the contrary, managers must follow an upper global project where the solutions they propose must keep up with other objectives and financial schemes. The operating space is much more limited (Varaldo, Scarrà, & Remondino, 2016).

The differences between startups and large firms are not only in terms of dimension and financing methods, they belong to two different cultures in assessing opportunities, risks and in taking decisions. Volatility and risks are elements that make innovative startups very different from well-consolidated firms. The latter are not easily changeable, as they reach stable structures over time and they aim at lasting and achieving short-term results, while startups continuously ideate, create, innovate, yet their actions are bound to structural and financial limits and their lifecycle is extremely unsure (Varaldo, Scarrà, & Remondino, 2016).

The integration of these two different cultures clashes also in three themes: teamworking, product management and management roles.

In startups, teamworking is the lifeblood: the collaboration among managers, researchers, graduate students with different backgrounds, skills and experience is the primary requirement to boost innovative ideas. In large firms, teamworking occurs to integrate complementary specific knowledge in well-defined different areas (*e.g.* marketing, R&D, product design) and the flow of information, differently from startups, is rigid, controlled and kept confidential

[18] Scaling-up phase is explained in Chapter 2 paragraph 1.

between the levels of hierarchy of management, inhibiting transparency and an overall vision over activities.

The conception of the product is another element that takes two different shapes contextualizing it in startups or large firms. In startups, the innovative product is not always considered as a direct output to a specific market segment, yet it is considered as an effective solution to explicit/tacit needs and a direct projection of the identity of the firm. In addition, the product is seen as an ever-changing entity, which needs to be continuously updated. In large firms, the development of new products is supported by market analyses and the product is conceived as an element of the marketing-mix, addressed to a predefined target, of which managers evaluate the economic and growth potential.

At last, the organizational structure and the management roles differ. In startups, the structure is more flexible, the projects are horizontally managed and when it comes to scaling-up stage, the startup may rely on external experts, who are able to undertake complex accounting and management procedures. In large firms, the structure is more formal and rigid (even though in recent years they have tried to adopt more flexible organizational models) and decisions are taken vertically by a restricted number of managers (Varaldo, Scarrà, & Remondino, 2016).

The common point between these two entrepreneurial and managerial visions may rely on *Open Innovation*. To survive and grow in high-tech markets, this perspective may be extremely relevant.

Collaboration agreements

If large firms need to leverage both internal and external knowledge-based resources, exploiting partnerships with other national and international large firms, startups as well must activate relationships with external actors to accelerate their development and growth. For example, startups can benefit from their relationships with large firms, using their assets to develop, test and commercialize new technologies and apps. As they lack specific skills to sustain their growth from the early-stage up to the scaling-up phase, they can exploit the commercial and distribution network of the large firm, and its visibility as well. In this way, startups can acquire reliability from potential customers and investors, also known as *corporate reputation* (Cohen & Hochberg, 2014).

Three core models of Open Innovation, binding relationships between large firms and startups have been outlined (Enkel & Gassman, 2004):

- *Outside-in process*: knowledge-based sources and technologies introduced in innovative processes are acquired through exploration (*e.g. spin-in* and *license-in*);
- *Inside-out process*: technologies/innovations are developed inside the firm through processes of exploitation (*e.g. spin-out* and *license-out*);
- *Coupled process*: it is an integration of the two previous processes, through partnerships.

Particularly, collaboration between these two entities takes shape as:

- Partnerships;
- Corporate Venture Accelerators;
- Spin-in processes (*e.g.* pure acquisition, license-in) and spin-out processes (*e.g.* corporate spin-out, license-out).

Partnerships

The collaboration is a form of *strategic alliance*, where two independent firms decide to cooperate in order to exchange and share knowledge, resources, skills and risks. A strategic collaboration pursues strategic objectives with the goal of reducing costs, acquiring a major range of skills and knowledge to exploit, achieving more rapidly objectives and accessing more easily markets.

For a successful collaboration, the requirements are: finding the correct partner, respecting different cultures, identifying common benefits and respecting the agreement subscribed by both parties. The aim is building a *business relationship*, based on reciprocal satisfaction and exchange: combining the innovative abilities of startups with the reputation and financial stability of large firms.

An example is Coca Cola. In 2001, the multinational company started a partnership with three startups in the biotechnological sector (Virent, Gevo and Avantium) to develop a new project called the "Plantbottle Packaging", where the final product was a new bottle made with 100% vegetal material. Coca Cola decided to work together with firms that already had the necessary technologies for the project, because the internal process would have taken too many years and financial resources (Frazier, 2011).

Corporate venture accelerators

Paul Graham created the first startup accelerator in 2005. Its name is *YCombinator*, an innovation hub that supports startups, providing seed financing or helping them to find

investors/acquirers. This kind of initiatives spread globally with the aim of offering to startups an educational journey with mentors and experts to achieve some strategic skills and results, like the lauch of a product or ending with a final presentation of mature startups to potential investors (YCombinator, 2014)[19]. Differently from independent accelerators, corporate venture accelerators are created and financed by large firms. They have the same structure as independent accelerators, but they foster corporate innovation through a direct interaction with entrepreneurial startups to build *outside-in open innovation* (Weiblen and Chesbrough, 2015). The creation of these type of corporate accelerators occurs because promising innovative startups in late stages are expensive; hence, incumbent companies have searched for alternative ways to attract startups before their development and growth (Kohler, 2016). A corporate accelerator selects a limited number of startups to include in its accelerator program. The founders have the chance to connect with each other, exchanging their diverse skills and supporting each other in problematic situations (Cohen and Hochberg, 2014). On the one hand, startups may gain resources, networks, credibility and funds from the large firm intervention and support; on the other hand, the latter may acquire disruptive innovations, new market solutions and technologies.

Spin-in and spin-out processes

Spin-in processes embed the pure acquisition of a technology from the outside. The process of acquiring a patent or technology, by formalizing the use of embedded information within the innovation process is called license-in. The exchange often includes information about collaborators, the existence of risks, the share of profits and whether the technology may or may not be modified or adapted. Spin-out processes represent the opposite concept. They consist in the sale of a technology through a merger or a joint-venture creation. In the case of a license-out, the founder of a new product or process, transfers the responsibility to a third party to implement further developments to make the products and services available to the market. The founder is not responsible for the commercialization phase, but retains his/he rights on the new business. What distinghishes the spin-out from the spin-off is the involvement of other external actors than the “motherfirm”.

The existence of these interactions’ modalities between startups and large firms enables them to exchange reciprocally resources to offset their weaknesses. The positive match between these two realities boosts economic growth and fosters innovation. To do so, it is necessary to

[19] Venture accelerators have been object of discussion in Chapter 2, paragraph 2, subparagraph 1.

leverage key factors that usually must be put together both within and outside the firm. Consequently, approaching external entities to transfer information, knowledge and resources support an entire ecosystem to grow and its innovation pace to never slow down.

2.3 The Italian Startup ecosystem: demographic trends and public incentives to foster startups' creation

In 2012, the Italian legislative system introduced a new framework[20] bound to foster a more reactive and stronger startup ecosystem: the so-called "Italian Startup Act" (ISA).

ISA encompasses a series of incentives aiming at supporting innovative startups at the early stages of their life cycle, from incorporation to expansion until maturity.

Innovative firms need tailored policies able to favor the achievement of some goals, linked to innovation, growth and development. Startup culture is necessary for the progression of an ecosystem, as it is linked to other firms: small and medium-sized enterprises, large corporations, MNE and institutional players as well.

Even though the innovation-driven approach aims at encouraging sustainable growth and productivity, ISA has the goal to sustain these two elements to spur social mobility. This aspect can affect the dynamicity of a market, because it can contribute to talent retention and capital attraction.

Since the creation of the special section for innovative startups had been created, the number of registered startups raised from 10.000 to 15.000. Studies carried out by OECD showed the relevant difference between startups that entered the policy and the ones that did not. Growth perspectives and resilience seemed to be stronger in the former (MISE, 2019)[21].

In recent years, provisions put in place[22] strengthened the legislative system around innovative startups, increasing the number of incentives and facilitations. Besides, they can exploit other new policies, such as the "National Plan for Industry 4.0"[23].

An *innovative startup* is a newly established company with a strong inclination toward technological innovation. To understand better what an "innovative startup" is, it is necessary

[20] Decree-Law no. 179 of 18th October 2012

[21] MISE. (2019). *"Structural data about innovative startups"*. Rome: MISE.

[22] Decree-Law no. 3 of 24 January 2015, Law no. 232 of 11 December 2018 (Budget Law), Law no. 145 of 30 December 2018 (2019 Budget Law)

[23] "National Plan for Industry 4.0" is explained in Chapter 1, paragraph 4, subparagraph 2.

to analyze art.25 of Decree-Law no. 179/2012 (paragraph 2). It is defined as a limited company, which satisfies the following requirements (MISE, 2019) (c):

- it is newly established or has been incorporated for less than 5 years[24];
- it has the headquarter in Italy, or in another EU Member State where the firm has part of its production or branch in Italy[25];
- it has an annual turnover lower than € 5 million[26];
- it has not distributed profits during its activity[27];
- the mission statement is predominantly or exclusively about the production, development and commercialization of innovative products or services with a relevant technological component[28];
- it is not the result of a company merger, split-up or branch transfer[29];
- it meets at least one of the following innovation indicators[30]:
    1. At least 15% of the higher value between turnover and annual costs expended for research and development;
    2. The workforce includes at least 1/3 of PHDs, PhD students or researchers, or at least 2/3 of the team hold a master's degree;
    3. The company is the owner or licensee of a registered patent or it owns an original registered software.

A continuous control on innovative startups enables public institutions to modify and adapt policies to the dynamics of change and transformation of the former, making them more effective in the scenario of innovation.

Monitoring innovative start-ups helps sustaining the creation of local ecosystems, understanding how they interact each other and how they network to exchange knowledge and resources. In the same time, it helps to understand how it is possible to boost their development, strengthen and multiply their chances to be successful (MISE, 2012).

[24] art. 25 of Decree-Law no. 179/2012 paragraph 2, letter "b"
[25] art. 25 of Decree-Law no. 179/2012 paragraph 2, letter "c"
[26] art. 25 of Decree-Law no. 179/2012 paragraph 2, letter "d"
[27] art. 25 of Decree-Law no. 179/2012 paragraph 2, letter "e"
[28] art. 25 of Decree-Law no. 179/2012 paragraph 2, letter "f"
[29] art. 25 of Decree-Law no. 179/2012 paragraph 2, letter "g"
[30] art. 25 of Decree-Law no. 179/2012 paragraph 2, letter "h"

2.3.1 Demographic, economic and financial trends

Considering an overview of Italian "innovative startups" undertaken on 1st July 2019[31], the number of startups registered in the Business Register was 10.426, with an increase by +3,48% (351 units) than late March 2019. The share capital subscribed by startups amounted to € 546,4 million, with an average amount for each firm of € 52.411 (MISE, 2019) (b).

For what concerns the distribution across the different industries, 73,1% of innovative startups provide services to firms (especially in software production and IT consulting, 34,6%; R&D activities, 13,7%; information service activities, 9,2%), 18,1% in the manufacturing industry and 3,5% operates in the commerce field.

With respect to the impact of innovative startups on the total number of limited liability companies in the economic industries, we have 8,1% innovative startups of total firms operating in the service industry; 5% in the manufacturing, but 35,3% in the computer production field; 36,2% in the software production and 68,2% in the R&D sector.

Considering the geographical distribution of innovative startups, we can see that Lombardy is the first in the ranking: 2.656 units, 25,5% of total. After that, Lazio (1.156 units), Emilia-Romagna (903 units), Veneto (890 units) and Campania, the very first region in the South Italy (818 units).

As it is shown in Figure 18, it is possible to see the distribution across Italian provinces. Milan with its high-paced economic development is the first innovation centre (1.860); Rome, the capital city, covers the second place (1.000); and with a relevant gap there are Naples (380), Turin (338) and Bologna (322). As it is possible to mark, there is a prevalence of innovative startups in the North and in the Centre of Italy (MISE, 2019) (b).

[31] At the end of every trimester, an assessment of demographic, economic and financial trends is made by the MISE (Ministry of Economic Development).

RANKING	PROVINCE	N. STARTUP	% OF TOTAL
1	Milan	1860	17,84%
2	Rome	1037	9,95%
3	Naples	380	3,64%
4	Turin	338	3,24%
5	Bologna	322	3,09%
6	Padova	246	2,36%
7	Bari	191	1,83%
8	Bergamo	186	1,78%
9	Salerno	180	1,73%
10	Trento	178	1,71%
11	Verona	178	1,71%
12	Brescia	171	1,64%
13	Palermo	167	1,60%
14	Firenze	166	1,59%
15	Genova	163	1,56%
16	Treviso	160	1,53%
17	Perugia	158	1,52%
18	Modena	138	1,32%
19	Caserta	136	1,30%
20	Catania	136	1,30%

Figure 17. Provincial distribution of innovative startups. (Source: MISE, 2019) (b)

2.3.2 Demographic trends in the Italian agri-food industry

Starting from a screening in the specific section of the Business Register including innovative start-ups[32], the total number of registered innovative start-ups in Italy is 10.547. In Figure 18, we can observe the distribution of innovative start-ups across Italian regions. As one might observe, Lombardy is an outlier with over 2.700 startups, Latium and Emilia Romagna lag behind with respectively 1.155 and 926 innovative start-ups. Coming after, Veneto and Campania with respectively 918 and 852 innovative start-ups. Basilicata, Molise and Valle D'Aosta come in last with respectively 117, 76 and 20 innovative start-ups.

[32] The Special Section of the Business Register containing the list of registered innovative start-ups was downloaded on 21st September 2019 (http://startup.registroimprese.it/isin/static/startup/index.html?slideJump=32)

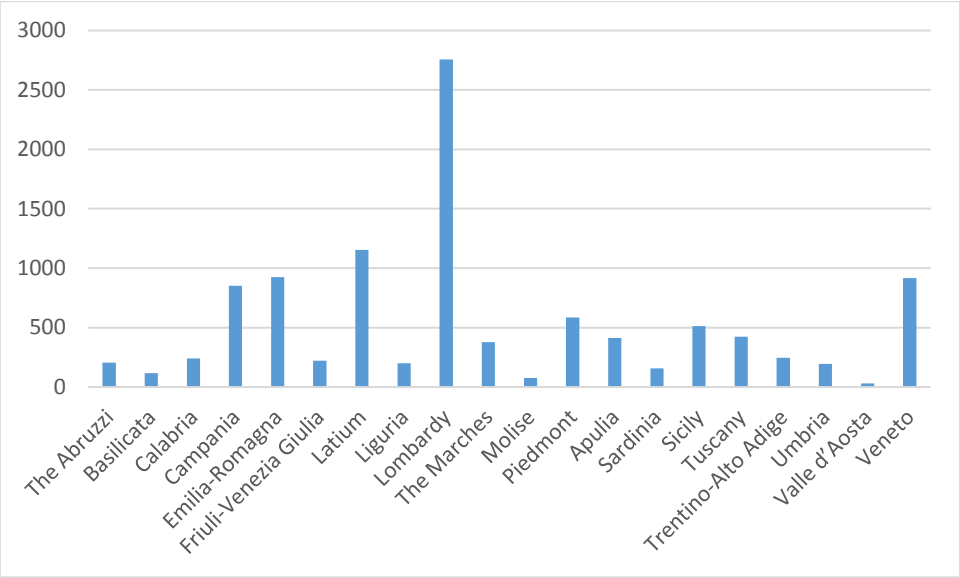

Figure 18. Distribution of innovative start-ups in Italy. Source: http://startup.registroimprese.it

In Figure 19, as one might see, the geographical distribution of innovative startups in the agri-food sector in Italy with the Ateco codes related to A-01, C-10, C-11 are represented. Ateco codes involve respectively agricultural activities, food & beverage production and manufacturing. Lombardy confirms its first place with 35 innovative start-ups operating in the agri-food sector. Emilia Romagna gains a second place with 18 start-ups, while at third place Sicily with its 16 agri-food startups. Valle D'Aosta comes last again, but Liguria emerges as the second-to-last region when it comes to agri-food innovative start-ups.

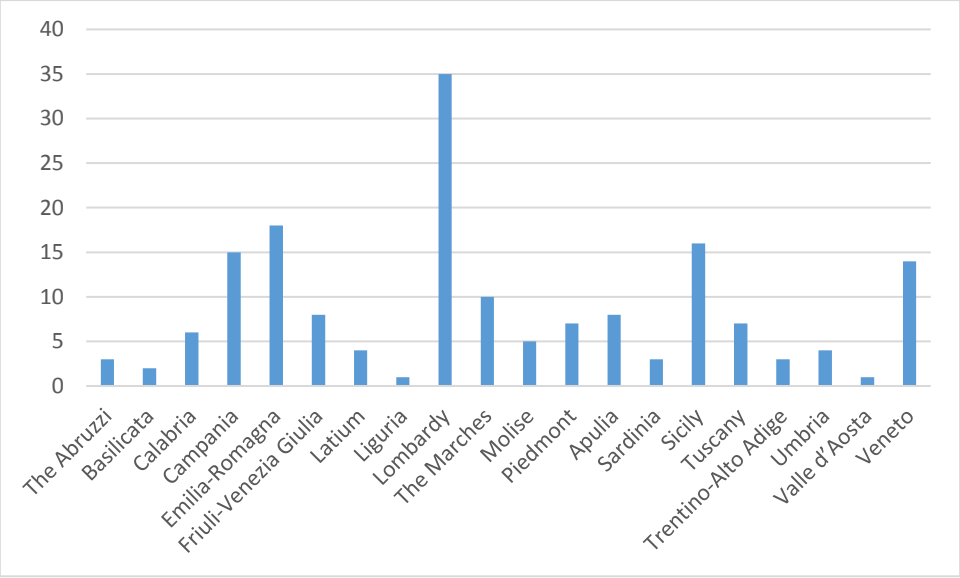

Figure 19. Distribution of innovative start-ups in Italy in the agri-food sector. Source: http://startup.registroimprese.it

In Figure 20, we may see that the innovative startups involved in the agri-food sector or in food & beverage processing, represent only a small percentage of the whole scenario of innovative start-ups: only 2% on the total Italian market.

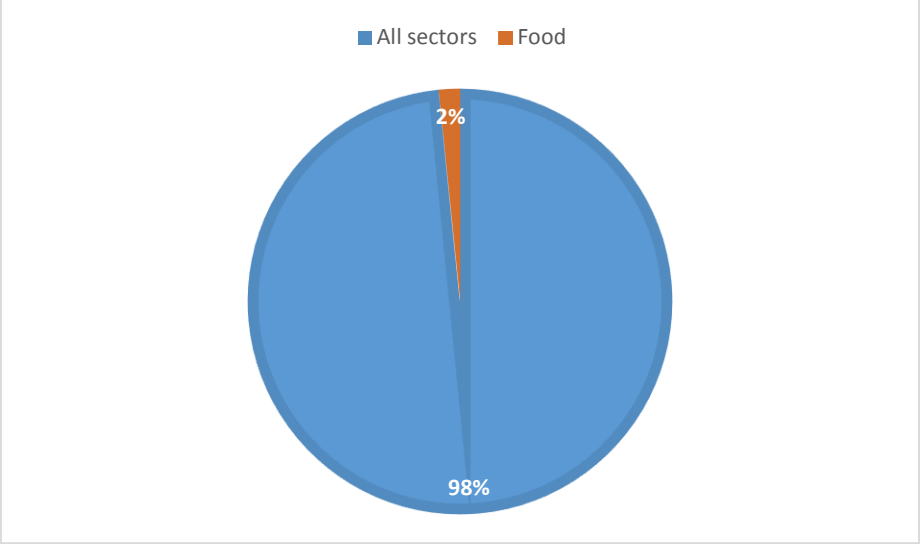

Figure 20. Agri-food innovative startups in the Italian domain.
Source: http://startup.registroimprese.it

The total number of innovative startups in the Italian agri-food field is 170 innovative startups: where 60 are involved in agricultural activities, 94 in food manufacturing and 16 in beverage production (Figure 21).

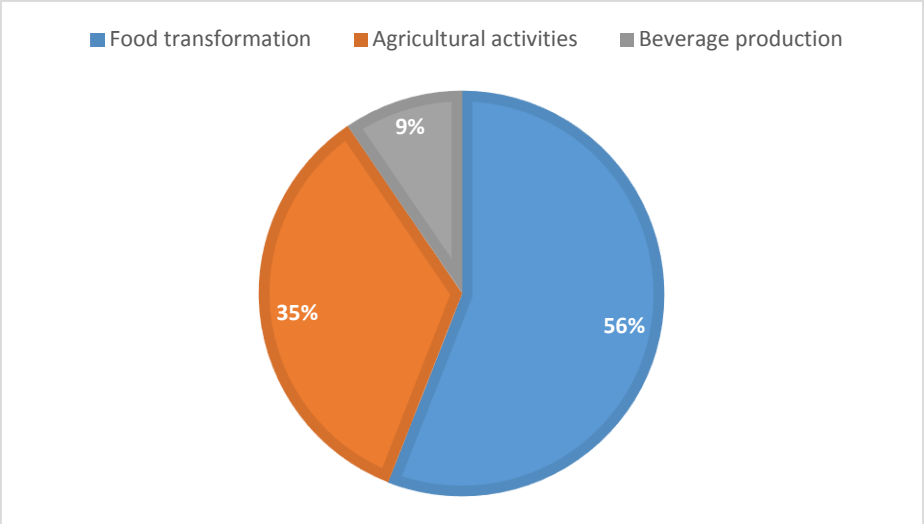

Figure 21. Italian innovative startups distribution among food micro-sectors.
Source: http://startup.registroimprese.it

As we can see, the agri-food sector is not a solid promoter of innovation yet. However, there are many innovative startups operating in IT and software production sectors, which are offering innovative solutions to food firms and actors. They are fostering changes within agri-food firms' business models and are influencing the relation between final customers and food producers (both agri-food firms and restaurants), e.g. food delivery, e-commerce and digital platforms.

2.3.3 ISA incentives and facilitations

ISA provides a series of benefits and incentives for innovative startups, whose they can benefit only from the date of registration up to the fifth year since incorporation. Before and after these deadlines, all advantages, of which innovative startups benefited, finish and there is the loss of the special status of "innovative startup".

Free and digital incorporation[33]

Startup founders can set up their company entirely online through a platform created by the Chambers of Commerce or through the AQI (Qualified Assistance for Businesses Office) that offers to startups the chance to be assisted in the whole process of registration.
This element is innovative, as it is the first time that incorporation is allowed even without the supervision of a notary public. The real benefits for startups are (MISE, 2019) (c):

- *No cost*: the registration and incorporation procedure do not entail costs for startups, which in normal practice should have paid notarial fees;
- *Simplification*: the digital conversion of the procedure makes it easier and faster the process;
- *Personalization*: the startup has the chance to modify data online without formal procedures;
- *Many possibilities*: it is possible for the startup to incorporate itself as an "s.r.l." company through a notarial act, and afterwards sets up online as a startup.

Further, innovative startups are relieved of annual membership fees. Besides, they do not pay any administrative duties or obligations to the Business Register.

[33] d.l. 3/2015, art. 4, paragraph 10

Exceptions to general company law[34]

If an innovative startup is established as an *s.r.l.* (comparable to a British "private limited company") accesses to a series of advantages. It can create shares with specific rights (e.g. shares without voting rights); carry out transactions on their own shares; emit financial instruments such as stock options and sell shares to the public.
The wide range of actions that innovative startups can undertake is similar to a *s.p.a. form* (comparable to a British "public limited company") rather than the one of a *s.r.l* (MISE, 2019) (c).

Extension of the deadline to cover losses[35]

The possibility of recording losses in the initial stages of the activity is high for innovative-driven company. According to the Italian Civil Code, if a loss causes a reduction in the company's share capital of more than one third, it can cover it by the end of the subsequent financial year. In the case of innovative startups, as they are naturally exposed to risks, the deadline is the second subsequent financial year (MISE, 2019) (c).

Derogation from measures on companies with systematic losses or dummy companies[36]

Innovative startups are not subject to regulations applied to dummy companies or companies with systematic losses. Indeed, in the case of low revenues or losses happening exceptionally, innovative startups are exempted from fiscal penalty (MISE, 2019) (c).

Exemption from conformity visa for VAT credits[37]

Standard regulations require to affix a costly "conformity visa" in order to offset VAT credits amounting to more than € 5.000. It can discourage the "horizontal compensation" (i.e. offset other taxes through VAT credits). To favor innovative startups' liquidity, the exemption from the obligation of compensation of VAT credits is applied until € 50.000, over this amount they have the same obligation (MISE, 2019) (c)

[34] d.l. 179/2012, art. 26, paragraphs 2, 3, 5-7
[35] d.l. 179/2012, art. 26, paragraph 1
[36] d.l. 179/2012, art. 26, paragraph 4
[37] d.l. 3/2015, art. 4, paragraph 11-novies

Personalized labour regulations[38]

Innovative startups follow the regulation imposed by Legislative Decree 87/2018 about fixed-term contracts: they can employ staff with fixed-term contracts for a maximum of 24 months per employee. However, unlike other firms with a maximum number of extensions equal to four, contracts can be short term and may be renewed several times, without limitations on duration and extension.

Besides, for startups with more than 5 employees there is no need to stipulate a number of fixed-term contracts proportional to the number of active permanent contracts (MISE, 2019) (c).

Flexibility in staff remuneration[39]

Staff remuneration variables are agreed by the parties (without prejudice to a minimum salary). These components may be decided according to profitability and efficiency of the startup, the individual or group productivity, or other performance indicators and objectives.

Besides, there is the possibility for representative trade unions to define some criteria for minimum wages in collective agreements and other guidelines to fix remuneration variables (MISE, 2019) (c).

Remuneration through equity tools[40]

Innovative startups are allowed to pay employees through equity participation tools (like stock options) and external service providers through work for equity schemes. The income perceived is not included in the amount of taxable income.

In addition, innovative startups, which carried out the incorporation procedure online, have the possibility to emit equity participation instruments via an online platform, signing a standard model and following specific regulations that are similar to those applied to online incorporation procedure (MISE, 2019) (c).

Tax incentives for equity investors [41]

The Italian Startup Act rewards equity investments in innovative startups with a remarkable tax incentive, both by natural and legal entities. It is foreseen a deduction from gross income tax (IRPEF) equal to 30% of the amount invested, up to a maximum of € 1 million for individual

[38] Legislative Decree 81/2015, articles 21 (3), and 23(2)
[39] d.l. 179/2012, art. 28
[40] d.l. 179/2012, art. 27
[41] d.l. 179/2012, art. 29

entities and a deduction from taxable corporate income (IRES) equal to 30% of the amount invested, up to a maximum of € 1.8 million for limited companies.
The incentives are worth both in terms of direct investments in innovative startups and indirect investments through collective investment undertakings (CIUs) or other companies that are the major investors in innovative startups and SMEs. Since 2017, the achievement of this facilitation is subject to a 3-year holding period of shares (MISE, 2019) (c).

Fundraising through campaigns[42]

Italy was the first country in 2013 to regulate the equity crowdfunding market, thanks even to authorized online platforms. Consob, the Italian Financial Market Supervisor, set out a series of provisions in the *Regulation on the venture capital fundraising through online portals* adopted in 2013 and updated with the resolution no. 20264 of 17th January 2018 (MISE, 2019) (c).

Simplification to access to the SME Guarantee Fund[43]

The Guarantee Fund for Small and Medium-sized Enterprises is a public fund that encourages access to credit by applying guarantees on bank loans. The guarantee, which is applicable directly and on operations deployed through credit consortia, covers up to 80% of the credit released by financial entities to innovative startups and up to € 2.5 million per firm.
Furthermore, on the part of the guarantee that is already covered by a public guarantee, the financial institution cannot request collateral insurance or other guarantees (MISE, 2019) (c).

Internationalization boosts[44]

Startups have a remarkable discount (30%) on contractual, credit, corporate and fiscal matters provided by the Italian Trade Agency ("Agenzia ICE" in Italian) by requesting the "Startup Service Card". Besides, this organization supports startups in the participation of several international events for hi-tech companies (with free access). Another help provided to startups is the "Global Startup Program", it consists in a series of formation courses about internationalization strategies and an incentive for a training partnership from 3 to 6 months at a certified incubator (MISE, 2019) (c).

[42] d.l. 179/2012, art. 30, paragraphs 1-5
[43] d.l. 179/2012, art. 30, paragraph 6
[44] d.l. 179/2012, art. 30, paragraph 7

"Fail fast" procedure[45]

The procedure that must be undertaken by innovative startups in case of failure is easier and more rapid than the ordinary one, as the entrepreneur can begin another project without being bonded to the previous activity. Startups are exempted from bankruptcy procedures, arrangement with creditors phase and compulsory administrative winding-up, but they have to carry out the procedure of compulsory resolution for asset liquidation and over-indebtedness. Innovative startups are included within the "no-fail" subjects (MISE, 2019) (c).

Conversion into an innovative SME[46]

Innovative startups, which achieve a mature level in their life cycle and maintain a sufficient innovation component, can become innovative SMEs. The upgrade to SME does not make lose the possibility to access to all the support measures, in fact most of ISA incentives are worth for both typologies, but some of them are reduced, as the innovative SME is considered stronger than an innovative startup and therefore with less requirements of being helped. For instance, the exemption from stamp duty does not include secretarial and annual chamber fees; tax incentives for equity investments are valid whether the firm performed its first commercial sale less than seven years before the investment or if they have compliance with the requirements in the implementing decree. Besides, there is no automatic access to Guarantee Fund, since there is an exclusion from the Fund for those that are classified in the low bracket in terms of credit assessment; others are subjected to same regulations of startups (MISE, 2019) (c).

2.3.4 Supporting programs

The policies put in place by the Ministry of Economic Development and other administrations are many. All these have the final aim of boosting innovation through the creation of an ecosystem, able to strengthen economic development and competitiveness of local, regional and national economy. These programmes focus on both the enhancement of Italian system of innovation and the improvement of Italian market attractiveness as receiver of foreign investments (MISE, 2019) (c).

Smart&Start Italia and Invitalia

This project fosters the creation and growth of high-tech innovative startups to encourage entrepreneurial initiatives linked to digital economy. It is the main financing organization for

[45] d.l. 179/2012, art. 30, paragraphs 1-3
[46] d.l. 3/2015, art. 4, paragraph 1

innovative startups. With the Budget Law 2017, the project has been refinanced by the Ministry of Economic Development with an investment equal to € 95 million (MISE, 2019) (c).

Italia Startup Visa

Italia Startup Visa's aim is encouraging foreign entrepreneurs to move to Italy to set up an innovative startup. The program, realized by Mise, the Ministry of the Interior and the Ministry of Foreign Affairs and Internal Cooperation on 24th June 2014, has introduced more simplified procedures to obtain entry visas for non-EU citizens, who have an entrepreneurial initiative and a basis of funds (personal or provided by third parties) with a minimum of € 50.000 (MISE, 2019) (c).

Italia Startup Hub

Another supporting program is Italia Startup Hub, which is consequence of the success of the Italia Visa Startup. Its goal is to accelerate entrepreneurial activities carried out by non-EU citizens, who possess already a regular residence permit and are willing to extend their stay in Italy with the possibility of turning the residence permit into a "startup permit for self-employment" and enjoy the same fast-track simplified procedures mentioned above (MISE, 2019) (c).

Entrepreneurial activities in universities: the CLabs

The CLab is a new teaching tool that combines a set of innovative activities, whose aim is the achievement of new ideas and their development. The methods applied support borderless exploration systems and crosscutting competencies approaches, thanks to the creation of work teams with students coming from different backgrounds. Besides, the presence of specialized tutors and experts who offer their knowledge and experience, help students to improve their ideas. The project was proposed in 2013[47] through a test of four prototypes, then reproduced in 2016[48] with an allocation of funds equal to € 5 million to finance projects with a maximum duration of 36 months and with a maximum contribution of € 300.000 per initiative (MISE, 2019) (c).

[47] At the dawn of the Italian Startup Act in the "Restart, Italy!" project, it was set up in 2013.
[48] With a provision of the National Program Research 2015-2020, it was reproposed in accordance with the Ministry of Education, Universities and Research.

Hyper-depreciation for 4.0 technologies

The Italian National Plan for Industry 4.0 has encouraged the digital transformation of firms and indeed the acquisition of state-of-the-art technologies, such as Internet of Things, robotics, AI systems, sensors, Cloud software. The incentive had consisted of an over-evaluation of the acquisition cost by 150% of its actual price, with any maximum amounts for the investment, until 2017. The 2019 Budget Law redefined the system, introducing a progressive structure with four brackets, of which intensity decreases as the invested amount increases (MISE, 2019) (c).

Patent box

Innovative startups can benefit another facilitation, which was introduced with the 2015 Budget Law[49]. This provision entails that 50% of incomes perceived through intellectual properties (such as industrial patents, formulas and models, copyrighted software and information) are not taxed. The goal of this provision is to boost investments in intangible assets and brands (MISE, 2019) (c).

Startup sponsors

2017 Budget Law[50] stated another provision that is valid for all young companies whose 20% of share capital belongs to a listed company. In this case, part of losses (fiscal ones as priority) occurred in the first three years of activity of the new firm may be transferred to the listed company, which can in turn deduct them as tax credit (MISE, 2019) (c).

The "National Innovation Fund"

This fund was created in 2019 by the Ministry of Economic Development, it is managed by Cassa Depositi e Prestiti (CDP)[51] and it brings together public and private funds bound to innovation matters and, overall, it aims at supporting innovative firms in two ways: by investing directly through the acquisition of minority shares or by investing indirectly through other funds. In fact, the operational tool of the National Innovation Fund (Fondo Nazionale Innovazione in Italian, FNI) is the Venture Capital and its financial allocation is estimated as €

[49] art.1, paragraphs 37-45
[50] art.1, paragraphs 76-80
[51] Cassa Depositi and Prestiti is an Italian financial institution, a public limited company controlled by the Ministry of Economics and Finance (83%) and partially by bank foundations (17%). It contributes in to the Italian economic development, by financing firms that are considered strategically relevant for the economy.

1 billion, so it may be considered one of the most remarkable venture capital ever set up in Italy (MISE, 2019) (c)[52].

Voucher for "innovation managers"

This incentive measure was introduced by 2019 Budget law[53] with the final goal of fostering digital transformation through the adoption of 4.0 technologies. Innovative SMEs and startups can benefit vouchers that are non-repayable and that must be used to receive digital consultancy services. The voucher amount depends on the size of the firm and on the service cost signed in the agreement with the consulting company (service contract) (MISE, 2019) (c).

Measures to support new technologies

The future evolution of economy is digital-based; therefore, MISE in 2019 has set up a series of funds to boost this transformation that is a result of the adoption of cutting-edge technologies, especially artificial intelligence, blockchain and IoT.
With 2019 Budget Law[54], MISE set up a Fund for emerging technologies with a budget of € 45 million in the period 2019-2021 in order to enhance innovative projects and competitiveness of Italian firms.
For this project, two groups of experts, academics and representatives of companies (30 people each) were established to give efficient and effective guidelines to two different action plans to implement digital strategies through new technologies. This Italian digital boost gets along with the European actions foreseen by the European Coordinated plan on artificial intelligence. In addition, it joins a more general European plan to strengthen European competitiveness through more "ethical and trustworthy" digital technologies (MISE, 2019) (c).

Certified incubators' support

To conclude, in the process of definition of the "innovative startup" regulation, in 2012 the Government adopted a new regulation to foster growth of these new high-tech firms[55]. It recognized officially the contribution of some subjects, which have made the difference in the growth processes and in the financial possibilities of startups: the *certified incubators*. Their presence and intervention may push the creation of a stronger and interconnected ecosystem of new ventures, which can increase Italian economy's competitiveness.

[52] MISE. (2019). *National Innovation Fund.* Retrieved from Mise: https://www.mise.gov.it/images/stories/documenti/presentazione-fondonazionaleinnovazione.pdf
[53] art. 1, paragraph 228
[54] art. 1, paragraph 226
[55] art. 25, paragraph 5 of D.L. 179/2012

The necessary requirements that a certified incubator must accomplish are[56]:

1) the ownership of structures, even real-estates, proper to host startups (equipment, research and test rooms);
2) the ownership of tools proper to innovative startups' activities (broad-band connection, meeting rooms, prototyping and testing machinery);
3) the management team is composed by experts in business and innovation matters and the managerial configuration is stable and permanent;
4) the cooperation with public institutions, such as academies, universities, research centers, which invest or join innovative startups projects, must be regular;
5) the extensive experience in supporting innovative startups' growth and development.

Besides, the chance of leveraging the SME Guarantee Fund encourages investments of certified incubators toward innovative startups. As innovative startups at the very beginning possess weak structural configurations and low amount of capital to invest, the role that certified incubators may play is absolutely relevant and significative (MISE, 2019) (a).

[56] Ministerial Decree of 22 December 2016

3 - SOCIAL CAPITAL AND ENTREPRENEURSHIP

In the process of innovation of firms, the surrounding context in which firms operate is crucial to their success. Constellations of actors exchange information, tacit and explicit knowledge, intangible and tangible resources to boost their process of innovation and growth.

Actors at both the individual level and the organizational level have a higher impact on each other, as the inclination of innovation is, actually, involving a multitude of subjects. Leveraging fertile collaborations, partnerships and open innovation approaches provide new ventures and established businesses with new opportunities and new assets to gain competitive advantages in the market.

Mutual trust and collaborations represent the basis on which a system of interdependencies develops itself at a local, regional, national and international level. Geographic concentration is relevant factor to improve the quality and quantity of interactions, as proximity makes innovation strategies more coherent between each other, especially when tacit knowledge is conveyed.

Hakansson (1987) regards regions as supports of knowledge-based linkages. He defines them as “learning regions”, in other words entities that embed infrastructures able to flare up new ideas and innovative technologies. These infrastructures are built by both private and public subjects, which encourage the development of dynamic networks, with the final aim of creating ecosystems, able to facilitate the connection between actors.

The context in which knowledge formation occurs and where actors may find complementary resources is influenced by social structures. People learn thanks to self-made but even imported knowledge, but the goal is to create an own knowledge and limiting the dependence on outside sources. Hence, cross-firm associations play a significant role in bonding relations beyond business linkages: through social interactions, it is possible to create a common context with shared values, entrepreneurial spirit and shared vision to boost exchanges (Brueckner, 2006).

The innovation process is concretely the conversion of knowledge into new ideas, disruptive products or services. To create innovative solutions, it is necessary to match different knowledge sources and be able to exchange them and combine them in new ways. New exploitation modalities are important as well, but the sources of information and knowledge are true crucial elements to set up a process of research (Moran & Ghoshal, 1996). Firms are subject to externalities, enabling processes of positive contamination and creative elaboration (Van Waarden, 2001). Spill-over effects and voluntary intra-firm exchanges rely on social networks, which work as bridges for information and assets. The bundle of linkages between different

actors creates the possibility of conveying trust, credit and resources, which are necessary to enable economic results and improvements on firm's performance and innovativeness (Andersson *et al*., 2002). The multiplicity of social networks that entrepreneurs may leverage to achieve goals and identify new opportunities represents the concept of *social capital*.

3.1 Social capital theories in the business management literature

Social capital in entrepreneurship is a theme that has been largely analyzed in social sciences, as well as in business management. In social sciences field, it has been observed under different perspectives.

It has been defined as 'the sum of the actual and potential resources embedded within, available through and derived from the network of relationships possessed by individual or social units' (Nahapiet and Ghoshal, 1998). According to Woolcock (1998), it represents the capacity of individuals of connecting and working together for a common aim. Fukuyama (1999) thinks instead that it is not the resources it stems, but rather an informal norm that pushes people to interact. The social capital, in his opinion, is the link between people, not what these ties carry. Coleman (1988), instead, proposes a different vision: social capital is at the same time the cause and the consequences. In other words, he considers it by its functions.

Similarly, Dakhli and De Clercq (2004) regards social capital as a source of knowledge or as a tool leading to resources. It seems to be a contradiction, as in the vision of Coleman, social capital is at the same time social capital and conducts to social capital.

Over time, the term "social capital" has been differently contextualized and adapted. Glaeser et al. (2002) defined it as a person's social characteristics. Putnam (2000) regarded it as a factual situation: it represents the networks, norms and social trust of a social organization. Thus, the concept of social capital is not uniformly regarded. Authors have deployed the term differently over time: do we have to consider it in terms of the norms having an impact on social relations, the person's capacity of networking, the resources underpinning relations or the relations themselves?

Entrepreneurship, according to Aldrich and Zimmer (1986), is strictly linked to entrepreneurs' decisions and actions in a social context: it may be facilitated and strengthened as well as limited by them.

The context in which entrepreneurs act is a constellation of nodes where actors interact with each other through direct and indirect relations. The dynamic environment underpinning the

actions of entrepreneurs represent a system of innovation, which is continuously changing and where actors position themselves differently according to different situations.

The *social network perspective* is a theory proposed by Brass in 1984, where the aim was discovering the position and the contribution of an actor on others. This model identifies how micro and macro relationships influence individuals or firms' actions. There are several criteria that may define a social network, e.g. closeness, betweenness, centrality, range, prestige, degree, indegree, outdegree. Further, within a social network each actor may embody some functions with respect to others: "star", which is central in a network; "liaison" which is connected to two or more networks that are not linked; "gatekeeper" who supervises the link between two actors; "bridge" is part of a variety of groups or "isolate" who has no links (Cross, Parker & Sasson, 2003).

Anderson (2002) states that the way entrepreneurs act in the environment they deal with has an impact on firm's performance, because the quality and the quantity of networks, they are capable of setting, give access to a series of opportunities, resources and stimuli, which are useful for the firm to grow, compete and keep up with market evolutions. The same idea is confirmed by Nahapiet and Goshal (1998). They regard social networks as a valuable asset for managing a business. Davidsson and Honig (2003) identify social capital as the ability of entrepreneurs of benefitting from their social ties, networks and memberships, and the ability of identifying specific social ties that may complement what former ties carry.

Some authors talk about *absorptive capacity* as a key factor to connect firms to external environments. Obtaining external knowledge is crucial for new ventures, as they have to deal with few resources, such as low capacity of R&D, low degree of managerial skills and little staff available (Ortega-Argiles, Vivarelli & Voigt, 2009). Social networks become relevant in the learning process of the entrepreneur. They can both identify new opportunities, improve the existing knowledge and absorb new one (Tsai, 2000).

Ngugi et al. (2010) identify three different skills: a *human relational capability* that balances the mechanisms of cooperation, a *managerial-based relational capability* that encourages interactive exchanges of knowledge and resources and *cultural relational capability* that is based on the establishment of a shared vision, able to co-create and discover opportunities and boost networking.

The ability of building social networks enables a series of benefits in terms of *size*, *positioning* and *relationship structure* (Blau, 1977). Augmenting the quantity of relations and interactions, entering a wide business network or searching actively new partners enable to access to a larger amount of information and multiply the possibility of bonding further relationships. This is how

size can have an impact on firms' development. Positioning is influential as well, as the position in which the new venture establishes itself can make interactions more rapid and fluid. The relationship structure embeds single stranded relations and multiplex ties: the former are created in a one-to-one form between an external person and the entrepreneur, where there is only one activity carried out. Multiplex ties foresee a series of interactions happening at different levels of content and relation typology, involving for example all team members who support the entrepreneur in bonding new ties (Burt, 1992).

Aldrich and Martinez (2001) state the existence of three different typologies of social capital: *human capital*, *financial capital* and *social capital*, but the latter is fundamental to access others.

Other studies demonstrated that social capital may be analyzed under different dimensions: three aspects have been identified by Napahiet and Goshals (1998), (Figure 23). The first social capital dimension is *structural*. It refers to the networking ties underpinning a specific business context where actors interact. The conformation of a network may be analyzed observing its characteristics: the number of ties, their connection and their hierarchy. For these reasons, this kind of social capital is more visible and easy to delineate. In this impersonal configuration of linkages entrepreneurs carry out social networking activities to access resources, but at the same time if they have access to a limited number of ties, they will have to find other actors who will be able to provide what they are searching for (Nahapiet & Goshal, 1998).

The *cognitive* dimension of social capital refers to the ability of entrepreneurs to leverage their social relations by exploiting shared values, a common vision and a common system of language or codes to exchange assets and knowledge. Similarly, it is necessary to understand other network actors' perspectives, needs and expectations to build consolidated and stable bidirectional relations. According to Cohen and Prusak (2001), conversation is a powerful tool to establish a fertile terrain to build relations. Conversation may occur in different forms: verbal and non-verbal communication, mutual expressions of disapproval, understanding or confusion, gossip, sharing of common beliefs and values. Differently from the structural dimension, which is tangible and clearly identifiable in its roles and relations, the cognitive dimension reflects an intangible element: the interpretation of a shared reality.

The third dimension of social capital is *relational*. If the cognitive dimension refers to how actors interpret the surrounding context, relational capital refers to feelings, obligations and friendships within particular personal relations. The relational dimension distinguishes itself for the quality and nature of a specific relation throughout its history and maturation. It represents the affective aspect of relations: interpersonal trust and shared norms. The key elements of the

relational social capital are trust and trustworthiness, sanctions and norms, obligations and expectations, identity and identification (Coleman, 1990). These aspects favor fluid and transparent interactions, transforming individual goals into collective goals. This concept is named *associability* (Lazarova & Taylor, 2009).

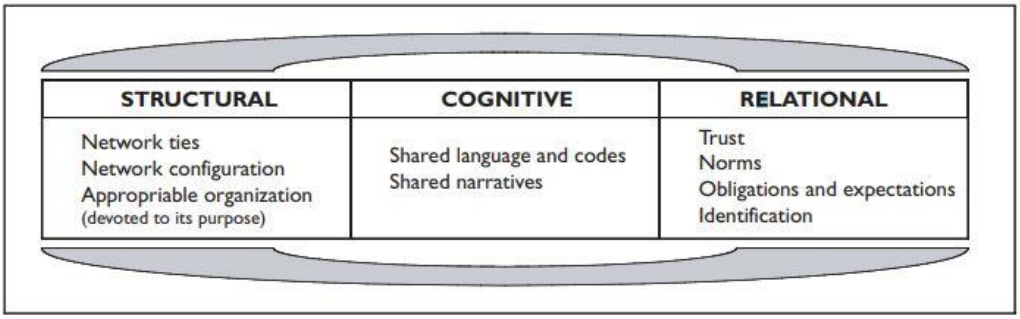

Figure 23. Three dimension of social capital (Napahiet and Goshal, 1998)

As we can see, there are many dynamics underpinning the creation of social networks. Their formation depends on entrepreneurs' intentions, actions, inclinations, aims and expectations. Language, codes, norms, values and beliefs: these are variables that influence the creation of a social tie and, at the same time, its quality and potential to be effective for the embedded actors. How social capital has been analyzed in the literature is clear, someone observes it considering the final aim of entrepreneurs or their ways of social networking. Others regard the typology of resources transferred or the effects on social networks' dynamics and on business performance. Social ties creation and exploitation is a theme that have been carefully observed, attempting to explain how, when, where and why they are originated. In relation to specific elements of distinction such as strength, actors' characteristics or position in the network or the objectives with which the ties are given birth, it is possible to outline different groups of ties and give them some distinctive features.

3.2 Ties' typologies and characteristics

The so-called *social network approach* (Johanisson, 1988) remarks the mechanism of establishing specific ties and acquiring resources to set up a new business. Different societal groups are associated to different visions, attitudes and beliefs: hence, their heterogeneity enables entrepreneurs to find those factors that they lack (Johannisson, 1988). However, social networks are dynamic: ties are activated according to the different entrepreneurs' needs. Weak or strong ties, individual or intra-firm ties, formal relations or non-work connections, between

far or close actors to the context in which they have to take decisions. As these social networks provide entrepreneurs with useful resources, they become the social capital of the entrepreneur (Burt, 1992).

According to Putnam (2000), through the improvement of the level of trust, it is possible to *bonding* social ties among actors inside a single societal group and *bridging*, as well, external networks to gain access to resources not internally available. Trust is like "glue", which can hold together all the subjects within a network and, at the same time, ensures the rapidity and easiness of informational exchange.

Bonding ties represent a sort of social capital where knowledge transferred is tacit and flows throughout strong ties, whereas *bridging ties* embed other external and heterogeneous networks (Putnam, 2000). The former are useful for "getting by"; the latter are proper ties for "getting ahead" (Putnam 2000, p. 23).

Fukuyama (1999) argues that bonding social networks hampers the openness to external stimuli. Differently, bridging social capital enriches the range and the diversity of resources available for the firm (Lin, 1999). Establishing a shared vision, shared norms of language and communication, beyond the mere exchange of resources, enables to create more trust-based interactions.

According to Davidsson and Honig (2003), *tie strength* results to be a key factor in the definition of a social network. The strength of a tie depends on four factors: the *amount of time* bound to the single interaction, the *degree of intimacy*, the level of *emotional intensity* and the *degree of reciprocity* (Granovetter, 1973). The more individuals invest time in the formation of ties and there is a high level of intimacy, emotional commitment and reciprocity, the more ties are strong. From this perspective, the distinction between strong and weak ties emerges (Davidsson & Honig, 2003).

S*trong* and *weak ties* play a crucial role in the start-up foundation and in the development phases. These concepts are connected to those of *bonding* and *bridging* social capital.

Bonding social capital means creating strong ties, whereas bridging social capital means forming weak ties. When social capital consists of strong ties, it means that these relations are trust-based, stable thanks to collaborative routine dynamics, where there is high degrees of emotional commitment. For instance, parents or friends who are entrepreneurs represent interactions that give a fundamental contribution in terms of suggestions, knowledge and finance, and that have an intense influence in the early stages of the process, especially because they are given for free.

Weak ties, instead, do not request high levels of emotional commitment and trust. They are easier to maintain as they need less effort and are related to less frequent and intense relations (Gulati, 1995). For instance, the participation to a business network may encourage the acquisition of both tangible and intangible resources that would be otherwise too expensive or unavailable to obtain (Shane & Venkataraman, 2000).

According to some authors, strong and weak ties are not only different because of their nature and strength, but also for *business goals*. Strong ties boost collaboration and a purest exchange of information and knowledge, reinforcing the degree of trust and transparency between the actors of a network, as well as combination (Ahuja, 2000). Strong ties, according to some studies, optimize their potential in favoring resource acquisition at early-stages of new ventures, as they are low-cost and enable young ventures of achieving higher degree of profitability than weak ties. Strong ties are more suited to be leveraged during initial stages, because in this step new ventures need specific knowledge, funds, stable collaborations and trustworthy partners (Aldrich & Zimmer, 1986). However, strong ties result to be expensive because to build them a large amount of time, efforts and commitment is necessary. Hence, few strong linkages must offset the quantity with a valuable quality of knowledge, useful to the start-up development (Adler & Kwon, 2002).

The role and function of weak ties have been analyzed in different models of analysis. Burt proposed the *structural holes approach* (1992). His theory is based on the idea that it is not the strength of ties that represent the key element for their effectiveness, though the structure of the network and the position of the entrepreneur and his/her firm. According to him, when single actors play the role of mediators between two or more networks, they transmit information and have the chance of leveraging a multiplicity of resources' typlogy. Comparing two constellation of nodes, with the same number of links, the position of the actor within the network influences the quality and degree of information received: in a network where nodes are highly connected between each other and the firm covers a central position, the typologies of ties received result to be redundant. However, in a network where the firm covers a perimetral position, as a "bridge" for other actors, it gains a wider variety of knowledge because these "structural holes" give the possibility of benefitting from the neighboring environment (Burt, 1992). The concept of structural holes is linked to that one of the *strength of weak ties*. In fact, Granovetter and Burt outline that strong ties show some weaknesses: an *informative* weakness and a *structural* weakness. The former refers to the similarity of actors involved in strong-tie relations, where an overlapping of contacts limit the creation of new ideas because they embed redundant information. This occurs because strong-tie relations involve individuals with same

characteristics, backgrounds or perspectives. Structural weakness is linked, instead, to the closure of networks, where linkages do not develop also among members surrounding the actor (or the entrepreneur), hampering the rapidity and the variety of information.

Weak ties, instead, allow to access to larger networks, which mean new information and exclusive resources. In fact, weak ties are useful to manage further gestation activities in the entrepreneurial project (Granovetter, 1973).

Davidsson and Honig (2003) agree with this concept of bonding and bridging social networks (as explained before) and state that social ties may have an impact on performance when they are meaningful, especially for nascent entrepreneurs of start-ups, so when they effectively lead to business networks that accelerate the nascent process, the probability of funds acquisition, sales and profitability. Thus, the interconnection with external actors, according to Shane and Venkataraman (2000) is articulated in two phases: the *discovery* of the entrepreneurial opportunities and their *exploitation*. These two steps find a concrete explanation in a model proposed by Davidsson and Honig (2003) represented in Figure 24.

During discovery, through social capital entrepreneurs are exposed to ideas, disruptive visions, research processes that affect the conceptual frameworks in which they move the first steps. Strong ties are relevant in this phase as they represent individuals or organizations very close to the entrepreneur, such as parents, close friends or the partner and may affect the early-stage decisions. Weak ties provide valuable resources thanks to the development of the individual's personal network and efficiency in resource utilization. But in discovery phase, there is not an equivalence of information between the actors, thus any typology of ties can improve the exchange of information. Entrepreneurs often start their new ventures in the sector they professionally belong and rely on friends and family's advice especially if they prefer keeping their project secret and confidential. Discussing about the entrepreneurial project with family members who manage an own business means, in this case, bonding social capital, relying on a relationship based on trust.

Talking with entrepreneurs in a community network, such as other businesspersons or community agencies, which may favor the will of self-employment, means bridging social capital (Davidsson & Honig, 2003; Shane & Venkataraman, 2000). In the second phase, the exploitation process, according to Aldrich and Zimmer (1986), social capital may be leveraged to exploit specific resources. Bonding social capital activates networks that give entrepreneurs the possibility to assess and exploit new assets. Instead, if individuals leverage ties with

organizations or associations they belong, it gives major opportunities to access to new markets, attract investors and allocate resources.

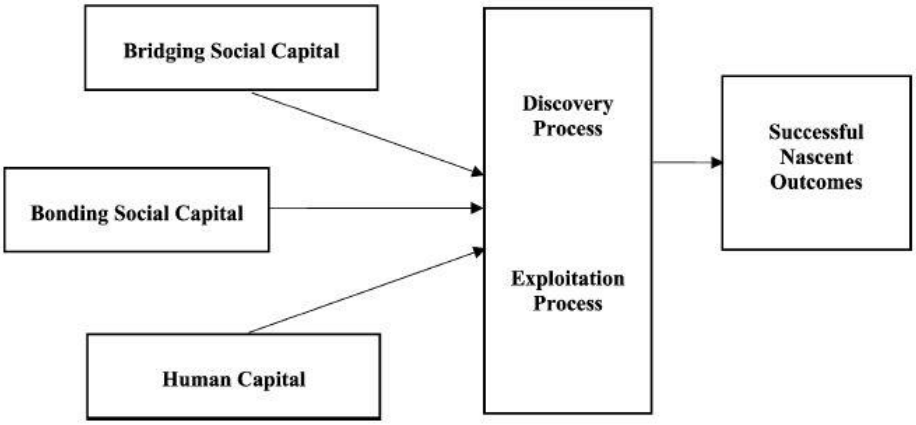

Figure 24. Social capital, human capital and the nascent entrepreneur (Davidsson & Honig, 2003)

Fukuyama (1999) points out that both *formal* (or *inter-organizational*) and *informal* (or *personal*) social ties may play a relevant role in the initial phase of new ventures. In fact, the same mechanism reflects the context in which business opportunities emerge, separate fragments of knowledge put together between individuals and institutions, both intra-firm and extra-firm. The individual's social networks according to Murray (2004), influence how much the firm is intertwined in the community, because the ability of entrepreneurs' themselves to connect to the external environment becomes itself a firm's asset. The flow of knowledge in the innovation processes runs multi-directionally, in many cases part of the knowledge utilized derives from the intellectual and social capital of the entrepreneur (Murray, 2004).

Informal ties are those ties that originated before the creation of the new venture and generally represent the categories of ties embodied by family, friends and colleagues (Granovetter, 1973). According to some authors, networks characterized by high levels of informal ties encourage entrepreneurial behaviors (Uzzi, 1997) and support entrepreneurs to easily identify new business chances. Among start-ups, the limited access to resources is an obstacle difficult to overcome, that is why informal networks embody a valid help: information and knowledge, especially contacts and opportunities, flow easily as trust and reliability overpower opportunistic behaviors (Hite & Hesterly, 2001). *Formal ties* have different characteristics, as they lack the level of intimacy and trust of informal ties. They occur at the firm level, where the "give-and-take" is the primary requirement for the exchange. Nothing is given for free in formal networks, economy rules and exchanges principles regulate actors' transactions. In fact,

they are more rigid and present a well-defined structure. Even though informal ties appear to convey more redundant information over time, for newly born ventures they represent the first and generally the main networks on which they may rely for emotional and financial support (Dìanez & Camelo, 2017).

Homophilic and *heterophilic* ties represent another dichotomy: the first are linkages between actors that are highly similar, the latter refer to actors that have not much in common in terms of characteristics, background and operational context. Age, gender and ethnicity may also distinguish the degree of similarity and affinity between actors (Lazarsfeld & Merton, 1954). Homophilic ties are useful for strengthening shared values between actors and for building stronger relations where it is easier to exchange information; heterophilic ties enrich the variety of information and openness to external networks. The degree of the influence of ties depends strictly on their *frequency*. The more the tie (either hemophilic or heterophilic) is frequent, the more actors' actions are subjected by its implications (Qureshi, Kistruck & Bhatt, 2016).

Ties are complex to define, but if they are exploited correctly and their potential is optimized, they might lead to mutual benefits that can foster business growth.

3.3 Social ties' benefits for newly-born ventures

Start-ups are by nature resource-constrained entities and for this reason, obtaining resources is crucial for their evolution. Studies have demonstrated that entrepreneurs leverage social networks to acquire resources but one of the biggest problems is the presence of informational asymmetry. New ventures, beyond the constraints of knowledge and networks, face obstacles in showing and demonstrating the value of their businesses to external actors. The opacity created by the lack of information makes difficult to gain credibility among incumbents and network actors (Shane, 2001).

Uncertainty leads to two obstacles in the creation of ties with external subjects. Firstly, because entrepreneurs want to exploit information that others ignore, so they opportunistically want to keep their knowledge protected; secondly, they prefer to limit the diffusion of key competitive elements (Shane, 2000). Linkages may bring benefits for the establishment of young start-ups. According to their different industry, needs are different and so are the actors with which they would like to interact. Carrying out a literature review, the key benefits that entrepreneurs obtain through social ties are the following: connectivity, credibility/exposure, market opportunities, network links, financial resources, technical and strategic knowledge.

Connectivity

The concept of connectivity relies on the relations built at the individual level. Entrepreneurs enter in contact with other entrepreneurs or people who may support them somehow. Usually these subjects represent individuals with whom entrepreneurs worked together in the past or had some personal bonds. Connectivity, as a condition of social capital, provides new relations or strengthens old ones, but how these ties may support entrepreneurial activity depends on ties' typology, appropriateness and relevance.

Connectivity is also referred to friendship built between individuals, when it is transferred into the organizational level. Even though friends do not keep in touch for years, they are able to activate their ties and be useful for each other. *Commonality* in this matter plays a relevant role: individuals, who had been colleagues in the past, may leverage common links to set up their new ventures and gain resources they need (Anderson, Park & Jack, 2007).

Credibility and exposure

In the creation of linkages with unknown actors, credibility results to be crucial. Entrepreneurs must face informational asymmetry and perception of risks when dealing with external actors. For this reason, they search for entities or people who may support them, by conveying part of their credibility to the new venture. Being credible means be attractive for investors, but also it increases the chance to build important relations, such as those with universities, accelerators, incubators, public institutions. Besides, the partnership with important players ensures to provide nascent entreprenerus major exposure and visibility within the surrounding environment (Anderson, Park & Jack, 2007).

Market opportunities

The outcome of social networks may correspond to the identification and exploitation of market opportunities. According to Hills *et al.* (1997), entrepreneurs who search for opportunities individually are less successful than those who rely even on their social networks. The interaction with actors enables the creation of new chances but, at the same time, it may happen that through relations with individuals or organizations, entrepreneurs are able to identify new business possibilities. World-of-mouth dynamics are part of social interactions and boost information diffusion. Even though they may happen in informal manners, they provide information, contacts and suggestion able to create chances for the new venture.

The more actors and individuals in the same network present different characteristics and visions, the more there is the possibility to pool different perspectives and new business

scenarios. In this concept, the strength of weak ties (Granovetter, 1973) may demonstrate its superiority over strong ties. If entrepreneurs relied only on their deeper social relations with which they share a common vision and shared beliefs, they would have low transaction costs and easiness to optimize the interaction; however, they would miss the opportunities to consider other alternatives and sources of benefits.

Network links and contacts

Social capital creation and activation stimulate entrepreneurship, as longtime contacts and new ones ensure the connection to market evolutions and avoid isolation. Isolation is the major antagonist for new innovative ventures, as innovation is a flow that must keep scrolling among nodes of networks to find implementation. In some crucial moments of the development of a start-up, contacts play a relevant role to accelerate the access to the market and to grow rapidly. Leveraging contacts helps to absorb information, knowledge, business advices and business dynamics, yet entering in contact with specific individuals and specific actors embody huge potentialities. Here the role of social networks is connecting the entrepreneur to other networks, not available before. For this reason, the position of the entrepreneur and his/her venture within a network is crucial. According to Burt (1992), as observed in the previous paragraphs, in a network where the firm covers a perimetral position and works as a "bridge" among different actors, the variety of the ties created allow entrepreneurs to tap into new contacts that can potentially favor venture's growth.

Financial resources

New ventures spend the first stages of their lifecycle in a continuous battle for gaining funds. The identification of finance alternatives has an impact on the entrepreneur's finance behavior. There is a contrast in finance literature, because existing theories assume that all entrepreneurs are aware of the finance chances and their characteristics; however, scholars have pointed out a knowledge gap between the amount of finance alternatives and the ones identified by entrepreneurs. This gap causes a reduction in the possibilities of finance that entrepreneurs may exploit and a weakness in the power of negotiating and pricing investments, due to this informational asymmetry. Hence, entrepreneurs in this situation may fail raising capital or cannot access to sufficient degrees of finance (Van Auken, 2001).

Human capital, which has emerged to play a fundamental role to attract investors because professional experience and formal education, reduces the uncertainty of transactions making the entrepreneur more reliable and trustworthy.

Social capital, instead, may help entrepreneurs in raising finance and know better the financial environment. Through social relations and business networks, entrepreneurs gain important resources that would be otherwise unavailable or costly to obtain (Granovetter, 1985). The relationship with actors playing in a financial context may minimize information barriers and increase the reception of tips about investors' characteristics, goals and financial decisions. Having relations with bankers, business angels, venture capitalists, managing directors of investment funds or crowdfunding platforms gives a huge chance of exploiting the business idea properly and gaining the support from right individuals or institutions. Financial investments give major credibility and attractiveness to the startup, as it means that someone has already attached to it importance and a potential recognition (Van Auken, 2005).

Technical and strategic knowledge

The geographical proximity helps the easiness and rapidity in which knowledge is transferred according to Marshall (1947), but it depends on the type of knowledge. When knowledge is explicit or codified, it is made of theories, processes, procedures that are easily transmittable and do not require direct experience as they are formally spread. The conveyed information is objective and does not depend on the person who conveys it. Differently, tacit knowledge is personally transferred; its recreation is context-based so highly personalized. In this case, proximity has a high impact as it is face-to-face transmitted. Thus, the person, not only the information, becomes crucial for the learning process (Marshall, 1947). When entrepreneurs set up their new firms, there is a high probability that they need technical support, as they cannot have all the capabilities to face the development of their business.

Co-working activities, incubators and accelerators are proper organizations that may favor the exchange of technical resources. External individuals with different backgrounds, skills and competence may contribute to the definition of the business idea, fine-tune the direction of the entrepreneurial project and provide advice about elements entrepreneurs do not know (Tello, Yi Yang & Latham, 2012).

Besides, Johannisson (1988) demonstrated that former employers and also former employer's customers, as well, are useful for acquiring technical tips and strategic advice and a rapid feedback.

Benefits that can derive from external interactions depend on the quality of these relations. The more these relations are based on reciprocity, equality and mutual support, the more there will be tangible and intangible advantages. Social capital represents a crucial aspect for entrepreneurship, as it enables the connection of one entity to others to receive the necessary

resources to set up or develop a new venture. However, social capital is tightly related to *human capital*.

3.4 Human capital: a complementary driver of Entrepreneurship

Literature remarks that generally there is a positive correlation between human capital and entrepreneurial performance. Human capital refers to individuals' knowledge and capabilities that may play a fundamental role in entrepreneurial activities. These abilities are results for instance of academic formation, but it does not involve only formal education. It may consist of practical learning developed during professional experience and non-formal education received through training courses that do not belong to traditional education structures such as schools or universities.

When individuals apply these cognitive skills developed over time, entrepreneurial activities may become more productive because high levels of human capital are associated to higher capabilities in perceiving new opportunities, in optimizing their potential and in facing obstacles that hampers growth (Coleman, 1988). More specifically, management experience and a previous experience as entrepreneur demonstrate to influence business performance (Robinson & Sexton, 1994).

Bourdieu (1986) describes the relationship between human capital and start-up performance. He has introduced the term "conversion," which represents the different types of capital that can be concretely converted into resources and economic outcomes. Better education and investment in skills are related to major capabilities to ensure benefits by activating more knowledge-based activities.

From a literature review, it has been possible to delineate two types of social capital: *general* and *specific* human capital. When it comes to general human capital, it represents a set of abilities that may be used in several fields and contexts, whereas specific human capital embeds competences strictly linked to particular activities, fields or environments (Florin & Schultlze, 2000). Specific human capital, indeed, results to have a major influence on venture performance rather than on venture creation (Reynolds & White, 1997).

Social systems may influence entrepreneurs to under-invest or over-invest their human capital in activities, by limiting their actions or by encouraging them. Investments in specific human capital are expected to provide higher outcomes in shorter periods; instead, general human capital is likely to be fruitful in a longer period of time (Becker, 1964).

Human capital represents the primary knowledge owned by entrepreneurs throughout their careers, education and work experience. This primary resource is combined with that one existing within external social networks. Individuals search to integrate what they already know with complementary information that they can gain from the surrounding contexts, either creating new social ties or activating already existing relations.

In fact, the reason that pushes entrepreneurs to turn their gaze towards external environment is that human capital turns out to be obsolete and depreciates over time, if it is not renovated and upgraded (Almeida & Carneiro, 2009).

Further, human capital encourages interactions among different communities and among actors of same communities, favoring exchange of information and resources. The presence of well-developed human capital boosts individuals to build social networks and invest in them (social capital), as they recognize the potential and the advantages that they may receive. For this reason, human capital and social capital are complementary elements. The former fosters the intention of creating and/or exploiting the latter (Som, 2014).

In social networks some common values, beliefs and behaviors represent the assumption that encourages people to engage with each other intra- and inter-communities. Structural characteristics of networks give a direction to how human capital may realize and be crucial both for individuals and for the network. The relationship between human capital and social capital brings together the different desires of individual choices and the willingness to connect to other actors in a same group or community.

Networks are useful and fruitful for entrepreneurs because they are carriers of capital. During interactions, bargaining power is a determinant factor in the balance of the distribution of the control over the relation, as entrepreneurs have to deal with uncertainty in fixing specific terms, conditions and clauses. Bargaining power depends on how individuals may influence the interaction's variables, and to influence them they must show particular skills and knowledge, that means, in other words, that they have a good level of human capital to manage relations with major control.

In this matter, rationality of actors pushes them to act opportunistically without assessing a distribution of benefits. Hence, even though human capital fosters rationality and behaviors that aim at maximizing individual interests, social capital, instead, may discourage this behavior, promoting the propensity towards cooperation and mutual support.

3.5 Entrepreneur's personality and the quality of social networks

An entrepreneur is the individual or one of the individuals who sets up or establishes a new firm (Daily & Dalton, 1992). His/her role is crucial for the potential success of the venture, as it is connected to the ability of recruiting and collecting all the necessary resources to boost the new venture's development. Attracting and absorbing stimuli occurring in the surrounding environment is part of the ability of being entrepreneur: absorbing what is around, to transform it into new resources, knowledge or strategic elements (Romanelli, 1989).

The ability of attracting resources is not sufficient, there is the need of exploiting them to build something new and innovative. The cohesion between innovative elements is crucial for the rapidity and stability of the success of the venture. Besides, the competitive aspect relies on the ability of gaining resources not easily accessible from the competitors.

Further, competitive advantage relies on entrepreneurs' ability of creating better relations with the surrounding context, identifying the correct resources that they need for their venture creation and development and, finally, feeding their relations to keep them "alive" over time. For this reason, the personality traits of a founder result to be fundamental. Being able to deal with the external context means being effective in building an internal consistency: two aspects that are strongly correlated to how the entrepreneur is and behaves with other individuals or organizations (Rauch & Frese, 2000).

Some authors argue that personality traits are not only internally developed, but they are linked to entrepreneurs' surrounding factors. The environment has an influence on how entrepreneurs behave and how their personality develop over time (Zhao et al., 2005).

As personality traits are correlated to entrepreneur decisions, actions and, hence, business performance, some authors have pointed out models to categorize personality traits of entrepreneurs. McCrae and Costa (1997) have drafted a model of analysis and interpretation: the Big Five model. It is a framework that embeds five traits of personality, which are significant for business performance: extraversion, agreeableness, conscientiousness, openness to experience and emotional stability.

Extraversion includes sociability and being prone to interact with others; openness to experience represents tendencies to be open-minded, creative, original and inclined to new experiences and ways of interpreting concepts and meanings. Emotional stability refers to the ability to be flexible to different situations and cope with obstacles and anxiousness. Agreeableness represents the tendency to be generous and sympathetic, whereas conscientiousness refers to accomplishment, dependability and tenacity.

The personality's traits of entrepreneurs have influence on how they deal with the external environment, on how they create new relations, how they exploit existing ones and how they use them to access to other networks of relations.

In the five factors of the model proposed by McCrae and Costa (1997), each trait of personality can influence how the entrepreneur sets up a relation, how successfully obtains what he/she needs and how he/she is good at preserving each single tie.

Extraversion, for instance, which is related to an individual who is prone to socialize, interact with other people, talk and exchange ideas or perspectives, is a fundamental trait of personality for nascent entrepreneurs. In the first phases of the new venture establishment, founders commit to find potential stakeholders (Shane, 2003) and extraversion is crucial, as it is a personality inclination that makes it easier to create external relations and communicate more effectively with other subjects (Yu, 2013).

Openness to experience refers to the intention of exploring constantly new meanings, new perspectives to change the way one person may interpret the world. Founders with this kind of personality have higher probabilities to make their entrepreneurial projects work, by reinventing the conformation of networks in the surrounding environments (McCrae and Costa, 1997).

Emotional stability represents the ability of managing stressful moments in ever changing environments, maintaining a focus on business goals and deadlines. In this case, entrepreneurs maintain their stability and resilience to face obstacles during the start-up establishment and development. New venture contexts are by nature risky and unstable, hence entrepreneurs may demonstrate high levels of security to maintain relations. In fact, those founders who are overwhelmed by stress and pressure are likely to find more difficulties in having success with their ventures. Social isolation is one of the negative factors affecting business performance (Rauch & Frese, 2000). According to Li et al. (2014), emotional stability turns out to be positive, as it enhances the preservation of long-term interpersonal social networks and the improvement of the quality of external social networks.

Agreeableness means the tendency to be generous and sympathetic, cooperative and tolerant. In western cultures, these adjectives are not considered crucial for business performance, as kindness is perceived as a weak element in competitive contexts because it may limit the ability of entrepreneurs to "use" others to achieve their final goals. In eastern societies, instead, agreeableness encourages the degree of trust and mutual support within social networks. Kind and more tolerant entrepreneurs are perceived trustworthy and reliable (Lau, 2002).

The last personality trait is *conscientiousness*. It represents tenacity and determination. Entrepreneurs with this personality are goals-oriented, very rational, good at planning, organizing and orchestrating many complex situations. The ability of optimizing each effort encourages other subjects to give value and trust to the founder, limiting their fear of risk and uncertainty. Besides, it increases the degree of commitment between stakeholders, investors and other potential actors (Zao & Seibert, 2006).

Hence, a "good" personality reflects entrepreneurial success through a projection of the quality of social relations on the venture potentialities.

Holland (1968) stated that the environments in which people live may reflect the entrepreneur himself/herself. Murray (1938) as well focused on the relation between personal needs and environmental dynamics. His idea was that personality is shaped by heredity, family, social patterns and cultural factor. Decisions and actions towards outside contexts are influenced by these factors, which through entrepreneurial intention acts on entrepreneurial orientation.

Social competence is a relevant attribute when it comes to social networking activities and entrepreneur's identity. Social competence represents the ability of an individual to identify and leverage his/her social relations. This competence results to be valuable when bridging ties with unknown actors, introducing a project or a business plan to investors, negotiating or making agreements. Social competence is linked to firm's performance and the existence of strong or weak ties is not sufficient if entrepreneurs are not able to exploit them effectively (Baron & Markman, 2003). An effective social competence emerges when entrepreneurs are good at introducing their ideas, being visible and attractive for other subjects of a business network, communicating and increasing the number of social ties.

Besides, creating a network that can be effectively fruitful for new ventures foundation and development requires the ability of choosing *right individuals* who can concretely provide benefits and help entrepreneurs to reach their goals (Wei *et al.*, 2010). Founders with developed social skills build linkages with more contacts and establish more interactive relations with them. They can create exclusive ties for their success (e.g. potential customers or ventures capitals or business angels), but they should be able to exploit them effectively.

3.6 Trust: a subtle dimension of social capital

The common denominator that boosts the creation, first, and the development and the exploitation, afterwards, of ties is *trust*.

Social and business relations are characterized by the presence of *vulnerability*, because one of the two actors involved in the relation depends on the actions played by the other one. Kollock (1994) argues that trust is strictly linked to vulnerability: the existence of trust foresees the existence of vulnerability as the more trust exists, the more one actor is subject to actions performed in a specific moment and in a specific manner by another actor.

Uncertainty is part of relations (Yamagishi & Yamagishi, 1994). The dependent (or trustee) actor does not know how and how much the actions of the other actor will have an impact on him/her.

The role of *trust* in social networking activities is fundamental. The higher trust characterizes relations, the lower transaction costs, existence of conflicts, misunderstandings and opportunistic behaviors will be. It is especially useful to provide stability into contexts in which there are high degrees of uncertainty, opacity and risk. Besides, trust encourages more frequent and transparent negotiations, a frequent information sharing, higher levels of collaboration and cooperation that may enhance the mutual business performance (Dyer & Chu, 2003). Among firms when trust is present, there is the expectation that other organizations will not behave in an opportunistic manner. Hence, trust works like a mechanism of control to monitor moral hazard behaviors and stabilize governance dynamics, playing the role of a lubricant for these relations (Gulati, 1995).

Trust may be distinguished into *dispositional* and *relational trust*. The former refers to the existence of trustworthiness among individuals or actors of a network; the latter belongs to specific one-to-one relations (Rotter, 1971).

Again, it may be distinguished into two types: *generalized* and *institutional trust* (Dakhli & De Clercq, 2004). Generalized trust refers to how much individuals trust each other. Institutional trust represents trust toward organizations and institutions. The first type of trust mirrors the interpersonal aspect of trust, and it is expected to limit uncertainty and encourage cooperation and interaction. The second trust typology represents the deterrent aspect of trust. The existence of trust minimizes sanction mechanisms that make agreement contracts between actors less stable. This enables to create a reciprocal expectation of mutual support (Dakhli and de Clercq, 2004). If individuals or organizations consider that mediating discourages opportunistic

behaviors in the definition of contracts' conditions, they will be more prone to interact with other individuals or organizations.

When trust is present amongst relations at an organizational level, it reduces the necessity of controlling and monitoring dynamics, by minimizing the rigidity of relations and making them more stable, flexible and fluid (Quinn, 1979). For this reason, trust is regarded as a mechanism of social control.

Trust harmonizes the interactions' variables, enhancing the creation of ideas and the ability of facing common obstacles. High levels of trust and reliability augments the exchange of useful information and knowledge, facilitating communication between individuals or organizations (Knack & Keefer, 1997). It enables the exchange of tacit knowledge and the capabilities to use it as well. The positive effects result to be major competencies to face complex markets with high entry barriers in terms of the institutional, regulatory and cultural framework (Agndal, Chetty, and Wilson 2008).

The presence of trust amongst actors may contribute to create a "signaling effect" for other individuals or organizations (Coleman, 1990), by enhancing the credibility of the single firm in a more rapid and effective manner. Trust may give a direction to the creation of new ties, as an extension of already existing relations. This happens because creating external ties occurs in a context of uncertainty, even ambiguity, where dynamics and results of interactions are not easy to foresee. Financing initiatives, where for instance venture capitalists and business angels have to decide where to invest their funds, rely strictly on trust variables, which may limit informational asymmetry, overpassing the limits associated to innovation risks (Yamagishi & Yamagishi, 1994).

Trust and reliability on the entrepreneur itself, on his/her competencies, experience and skills, or on his/her business idea or on intermediary actors that guarantee for them represent factors that encourage the definition of contracts, agreements, new ties and financial investments.

Trust improves the quality of relations, limiting many protection elements that actors set up not to be damaged from opportunistic behaviors. It increases over time when the trustor is satisfied with the transaction and decides to lower barriers, reducing transaction costs and minimize decision time. In this way, the relation turns out to be more effective and fluid.

Trust enhances the quality and the competitiveness of an entire ecosystem, as it encourages the rapidity of investments, the quantity and their quality, leveraging credibility and reputation that actors exchange. Communication in this issue plays an important role, as it conveys trust. Communication and interactions lead to a reduction in the information asymmetry, making it possible to create more transparent and long-term relations (Klabunde, 2015).

The role of trust is fundamental to understand and explain complex dynamics occurring in social networks. Hence, when entrepreneurs start their entrepreneurial project, they usually rely on high-quality and stable relations that can support them in some ways: emotively, financially, technically or strategically.

Many actors may take part of the development process of a startup: universities, other startups, incumbents, accelerators, incubators, public institutions, field operators and so on, but when entrepreneurs take this decision, usually the first actors involved are embodied by family and friends. In fact, the relation with these subjects is stable, intense and strong, since it originates independently from the business level, or, if originated at the business level it represents ties consolidated over time. Besides, this kind of relations embeds higher levels of emotional commitment and hence, demonstrate more reliability and synergic behavior.

3.7 Family and friends: primary strong ties for entrepreneurs in the early-stages of a new venture's formation

The role of personal ties influences the actions carried out by entrepreneurs. For instance, entrepreneurs have to decide where to locate their new ventures, before starting them. They have to decide where to find partners, market opportunities and move to expand their businesses. The orientation of their choices rely on several factors and existing literature have pointed out the role of family and friends ties as key factors.

Entrepreneurs set up new ventures for several reasons: they might want to go out from the firms they have worked at, because they have a new innovative idea or, instead, because they have matured high levels of specialized knowledge to invest in an own autonomous business (Sorenson, 2018).

In this decision and, overall, in the new venture foundation family and friends have a relevant influence. First, family and friends represent tight relations that connect entrepreneurs to places where they live. Besides, they usually provide entrepreneurs with emotional support in terms of motivation for the start-up creation (Van Auken & Werbel, 2006).

Parents, for instance, may figure out as incubators for their children. The *family embeddedness perspective* shows that individuals are born in a specific context, within specific networks ties, being installed into three interrelated elements: transitions (e.g. marriage, divorce); resources (e.g. human, social, financial) and norms, culture and values (Aldrich & Cliff, 2003). In some cases, the entrepreneur's family not only supports concrete capital, it also provides other

intangible elements such as market access, new ideas, opportunities and strategic suggestion (Dyer Jr., 1992).

The role of the family in the formation of a new venture acts as an incubator. Not only as family members, but especially when the family already manages an own firm. Entrepreneurs are more likely to set up a new venture if parents run an own business (Rosenblatt *et al*., 1985). A family-owned incumbent firm may contribute to the creation of the start-up by providing vital resources, such as financial, technical, social or strategic resources to favor the foundation of the new venture. Supporting newly born entrepreneurs and giving them access to resources enables to accelerate the mechanisms of growth.

Some authors have introduced the concept of *familiness*, which represents the mechanisms of tangible and intangible inclusion of knowledge, culture, mindset, concrete resources and skills that a family-owned firm incorporates. In these firm typologies, resources are reunited in a unique cradle (Habbershon & Williams, 1999). The way family firms think, act, make decisions, connect to other actors, access to financial resources, exploit their reputation and their leadership capabilities reflects itself on the way new ventures establish themselves (Greve & Salaff, 2003).

If start-ups start from a family-owned firm, it is possible to talk about *corporate entrepreneurship*. It refers to the creation of a new venture by a single person or a group of individuals managing already an existing organization, where the new entity presents a renewal of characteristics of the already existing firm or the introduction of new innovative elements (Sharma & Chrisman, 1999).

Family-affected resources and capabilities influence new venture's entrepreneurial decisions. The growth of a new venture, which is usually resource-constrained, leads to the exploitation of existing and available ties surrounding the newly born entity. Social networking ties of the mother company, in which the new venture establishes itself, are fundamental to start a business with a solid starting scenario. Bonding ties with partners who have already entered in contact with the mother company is easier as they may rely on a major degree of credibility and reliability. Further, leveraging these ties means having more chances to obtain financial resources and, at the same time, discovering more market opportunities linked to existing business networks in which the new venture may be installed.

Some authors have argued that partners of entrepreneurs support them actively, calling their team work "copreneurs". Emotively, financially or technically, there is the possibility that the partner contributes actively, providing his/her experience in a specific field or his/her experience as entrepreneur or manager (Bensemann, 2011).

Entrepreneurs may gain financial resources from their family and friends, especially during the early-stages of new ventures' lifecycle. Even during crowdfunding rounds, their contribution might favor positive trends and may encourage the attraction of other investors, even though some authors have pointed out that the diffusion of crowdfunding platforms weakens the relevance of these ties (Mollick, 2014). In the financial issue, family and friends are also important because if they support entrepreneurs at the very beginning, where uncertainty negatively influences both the business project and entrepreneurs themselves, the chances that other additional actors believe and finance the entrepreneurial project augment. Family and friends' support happens when they regard entrepreneurs' idea or skills more innovative or powerful than others (Sorenson & Waguespack, 2006).

The entity of the *family* is usually associated to the category of *friends*. *Family* and *friends* represent the primary capital that startups may leverage to develop their business idea. Entrepreneurs are obviously the first investing capital in their activities; their families and friends come after, they believe in the business idea of the entrepreneur and are likely to purchase an ownership interest in the business venture.

"Friends" represent those individuals with whom entrepreneurs have a close and personal relation. Entrepreneurs rely on them to obtain emotional or more concrete support. They play different professional tasks, working in relevant or irrelevant fields linked to the new venture's one. Thus, they may contribute with technical advices; they may invest in the new venture or offer their own social networks to support the entrepreneur in obtaining the necessary resources. Key advantage of close ties (or so-called *strong ties*) and informal ties is that they are fundamental for first steps of firm foundation and early-stages of development because they are characterized by high levels of intimacy, trust and emotional commitment, which harmonize the interactions' variables, enhancing the creation of ideas and the ability of facing common difficulties. High levels of trust and reliability augments the exchange of useful information and knowledge, facilitating communication between individuals or organizations (Knack & Keefer, 1997). Besides, they are easily available, easily accessible and minimize potential imbalances between actors involved in interactions.

Trust enhances the quality of relations by reducing the degree of fear, uncertainty and perception of risk because the two actors have developed their relation over time, creating a solid tie.

Family and friends represent even the informal ties, which are relations that are antecedent to the creation of the new venture.

The positive benefits occur especially when family and friends are not completely sure about the future and success of the newly born venture, but they decide to invest financial resources anyway, as they rely the entrepreneur's personal characteristics and skills (Chang *et al.*, 2009). Hence, personal contacts play a crucial role especially in the first stages of the start-up foundation. Firstly, because they are the first with whom the entrepreneur enters in contact, secondly because they offer their help even though the entrepreneurial project is not solid yet.

4 - DESCRIPTION AND ANALYSIS

As main promoters of new solutions and innovation, innovative start-ups are crucial actors for every country's economic development. Their activity encourages the move towards unexplored fields to create new business ideas and market solutions. Start-ups aim at rapidly becoming established firms with scalable and repeatable business models. The context in which they act is dominated by high levels of uncertainty, risk and lack of resources. In fact, founders usually do not possess what they need to set up their new venture, they have to look for it externally and in this case, social networks of entrepreneurs represent the channel through which they may obtain the desired assets to give birth or boost the start-up's development. Hence, I decided to analyze this typology of ventures to observe the way entrepreneurs exploit their social networks to foster the development of their ventures, and delineate the processes and mechanisms underpinning these relations. I tried to investigate as well the different ties typology that nascent entrepreneurs exploited within the single steps and venture crucial events, in order to identify common traits and differences.

4.1 Description

The specific context chosen to carry out the research has been the region of Veneto, circumscribing the selection to innovative start-ups in the food sector. The rationale for choosing this area is that Veneto is a terrain rich in business initiatives and a fertile territory for new ventures. The ecosystem installed allow incumbents and new players to reciprocally link and interact to each other. This is possible thanks to a series of actors: incubators and accelerators, which favor the establishment of innovative start-ups by providing them the tools to take a direction, the contacts of financial actors and the proper strategies to face the market. Public institutions as well provide their knowledge and skills, putting them into the local network system in order to boost and accelerate the innovation process, or thus, financial actors like banks, ventures capitalists or business angels that strongly influence the speed of new ventures' establishment.

The first step in the analysis has been selecting the innovative start-ups belonging to the Veneto region: these startups are 918. Through the identification of targeted ATECO codes[57] I searched

[57] Ateco 2007 is a classification of economic activities. It consists of a numeric code, which is associated to a specific economic activity. It has been created for statistical goals in order to unify the monitoring of Public Administration and the Chambers of Commerce.

for the innovative start-ups operating in the food sector. In the selection, I considered agri-food startups with the Ateco codes related to A-01, C-10, C-11 which embed agricultural activities, food and beverage manufacturing. I considered then start-ups providing digital products or services to food players and customers (in this case I carried out a manual selection of innovative start-ups with Ateco codes associated to J-62, which embed the production of software and IT consulting). The selection of innovative start-ups in the region of Veneto operating in the food industry encompasses 27 innovative startups, of which 14 belonging to agriculture or food/beverage production (3% of innovative startups in the Venet region) and 13 startups offering digital services to firms and customers in the food scenario (13 out of 301 startups offering digital products and services in other sectors).

In my research, I selected eight innovative startups with diverse business activities, maturity and years of activity. Two startups play agricultural activities; six of them offer products or services in the food sector. The rationale was opting for innovative start-ups with different structural characteristics in order to analyze how entrepreneurs' social networks are used and are useful in these different organizational contexts. I selected innovative startups involved in the production of solutions for agriculture, certain innovative startups engaged in the provision of digital services for agri-food firms or those providing products or services to final consumers in the food sector. The diversity of business activities may help us to delineate common patterns or differences.
Further, I included innovative start-ups with different years of activity and maturity in order to observe the incidence of social networks on business development within both start-ups in the early stages of their lifecycle and more mature start-ups.

4.1.1 Research cases

In this paragraph, I will describe the eight innovative start-ups involved in my research. Eight startups with different business ideas, different journeys, managed by founders with different mindsets and visions.

Bios Hydrogel

Bios Hydrogel is an innovative startup based in Padua founded in 2019 by Giacomo Guerrini and Carlo Scarpa, the co-founder. Bios Hydrogel holds the patent of an innovative hydrogel, which releases water and some elements fostering soil fertility. Once it enables the dispersion

of beneficial substances, it absorbs itself completely in the soil with no negative environmental impact. It is completely degradable. The principles on which Giacomo Guerrini set up the venture were the willingness of fighting harmful treatments used in agriculture with sustainable products in line with the new ecology requests. The startup works in a solid partnership with the University of Padua; in fact, when Giacomo Guerrini moved from his region of origin (Tuscany) in 2015, he found a positive feedback from some professors in the university and hence started his professional experience as research agronomist. In this context, he elaborated the Innogel and together with the university won some prices. Bios Hydrogel has becme and innovative start-up but it is waiting to be recognized as university spin-off. Currently, G. Guerrini is defining the lines of the offer. Three products based on the same innovative-patented innogel BH-Coat (for mainting and protecting seed), BH-Fert (for releasing sustainable fertilizers), BH-Hydro (for retaining more water) and the possibility of providing tailor-made substances. The target of Bios Hydrogel are companies involved in the production, e.g. fertilizers sellers or firms interested in using directly the product on their crops, e.g. farmers. There are any economic and financial data available about Bios Hydrogel and any employees yet.

Sietrace

Sietrace is an innovative start-up established on December 2017 by Roberto Calliari. Roberto Calliari, the founder, has worked years on European projects. Once he came across a project about traceability in the food sector, he started with market analyses, which allowed him to understand the value, the impact of information and the increasing importance of the role of consumer within the supply chain. After four co-working and crucial partners, Sietrace gave birth to the QR SI.

QR SI speaking label's final goal is to transfer information about the product to the final consumer. The QR Code enables a bi-directional transfer of elements guaranteeing anticounterfeiting through unique codes. This tool provides both the divulgation and the protection of data. Food products are tracked from the agri-food producer to the consumer and viceversa, in this way producers may collect data about the sale of their products, and consumers may have a larger amount of information about the product it self and the producer (distinctiveness of the area of production, production process, ingredients, authenticity, sensory profiles, combinations and receipts). The target group consists of farmers, agri-food firms and packaging centres. Sietrace offers three types of "speaking label": QR SI Easy may be applied for one brand up to five products, QR SI Brand is available for producers' organization (e.g. a

consortium) and is completely an in cloud service, QR SI Multibrand is a solution for illimited products, promotion and data analysis. It is suitable for whole supply chain projects. Further, the start-up offers another service called SiFood (Art, Food and Culture), which represents a service for the Ho.re.ca sector to convey value and combinations starting from a scientific method to consume food.

The QR SI speaking label platform has been introduced in the Italian market in 2018 with over 1.500.000 codes sold. The perspective is to reach over 4 million codes sold by April 2020. Thanks to powerful collaborations with Coldiretti[58], Filiera Agricola Italiana[59] and the University of Padua, Sietrace has been involved in partnerships with important players of the large-scale retail trade. There are no economic and financial data available about Sietrace.

Frescofrigo

Frescofrigo is an innovative start-up founded in 2018 in Verona by Enrico Pandian and Tommaso Magnani, two startuppers operating between the geographical areas of Milan and Verona. Enrico Pandian, a "serial startupper" with an experience of 17 startups founded. Tommaso Magnani, as well, a startupper of a web company aiming to simplify the customer journey in grocery stores enhancing the communication of special offers and showing receipts related to products.

Frescofrigo was born on the initiative of these two entrepreneurs of finding an alternative solution of food distribution. It consists of an innovative system of distribution of food products. It is a fridge, equipped with a RFID technology and connected real-time in cloud, able to recognize what is picked up from the fridge and charge it to the consumer. The idea relies on the intention to provide workers an alternative solution to food-delivery during their lunch break through fresh and healthy products brought daily from restaurants. Gyms, large firms, airports, railway stations, apartment buildings, hotels and hospitals represent the target of Frescofrigo. The business is spreading in the Milan area, but since August, Frescofrigo is present also in New York. The next steps will consist of dealing with two MNEs in the food sector like Unilever and Procter & Gamble, which will use Frescofrigo fridges to sell their luxury food products. Frescofrigo currently employs fifteen people with a turnover of almost € 750.000 in 2019.

[58] Coldiretti is one of the main organization operating at the national and European level that represents entrepreneurs in the agri-food industry.

[59] Filiera Agricola Italiana consists of an Italian organization that promotes agri-food products and their producers, by promoting authenticity and traceability of products and boosting partnerships in GDO to enhance the communication of food safety and quality.

Orapesce

Orapesce is an innovative start-up founded in 2018 in Verona by Giacomo Bedetti, experienced Head Organization manager with a demonstrated history of working in the financial services industry in Milan. Giacomo gave birth to the start-up for a project work during an MBA in Milan. He decided that the project work should have been not just a simulation, yet a real entrepreneurial project. The business idea was born after a deep analysis of the food sector, where Giacomo and his team identified a gap in the fish market and talking with a long-time friend working as angler. In other food branches, e-commerce and online delivery were well-developed segments, in the fish sector there was no solution for online purchase. Hence, together with classmates and external collaborators, G. Bedetti set the startup on March. Orapesce consists of a digital platform that connects directly the final consumers and Ho.re.ca operators to anglers' cooperatives, enabling them to purchase online fresh and ready-to-cook fish and receiving it directly at home. The service includes the possibility of consulting receipts and knowing the stories about anglers. The objective is to reduce the informative distance existing between anglers and final users. After the business model was completed, through a beta test with seventy families in the city of Verona, the idea was pitched to the market. In a year, the startup reached a turnover of € 30.000. Currently, the service is active throughout Italy thanks to two actors: Little Fish that cleans and fillets fresh fish and Stef Italia that is a cold chain operator, delivering the product throughout Italy.
Orapesce is managed by a team of four people and employs one person. The turnover was equal to € 100.000 in 2019.

Geppa

Geppa is an innovative startup founded in 2015 in Treviso by Luca Vescovi and Marco Vescovi, but it has become an innovative startup only in 2018 with the registration of a patent. Geppa is a software house offering to agri-food firms an e-commerce channel with the integration of a service of logistics. Further, it integrates the offer with tailor-made services e.g. inbound marketing and sales strategy consulting. The idea was born from Luca and Marco Vescovi, two entrepreneurs with a solid experience in software development, e-commerce and web strategy sectors, who met Enrico Cammareri, a sales manager and a wine lover with years of experience in this industry. They decided to give birth to this new entrepreneurial project. Currently, Geppa employs four people. In 2018, it detained a turnover of € 394.000.

SAM

SAM stands for "Società Agricola Moldoi" (Moldoi agricultural firm). It is an innovative start-up founded in 2016 by Nicola De Zordi in the province of Belluno. It has been registered as innovative start-up in 2019. SAM is an agricultural firm operating at the National Park of Dolomites in the production of health foods and supplements, whose raw materials derive from local plants of the Dolomites terrain. From seeding, to cultivation, harvesting and transformation, the startup controls the entire process. The processing happens using high technological content tools and complex processes, which have been a result of an accurate research in collaboration with the University of Padua and Trieste. SAM employs three people.

Open-farm

Open-farm is an innovative startup based in Noventa Padovana (Padua) founded by Luigi Forte, sales manager at Conduzioni Agricole Forte, which is a firm involved in the production of dry fooder of alfalfa.[60] Luigi Forte set up the venture in 2015 (registered as innovative start-up in 2018) on the initiative to support farmers. Concretely, he started with the idea of a digital platform for agronomic consultation, in which farmers could compare prices of equipment, machinery and raw materials, but also a place of discussion about obstacles and oppurtunities in the sector and, at the same time, a communication tool through which farmers could tell their stories. However, the platform had not been achieved; hence, he started with another business idea: creating products made of dry fodder for final customers (biscuits, snacks, nutritional supplements and body creams) in order to have a direct relation with people and communicate more effectively the world of farmers. Transversely, Open-farm aims at communicating the importance of the primary sector, by organizing meetings where farmers mainly are stimulated to understand the opportunities derivating by major levels of integration between actors along the same supply chain. Currently, the sale of products has not started yet and the revenue comes actually from sponsors. The perspective is that by March 2020, products will be available online in a new website and will be traded in health-food stores. Open-farm has one employee, who looks after the web marketing and communication.

Kemanji

Kemanji is an innovative start-up founded by Ernesto De Marchi and Roberta Tardugno at the beginning of 2019, legally located in Vittorio Veneto. Ernesto, a chartered accountant, and

[60] Alfalfa is an herb, used for animal breeding.

Roberta, a pharmacist expert in natural products and food biochemistry, have ideated a mobile application named “Appeaty” with three functions. Firstly, Appeaty provides restaurants a fluid digital and automated cloud-based system for the collection of customers’ orders.
Secondly, Appeaty avoids long waits to consumers allowing them to consult the menu and the list of allergens in different languages, to pre-order what they intend to eat and to book a table. Finally, Appeaty proceeds payments and tax receipts also reducing the use of not environmental friendly chemical paper. Currently, the application is being prototyped and it has not been pitched to market yet.

Table 2. The eight cases in summary

	Year of beginning of activity	Specialization	Operational area	Turnover	No. of employees	Collaboration with institutional players	Incubators/Accelerators/ Coworking	Investments	Founder's entrepreneurial experience
Società agricola Moldoi Srl	18/01/2016	Agricultural activity	Belluno	€3K (2018)	3	University of Padua; University of Trieste	Polo tecnologico of Pordenone	5 business angels	None
Bios Hydrogel Srl	09/04/2019	Agricultural activity	Padua	0	0	None	Paradigma City	None	None
Geppa Srl	26/02/2015	Digital service	Treviso	€135K (2015); €247K (2016); €317K (2017); €394K (2018)	2 (2018); 4 (2019)	None	None	None	Yes
Sietrace Srl	28/11/2017	Digital service	Verona	n.d.	0	University of Padua; Coldiretti association; FAI	None	Joint project University of Padua	Yes
Orapesce Srl	16/03/2018	Digital service	Verona - Milan	€13K (2018); €100K (2019)	1 (2019)	None	Talent Garden	Business angels €37K (2018); €82K (2019)	None
FrescoFrigo srl	20/09/2018	Digital product	Verona - Milan	€750K (2019)	3 (2018); 15 (2019)	None	None	Pre-seed €500K (2018); €900K (2019)	Yes
Kemanji Srl	31/01/2019	Digital service	Treviso	0	0	None	None	None	None
Open-farm Srl	20/11/2015	Digital service	Padova	10K (2017)	1 (2019)	None	None	None	Yes

4.2 Methods

In the first stage of my analysis, I collected all the available information about the innovative startups involved in my selection. To understand their crucial aspects, I triangulated information extracted from websites, videos, press and AIDA[61].

Through websites and Youtube videos, I identified the products or services offered, their unique selling propositions, their business models and their target. Through AIDA database, I extracted economic and financial data e.g. income statement, balance sheet, turnover, number of employees and most importantly the name of investors and shareholders. Through a press review, I found out additional elements about the startup's story, its birth, its collaborations, the investments received and their amount, and all the supplementary information to build a solid starting point to delineate start-ups' profile.

As my research question aims at identifying how founders' social networks have an impact on start-up development, in this second stage of analysis I searched to rebuild entrepreneurs' social ties by using Linked-In. As we know, Linked-In is a digital tool, used mainly for professional purposes where people may show their professional experiences, their interests, their new projects or express their opinions. I decided to exploit Linkedin to access social networks of entrepreneurs with the assumption that hypothetically their *digital/virtual social ties* may partially represent the *real social ties*. Therefore, I built a dataset where I firstly collected information about each founder. I extracted these elements:

- Name and surname;
- "About" (the short description that every Linkedin member may associate to its profile);
- Professional experience and the timeframe;
- Academic experience;
- Number of links;
- Skills;
- Endorsements;
- Recommendations (both given and received).

Subsequently, starting from the endorsements received and the recommendations, I gathered the names, "About" descriptions, current job and firms of these contacts. I carried out this work, as I assumed that if these contacts confirmed one of the founder's skill or wrote a

[61] AIDA is the Italian database containing Digitalized data (financial, economic, structural data) about Italian firms.

recommendation, they could have played a direct or indirect role in the startup path of development, by collaborating or supporting the founder somehow.
This data collection helped me to understand the social context in which founders are active and gave me some inputs to delineate which kind of interactions founders could have had during their professional life (e.g. university attendance, incubators or accelerators participation, work experience in a MNE, entrepreneurial experience).

In the third stage of my research, I conducted semi-structured interviews by phone or on Skype, ranging from 25 minutes to two hours and a half, according to the degree of maturation and the complexity of the innovative start-up considered. I interviewed founders twice, where in the first interviews I searched to gather the crucial events featuring the startup path, such as idea conception, investments, important customers and partnerships. In the second interviews, instead, I deepened the role of interactions occurred, their impact on the startup's growth and their consequences. I recorded the interviews to transcribe them and work on them to extract theories and processes.

I adopted the Gioia methodology to analyze the interviews. This method is based on the process of attributing to sentences further meanings than those explicitly expressed. The rationale is turning a photograph into a motion picture: in other words, extracting value from a simple sentence, elaborating it with additional documentation (e.g. documents, videos, Aida, social media) in order to generate codes of interpretation that let specific mechanisms emerge (Gioia, Corley, & Hamilton, 2012).

4.3 In-case analysis

After the collection of all available information about the innovative startups, by collecting secondary data and primary data through qualitative analyses, I reconstructed the timeline of each innovative startup. Crucial events and steps that mark the path and the processes of development of the single venture.
In the description of each innovative startup's history, I outlined the role of the formation of new ties, or the exploitation of existing ties, which had been involved at key moments, by focusing on the content and the effect of the tie.
Besides, for each case I reconstructed both the relation between specific events and social networks dynamics and the consequence of the creation (or exploitation) of these ties on the startup's development and growth.

Bios Hydrogel

When Giacomo Guerrini (the founder of Bios Hydrogel) had understood that his region of origin was not an ideal place to create innovation, in 2015 he decided to leave to find a more fertile ecosystem in which he could have developed his idea. Before leaving, he contacted several research institutions to find someone who could support him in studying new fields of research and application toward sustainability themes. After an inconclusive meeting in Florence, he started sending emails to both research centres and universities in Italy and abroad. One of the most interesting contacts was the referent of an agency for European research promotion in Mestre (in the region of Veneto). Thanks to the emotional support of his family and a friend, he moved there. When he began collaborating in this agency, he understood that that place was not proper for his project; hence, he visited the University of Padua and entered in contact with some professors. In the Department of Chemistry, he started the activity research and began the attendance of university courses in order to become a research fellow.

In the laboratory, he began prototyping formulas to create a sustainable hydrogel to feed crops limiting the environmental impact. In 2017, he came out with the new formula and licensed it jointly with University of Padua (InnoGel), but Giacomo had problems with university in the license rights acknowledgment, therefore in that period he knew Carlo Scarpa, a commercial law attorney, to whom he asked for a legal support. Carlo gave tips to Giacomo and at the same time, he got very interested in his project.

At the beginning of 2018, Giacomo together with the University took part of a competition and got the award from Cariparo Foundation to continue developing Innogel. In that period Giacomo and Carlo requested to be acknowledged as university spin-off.

In 2018, the founder started searching for new contacts: he went to SMAU[62] and knew a referent person of Paradigma City[63], who encouraged him to join a competition. Hence, they won "Luca Russo startup's award", received as prize the revision of the business model and had access to some institutional referents and firms (e.g. a Coldiretti's spokesperson, some firms and associations).

During 2018, Carlo suggested Giacomo to found an own innovative start-up as the acknowledgement as university spin-off was late to come. Therefore, in 2019, they became founders of Bios Hydrogel Srl. In that time, their autonomous research intensified. Together

[62] SMAU is a platform based in Padua that boosts the connection and networking between startups, big players and institutions.

[63] Paradigma City is a co-working space in Padua.

with Start Cube[64], they took part of a competition between startups and won the third prize at Start Cup Veneto 2019.

The co-founder supported his partner by identifying some commercial tools through which they could sell their products to firms and searched among his customers someone who could be interested. Thanks to Carlo Scarpa, Giacomo entered in contact with some people with whom they are going to participate to a European call in the food industry sector. Some of these partners provided them some precious contacts with which they could create joint ventures.

Venture crucial events	Ties formation or exploitation
Fertile context identification	New professional tie with institutional players
Moving to Veneto region	Personal tie. Emotional support of a friend in leaving his region of origin
Development of the formula	New professional tie. University context as basis for R&D development
License of the new formula	Personal tie. G. Guerrini met the co-founder during a non-professional event. C. Scarpa got interested in his project and helped him. Content of the tie: suggestion of licensing the formula, suggestion of founding an innovative start-up
Formula rights acknowledgement	Strong tie. C. Scarpa, a commercial lawyer, supported the founder with legal advice
Financial funds and partners research	New professional tie. G. Guerrini went to a co-working space to search for partners and funds. Content of the tie: the referent person of an incubator suggested him to join a competition
Contact with institutional players	New ties. After having won the competition, they met institutional players (e.g. Coldiretti) and potential customers. Content of the tie: the incubator gave him strategic support
Visibility to some firms	Professional tie. University incubator Start cube encouraged Bios hydrogel to join another competition
Customers' research	Personal tie. C. Scarpa provided potential customers thanks to his professional network
Opportunities identification	Weak tie. A friend of C. Scarpa suggested him an Asian call about vertical farming

Table 3. Bios Hydrogel case. Venture crucial events and ties involved

As one might observe, in this research case, the entrepreneur integrated himself into a total new context. The entrepreneurial idea has been set and developed through *new ties*. G. Guerrini chose to abandon his region of origin to install himself into a new context. Hence, there was no possible exploitation of already existing ties. This decision shows a personality trait, which is openness to experience: the founder set the venture in a context where he could not rely on his social network. The active behavior toward new ties formation led him to find a partner, who both supported him legally and strategically. The background of his partner provided strategic opportunities to undertand through which contractual forms they could sell the product. His

[64] Start Cube is an incubator that belongs to the University of Padua.

partner enabled a series of interactions with some of his customers and identified some call opportunities, thanks to some of his personal contacts. At the same time, Giacomo relied on incubators and co-working spaces to obtain visibility, new opportunities and contacts.
Personal ties as well as professional ties helped the start-up to leverage precious opportunities. However, the role of the university is crucial. The context of the university enabled to undertake some steps and worked as trigger for G. Guerrini desire to set up an own business.

Sietrace

Roberto Calliari, the founder of Sietrace, during the participation and the analysis of European projects about traceability identified some market opportunities in the food industry. In 2014, after the analysis of a research that compared fashion and agri-food products in terms of traceability, he understood that authenticity, traceability and the necessity of anticounterfeiting mechanisms were as important for fashion products as for agri-food products. He deepened the importance of information for final consumers and, at the same time, searched for already existing projects that dealt with traceability technologies. The lack of European businesses in the provision of tools to final consumers in order to know deeply food products (origins, authenticity, stories of producers,..) convinced him to find a way to convey this information. Hence, he identified the Qr code, which appeared to be the most suitable and flexible tool on which building his business idea.

The next decision was deciding where to start the entrepreneurial project. The region of Veneto emerged to be the most proper; hence, he started his activity in Verona, a “food valley” where an intense and dynamic ecosystem could facilitate the development of his project. In 2015, he attended co-working organizations, as they were ideal spaces to find complementary knowledge, meet experts from different fields and young freelancers with open-minded visions. During co-working activities, he met two people that made the difference for his project: a Lebanese IT experienced specialist with an international experience on IT systems’ development and Mr. Zavan, an experienced commercial consultant. Besides, this team entered in contact with two large firms in the medical and banking industry, which helped them to develop the IT systems in order to build a correct traceability structure. However, their settings were not ideal to create traceability communication in the agri-food industry, as they pertained to fields that were more scientific. This approach instilled instability in the team of Roberto Calliari, who was not sure to follow their tips or go on with its idea. Traceability in the agri-

food industry worked out more at an emotional level than an objective level. Besides, they decided to continue with their idea.

At the same time of co-working activities, Roberto got in touch with two experts that he had known in 2013 in a project organized in the Museum of Rovereto about multi-sensoriality. The director of AIPO Verona[65] Mr. Gambin, and Mr. Tonelli, an experienced physician. They helped him to understand how to convey the authenticity of products. The involvement of these two people enabled the business project to do some steps further: the tool Qr code began to be able to convey specific information and worked correctly.

Mr. Gambin enabled Roberto Calliari to meet Mr. Ruffin, the director of Coldiretti Verona. The headquarter Coldiretti was just in front of AIPO Verona, where Roberto met Mr. Gambin. Entering in contact with an association like Coldiretti gave him several opportunities. The start-up Sietrace was not still existing, but the first projects and collaborations to test the Qr code began. Experimentations with Consortia, museums, food and wine firms helped Roberto and his team to implement his business project. The most crucial relation was the relation with the University of Verona. Mr. Gambin introduced Roberto to Professor Begalli. In 2016, Roberto was involved in an academic project in Scotland to explore the industry of beer. This collaboration was another opportunity to test the Qr code functionality.

The positive ecosystem in which Roberto Calliari installed himself brought to the decision of establishing a start-up. In 2017, Sietrace was founded. In 2018, Sietrace entered an agreement with FAI[66] thanks to Coldiretti, in which the packaging of the products belonging to FAI presented the so-called “SI Label”. Months later, another crucial agreement: Sietrace signed a joint project with the University of Verona, where the University committed to provide half of financial resources and the other half was brought by firms involved in the agreement. This agreement with the University enabled Sietrace to access to several market analyses, to understand how to exploit data collected by the Qr code and how to convey synergic communication strategies through this tool. The technical, financial and strategic contribution of the University marks one of the crucial events for the survival of Sietrace. Besides, thanks to the agreement signed with FAI, Sietrace has been involved in quality of technical partner in many projects. Creating a collaboration with a solid partner like FAI allowed Sietrace to enter in contact with large firms and GDO, and to be involved in a deal with Lidl[67]. Besides, the

[65] AIPO is an interregional association of Italian oil producers.
[66] FAI is the acronym of Italian Agricultural Supply-chain, which is an association that supports and promotes Italian agri-food producers in Italy and abroad.
[67] Lidl is a German supermarket chain spread worldwide.

possibility to exchange opinions with several FAI directors has represented a constant growth and improvement.

Venture crucial events	Ties formation or exploitation
Idea generation	Strong ties. Colleagues gave some advices to explore market needs
Geographical context identification	Strong ties. Colleagues contributed to identify fertile areas of establishment of the new venture
Platform development	New ties. Co-working activities. Content of ties: technical support by IT experts, by two incumbent MNEs and open-minded communication and marketing freelancers. Connection to an association "Piace Gusto Sano" to test the idea and its potential evolutions
Business model integration	Weak ties. Two experts known at a museum event. Content of the tie: suggestion of additional functions of the service
First partners	Weak tie. AIPO director. Content of tie: introduced the founder to the director of Coldiretti Verona and to a Professor of the University of Verona.
Testing	Weak tie. University relation. Content of the tie: involvement in a project in Scotland to test and improve the product. Weak tie. Coldiretti relation. Content of the tie: possibility of collaborating with consortia and agri-food firms
First strategic agreement	Professional tie. Coldiretti. Content of tie: through Coldiretti Sietrace signed the first agreement with FAI.
Second strategic agreement	Professional tie. Coldiretti. Content of tie: join project with the University (both technical and financial support)
Incumbent technical support	Professional tie. Content of the tie: technical support in empowering the potential of the product, the variety in its use

Table 4. Sietrace case. Venture crucial events and ties involved

As one might observe, in this research case, R. Calliari's startup evolution relied on the creation of new ties and the exploitation of weak ties, enabling the founder to have access to a multiplicity of networks that allowed him to receive technical, financial and strategic support. The collaboration with institutional players ensured Sietrace to be involved in many projects and this boosted the improvement of the product and its reputation. The credibility of actors like Coldiretti and the University of Verona, indeed, generated a halo-effect on the credibility of the firm.

Frescofrigo

Enrico Pandian, a serial startupper in the area of Milan, founded Frescofrigo in September 2018 with Tommaso Magnani, another startupper operating in the food retail sector as Enrico.

At the beginning of 2018, Tommaso Magnani contacted Enrico, who he had met during a startup hackaton at H-Farm[68], in order to introduce him a new idea. Enrico considered it and tried to understand its feasibility, but it was very complex and risky; hence, Enrico told Tommaso about his idea. The insatisfaction of Milan food delivery services instilled in Enrico

[68] H-Farm is one of the most important certified incubator in the Italian domain.

the idea of creating an alternative: a vending machine selling fresh products provided daily by restaurants. Thus, they founded Frescofrigo and began searching for validate their idea. After having understood that the vending machine was not the suitable tool to sell fresh products, as it is associated to industrial products, they bought a Coca-cola fridge and installed it in the hall of a MNE. A friend of Enrico, who was the CEO, gave him this opportunity. Daily, Enrico and Tommaso supplied the fridge with gastronomy fresh products and observed the feedback of employees. They talked to them to understand if the service could solve an unsatisfied need and, at the same time, they received precious tips on how to improve the service.

The startup was set up in September 2018. By the end of October 2018, Frescofrigo gained a pre-seed capital equal to € 500.000. Investors who had already invested in E. Pandian's start-ups decided to finance his project or business angels with whom the founder shared the same "investors" network. Thanks to his social ties with business angels and venture capitalists, E. Pandian attracted another round of capital by January 2019. Frescofrigo's equity financing amounted at that time to almost € 1.2 million. In those months, Enrico and Tommaso started to find a team of engineers able to create the "Frescofrigo" fridge (as explained before the product is a smart fridge with Rfid technology). Through a head hunting company, they found the engineers, while the Chief Financial Officer (Mr. Tonon) and the Head of Technology (Mr. Loiacono) were respectively a colleague of the previous start-up founded by Enrico and a start-upper met at a start-up event.

They installed the first fridges at some MNEs offices in Milan, of which E. Pandian knew the CEOs. Some of them were investors of Supermercato24 (his previous start-ups) and others were friends belonging to his business network in the food retail industry. In summer 2019, the step further: the collaboration with Epta spa, a large firm operating in the commercial refrigeration sector. Signing an agreement with Epta brought to Frescofrigo the chance to have a partner that could entirely produce the fridges.

The business of Frescofrigo rapidly grew in 2019, finding new customers and investors. Many of the new shareholders (VCs and business angels) contributed strategically to the business development, by providing tips and exploiting their contacts to install fridges at other large firms. In July 2019, a VC (Club of Investors Turin) and a certified incubator (Digital Magics) provided funds equal to € 260.000. They decided to invest, as they believed in the project and knew the reputation of Mr. Pandian. On August 2019, Frescofrigo installed the first fridge in New York. An ex-manager of Uber living in NY contacted Enrico, who he had met at an informal event of startuppers in Milan, to outline the interest of an American MNE of adopting the product (in half a day the success was twice an Italian fridge). In this phase, some investors

of Frescofrigo, having managerial competence on internationalization strategies, provided strategic advice. In October 2019, two banks invested in Frescofrigo. The credibility and reputation of the shareholders already present in Frescofrigo convinced them to start with the financing. Last but not least, the last collaborations that will start in the next months. Two MNEs playing in the food industry (Unilever and Procter&Gamble) will exploit Frescofrigo fridges to sell their high-end food products.

Venture crucial events	Ties formation or exploitation
Idea generation	Weak tie. Tommaso Magnani, a startupper in the food sector got in touch with E. Pandian. Content of the tie: a new business idea that afterwards became Frescofrigo
Idea feasibility comprehension	Strong tie. CEO of a MNE that E. Pandian has known for 20 years. Content of the tie: he gave the chance to install a Coca Cola fridge at the office of the MNE to test the feedback of employees
First pre-seed round	Weak ties. Managing directors of VCs, investors of his former startup and those belonging to his network of acquantaincs. Strong ties: friends (business angels and entrepreneurs)
Team construction	Strong ties. Employees of the previous startups Weak tie: an engineer known at a startup event. Content of the tie: technical competence on industrialization process New ties. New employees
Seed funds	Weak ties. Managing directors of VCs, investors of his former startup and those belonging to his network of acquantaincs. Strong ties: friends (business angels and entrepreneurs)
Strategic partner agreement	Weak tie. Managing director of Epta. E. Pandian knew him. Content of the tie: meeting with the CEO of Epta to present the project and make the deal
Testing/first customers	Weak ties. Investors and customers of former startups
Banks financing	Professional ties. The positive evaluation of Frescofrigo business depended even on the investors' reputation
Internationalization	Weak tie. Ex-manager of Uber. Content of the tie: he contacted E. Pandian to outline the interest of an American firm. Result of the tie: first Frescofrigo fridges in New York Professional ties. Investors with managerial experience on internationalization strategies. Content of the tie: strategic advice on access to foreign markets
Important agreements with MNEs	New professional ties. Agreement with Unilever and P&G. No social networks leveraged

Table 5. Frescofrigo case. Venture crucial events and ties involved

In this venture evolution, it is possible to observe the crucial role of social networks. E. Pandian, a serial startupper, exploited a large amount of social ties to have access to information, gain funds and have strategic advice to accelerate its access to the market. He is playing the role of a "bridge", as he participates to a multiplicity of different networks (Cross, Parker & Sasson, 2003). Here the typology of ties has been even more relevant, since the social and business networks in which the founder positions himself consists of managers of MNEs, entrepreneurs, startuppers and serial startuppers as well. On the one hand, as the main target of Frescofrigo are large companies, the acquantaines of managers and CEOs have given E. Pandian the chance of

rapidly testing the product and selling it in the initial stage of the venture evolution. On the other hand, the managerial competence and the innovative inclination of many entrepreneurs and startuppers involved in quality of investors or friends, provided the proper strategic advice to delineate an effective business model and access effectively new markets.

Orapesce

Giacomo Bedetti gave birth to the start-up for a project work during an MBA in Milan (as mentioned before). When he and his friend Pietro Graziano (an angler) noted that in the fish sector there was no solution for online purchase, he decided that his participation to the MBA was the ideal place to set up the entrepreneurial project. Attending brand management and digital transformation courses helped him and his team to gain the necessary knowledge to develop the business idea. Giacomo involved also external collaborators, as he strongly wanted that the startup worked out: his wife Vanessa, Global Brand manager of an Italian corporate in the wine sector, expert in market analyses and marketing strategies; a high-school friend Alberto Mazza (co-founder), an architect and web designer who developed the digital platform and Alessandro Nanni, a long-time friend. Pietro Graziano as well helped Giacomo to understand the fish sector dynamics, the gaps, the obstacles and provided the contacts of the anglers involved in the project. During the project work, Giacomo and his team went to the Silicon Valley to present their project, as the MBA offered this opportunity. Entering in contact with that context instilled in Mr. Bedetti new perspectives. The mechanisms of acceleration existing in Silicon Valley let the founder understand that financial networking was essential to foster the growth of his new business.

Once the platform was ready, Orapesce was founded (March 2018) and on April through a beta test with seventy families in the city of Verona, among whom there were friends of Giacomo and his collaborators, the new service was pitched to the market. Setting up the startup in the university context helped them having strategic tips from professors and classmates with consolidated experience. For instance, Antonio Ghezzi, professor and expert in Italian startup ecosystem and financial mechanisms; or Mr. Braga, one of his MBA classmates and director of the accelerator Talent Garden, who suggested him to establish his business activities there.

The feedback of the beta test was positive, so this encouraged Orapesce team to go further. In 2018, Orapesce signed an important agreement with Little Fish, a company specialized in the commercialization of fishery products. Little Fish cleans, fillets and packs fresh fish provided by Orapesce's network of anglers. The collaboration enabled Orapesce to have a solid partner and deliver products to Verona, Milan and Bologna.

At the end of 2018, Orapesce launched the first round of equity capital (€ 65.000), provided by family and friends. In fact, G. Bedetti involved ex-colleagues, colleagues, long-time friends and relatives in the financing. Many of these investors were friends: entrepreneurs and managers of important MNEs, as Giacomo has worked for years in consulting firms in Milan. The network he had developed over years helped him financially, but also strategically. Many of them, in fact, were experienced entrepreneurs in the food sector. Currently, some of these experts support Giacomo in the management of the startup.

At the same time, thanks to a contact provided by a start-up in Talent Garden, G. Bedetti signed a collaboration with Stef Italia, an Italian cold chain operator. Through Stef Italia, Orapesce at the very beginning of 2019 could reach the entire Italian market.

In September 2019, the second round of equity capital (€82.000). This time, no friends and close contacts had been involved, but thanks to his business network, he met the CEO of an important financial institution who provided the investment of five business angels and supported Orapesce in his acceleration through a platform of crowdfunding.

Venture crucial events	Ties formation or exploitation
Idea generation	Strong tie: long-time friend. G. Bedetti chose to implement the business idea in the context of his MBA
Development of the service	Professional ties. Classmates and university tutors. Content of the tie: managerial and technical competence Strong ties. Family and friends. Content of the tie: market analysis, contact with network of anglers, technical competence
Silicon Valley visit	University context. Acquisition of a new mindset about acceleration mechanisms
Testing/first customers	Strong ties. Seventy families involved in a Beta-test. Family and friends of Orapesce team members. Content of the tie: business idea validation
Strategic partner agreement	New tie. Agreement with Little Fish.
First round of financing	Strong ties. Family and friends. Content of the tie: financial funds and strategic advice New tie: university tutor. Content of the tie: funds and strategic competence
Co-working space attendance	New tie. Classmate of the MBA. Content of the tie: he suggested G. Bedetti the possibility to establish the base of operations at Talent Garden
Stakeholder identification	New tie. A startup attending Talent Garden. Content of the tie: it suggested Stef Italia as strategic partner
Second round of financing	Weak tie. A manager of financial institution. Content of the tie: he convinced five business angels to invest in Orapesce
Crowdfunding platform access	Weak tie. A manager of financial institution. Content of the tie: he accelerated the access of Orapesce in the crowdfunding platform

Table 6. Orapesce case. Venture crucial events and ties involved

Similarly to the former case, Orapesce's founder is a manager with consolidated experience in business strategy and innovation of large companies. His professional experience and the

business network that he could exploit for the venture development was of crucial importance. Differently from Frescofrigo, G. Bedetti involved mainly friends and family with complementary resources to his ones. This enabled high levels of commitment, effort and rapidity in the business creation. His business network and ex-colleagues played a relevant role in terms of financial and strategic support. In the growth phase of Orapesce, instead, there has been the involvement of weak ties and new ties to boost the growth of the business (e.g. second and third rounds of funds raising and the access to the crowdfunding platform).

Geppa

Geppa is an innovative startup, founded as spin-off of an already existing venture. When Luca and Marco Vescovi in 1998 founded Promoservice, a web development agency, they understood over time that food and wine sector had an own identity and independence. Marco Vescovi met Enrico Cammareri, a sales manager and a wine lover with years of experience in this industry. His competence convinced the two brothers to give birth to an independent entrepreneurial project. In 2015, they set up Geppa.

To create a service that could be tailored-made to each wine or agri-food producers, they interacted with the customers of Promoservice to explore their specific needs and requests and adapt the business models to them.

Enrico Cammareri, CEO of Geppa, attended several start-ups events in the e-commerce sector and there, he met several entities from which he gained precious feedbacks. Besides, the comparison with some relatives, experts in digital services and e-commerce, was the possibility to talk about the trends of the market and explore interesting perspectives. Enrico and Promoservice team had implemented the development of Geppa internally.

In 2017, Luca and Marco Vescovi together with some sector experts set up Neurowebdesign, another start-up that deals with website development through the exploitation of innovative theories base on the association of psychology and marketing concepts. The creation of another business unit created the need for a corporate brand: Jampaa.

In 2018, Geppa became an innovative start-up thanks to the creation of a license for logistics management, and in the same year, Progetto 37, a customer of Promoservice, invested in Geppa to boost innovation.

Venture crucial events	Tie formation or exploitation
Establishment	Weak tie. M. Vescovi met E. Cammareri, a sales manager working for a client company of Promoservice. Content of the tie: E. Cammareri was involved in the formation of the new venture, as he well knew the wine sector
Development of the product	Strong ties. Promoservice team members developed internally the service
Testing	Professional network. Customers of Promoservice. Content of the tie: they gave suggestions on their needs and preferences
License	Strong ties. Promoservice team members
Improvement of the service	Strong ties. E. Cammareri talked to some of his relatives, experts in the e-commerce sector
Stakeholder identification	New professional ties. E. Cammareri attended start-ups and e-commerce events. He identified a new stakeholder
Investment	Professional tie. Progetto 37, client of Promoservice. Content of the tie: it became partner and invested in the venture

Table 7. Geppa case. Venture crucial events and ties involved

In this research case, the mother company's founders created the startup. The development of the service and the realization of the license was in place by the internal team of the mother company. As one might see, there is a strict relation between the startup and its mother company. In fact, the service of Geppa is similar to the service provided by Promoservice, hence it was possible to share technical and strategic competence. The social ties involved were mainly those ones of the mother company. In fact, talking to Promoservice clients was useful to understand rapidly the target needs.

SAM

Nicola De Zordi began his research activities during his PhD at the University of Trieste. His permanence at the university and the experience at PQE (a society offering consultancy in pharmaceutical and medical sector) provided him the technical knowledge and the possibility to visit firms, understand their organizations, explore innovative fields of application and identify the necessary documentation to create a business. Entering in contacts with other researchers, professors with mature experience and firms in the pharmaceutical and medical sectors helped him to gain the necessary tools to start his entrepreneurial project.

Between 2012 and 2015, he studied the market, the necessary raw materials, the production processes. In these years, he worked also in a pharmacy, where he could understand the needs of final customers. Initially, the idea of the startup came out when talking with colleagues, where they wanted to create a university spin-off, but when N. De Zordi decided to really set up the venture, he did not receive much support. The first person supporting him was her sister, who supported him financially. Afterwards, he knew Simone Zandomenego who was his colleague and joined actively the project.

The first step to start the business was searching for agronomic advisors who could help him to understand how to begin the agricultural activity to produce nutritional supplements. Firstly, he contacted Mr. Alberton, an agronomic advisor who well knew the territory of Dolomites where Nicola wanted to start his activity. Thanks to him, Nicola knew Mr. Lovat, another agronomic advisor who helped him to draw up the documentation for the Rural Development Program (PSR). Besides, he contacted Mrs. Pedoni, a business advisor, expert in financing research and start-up foundation.

In 2016, Nicola set up SAM and introduced his project to the Region of Veneto. He obtained the funds and started the construction of the laboratory. In the initial phase of his project, once he began the agricultural development, he carried on the collaboration with the University of Trieste. The group of researchers with whom he shared the activity continued to support him at a technological level, by studying operational processes and conditions to convert plants and fruits into nutritional supplements. Another precious tie was that one with Professor Dall'Acqua of the University of Padua, who supported Nicola in the analysis of production processes.
In 2018, Sam started launching the first products on the market. In 2019, instead, five business angels contributed with a round of investments. Mr.Venturelli manages two pharmacies in the geographical area where SAM is based. Nicola knew him through a financial consultant; Mr. Mummolo is instead a university classmate of Nicola and he is a pharmacy owner as well; Mr. Liotta, a pharmacy owner as well, Nicola introduced him the products and he accepted to invest. Mr. Pistolato is a chemist and expert in quality and safety monitoring, he is a friend of Nicola; and Mrs. Pedoni, a sales and marketing specialist, a contact emerged during the interaction with Mr. Venturelli. The involvement of these pharmacists boosted the commercial aspect of SAM, as they could sell them directly to final customers. They provided also technical competence to improve the quality of the products and their regulamentation.
Besides, thanks to Mrs. Pedoni, Nicola had the chance to know a referent in the Technological Pole of Pordenone, who outlined him the possibility to settle SAM there. Recently, SAM has also been involved in a FEASR[69] with a large firm and the University of Padova to start a project of research.

[69] FEARD means European Agricultural Fund for Rural Development, as explained in Chapter I, paragraph 4.

Venture crucial events	Tie formation or exploitation
Idea generation	Strong ties. Colleagues at the university. Content of the tie: they firstly supported him but when N. De Zordi decided to set up the venture, they did not contribute
Development of the product	Strong ties. Ex-colleagues at PQE and universities. Content of the tie: technical knowledge on technological tools and production processes New professional ties. Agronomic advisors. Content of the tie: technical knowledge on agricultural systems and support with the documentation about PSR New professional tie. Mrs. Pedoni, business advisor. Content of the tie: strategic support to found the innovative startup
PSR funds reception	New professional tie. Agronomic advisor known through the other agronomic advisor Content of the tie: technical support with the documentation about PSR procedures
Laboratory creation	Strong tie. His sister. Content of the tie: financial support Strong tie. His colleague Simone. Content of the tie: technical support
Testing	Strong ties. Universities colleagues. Content of the tie: continuous improvement of production processes Professional ties. Customers of the pharmacy he worked at. Content of the tie: feedback on products' quality
Fund raising	Strong tie. University classmate and his colleague Simone Professional network. Local pharmacies' owners Weak ties. Colleagues of local pharmacies owners
Increase in the sales network	Strong ties. Investors provided new pharmacies as clients and sold products in their pharmacies Strong tie: university of Padua. Content of the tie: Professor Dall'Acqua suggested some names of firms that could be potentially interested
Accelerator entrance	Professional tie. Mrs Pedoni. Content of the tie: she introduced N. De Zordi to a referent person of the accelerator who invited him to enter

Table 8. SAM case. Venture crucial events and ties involved

In this case, exploited ties have been multiple. The relation with the two universities fostered the realization of the products because N. De Zordi had many relationships with ex-colleagues and professors. This aspect is relevant because the founder could access information and knowledge through people working there. The founder's strong ties (family, friends, ex-colleagues) and weak ties enabled him to have concrete resources like funds and a more extensive sales network.

Open-farm

Luigi Forte in 2015 started the idea of a digital platform for agronomic consultation. In this platform, farmers could compare prices of equipment, machinery and raw materials but also it was a digital place for discussion about obstacles and oppurtunities of the sector. Working in the agricultural sector for years instilled in him the necessity of empowering farmers, as they were, in his opinion, the more fragile actors in the entire supply chain. When he talked to other colleagues, he found a positive feedback and many farmers shared his opinion. Thus, he decided to start this entrepreneurial project. Thanks to his wife, Luigi met Roberta Biendi, a social media

and web marketing specialist. Thanks to Roberta, Luigi found the communication agency that supported him in the development of the platform and Roberta as well collaborated in the content creation.
During the development of the platform, Luigi went three times to Confagricoltura in Rome to present his business idea, thanks to a local referent of the association who helped him to organize the presentation. However, the presentation had low success. He talked thus to some important customers, part of the supply-chain, to find a positive feedback, but they were skeptical about the fact that farmers could put into the platform autonomously the prices of raw materials.
Luigi had the feedback of H-Farm (one of the most important incubators in Italy). One of the founders is his relative. They suggested him to remove the e-commerce function, as it was really challenging to make it work.

The completion of the platform was slow to come; hence, in 2018, Luigi abandoned the idea and started a strategy aimed at communicating his message mainly through events and social media. The value of farmers along the supply chain could be stronger and more valuable to final customers, if all the members of the supply chain could integrate properly their communication strategies. Starting from his customers, Luigi talked to many people and firms throughout Italy to sensitize agri-food firms in better matching farmers'realities. Thanks to some agri-food firms and nutritionists involved, known in food exhibitions, Luigi began organizing events thanks to sponsors, where farmers, agri-food firms and schools or people in general could interact with farmers and know more deeply raw materials from which final products derived.

At the same time, Luigi began thinking to create products for final customers made of dry fodder (biscuits, snacks, nutritional supplements and body creams) in order to have a direct relation with people and communicate better the world of farmers. He studied the effects of dry fodder to human health and discovered that they were positive. Thus, he began searching for stakeholders, which could produce these products for him.
Firstly, thanks to two people met in a digital communication course, he got the contact of a firm producing natural creams; in Sicily, during an exhibition about natural products, he met a firm producing nutritional supplements and started this collaboration immediately. Besides, Luigi, thanks to a friend, contacted a professor of a Cooking School. He prototyped some products (crackers, biscuits) during classes and the feedback was positive; thus, the professor gave him the contact of an artisan who produced baked goods. Thanks to a friend, Mrs. Fogarin, President of the Consortium of Veneto villas, Luigi knew the new communication agency to develop the

new website and sell the products online and thanks to her, he met a new collaborator, Mr. Monopoli, a video maker who helped him in the creation of videos communicating his message.

By March 2020, Luigi Forte will be ready to sell the new products online and will start ten events to promote them in ten Veneto villas thanks to his friend Mrs. Fogarin.

Venture crucial events	Tie formation or exploitation
Idea generation	Professional network. Content of ties: other stakeholders in the supplychain gave a positive feedback
Product development	Strong tie. The wife of L. Forte introduced him R. Biendi, a marketing specialist who helped him in the first steps of realization Weak tie. R. Biendi suggested him the communication agency that could develop the digital platform
Presentation of the project to Confagricoltura	Professional tie. He presented 3 times the project to Confagricoltura with no positive feedback
Comparison with H-Farm	Strong tie. One of his relatives working at H-Farm gave advice about the business model
Change of the business idea	Professional tie. The platform realization was slow to come
Openfarm events	Professional ties. The network of farmers in which L. Forte worked
New business idea	No ties involved
Stakeholders identification	Strong tie. A friend introduced him the professor of a cooking school to prototype the first dry fodder products New tie. The professor introduced him an artisan for baked products production Professional tie. During an event, he met the producer of natural creams Strong tie. A friend, Mrs. Fogarin suggested the communication agency for the new website and the new collaborator (video-maker)
Open farm promotion	Strong tie. Mrs. Fogarin, President of Veneto villas, supported him in the organization of Openfarm events in villas

Table 9. Open-farm case. Venture crucial events and ties involved

In this research case, the founder has an extensive business network that he exploited to have feedback, promote his business idea and search for support. The intensity of the founder's professional network is different from Frescofrigo and Orapesce for instance. The little support received by colleagues and by the stakeholders of the supply chain had a crucial impact on his decision to change the business. The importance of strong ties here resulted in a more rapid stakeholders' identification process.

Kemanji

Ernesto De Marchi and Roberta Tardugno set up Kemanji in January 2019. When they had the idea of creating an app ("Appeaty") for restaurants and final customers, they started to explore the unsatisfied needs of the market. The feasibility of their idea was confirmed by talking to restaurant owners from different locations of Italy. Besides, they wanted to keep the idea protected, so they interacted with ten already known owners. The feedback was positive, in fact,

some owners declared their concerns related to managing customers' orders, additional ideas to improve their performances and to better match market needs were also provided.

In the initial phase, Ernesto discussed about the potential of the app and the related fiscal topics with some colleagues and thanks to their network the software company responsible for the App development was selected. In addition, friends and family members working as sales agents supported the development of Appeaty with important tips regarding how to sell products and to build a sales network.

Currently, Appeaty is being tested by some of the above mentioned restaurants.

Ernesto and Roberta are now promoting Appeaty for free by using its website and the related social network profiles.

Venture crucial events	Tie formation or exploitation
Idea generation	Strong tie. Roberta and Ernesto decided to start an entrepreneurial projectafter having explored unsatisfied market needs
Business model integration	Personal ties. Comparison with local restaurants owners. New ties. Comparison with restaurants owners of different locations in Italy
Technical support	Professional network. Category assembly as possibility to discuss about technical elements
Stakeholder identification	Personal tie. Colleague as way of understanding technical product improvement
Testing	Personal ties. Local restaurants owners as possibility of testing and improving the product
Strategic support	Strong ties. Family as provider of sales tips

Table 10. Kemanji case. Venture crucial events and ties involved

Kemanji is a startup at the very beginning of its lifecycle. Nevertheless, it is possible to notice the importance of the personal connections such as colleagues, friends and family members expert in the fields of interest for the selection of the partners restaurant owners and the software developers.

4.4 Cross-case analysis

After having extracted the crucial events and actors involved (firms, institutions) in each innovative start-up's path, I explored the different mechanisms, actions and social networks'exploitation that founders put in place within the process of development of the start-ups.

In the eight case studies selected, as I explained before, we have different ways of building and developing the startup and different ways in which founders' social networks play a crucial role at key moments of their growth. As we will see, the entrepreneurial vision of entrepreneurs on

developing the venture determines, and is determined at the same time, by their social networks and the way in which they exploit them.

4.4.1 First typology of venture evolution

I acknowledged at first glance *one typology of venture evolution*, where the entrepreneurs have tracked the same steps during the growth of the businesses, showing a similar managerial propension to involve specific actors and fit in particular contexts to accelerate their growth. Orapesce and Frescofrigo, two innovative start-ups created both in 2018 with a rapid pace of growth. Frescofrigo has gained over € 2 million of funds, whereas Orapesce has gained over € 100.000 but it has launched recently a capital increase through a crowdfunding platform and it is achieving a target of € 300.000.

E. Pandian and G. Bedetti are entrepreneurs with a consolidated managerial experience in the Milan area. The former, a serial startupper with 17 startups founded; the latter is a manager who has covered top management roles at well-known MNEs. These two entrepreneurs have created over time professional ties with top managers of important incumbent firms: G. Bedetti as top manager and E. Pandian as successful entrepreneur (his previous startup Supermercato24 was one of the most financed Italian startups in 2018). In fact, an interesting element is that Enrico and Giacomo know each other. This feature well represents the intense ecosystem characterizing the Milan area.

The third case is SAM, the entrepreneur N. De Zordi gave birth to an innovative startup producing agri-food products in the Dolomites area. The configuration of his social networks is different from that one of Enrico and Giacomo, as he do not know any manager of MNEs; yet, he went through similar steps but with different social networks' dynamics.

Their venture development approaches represent the "textbook" way of setting up a startup. All of them had gone through the same stages: *idea generation*, *idea validation to the market*, *funds reception and partnership with a strategic actor*, which allowed them to achieve a stability in the market.

The startups were founded at different *contexts*: Frescofrigo was set up in collaboration with another startupper Tommaso Magnani. Enrico and Tommaso knew each other at a startup event at H-Farm in 2014 and since then they kept the contact, whereas Orapesce was founded on a project work during an MBA in Milan, where the idea came out after a conversation with Pietro Graziano, a long-time friend of Giacomo. In both cases, the intuition was born as result of an interaction, but in the first case Enrico Pandian activated a weak tie (T. Magnani with whom he was in contact rarely), while Giacomo Bedetti exploitated a strong tie. N. De Zordi, founder of

SAM, decided to create an own business after a PhD at the University of Trieste and a professional experience in a pharmaceutical firm where he absorbed crucial technical and strategic knowledge to run a business. Besides, the last work as pharmacist helped him in generating new ties and entering in contact with potential customers. In this case, there is not an interaction triggering the entrepreneurial decision.

The event featuring the initial stage of the evolution of the three startups was understanding the *feasibility of the idea*. When Giacomo Bedetti decided that the business idea during the project work would have become a real project, beyond his classmates, he decided to involve his family and friends as collaborators. His wife Vanessa and his long-time friends Alberto, Alessandro and Pietro. The involvement of these strong ties in the project enabled to obtain high levels of commitment and complementary knowledge that ensured to accelerate the business model definition. Besides, the possibility of being set in the university context enabled him to gain specific strategic knowledge from tutors and classmates.

> "Pietro Graziano is a long-time friend, working as fisherman. He has been the hero of the project. When we had to realize the business model, he helped me to understand which path was correct. His 20-years experience in that sector allowed us to choose the proper way to connect families and anglers. [..] When I decided that the project work would have become a real business, I involved Vanessa, my wife, and Alberto, my highschool classmate, who provided a relevant technical and strategic contribution."

In the case of Frescofrigo, when the founders decided to install a Coca Cola fridge to test the concept of the fridge, as alternative option of the vending machine, the possibility was given by the CEO of a MNE (Frescofrigo's target), who Enrico has known for twenty years. The strong tie with this friend, who was in the same "circle of friends" in the marketing and communication sector, provided the necessary positive feedback to start the business.

> "The first thing we did was buying a Coca Cola fridge and put it at a MNE office. I knew the CEO of this MNE and I asked him a favor. I've known him for twenty years, we are in the same circle of friends in the marketing and communication sector".

N. De Zordi, founder of SAM, started prototyping the first products thanks to the constant collaboration with two universities with which he maintained a positive relationship and an active role in research. The tie with former colleagues both belonging to universities and to the pharmaceutical company supported him in the exploration of innovative production processes.

> "During the PhD, I had the opportunity of observing the production processes. Afterwards, at PQE I could explore how firms were structured. [..] I collaborated with the University of Padua and

> Trieste. I developed a friendship with some professors of the University of Trieste. They were interested in my project, so we kept this relation in order to write articles and publish new studies. During my PhD, instead, I entered in contact with a professor of the University of Padua and we became friends. He and his team supported us in the operational phase of products development. When we want to improve a product, I often asked him for advice."

At this stage, differently from Giacomo and Nicola, Enrico started to search for investors. He activated all the contacts in his professional networks (ex-colleagues, investors of his previous startups, VCs, business angels), Frescofrigo gained in the pre-seed stage € 500.000. In this crucial moment where the development of the product had not started yet, the professional network in which Enrico was positioned made the difference. It is important to say that being a successful entrepreneur enabled Enrico to access already existing ties to VCs and business angels who knew his reputation in terms of business performance (most of them were investors of his previous startups or were business angels who worked for VCs that had invested in his startups). Both strong ties and weak ties played a significant role at this step: with some business angels and investors, Enrico had built a personal and daily relationship:

> "With some of my investors I created a friendship. After the establishment and the success of Supermercato24, it has been easier to interact with them. [..] With some of them, I have a daily contact, even on Whatsapp"[70].

In the *concrete development of the product or service* of both startups, Orapesce had his team of classmates and friends supporting him in the rapid realization of the digital platform, whereas Frescofrigo involved a multiplicity of people to create this innovative and "smart" fridge. He involved a startupper knew at a startup event who had a high degree of knowledge about the vending machine sector, so he provided precious tips about engineering aspects. Again, being entrepreneur provided him the possibility to select specific people with proper knowledge for his project and enabled a transfer of knowledge. In the case of SAM, instead, N. De Zordi had his sister who supported him financially and Simone Zandomenego, his colleague, brought technical competence. These have been strong ties exploited by the founder in the initial phase. Besides, Nicola contacted agronomic advisors for technical consulence on agricultural activity and for the presentation of the documentation for the Rural Development Program (PSR). The first agronomic advisor provided the contact of the other one. After that, he got in touch via Internet with Mrs. Pedoni, a business advisor, expert in financing research and start-up

[70] Information retrieved from an interview on the online magazine Pantheon (06/01/2020). Available from: https://pantheon.veronanetwork.it/personaggi/piu-che-pirati-siamo-startupper/

foundation. She provided her strategic support in the startup foundation and search for financial funds.

> "Since my project diverged from traditional agriculture, I had to search for someone who could support me. Indeed, I contacted Mr. Alberton, an agronomic advisor and thanks to him, I met also Mr. Lovat. They helped me with the documentation to receive PSR funds and understand how to start with the agricultural activity. [..]. Silvia is a startup business advisor. I was searching on the Internet and I found her profile. She works at Backtowork24 in Milan, which is an equity crowdfunding platform. She helped us to find new financial opportunities and she supported us in the application to new funding bids".

As we can see, the professional ties with universities, the strong ties maintained with former colleagues (both at universities and at the former work) and the involvement of new ties (e.g. agronomic advisors and the business consultant) had a crucial role in obtaining the first funds from PSR and starting the activity at the laboratory. Here the difference is that if G. Bedetti and E. Pandian did not search for new contacts but exploited mainly existing relations, N. De Zordi had to search for new experts with the proper technical knowledge to foster his project's growth.

Once the product/service was ready, they tested it. Orapesce created a Beta-test involving seventy families in Verona and these families were friends or colleagues of Orapesce team members; whereas Frescofrigo installed ten fridges in Milan, by contacting CEOs and entrepreneurs operating in the food sector. One of the first customers was PAM[71], one of the investors of his former start-up. These people were both friends and acquantainces. Again, the variety of ties involved: strong ties (friends covering top positions in MNEs) and weak ties (managers with whom he had occasional contacts).
At this stage, SAM did not really test the products, but he prototyped products with the University of Padua and asked for feedbacks to customers at the pharmacy he worked at. Here, the possibility to interact with final customers allowed him to improve the quality of the products. At this phase, there is a major involvement of strong ties by entrepreneurs.

Another key event of these three startups has been the *identification of a strategic partner*. Orapesce needed stakeholders that could clean and pack the fresh fish and, at the same time, deliver it throughout Italy. Hence, G. Bedetti entered in contact with two incumbents Little Fish and Stef Italia. G. Bedetti contacted Little Fish, as it was in the same geographical context of the network of anglers involved in Orapesce. It enabled Orapesce to solve the problems related to packaging and freshness preservation. The contact with Stef Italia was suggested, indeed, by

[71] Pam is a national player operating in the large scale retail distribution sector.

a startup at Talent Garden, in which Orapesce had its base of operations. Through Stef Italia Orapesce can now deliver to the entire Italy.

> "Little Fish has been a crucial partner for the venture growth and it will be even more important in the future. The perspective of Orapesce could be that one of being absorbed in a forward integration done by Little Fish. The future financial gain for investors won't be the dividend, but the potential sale of the startup to an incumbent."

Frescofrigo, instead, signed an agreement with Epta for fridges production. E. Pandian knew the managing director of Epta and they organized a meeting with the CEO to make the deal.

> "I knew the managing director of Epta. I organized some meetings with him, after that he introduced us the chief of Epta. We brought a business plan with credible financial perspectives. They validated the numbers and decided to make the deal. [..] Besides, they recognized that we could be a sort of Open Innovation for them and they chose to invest."

Differently, the strategic partners in SAM were still the two universities, which provided the technical support N. De Zordi needed. As one might observe, social networks have again played a relevant role in sustaining the rapidity of agreement. Especially in this case, the strength, the intimacy and the level of trust accelerated the conclusion of agreements.

Another crucial event consists of *financial investments acquisition*. Frescofrigo was the only one among my research cases with a pre-seed stage. However, similarly Frescofrigo and Orapesce gained a capital increase in the initial phase of their lifecycle to obtain major financial stability. Frescofrigo gained a second round of investments, here again E. Pandian contacted some friends (entrepreneurs and business angels) and investors of his previous startup Supermercato24. Besides, the partner Epta invested as well. G. Bedetti contacted instead his family, friends and ex-colleagues. Many of them covered head positions in MNEs.

> "The first round investors were family members, friends and ex-colleagues. All of them trusted me and accepted to invest, as they know that I would have achieved what I had set myself."

As we can see, the network of both founders favored the investments attraction. SAM gained a first round of investments from five business angels: a university classmate, a long-time friend and some local pharmacy owners. Funds as we know are fundamental for a startup's growth as it is resource-constrained by nature and rapidity as well is one of the principles in the startup management. Hence, the amount and the intensity of social ties entrepreneurs may benefit of, allowed to obtain funds rapidly and to accelerate the pace of their project's evolution.

Frescofrigo and Orapesce achieved other fund raisings. In the case of Frescofrigo, the investments done by well-known investors in Milan favored the acquisition of funds by two banks (equal to € 1,2 million). The reputation of the investors instilled major credibility in the venture credibility. Orapesce received another capital increase thanks to a manager of a financial institution, who brought him five business angels and the access to a crowdfunding platform.

> "A crucial step for Orapesce has been meeting the CEO of a financial institution. He allowed us to accelerate our access in the crowdfunding platform and at the same time it gave us a pillar of credibility. [..] "

As one might observe, not only strong ties, but also weak and new ties may bring huge benefits. Financial advantages but also strategic benefits. For Frescofrigo and Orapesce investors and business angels had, in both cases, high levels of managerial experience. In the case of Frescofrigo, the founder belonged to many networks (e.g. "a circle of friends in the marketing and communication sector"; "a network of investors I am part of") and this ensured him to exploit a larger number of ties.

In the commercial phase, we have again some diverse dynamics. The first customers of Frescofrigo were friends or former investors; then he involved some occasional contacts. Many of the investors and business angels started using their social networks to promote the product and they provided Frescofrigo strategic tips about the access to foreign markets.

> "Mr. Paganin supported us in the deal with an important financial instution to install Frescofrigo fridges. Generally, most of the installations are due to investors who know top managers or CEOs of large companies. I met Mr. Paganin when I founded Supermercato24, my previous startup."

One acquantaince of E. Pandian, in fact, contacted him telling that he had seen Frescofrigo on the Internet and that in New York there was an American large company that was interested. This weak tie enabled Frescofrigo to access the American market. In half a day, the first Frescofrigo installed gained much than any other Italian fridge. This confirmed to the founders the scalability of the model and the potential of foreign markets.

Orapesce team members' social networks were fundamental at the beginning of the path when the service was tested in Verona. In the commercial phase, the installation of the startup at Talent Garden and the crowdfunding activated on February 2020 have been enabling the creation of many partnerships and the obtention of important tools to promote activities. Besides, Orapesce team members and investors are promoting it actively.

SAM's business angels have boosted the commercial activities by selling the products at their pharmacies and proposing the products to other pharmacies. The University of Padua as well brought many customers (as B2B market). As we can see, business angels and investors are fundamental for new market opportunities, new markets' access and promotion.

These innovative startups have tracked similar paths: the involvement of ties for venture development, the funds acquisition from strong and weak ties and the relationship with strategic partners. The conformation of networks and the managerial competence of entrepreneurs have enabled to gain a valuable rapidity to enter the growth stage of their lifecycle. A valuable aspect is that the extraordinary rapidity of Frescofrigo is due expecially to the amount of weak ties. In this case, E. Pandian is an entrepreneur who is present in many different networks, and most importantly a network of investors that ensured him to receive a pre-seed financing. The other five startups show different paths and venture development steps. Both for founders' venture management perspectives and for the lack of specific social networks that they could rely on. However, between them, there are two startups having tracked a quite similar path, as they have been increasingly "absorbed" by institutional players: Bios Hydrogel and Sietrace.

4.4.2 Second typology of venture evolution

In these two startup cases, as we will see, there is a high involvement of institutional players and a tight integration between the startup and the university scenario. The evolution of the ventures is due to university knowledge and associations of category network configuration.

R. Calliari (founder of Sietrace) started his entrepreneurial project after having analyzed several European projects in innovation themes and after having ascertained that there were new customers' requests in the food market. He decided to start from co-working spaces in Verona to find people interested to join his business idea, but he did not search for support among his strong ties. He chose Verona as he identified many opportunities there.

> "Verona is a sort of Silicon Valley, an Italian Food Valley. When I chose to move here, I believed in that ecosystem. In the agri-food industry of Verona, there are some business realities that interact continuously and that guarantee flows of information and new chances of collaboration."

G. Guerrini, instead, founder of Bios Hydrogel, started his project at the university context after having left his region of origin because it was not a fertile context to set innovation projects. Both of them had an institutional background: R. Calliari had worked for years in the management of European projects and G. Guerrini became a university fellow once he was accepted by the university.

> "When I was in Tuscany, it was difficult to find open-minded people in the agri-food sector. [..] The first contact was the referent person of a research centre in Mestre [..] but then I decided to go to the University of Padua [..], I had the chance of working there as a research fellow, so I could develop the product, transforming my idea into a real project".

The initial development of Sietrace SILabel has been result of a series of interactions. First, the attendance to co-working spaces. It enabled R. Calliari to absorb complementary technical knowledge and through a co-working at Piacenza (in the region of Emilia Romagna) he entered in contact with an association "Piace Gusto Sano", operating in the innovative field of the food sector, through which the Qrcode was tested. Besides, R. Calliari activated two weak ties, two experts in the wine sector and in the diagnostical analysis of food. Through one of them, R. Calliari got in touch with Coldiretti and through Coldiretti he entered in contact with the University of Verona. As we can see, R. Calliari's professional tie with Mr. Gambin enabled him to access a thick local network of institutions, giving him the possibily to improve the product and the variety of its functions. The connection to these institutional players provided even the possibility to enter in contact with agri-food firms to test the product.

> "Coldiretti and the University of Verona represent two actors that collaborate for new projects. This web of relations enabled to set in motion different elements, which have been crucial for understanding the functionality of the project Sietrace."

G. Guerrini gave birth to the innovative formula during his permanence at the University of Padua. He developed the first prototype of the product alone, but some university researchers supported him in the presentation of the project to a Foundation, where he (jointly with the university) gained an award and received a financial support to continue the research on the innovative formula. His business partner C. Scarpa suggested him to license it.
In both cases, the relationship with institutional players (the university in the case of Bios Hydrogel, the University of Verona and the association of category Coldiretti for Sietrace) has played a role for the concrete development of the product and its implementation.

Bios Hydrogel hasn't pitched the product to the market yet and there hasn't been many possibilities to test it. The University of Padua was a fertile context in which starting the project, indeed, G. Guerrini started the procedure to let his business recognized as spin-off. The co-founder C. Scarpa, instead, has played a crucial role in providing precious opportunities such as European calls, potential customers and strategic tips on how to exploit the formula.

The same dynamic occurred in the *commercial phase*. When Sietrace brought the product to the final version, the collaboration with Coldiretti and the University switched to a higher level.

In fact, Sietrace signed an agreement for a joint project with the university and through Coldiretti it signed an agreement with FAI. Being the technical partner of these two actors enabled Sietrace to gain major visibility and many market opportunities thanks to projects in which its partners were involved. But at the same time, it allowed to receive a financial support thanks to the joint project.

Bios Hydrogel, although it has not yet pitched the product to the market, has engaged potential customers contact. C. Scarpa the co-founder, thanks to his work as commercial lawyer, had the chance of interacting with many firms who could be interested in the project. The relationship with one of the customers will provide the implementation of the product.

As one might observe, in these two case studies, the founders are strongly linked to their institutional partners, both for technical knowledge, business idea testing and for market opportunities. In the case of Sietrace, being present in the network of institutions provided them the possibility to make deals and enter new partnerships. In the case of Bios Hydrogel, the university has been important as primary context to start the business. It is relevant to say that the startup is at the beginning of its path and it is being recognized as university spin-off.

4.4.3 Other typologies of venture evolution

The last three cases represent innovative startups that have undertaken different journeys, which cannot be totally compared to the previous ones. In these innovative startups evolution, there has not been research for funds or crucial interactions with external actors that boost their evolution.

L. Vescovi and M. Vescovi gave birth to the startup as a spin-off of the existing business of which they were owners. When his brother Marco met E. Cammareri, working for a client company, they decided to start a new entrepreneurial project.

> "Enrico worked for a client of ours. He was interested in the marketing field and wanted to approach new opportunities in the sector he was interested in, the wine sector. Enrico seemed to us a very precise and talented person, so we decided to start this project together."

In the case of Kemanji, N. De Marchi and R. Tardugno, engaged in a relationship, came up with the business idea, by asking local restaurants owners the feasibility of the idea. They provided precious tips and explained some of their needs related to orders management.

> "Through the relation with local restaurants, we added new services and options to the application. They gave us the idea of the doggybag and the idea of introducing the possibility of booking also for children (who often are not considered in reservations)".

L. Forte, founder of Open-farm, started his project with the support a freelancer, known thanks to his wife. He tried to have feedbacks from his professional networks of suppliers and clients to understand the existence of positive interests on the business. Openfarm had a problem with the digital platform realization and this breaking point signed the shift to another business idea (I will explain this critical moment after). When he decided to start with another business idea, the dynamic was the same. He searched for feedbacks from his professional network, suppliers and customers.

At this stage as one might observe, founders' social networks embed mainly strong ties, linked to the local context and the personal level. As we can see, we have different contexts and interactions at the startup establishment. In Kemanji and Geppa there has been an external tie that triggers the decision of setting up the venture, whereas in Open-farm the entrepreneur decided autonomously to start the business.

In the *development phase* of Geppa, the mother company team implemented the e-commerce service and its new license for logistics management. The strategic partner here enabled to develop rapidly the service deleting the need for external funds. The entrepreneurs could in fact exploited former ties with clients of the mother company to better delineate the business model. The founders of Kemanji hired a web agency for developing the mobile application thanks to a colleague of N. De Marchi who suggested it.

L. Forte, instead, hired a web agency to develop the digital platform, a web agency that was suggested by his collaborator R. Biendi. When he searched for new stakeholders to begin with the new business, he partecipated at industry events and found them. He was also introduced to one of his suppliers through a weak tie.

Again, the role of strong ties emerge to be crucial for implementing the idea. At this step, we have different ways of realizing the business idea. Some of them hired external stakeholders (as in the cases of Kemanji and Openfarm), while Geppa maintained the development of the service within the mother company.

At the commercial phase, Geppa relied on former ties with mother company clients, Kemanji has not started with the commercial strategy yet, but the perspective is involving friends working as salespeople to boost the commercialization of the mobile app. Openfarm, instead, will exploit industry events and the professional network of the entrepreneur.

In the Table below (Table 11), we can observe the majority of ties typology that have been involved at the different stages of ventures evolution.

Case	Idea generation	Development of product/service	Strategic partners identification	Fund raising	First clients	Commercial phase
Bios Hydrogel	New	New	Strong	-	-	-
Sietrace	New	Weak	Weak	Weak	Weak	New
Frescofrigo	Strong/weak	Strong/weak	Weak	Weak	Weak	Weak
Orapesce	Strong	Strong	Weak	Strong	Strong	New
Geppa	New	Strong	Strong	Weak	Weak/new	New
SAM	Strong	Strong	Strong	Strong/weak	Weak	New
Openfarm	Strong	Weak	-	-	Weak	-
Kemanji	Strong	Weak	-	-	-	-

Table 11. Ties' typology throughout the venture evolution

A comparison on crucial points

A common feature emerging in some of these startups is the *relationship with co-working spaces*. None of these startups have been incubated, however, they entered in contact with them. L. Forte of Openfarm asked to a relative working at H-Farm a strategical suggestion for the business model configuration who suggested him to modify the configuration of the platform. G. Guerrini, entered in contact with Paradigma City obtaining the contact of potential customers and partners. R. Calliari began the development of the product by attending four co-working spaces. N. De Zordi had access to an accelerator (Technological Pole of Pordenone) on the suggestion of a strategic advisor to accelerate its growth pace. G. Bedetti had its base of operations in a co-working space that is bringing currently many chances of creating new partnerships. Besides, G. Bedetti found Stef Italia, a stakeholder thanks to a startup known there. The relationship with these innovative hubs resulted to be more or less relevant for founders. In some cases, the attendance brought precious consultance on the business model configuration and product development, in other cases it enabled founders to access some new contacts.

Throughout my research, the *reactions of founders to moments of criticality* have been interesting. In Sietrace, for example, during co-working spaces, R. Calliari received the technical support from two large firms (one operating in the banking sector and the other operating in the health sector). These two firms were convinced that the approach of the Qr code should have been more scientific and rigid, while R. Calliari was of the opinion that a tool for customers had to be more communicative and emotional. This feedback of experts created a moment of instability that R. Calliari overcame with other team members known at the co-

working spaces. As one might observe, being present in an innovative context implies the comparison with many actors that can more or less have an impact on the idea realization. In the case of Openfarm, instead, he faced two critical moments: the first when he presented for three times the project to his association of category Confagricoltura and he did not receive any support. So he continued with his project, trying to find support from his professional network of stakeholders. After two years from the ideation, the digital platform realization was slow to come. At this moment, when Luigi did not find much support from his professional network and institutional players, he decided to change business and create products for final customers. Another example is Bios Hydrogel. When G. Guerrini licensed the innovative formula with the university, he asked for being recognized as university spin-off. As the recognition was slow to come, his business partner C. Scarpa suggested to him to found an innovative startup separately to be able to start with the business activity.

As we can see in the last two cases, professional and new ties rather than personal ties have supported the entrepreneurs in facing critical moments and recovered from a negative event.

CONCLUSIONS AND LIMITATIONS OF THE STUDY

The role of social networks in entreprenership is a theme that has been largely discussed. In my research, I tried to extrapolate the interplay between ventures' crucial events and founder's social ties, by analyzing how and when founders deploy them and what their contribution is.
As one might observe, venture evolution depends on several factors: the geographical context, the presence of an ecosystem, the density of business networks' relations, the presence of active institutional players and the humal capital of the entrepreneur as well (in terms of professional experience and managerial competence). All of these aspects represent different features of social networks.
The creation and the mobilization of new or prior ties allowed entrepreneurs to gain valuable resources to set up their ventures more rapidly and more easily. Some entrepreneurs started their business project with little support, as they had no social ties that could be fruitful for their project. Yet, they changed the context and accessed to new networks to search for relations providing what they needed. In fact, if entrepreneurs position themselves in highly-connected and dense social networks, there are higher possibilities that they will have higher levels of success, as the amount and variety of resources exchanged (both financial resources and knowledge) may be greater. This aspect, in fact, has emerged to be crucial.

Beyond the density of social networks, a crucial theme that I explored in my research has been the strength of social ties and the difference between bonding and bridging social capital. Strong and weak ties are characterized by different levels of intimacy, trust, commitment, intensity and maturity. In some case studies, the degree of trust embedded in specific social ties enabled entrepreneurs to gain financial and technical resources to start their projects. The chance of accessing freely these assets has been fundamental to start. However, in the majority of my cases, entrepreneurs relied on personal funds or searched for financing through new ties. This aspect emerged to be relevant. When entrepreneurs do not possess the sufficient technical or financial resources, they are likely to move towards fertile ecosystems or towards new networks, as in the case of Bios Hydrogel, Sietrace and SAM. Strong ties in my research cases provided mainly financial resources, feedback on idea feasibility and chances to test the product.
Weak ties and new ties as well played a relevant role in the development of the product/service and in the identification of strategic partners, as in the case of Orapesce and Frescofrigo. Besides, weak ties made a real difference in the evolution of the venture, as they boosted the

acquisition of new exclusive assets: funds, technical knowledge, new contacts and new customers. Weak ties, indeed, favored the obtention of larger amounts of funds as they involved a multiplicity of actors with different networks, visions and goals. In my research cases, bridging social capital boosted the possibility of finding the necessary resources to foster the growth of their ventures, especially at moments of crysis. Bridging social capital has been possible for instance thanks to industry events, startup events or co-working spaces, which provided the opportunity to be embedded in new channels and, consequently, to absorb the desired assets. Founders could gain different types of information and knowledge by entering new networks or by leveraging specific ties to enter them. Here, heterophily resulted to be a significant theme for my study. In some cases, the little responsiveness and the redundancy of information conveyed within specific professional networks forced entrepreneurs to focus on new web of relations. However, even homophilic ties emerged to be crucial in some cases. In the case of Frescofrigo for instance, intense and frequent interactions with actors showing same characteristics and common values (e.g. top manager of MNEs or successful entrepreneurs) fostered the dynamism of those networks.

Nowadays, nascent entrepreneurs can tap into a great variety of ties and new innovative contexts to absorb the desired knowledge they need to develop their business ideas. As Giacomo Bedetti (the founder of Orapesce) said, *financial networking* is a new activity that combines bonding social capital and bridging social capital activities as a way to have access to fruitful social networks.

Besides, social capital has not only represented the tool through which actors exchanged assets. Social ties with specific people, experts or actors (investors, universities) let new ventures obtain “halo-effects” in terms of reputation and credibility, in addition to knowledge. As in the case of Sietrace, the connection to actors like the University of Verona or Coldiretti made possible to enter new networks of actors and deal with them with a greater credibility and visibility. The positive interconnection existing in the area of Verona encouraged the involvement of Sietrace in many projects.

Another interesting point that has emerged in my research is the role of the Internet. Social media (especially Linkedin) allowed entrepreneurs to facilitate and accelerate their connection to their professional networks. As in the case of Frescofrigo, the founder attracted business angels covering top management roles through Linkedin and they enabled him to have strategic tips about production and internationalization strategies.

As one might observe in the cross-case analysis, venture crucial events have been caused by a combination of many ties’ typologies. The exploitation of strong ties, for instance, provided the

chance of forming new ties, and consequently gave the possibility to gain new resources, new contacts or greater visibility.

Afterwards, an interesting point has been the collaboration between startups and incumbents. In four out of eight cases, the relation with an incumbent provided especially technical knowledge and the access to its salesnetwork. As in the case of Frescofrigo, the partner Epta became responsible for the production of fridges. It improved some of their components and gave precious strategic tips to face the challenges of the vending machine sector. Besides, the relation with a large company ensured to access wider networks and gain greater stability. Thanks to the partnership with Little Fish, instead, Orapesce solved the problems linked to package process. It is important to underline that the identification of strategic partners demonstrated powerful opportunities for the future of the startups. In the case of Frescofrigo and Orapesce, the tie with the incumbents have led to a sort of Open Innovation processes and a potential perspective of selling the startup.

A valuable remark about institutional players' contribution has to be done. In four out of the eight cases, universities have played a relevant role. In some cases, entrepreneurs chose universities as contexts to give birth to the startup. For instance, G. Guerrini (the founder of Bios Hydrogel) moved to the University of Padua to realize his business idea, while G. Bedetti chose to exploit a project work during an MBA as a real business simulation. He decided to leverage the dynamic context of the MBA, with high-skilled professors and talented classmates to turn the idea to a real business. In the case of SAM, instead, the academic path led N. De Zordi to the entrepreneurial decision. In fact, the time spent at the university and the complementary knowledge gained through the experience in the pharmaceutical firm instilled the willingness of setting an own startup. In addition, the consolidation of strong ties with university researchers (his ex-colleagues) ensured to innovate products, without paying high costs of interaction. Sietrace, instead, entered in contact with university gradually. The contribution of the university in this case has been fundamental, because it provided funds, access to market analyses, technical knowledge, market opportunities and the chance of exploring further potential functionalities of the SiLabel.

As one might observe, trust works like glue for social ties. Within weak and new ties there is a low level of intimacy and reliability. These interactions are effective thanks to the proactive behaviors of entrepreneurs to communicate the value of their business ideas or to stand beside trustworthy incumbents or institutional players. Differently, within strong ties, trust improves the quality of relations, reduces barriers and costs of transaction and fosters the degree of commitment and transparency. These elements lead to a greater rapidity and easiness of

obtaining investments, more frequent information exchanges to face new obstacles and a greater support during challenging times.

This study presents some limitations. First of all, the research cases belong to a single region, presenting an own ecosystem with different rules and different actors (e.g. incubators, accelerators, universities, category associations, incumbents). The constellation of networks present in Veneto potentially differ from other regions. This implies that contingent factors having an impact on ventures' evolution could be different among regions. In fact, geographical context has emerged to be different between the six startups operating only in the Veneto region and those operating both in Milan area and in Veneto. The presence of a greater multiplicity of investors in the Milan area (business angels and venture capitalists) makes it a more fertile context for new ventures and represents a variable that influences the chance of success of startups in a decisive way.

I developed my study on eight case studies through a qualitative method of research, in order to investigate deeply contingent factors, background dynamics and actions' meanings that a quantitative method could have neglected. In fact, by conducting semi-structured interviews I could explain the interplay between founders' decisions and ventures events. However, the small number of cases analyzed is not statistically representative. In fact, generalizing conclusions has been difficult because each respondent and each startup growth path possess own characteristics and influential variables.

Besides, founders' personal visions may have caused the omission of relevant facts and reasons of action that could have been interesting for the objective of the study.

Another remark is that I considered innovative startups at different degrees of maturity. Some startups were at the very beginning of their path, other startups presented a more consolidated structure. For this reason, the cross-case analysis about the mobilization of ties at crucial moments of growth could not compare in parallel all the events. In fact, if a startup had not reached the commercial phase yet, it was not possible to investigate which ties favored the access to the market for example.

In conclusion, I underline that in my research cases I did not involve all members of the startup. I interviewed the founders, who actually orchestrated the social networks from the very beginning to the current moment. The first collaborators and employees may have contributed to enlarge the startup network or could have provided specific resources. Yet, the exploration of ventures evolution resulted to be accurate and precise through the reconstruction done with secondary data (press, AIDA, social media and youtube videos).

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