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**Financing and innovation in start-ups:
A comparative analysis between
Italy and the Netherlands**

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When Henry Ford made cheap, reliable cars people said, "Nah, what's wrong with a horse?" That was a huge bet he made, and it worked.

Elon Musk

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INTRODUCTION

In an era characterized by rapid technological advances and global interconnectedness, the landscape of innovation and entrepreneurship has undergone significant transformations. In my thesis I explored several chapters that provide an overview of the relationship between innovation and startups and then explore the figure of the entrepreneur of innovative startups coming from two different geographical areas with which I came into contact during my academic career: Italy and Netherlands.

Chapter 1 delves into the fundamental aspects of innovation and startups, laying the foundations for a comprehensive exploration of the complex dynamics that govern entrepreneurial initiatives.

The chapter provides a meticulous definition of innovation, revealing its multifaceted nature and highlighting its central role in driving economic growth and social progress. Subsequently, I focus on the figure of the entrepreneur, exploring the characteristics and qualities that define this as the key force in the innovation ecosystem.

Attention then turns to the contemporary innovation model and the indispensable role that startups play in this paradigm. This chapter clarifies the symbiotic relationship between innovation and startups, highlighting how these dynamic entities act as catalysts for transformative change.

The chapter also delves into different business models, in particular the small and medium-sized enterprise (SME) entrepreneurship and innovation driven entrepreneurship (IDE). This exploration aims to capture the different approaches that entrepreneurs employ in tackling the terrain of innovation.

Subsequent chapters delve into the practical aspects of startup operations by exploring the various financing methods available for startups, analyzing equity financing, debt financing and leasing, followed by startup financial cycle analysis that explains the complexities related to the startup path they take during their life cycle and how their revenues/cashflows vary as time passes and milestones are achieved.

Chapter 3 shifts the lens to the startup landscape, examining startup failure rates and the crucial role played by incubators and accelerators. Specific organizations such as I3P and YES!Delft are examined as examples of support structures in this dynamic environment.

In Chapter 4, the focus expands towards an international exploration of startup ecosystems. The Dutch and Italian startup landscape takes center stage, with case studies on exceptional startups such as

DeNoize and Respyre representing the Dutch context; Ecoplasteam and Vesevo serving as examples of the Italian entrepreneurial scene.

Finally, the thesis concludes with a comprehensive analysis in the final chapter, exploring the differences in the entrepreneurial approaches of the Italian and the Dutch entrepreneur. This comparative analysis seeks to reveal the unique factors that influence entrepreneurial success in these distinct contexts, contributing to a deeper understanding of the global innovation ecosystem.

Methodology of the thesis

The methodology used in this thesis is based on a multi-approach that includes an extensive literature review, my academic experiences at the Polytechnic of Turin and at the Technische Universiteit Delft and a direct involvement with entrepreneurs through interviews and practical collaboration. This methodology aims to provide a comprehensive and detailed understanding of the topics explored, ensuring a solid basis for subsequent analyses and conclusions.

Academic Literature:

An in-depth review of existing academic literature forms the backbone of this thesis. Relevant research articles, journals, books and websites were consulted to establish a theoretical framework for understanding innovation, entrepreneurship and startup dynamics.

Academic experiences:

Polytechnic of Turin: The academic path at the Polytechnic of Turin has provided valuable insights into the Italian context of innovation and entrepreneurship. Class discussions, lectures and collaborative projects enriched the understanding of local dynamics and challenges faced by startups in the Italian ecosystem.

Technische Universiteit Delft: Academic experiences at Technische Universiteit Delft contributed to a comparative perspective, enabling insights into the Dutch innovation and startup landscape. Furthermore, interactions with professors, colleagues from all over the world and discovering the realities of Dutch startup innovations were crucial, which facilitated a deeper understanding of the entrepreneurial ecosystem in the Netherlands.

Interviews: In-depth interviews were conducted with entrepreneurs representing the case studies explored in Chapter 4. These interviews aimed to capture first-hand experiences, challenges and strategies employed by entrepreneurs in navigating the startup landscape.

Working close to entrepreneurs: Collaborating directly with entrepreneurs from DeNoize and Vesevo provided a unique opportunity to gain practical knowledge about the daily operations of startups. This immersive experience enabled a nuanced understanding of the challenges and decision-making processes involved in running a startup.

Case studies: The case studies were selected based on their relevance to the research objectives and the diversity they bring to the comparative analysis of the Italian and Dutch entrepreneurial landscapes.

Analysis: Case studies (DeNoize, Respyre, Ecoplasteam, Vesevo) are analyzed through a qualitative lens, focusing on key themes such as innovative value propositions, business models, financing strategies and operational challenges. Comparative analysis is used to identify similarities and differences between Italian and Dutch entrepreneurial approaches.

Synthesis: Information gathered through literature review, academic experiences, interviews, and case studies is synthesized to form a coherent narrative.

Analysis: The comparative approach helps to highlight distinctive characteristics and trends of the Italian and Dutch entrepreneurial ecosystems.

By combining these different research methods, this thesis aims to offer an understanding of innovation and startups, supported by theoretical insights and real-world experiences, contribute to a detailed exploration of the entrepreneurial landscape.

CHAPTER 1 – INNOVATION AND STARTUPS

Chapter 1.1: Definition of Innovation

Innovation is a concept of fundamental importance in the social and economic development of a country, representing its ability to constantly evolve and adapt to ideas, products, services and processes, in order to respond efficiently to the needs of the society. It is important to define the difference between two concepts that are often confused and not correctly distinguished: innovation and invention.

The term invention refers to the act of conceiving and developing a completely new product, process or system that did not previously exist, giving life to something that is characterized by its uniqueness and patentability. Therefore, it refers to a completely new product that can lead to completely unexplored areas, although it may require a considerable period for its actual implementation.

On the contrary, the term innovation refers to the process of improving and perfecting an already existing product or service in order to give it greater added value and solve problems that distinguish it through the application of innovative ideas through pre-existing technologies. In this case, these are incremental, profoundly innovative improvements and adaptations aimed at improving the efficiency of a specific product.

It is therefore possible to identify points in common between these two concepts. Both underline the company's ability to create something new, whether it is a product or a business model; to respond efficiently to new needs; develop creative ideas and thoughts as well as create value for the company and for the company's users.

The differences, however, concern the nature of the output: on the one hand, the invention refers to the theoretical creation of an idea and a concept, even if difficult to implement and, on the other hand, innovation is oriented towards practical and tangible improvement, which, thanks to a broader spectrum of skills, manages to guarantee a competitive advantage.

The problem of innovation is addressed for the first time in the thoughts of the famous economists of the 18th century; in particular, the first studies on economic dynamics by the economist scholars Smith and Marx are important.

Despite this, the most significant contribution to the study of technological innovation starts from Shumpeter's studies, which will influence subsequent considerations. The author defines innovation

as "*the act of introducing new economic combinations through the entrepreneur*", who becomes a fundamental figure and is required to have a culture linked to the innovative process.¹

The innovative process is characterized by 3 different phases:

- *Invention*: represented by an idea or model for a new and unprecedented product or process.
- *Innovation*: after years of experimentation, an idea can overcome the first phase and become concretely usable. For Shumpeter, innovations are considered to be those that involve the entire process, including innovative product ideas but also those linked to new organizational and management processes, such as opening up to new markets.
- *Diffusion*: innovations tend to be imitated by competitors.

Within the "Theory of economic development", Shumpeter defines five types of innovation:

- **Innovation of Product**: refers to the process of developing new products or improving existing ones, with the introduction of innovative features that meet the needs of users.
- **Innovation of Process**: improvement in the company's production methodologies or production efficiency, with the aim of reducing costs, increasing productivity and product quality.
- **Marketing innovation**: development of new methods of promotion, distribution and strategic positioning of products on the market.
- **Organizational innovation**: refers to change in structure, decision-making processes and corporate culture.
- **Market innovation**: identifying new development opportunities on new markets or introducing new products that develop a new request and need.

The concept of innovation developed by Shumpeter is the result of a series of studies which were collected in two different models: Shumpeter Mark I and Shumpeter Mark II, named as such by Nelson and Winter in the early 1980s.

With *Shumpeter Mark I* (1912) the economic context of the time is analyzed, characterized by the presence of small-medium enterprises and, therefore, easier access for companies to the market,

¹ Perano Mirko (2005); "L'evoluzione del concetto di innovazione"

bringing with them innovative ideas, new products and processes. It is in this phase that we talk about "creative destruction", a key concept in Schumpeterian economic theory. This states that the innovation process is dynamic and inevitably involves the destruction of previous economic patterns and structures, replacing obsolete business models. Innovation, in this way, leads to the creation of new entrepreneurial opportunities which fuels economic growth.

Shumpeter II (1942) refers to the next phase of Shumpeter's theory, highlighting the capacity and knowledge of large companies. These, in fact, are very well prepared from a technological point of view and have advanced skills, therefore they hinder the entry of new companies.

Chapter 1.2: The figure of the entrepreneur

In the framework of the Schumpeterian model, the entrepreneur emerges as the main driver of economic growth, taking on a role far beyond the simple management of existing resources.

The theory highlights the fundamental importance of entrepreneurs as agents of dynamic change, capable of introducing radical innovations that transform the economic landscape. The entrepreneur is the figure whose innovative action destroys an established order and causes disequilibria, so development and equilibrium are opposites that exclude each other.

“Creative destruction,” a key concept in this perspective, emphasizes the process by which innovations not only create new opportunities but concomitantly break down obsolete economic structures. This ceaseless cycle of disruption and creation represents the beating heart of economic vitality. In the sphere of commercialization of inventions, the entrepreneur plays an essential role, acting as a catalyst for the transformation of innovative ideas into commercial realities. The judicious management of risks and investments becomes a crucial element in this context, as the entrepreneur strives to translate the innovative vision into tangible commercial success. The business cycle itself is intrinsically linked to waves of entrepreneurial innovation, with growth phases often related to eras in which entrepreneurs drive significant change. In this perspective, the entrepreneur's function extends beyond mere business management, moving towards the active creation of new economic models and the development of innovative sectors. In this context, entrepreneurs assume a crucial position in shaping the economic future, making a key contribution to long-term prosperity.

It is only since the 1960s that the factors that determine innovation within a company have begun to be studied, a topic that has contributed to the birth of two very important opposing positions: on the one hand there is a demand-pull vision and on the other technology-push.²

For supporters of the **demand-pull** trend, the intensity of innovation is determined by market forces, in particular the traction of demand. In this context, innovations are developed in response to specific consumer needs. The company's task consists in identifying the market opportunity and investing in research and development in order to satisfy customer demand. Furthermore, it assumes the existence of a market in which a large amount of reliable information such as prices and quantities demanded is available which suggests the direction in which the market is pushing innovative activity.

There are various risks to which this type of innovation can lead: focusing solely on easily identifiable needs and not on potential ones, which have probably remained latent; continuously define a new "opportunity" generating uncertainty about the definitive direction of the development of the innovative product; it is necessary to have passion and motivation in supporting the innovative idea that you want to propose to the market.³

With the demand-pull approach, a push from the market is hypothesized, i.e., a group of people who express their needs to the market with the aim of obtaining a functional product that can be used by everyone. A clear example was presented during the pandemic period with the introduction of masks to prevent the covid infection.

Those who support the **technology-push** approach, however, believe that the drive for innovation derives from the availability of new scientific technologies by society. In this case, companies invest in research and development to create new products or develop new knowledge regardless of market demands. A clear example is the smartwatch, which is a product "pushed" to the market whose needs was not asked by the majority of people.

The risks in this case are multiple: the danger of focusing on innovations based on easy-to-examine technologies, neglecting new revolutionary approaches; satisfy the requests of an atypical user and

² Christopher Freeman; "Innovazione tecnologiche e organizzative" da Enciclopedia Treccani

³ Indriany Ameka, Wawan Dhewanto (2013); "Technology Push vs. Market Pull in Technology University Innovation Commercialization"; cap. 2

therefore not subsequently applicable to the entire market; risk of remaining dependent on a single technology that is not easily adaptable in the future to respond to new challenges.

The linear model of innovation distinguishes between technology-push and demand-pull, presenting them as apparently opposite approaches. However, in practice, these two perspectives are interconnected. The Technology-push approach, based on the push of scientific and technological research, often converges with the demand-pull, which responds to market needs. For example, a technological innovation could arise from a scientific discovery (technology push) and subsequently adapt to meet market demands (demand pull). Furthermore, market feedback can drive further technological developments. So, rather than being opposites, technology push and demand pull integrate into a dynamic cycle of innovation.

Chapter 1.3: Contemporary Innovation Model and Role of Startups

The contemporary innovation model moves away from the linear vision and embraces a more open and collaborative approach. Startups and small businesses play a crucial role in this context.

Contrary to the traditional model, where large companies could monopolize innovation, startups are agile, flexible and capable of responding quickly to market needs. The current model sees greater interaction between different actors in the innovation ecosystem, including governments, academic institutions and businesses, with startups often acting as catalysts for new ideas.

Startups are often at the center of collaborative networks, working in partnership with other companies, accelerators, investors and research centers.

Their ability to adopt more flexible approaches and experiment with new solutions allows them to bring innovation to market quickly. Furthermore, startups are often pioneers in emerging and disruptive sectors, thus significantly contributing to the transformation of the economic landscape.

Chapter 1.4: Knowledge Management

To date, the concept of innovation has been interpreted as a tool through which it is possible to address and resolve existing problems through the implementation of innovative solutions that derive from the in-depth study of new knowledge.

The production of new knowledge, which adapts dynamically to meet the needs of new products or management structures, plays a fundamental role in the productivity of the company.

Firstly, knowledge is analyzed, incorporated and absorbed among the subjects involved in the innovation process and this allows the intrinsic value of the company to be increased.

One of the best-known benefits is *Knowledge Management*, which consists of the process of managing and processing knowledge in order to guarantee greater efficiency in decision-making processes, in solving problems and in the ability to seize new business opportunities. Therefore, it represents a driver of competitive advantage that allows companies to innovate and differentiate themselves from the competition, but it is necessary to formulate a suitable strategy to be able to build unique and distinctive skills and be able to constantly improve:⁴

- *Identification of the knowledge to be investigated*: the organization has as its objective the selection of the type of knowledge to be explored, which must have a high value and must be the main knowledge of the organization itself. Unrelated knowledge can be purchased from external vendors.
- *Re-evaluation of the company vision, values and strategies*: if these elements are not clearly defined, it is necessary to intervene so that the resulting knowledge is in line with the company strategy.
- *Current process identification*: It can be difficult to investigate the tasks that individuals perform within the organization. This can be achieved through a field survey with end users to identify a shared interpretation of the workflow model.
- *Comparison of the workflow with the identified strategy*: this activity allows you to identify the gap between what the company is doing with what it wants to achieve, to remove old processes or implement new ones in order to successfully achieve the strategy.

⁴ Gbosien Chris Sokoh, Ugo Chuks Okolie (2021); "Knowledge management and its importance in modern organizations"

- *Determination of commitment to transfer*: the creation of a new strategy involves an effort to assimilate it into the current organization, for example by supporting newbies in the case of high turnover.

The company's ability to formulate new knowledge integrates with its ability to maintain this competitive advantage and appropriate the resulting benefits without the competition being able to easily imitate it. From this need derives the concept of **appropriability** of knowledge, which can be formulated as follows: society will enjoy a high degree of appropriability when knowledge has a low probability of imitation and society has adopted effective protection mechanisms and vice versa.

Some protection mechanisms are the patent that protects an invention, which must be original, unique and must be applicable to the industrial sector; the trademark that identifies a distinctive element of the company and establishes its exclusive use; the copyright that protects the works subject to copyright of the company, which will be the only one to be able to benefit from economic advantages deriving in any form and way.

Over the years, the speed with which innovations are produced leads to a decrease in imitation, but inevitably requires a sharing of knowledge and experience by actors to facilitate the creation of value. In this case, the most innovative companies gain a competitive advantage over the others by proving themselves to be the "first movers", that is the first firm to push the product on the market, ensuring a strengthening of their brand.

Different appropriability regimes influence market entry for innovators and imitators. In environments with strong legal or technical appropriability, where innovators have robust protection through patents, copyrights, or trade secrets, they are better positioned to enter the market and capture the value generated by their innovations. This strong protection provides innovators with a period of exclusivity, allowing them to commercialize their innovations and potentially establish a competitive advantage.

On the other hand, in weak appropriability regimes, where technology is difficult to protect, innovator entrepreneurs face challenges in preventing imitators from capturing the economic benefits of their innovations. This can lead to imitators and other industry participants benefiting from the innovation, while the innovating firms struggle to obtain significant economic returns. As a result, the ease of

market entry for imitators is increased, potentially leading to a more competitive and challenging environment for the original innovators. These conditions under different appropriability regimes have significant implications for market dynamics, competition and the distribution of economic returns from innovation. They underscore the importance of legal and technical mechanisms of protection in shaping the opportunities and challenges for innovators and imitators in entering and competing in the market.

In conclusion, innovation is stimulated by a set of factors that can be internal or external to the company. Among the **endogenous variables** we can identify:

- *The characteristics of the economic entity* referred as the group of people who have control over the company. People are evaluated based on their ability to analyze the characteristics of the company and how it can satisfy market demands through the ability to negotiate the financing of innovative activities and the assessment of the related risks.
- *The organizational structure*, which groups together the bodies, tasks and relationships between them. Innovation can lead to changes in the structure through the formation of staff bodies which are entrusted with different tasks and responsibilities.
- *A business management plan* that responds to the evolution of the market conditions in which the company operates. Huge investments are required to adopt innovation programs, but this can limit the company's flexibility in the event of sudden changes, as it is more difficult to adapt highly specialized systems.
- *The combination of financing sources* is relevant to meet the financial needs required by innovative investments. The company can guarantee the coverage of investments through: third-party means, such as the mortgage deriving from the banking channel, with its own means, for example with a request for new contributions of risk capital, or with self-financing, i.e. the use of the monetary resources realized during management, such as profits.

Among the **exogenous variables**, therefore which involve the context external to the company, we can find:

- *The position in the market* that the company holds is fundamental as it stimulates constant recourse to innovation. The study and invention of innovative technologies requires heavy investments which must be compensated by the potential positive economic results deriving from commercialization. Within the market, the drive for innovation and consequently the effort to maintain its position, will depend on the company's ability to come into contact with competitors who will try to overtake the position of the company.
- *The intervention of the Public Administration* favors development in the field of research in order to satisfy the collective needs of society. Its involvement can be direct providing incentives to companies such as, for example, the provision of structures dedicated exclusively to carrying out R&D activities, or indirect to respond to technical or economic reasons such as the difficulty of companies in supplying of production factors.
- The importance of current *environmental and safety issues* requires an adaptation of the production process from a sustainable perspective, combining environmental protection and business development.

Chapter 1.5: Definition of startups and how they are related to innovation

As we defined in the previous paragraph, innovation consists of the process by which new ideas are developed and implemented that bring significant improvements in the use of pre-existing services. This is put into practice by companies whose drivers are constant change and improvement that generates innovation.

Entrepreneurship plays a pivotal role in economic development and two prominent paradigms within this realm are Small and Medium Enterprise Entrepreneurship (SME) and Innovation-Driven Enterprise Entrepreneurship (IDE). Although both contribute to the entrepreneurial landscape, they exhibit notable differences in objectives, approaches and impacts on industry dynamics.⁵

Chapter 1.6: SME entrepreneurship & IDE entrepreneurship

- **SME Entrepreneurship:** SME entrepreneurship primarily focuses on establishing and growing small to medium-sized enterprises. The primary goal is often sustained growth, job creation and meeting the demands of local markets.
- **IDE Entrepreneurship:** IDE entrepreneurship emphasizes innovation and the creation of groundbreaking products or services. The primary objective is to introduce new ideas, technologies or solutions that have the potential to disrupt markets and generate significant value.

These two present different approaches:

- **SME Entrepreneurship:** SME entrepreneurs typically adopt traditional business models, concentrating on operational efficiency, cost-effectiveness and meeting local market needs. The emphasis is on steady growth and stability.

⁵ Dr. Budden P., Prof. Murray F, Ukuku O. (2021); “*Differentiating Small Enterprises in the Innovation Economy: Start-ups, new SMEs & other Growth Ventures*” from MIT

- **IDE Entrepreneurship:** IDE entrepreneurs adopt more dynamic and risk-taking approaches. They often engage in research and development, explore emerging technologies and seek to create a unique value proposition. Embracing uncertainty and disruptive strategies is common.

Their impact on the industry dynamics differs:

- **SME Entrepreneurship:** SME entrepreneurship contributes to the stability and resilience of local economies. These enterprises often form the backbone of communities, providing employment opportunities and essential goods and services.
- **IDE Entrepreneurship:** IDE entrepreneurship has the potential to reshape entire industries. Innovations driven by IDE entrepreneurs can lead to paradigm shifts, transform markets and create entirely new industries, impacting the global economic landscape.

SME and IDE entrepreneurship represent distinct yet complementary approaches to economic development. SME entrepreneurship sustains local economies, while IDE entrepreneurship propels innovation and drives significant changes in industry dynamics. Both paradigms are essential components of a vibrant and evolving entrepreneurial ecosystem.

Considering the growth journey of these 2 enterprises, they differ:

Small and Medium Enterprise Entrepreneurship (SME)

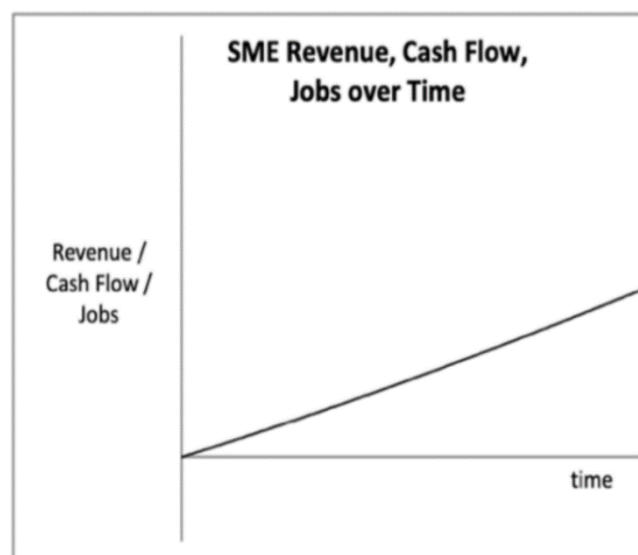


Figure 1 - SME Revenue-Time Graph

The company grows at a linear rate. When money is invested into the company, the system will respond quickly in a positive manner. In the beginning revenues are low and they will take time to increase.

Innovation Driven Enterprise Entrepreneurship (IDE)

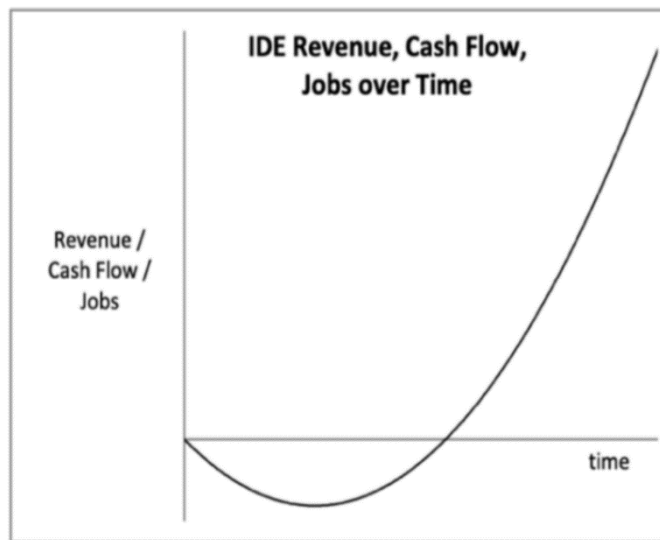


Figure 2 - IDE Revenue-Time Graph

The company starts by losing money, but will have exponential growth. When you put money into the company, the revenue don't respond quickly.

CHAPTER 2 – FINANCING METHODS FOR STARTUPS

Chapter 2.1: Description of Startups financing methods

Startups usually cannot count on large sums of money, so, in order to start their business, financing is needed to ramp it up to profitability.

There are several sources to consider when seeking funding to launch a startup. But first it is important to consider how much money is needed and when it will be needed.

The financial needs of a business will vary according to the type and size of the business.

For example:

- Processing businesses are usually capital intensive, requiring large amounts of capital.
- Retail businesses usually require less capital.
- Debt and equity are the two major sources of financing.
- Government grants to finance certain aspects of a business may be an option. Also, incentives may be available to locate in certain communities or encourage activities in particular industries.

All financing methods can be divided into three major macro groups: Equity financing, Debt Financing and Lease.

Chapter 2.1.1: Equity financing

Equity financing involves trading a portion of a company's ownership for a financial investment in the business. The ownership stake acquired through an equity investment grants the investor the right to share in the company's profits. Unlike other forms of financing, equity represents a lasting commitment to the company and the invested capital is not repaid by the company at a later date.

It is crucial to clearly define the investment terms within a formally established business entity. The ownership structure in a company can manifest through membership shares, as seen in limited liability companies, or through common and preferred shares in a corporate setting. Companies have the flexibility to create various classes of shares, influencing voting rights among shareholders. This

practice is also applicable to startups. For instance, common shareholders typically have voting privileges, while preferred stockholders generally do not. However, it is essential to note that in the event of default or bankruptcy, common shareholders find themselves at the bottom of the priority list for company assets, whereas preferred shareholders receive a predetermined dividend before common shareholders do.

Within Equity Financing there are the following financing methods:

Bootstrapping

Bootstrapping is the method of establishing a business without seeking external investments or relying on minimal external capital. This approach involves financing small enterprises through the acquisition and utilization of resources at the owner's expense, avoiding the need to share equity or secure substantial loans from financial institutions. The primary source of funding in bootstrapping is often the owner's personal savings or equity. Personal savings may encompass profit-sharing or early retirement funds, loans against real estate equity or the cash value from insurance policies. This method allows entrepreneurs to initiate and develop their ventures while maintaining financial independence and control.

Life insurance policies

A common component of numerous life insurance policies is the option for the policyholder to borrow against the accrued cash value. This borrowed sum can be utilized to fulfill various business requirements. Typically, it takes approximately two years for a policy to gather sufficient cash value to support loans. The policyholder is generally allowed to borrow a significant portion of the policy's cash value. However, it is essential to note that taking out a loan against the policy will diminish the face value of the insurance. In the unfortunate event of the policyholder's death, the outstanding loan amount must be settled before any payments are disbursed to the designated beneficiaries.

Home equity loans

A home equity loan is a financial arrangement secured by the equity value inherent in a house. In cases where a house is fully paid off, this type of loan allows to leverage the entire value of the property to generate funds. However, if there is an existing mortgage on the house, the loan can

provide funds based on the difference between the house's value and the outstanding mortgage amount. For example, if a house is valued at € 200.000 and there is an outstanding mortgage of € 150.000, it would be € 50.000 in equity available for use as collateral in securing an equity loan or line of credit.

Certain home equity loans are structured as revolving lines of credit, enabling you to withdraw funds as needed. It is worth noting that the interest accrued on a home equity loan is generally tax deductible, adding a potential financial benefit for borrowers. This flexibility and potential tax advantage make home equity loans an appealing option for those seeking additional financial resources while utilizing the equity in their homes.

Friends and Relatives

Entrepreneurs launching start-ups often explore private funding options which may involve seeking support from family members or friends. This form of financial backing can manifest as equity financing entailing that the friend or relative contributing the funds receives a share of ownership in the business. It is crucial, though, that these investments are approached with the same level of formality typically applied to dealings with external investors.

In other words, even when securing funds from personal connections, it is advisable to establish clear and formal terms of the investment. This includes delineating the percentage of ownership the friend or family member will hold, as well as any relevant rights and responsibilities. Maintaining such formality not only ensures transparency and professionalism but also helps mitigate potential conflicts and misunderstandings down the road.

Venture Capital

Venture capital encompasses financial support provided by investment firms or individuals to nascent private companies, offering capital infusion in exchange for ownership stakes. Venture capitalists, often associated with risk capital firms, look for key attributes in potential investments, including experienced management, competitive advantages and a proactive involvement approach. This involvement may extend to securing board representation and decision-making authority.

While venture capitalists offer valuable business guidance, their primary objective is to yield substantial returns on their investments. This focus on high returns can sometimes clash with the long-term objectives of founders, as venture capitalists may prioritize short-term gains. The

overarching goal of venture capital firms is to construct a high-growth, high-return investment portfolio. They typically target annual returns ranging from 25-30%, with a particular emphasis on ventures carrying significant risk.

Venture capital firms adopt a strategic approach, often guided by the 2-6-2 rule. This rule outlines the portfolio composition as two high-return successes, six moderate-return ventures and two failures. This diversified portfolio strategy aims to balance risk and reward, with venture capitalists aspiring to achieve returns of 50% or more on specific investments.

Angel Investors

Angel investors play a pivotal role in supporting the survival and expansion of small businesses. These individuals and businesses, driven by an interest in fostering growth, may have objectives that extend beyond mere economic returns. While angel investors often exhibit a mission-oriented approach, they maintain a keen interest in the profitability and security of their investments. Consequently, their demands and expectations may align with those commonly encountered in dealings with venture capitalists.

Angel investors may also express a vested interest in the economic development of a particular geographic area where they are situated. This localized focus distinguishes them from other investors, as they seek to contribute to the growth and prosperity of specific communities. Moreover, angel investors frequently concentrate on earlier stage financing, providing support during the nascent phases of a business's development.

In terms of funding amounts, angel investors typically engage in smaller financing commitments compared to venture capitalists. This characteristic allows them to satisfy the unique needs and scale of smaller enterprises, contributing to the diversity and dynamism of the entrepreneurial landscape.

Government Grants

Governments, both at the federal and state levels, frequently extend financial support to businesses through various mechanisms such as grants or tax credits. These forms of assistance aim to facilitate the initiation or expansion of businesses, fostering economic growth and job creation.

Grants are funds provided by the government, often with specific eligibility criteria and designated purposes. Businesses can apply for grants to obtain financial assistance for activities ranging from research and development to community development projects. These grants are typically awarded

through a competitive process and successful applicants must comply with established guidelines to ensure proper utilization of the funds.

Tax credits are another avenue of support, allowing businesses to reduce their tax liabilities. Governments may offer tax credits to incentivize certain activities such as investing in research and development, promoting environmental sustainability or creating employment opportunities. Businesses can claim these credits when filing their taxes, thereby reducing the overall amount of taxes owed.

By providing financial assistance through grants or tax credits, governments aim to stimulate economic activity, encourage innovation and enhance the overall business environment. These measures contribute to the growth and vitality of the business sector while aligning with broader economic development goals.

Initial Public Offerings

In this scenario, the company engages in a process known as an Initial Public Offering (IPO), where it sells shares directly to the public. Depending on the circumstances, stock offerings through an IPO have the potential to generate substantial funds for the company. The complexity of the offer can assume various forms, necessitating meticulous oversight by the company's legal representatives.

The IPO process involves the transformation of a privately held company into a publicly traded one, enabling it to issue shares that can be bought and sold on the stock market. This transition demands a comprehensive understanding of regulatory requirements, market conditions and legal frameworks. The company's legal representatives play a crucial role in structuring the offer, ensuring compliance with securities laws and safeguarding the interests of both the company and its new shareholders.

The supervision by legal representatives encompasses aspects such as drafting prospectuses which provide detailed information about the company, the offering and addressing any potential legal challenges. The careful navigation of this process is vital to the success of the stock offering and the subsequent listing on the stock exchange. Overall, an IPO is a significant financial event that demands strategic planning, regulatory adherence and legal proficiency to ensure a smooth transition to public ownership.

Warrants

Warrants serve as a specialized financial instrument particularly suited for long-term financing, proving advantageous for start-ups seeking to attract investments by minimizing downside risk while presenting potential upside benefits. They can be integrated into compensation packages for management within start-ups. A warrant, essentially a security, grants its holder the right to acquire shares of the issuing company at a predetermined price (known as the exercise price) on a future date, before a specified expiration date.

The value of a warrant is determined by the ratio between the market price of the shares and the warrant's purchase price. When the market price surpasses the warrant price, the holder has the option to exercise the warrant, allowing them to purchase the shares at the predetermined warrant price. This presents an opportunity to acquire shares at a price lower than the prevailing market rate.

Conversely, if the current market price of the shares is below the warrant price, the warrant holds no intrinsic value. Exercising it in such a scenario would mean acquiring shares at a higher cost than the existing market price, leading to the warrant's expiration. Warrants typically come with a specified expiration date, beyond which they become invalid if not exercised.

In essence, warrants function as a strategic tool for both start-ups and investors, offering flexibility and potential advantages based on market conditions.⁶

⁶ Hofstrand D., (2022), "Types and Sources of Financing for Start-up Businesses", IOWA University".

Chapter 2.1.2: Debt financing

Debt financing involves the process of borrowing funds from creditors with the commitment to repay the borrowed amount along with interest at a specified future date. For creditors, the compensation for extending debt financing comes in the form of interest earned on the loaned funds. Debt financing can take two primary forms: secured and unsecured.

Secured debt is backed by collateral, which is a valuable asset that the lender can seize in the event of the borrower's default, providing a level of security for the creditor. On the other hand, unsecured debt lacks collateral, placing the creditor in a relatively less secure position regarding repayment in the event of default.

Debt financing arrangements, commonly in the form of loans, can vary in terms of their repayment plans, classified as either short-term or long-term. Short-term debt is typically utilized to finance current assets such as operational expenses, while long-term debt is often employed for financing assets like buildings and equipment. The distinction between short and long-term debt reflects the intended use of the borrowed funds, aligning with the specific financial needs and goals of the business.

Friends and Relatives

Entrepreneurs launching startups often seek initial funding from private sources, including family and friends. This financial support may take the form of low-interest-rate debt capital. However, when borrowing from relatives or friends, it is crucial to approach the transaction with the same formality as with a commercial lender.

This formality entails the creation and execution of a formal loan document that delineates key details. This document should specify the amount borrowed, the agreed-upon interest rate, precise repayment terms based on the expected cash flow of the startup business and guarantees in the event of default. By establishing a clear and comprehensive loan agreement, both parties can ensure transparency, understanding and legal protection throughout the lending process.

Taking such formal steps is essential not only for maintaining professional relationships but also for safeguarding the financial interests of both the startup founder and the family or friends providing the funding. Clear documentation helps prevent potential misunderstandings and disputes, fostering a more secure and productive financial arrangement for all parties involved.

Banks and Other Commercial Lenders

Banks and other commercial lenders are commonly sought-after sources of business financing. However, obtaining funding from these institutions typically requires a well-defined business plan, a positive track record and substantial collateral. For many startups, meeting these criteria can be challenging.

In the initial stages, startups often lack a proven track record, making it difficult to present a solid business plan or offer significant collateral. As the business becomes established and can provide financial documents such as profit and loss statements, cash flow budgets and net worth statements the chances of securing additional funds from lenders may improve.

Established businesses with a reliable financial history can leverage these documents to demonstrate their ability to generate revenue, manage expenses and maintain a positive financial standing. This increased financial transparency can enhance the business's creditworthiness, making it more appealing to commercial lenders for further funding opportunities.

Therefore, while startups may encounter challenges securing financing from traditional lenders initially, as they develop a track record and financial stability, they may become more eligible for additional funding from banks and other commercial sources. It highlights the importance of establishing a solid financial foundation and gradually building a positive business history to access more extensive financial support in the long term.

Commercial Finance Companies

Commercial finance companies can be a viable option for businesses facing challenges in obtaining financing from traditional sources. When other commercial lenders may be hesitant due to factors like a lack of established track record or profit projections, commercial finance companies may prioritize the quality of collateral as a means of repayment.

These finance companies often place a greater emphasis on the value and security of the collateral provided by the business, making them potentially more lenient in their lending decisions. However, it is essential to note that if a business lacks personal assets or substantial collateral, seeking financing from a commercial finance company may not be the most suitable option.

Furthermore, it is important to be aware that the cost of borrowing from commercial finance companies is typically higher compared to other commercial lenders. The increased cost reflects the

higher level of risk these companies may be undertaking by relying more on collateral and less on the business' track record or future projections.

Ultimately, the choice of financing sources depends on the unique circumstances and financial profile of the business. While commercial finance companies can offer flexibility in certain situations, businesses should carefully weigh the costs and benefits before opting for this form of financing.

Government Programs

Governments at the federal, state and local levels often offer programs specifically designed to support the financing needs of new ventures and small businesses. These programs typically take the form of government guarantees where the government provides assurance to conventional lenders regarding the repayment of a loan extended to a business. This guarantee serves as a safety net for the lender, especially when the business may have limited assets available as collateral.

In essence, the government guarantee mitigates the risk for lenders, encouraging them to provide financial assistance to businesses that might otherwise face challenges in securing loans due to their size, limited assets, or higher perceived risk. This type of support helps stimulate entrepreneurship, foster economic growth and facilitate access to capital for small businesses that play a vital role in local and national economies.

These government-backed programs vary in scope and nature, but they commonly aim to address the financing hurdles faced by startups and small enterprises. By offering guarantees, governments aim to enhance the availability of credit to these businesses, promoting innovation, job creation and economic development. Entrepreneurs seeking financing should explore these government programs to determine if they qualify for additional support and favorable loan terms.

Bonds

Bonds represent a form of debt financing employed by businesses to raise capital. In this method, the company issues a debt instrument, distinct from other debt financing instruments, such as loans, as bonds allow the company to specify the interest rate and set a predetermined maturity date for repayment of the principal amount.

One notable characteristic of bonds is that the company is not obligated to make any principal payments (and interest payments) until the specified maturity date. The initial price paid for the

bond when it is issued is referred to as the par value. By issuing bonds, a company commits to repaying the principal (or face value) along with interest.

From a financial perspective, issuing bonds provides the company with a means of accessing financing without an immediate repayment obligation. This flexibility allows the company to utilize the funds effectively before having to start repaying the debt. While the investor assumes the risk of potential default or bankruptcy before the maturity date, bonds, being a form of debt, hold priority over equity holders in the event of business activities.

In summary, bonds serve as a valuable tool for businesses seeking long-term financing, offering flexibility in repayment while providing investors with a structured form of debt investment.

Chapter 2.1.3: Leasing

Leasing is a method that allows businesses to access and use assets without resorting to traditional debt or equity financing. It involves a legal agreement between two parties, typically the company and a leasing or financing organization, detailing the terms and conditions for the leased use of a tangible asset, such as equipment or a building. Lease agreements often stipulate annual rental payments.

In most cases, the lease arrangement is established between the company and the leasing organization rather than directly with the entity providing the goods. At the end of the lease term, the company typically has the option to return the asset to the owner, renew the lease, or purchase the asset outright.

Leasing presents an advantage for businesses as it does not tie up capital for the outright purchase of an asset. This is often contrasted with debt financing, where the repayment is spread over several years. While lease payments may be due at the beginning of the year, similar to a down payment for debt financing, they can offer businesses more time to generate funds for repayment compared to the end-of-year payment structure associated with debt.

In summary, leasing provides businesses with a flexible alternative to acquiring and utilizing assets, offering advantages such as reduced upfront costs and potentially more favorable payment timing when compared to debt financing.

Chapter 2.2: Startups Financing Cycle

The journey of a startup is often characterized by distinct phases, each different from the other, necessitating a specific approach to funding. In this chapter, it will be presented the phases a startup will face. The main ones can be divided in: Valley of Death, Scale Up, Growth and Public Market.

- **Valley of Death**

The "Valley of Death" represents a crucial juncture in the startup trajectory, occurring between the initial seed and early-stage financing rounds. At this stage, startups often confront a precarious funding gap, having spent their initial seed capital. However, they have not reached the stage where they can attract substantial venture capital funds. The Valley of Death is characterized by the exigency of capital to propel product development, validate business models and acquire initial customers. This challenging phase necessitates prudent resource allocation and rigorous financial planning, distinguishing startups that navigate this valley successfully and emerge stronger, enhancing their appeal to venture capitalists.

- **Scale Up**

Scaling up constitutes the strategic process of business expansion aimed at augmenting revenue, enlarging the customer base and broadening market presence. This pivotal stage typically follows the attainment of a product-market fit and the initial traction that startups secure. Scaling activities encompass geographic market expansion, heightened production capacity, optimized distribution channels and the augmentation of the workforce. To support these growth initiatives and secure a more substantial market share, companies often necessitate additional funding during the scale-up phase. Effective scaling is critical for startups as it fortifies their position in the market, rendering them more attractive to investors.

- **Growth**

"Growth" encapsulates the ultimate objective of most businesses, especially startups.

It signifies not only an increase in revenue, but also an expansion in market share, profitability and overall business size. This growth can manifest in numerous forms, encompassing organic growth

(leveraging existing resources) and inorganic growth (involving the acquisition of other companies), or a combination of both. Startups must sustain and expedite their growth trajectories to remain competitive and continue to attract investment. Growth stages are characterized by the scaling of operations, process optimization and the expansion of the customer base.

In addition to these significant growth phases, startups navigate a series of financing cycles, each marked by unique challenges, opportunities and expectations.

These cycles can be categorized into various stages, each with its distinct characteristics and funding sources:

- **Seed Stage**

The seed stage represents the nascent phase of a startup's lifecycle, marked by the pursuit of initial capital to materialize a conceptual idea into a functioning business entity. Funding sources typically include founder contributions, familial and friendly investments, or angel investors. At this stage, startups focus on idea validation, market research and the development of prototype solutions.

- **Early-Stage Financing**

Early-stage financing occurs as startups seek additional capital to refine their products, build competent teams and secure their initial customer base. Angel investors, early-stage venture capital firms and crowdfunding platforms often serve as funding sources. Objectives in this phase entail product maturation and market positioning.

- **Series A**

Series A financing comes into play when a startup exhibits a proven business model, sustains a growing customer base and requires capital for scaling operations. Specialized venture capital firms that focus on early-stage investments typically lead Series A funding rounds. These funds are intended for business expansion, key personnel recruitment and enhanced marketing efforts.

- **Series B and Beyond**

Subsequent rounds of financing, such as Series B and beyond, are instrumental for startups to accelerate growth and capture a more substantial market share. These financing rounds are typically led by venture capital firms specializing in growth-stage enterprises. Capital utilization focuses on extensive scaling, market expansion and product or service diversification.

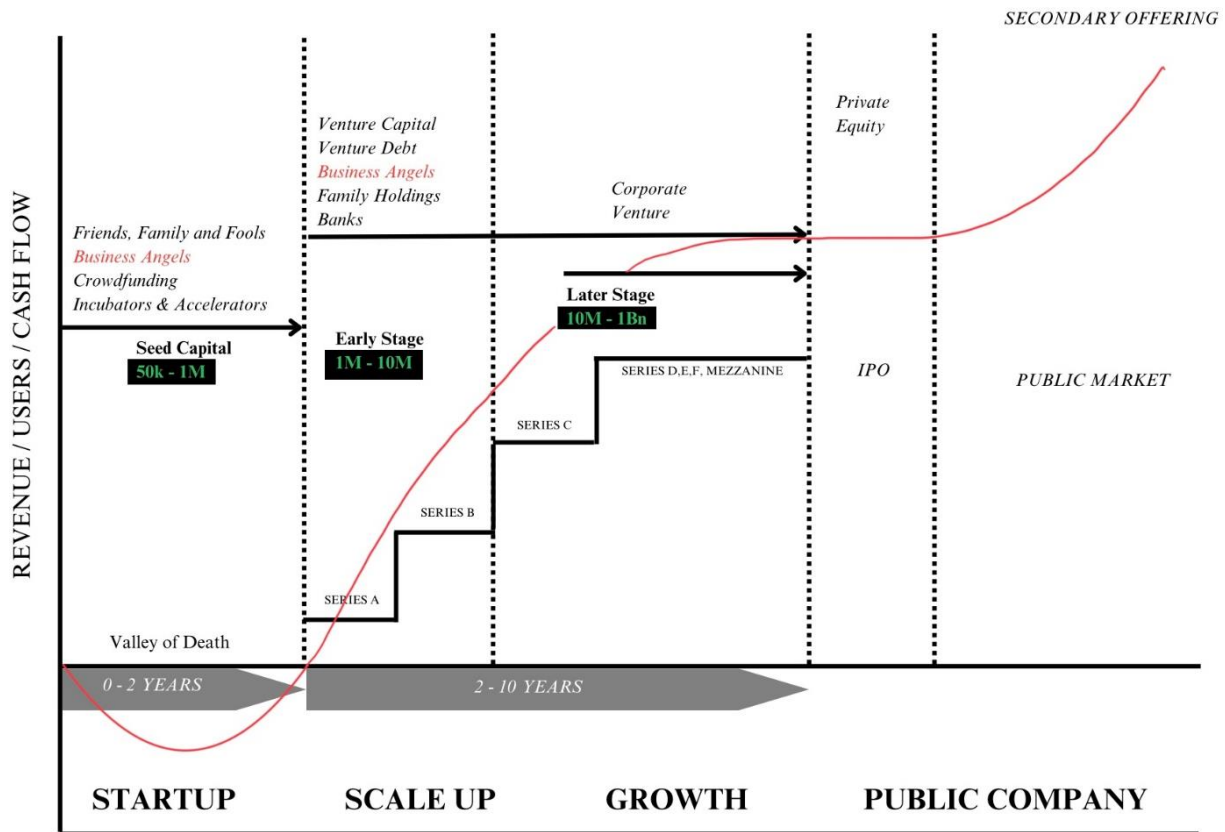


Figure 3 - Own made illustration Startups Financial cycles

- **Mezzanine Financing**

The mezzanine financing phase is intended for startups near to going public or being acquired. It includes convertible debt, preferred stock issuances or other financial instruments bridging the funding gap between venture capital and an exit event. Funds secured at this stage serve as the final impetus for growth initiatives in advance of a significant exit event.

- **Initial Public Offering (IPO) or Exit**

Some startups opt for the Initial Public Offering (IPO) route, enabling them to raise substantial capital from public markets. Alternatively, startups may choose acquisition by a larger corporation as their exit strategy. An IPO provides liquidity to early investors and founders while setting the stage for a future stronger market presence.

- **Highest achievement – become Unicorn**

The term “unicorn startups” refers to private companies in the technology sector that have achieved a market valuation of more than \$1 billion. This concept was coined in 2013 by Aileen Lee, founder of Cowboy Ventures, a venture capital fund. The attribute "unicorn" suggests the rarity and exceptionality of such feats, similar to the mythical animal representing strength and imagination.

The difficulty in achieving unicorn startup status is highlighted by the fact that only 0.000006% of companies have a chance of achieving this recognition, requiring an average of seven years for a nascent startup to reach such extraordinary valuation. The billion-dollar valuation of unicorns is determined by venture capitalists and investors who participate in the companies' financing rounds, based primarily on expected growth and development potential, rather than actual financial performance.

Strategies adopted to achieve unicorn startup status may include rapid expansion through large funding rounds, adopting a “get big fast” strategy, acquiring other companies, increasing available private capital and using technological advances and innovations to quickly reach critical mass.

In the Italian and European context, Europe is home to 70 unicorns, with a strong presence in the fintech sector. Some examples of European unicorns include Revolut, Sumup, Starling Bank, Checkout.com, Monzo, Klarna, Trusty, N26 and Bitpanda. In Italy, there are two unicorn startups: Yoox Net-a-porter Group SpA, founded in 2000 and Depop, a social shopping platform acquired by Etsy for \$1.6 billion in 2021. The presence of unicorn startups is limited, but their impact is significant in the context of the Italian and European entrepreneurial ecosystem.⁷

⁷ Adonopoulos, G. (2023, November 28). Startup unicorn: cosa significa e quali sono in Italia e in Europa. *Money.it*. <https://www.money.it/Startup-unicorn-significato-dove-si-trovano-Italia>

CHAPTER 3 - STARTUPS LANDSCAPE

As discussed before, startups are emerging businesses that develop around an innovative idea with the potential to grow and transform their target market. These are temporary organizations whose primary purpose is to solve problems for which no solution previously existed.

However, not all new businesses are destined to become successful multinationals. In contrast, most startups fail to even survive in the market, with a failure rate varying between 90% and 95%, depending on the geographic area.

Chapter 3.1: Failure rate of startups

As mentioned before, the failure rate of startups is around 90%. On top of this, 10% of novel startups don't survive the first year. 20% of new businesses fail within the first two years. 45% of new business startups don't survive the fifth year. 65% of new startups fail during the first ten years. 75% go out of business during the first 15 years (Startup Failure Rate Statistics, 2024).



Figure 4 - Startup Failure Rates illustration

On the other hand, the startup success rate are around 10% to 20% over the long term.

The main question is why startups fail?

Research has identified the three main reasons why young businesses fail:

- Lack of validation of the business idea
- Lack of funding
- Presence of an incomplete team

Business incubators and accelerators are solutions to address these challenges. These are private, public or public-private partnership entities that offer a range of services and resources to support the development of new business ideas.

Chapter 3.2: Incubators & Accelerators

To facilitate the development and support of growing businesses, two specific ecosystems have been identified, designed to promote a favorable environment for startups and provide them with financial support. In this circumstance, startups can rely on two types of initiatives:

Incubator

An incubator is an environment that aims to support and perfect the startup's business idea, making the resources it needs available. In particular, the time horizon considered is medium-long term, in fact the company can remain in this structure for many years.

Managed by academic institutions, such as universities, or government associations, incubators aim to provide startups with a physical place like offices in which to carry out their activities, financial support in terms of the provision of resources and the possibility of coming into contact with a network of other potential financiers and investment funds.

Accelerator

Unlike the incubator, the accelerators organize training and mentorship programs, support startups in the initial stages of business project conception, development and validation of the business plan, provide logistical and organizational support and facilitate fundraising.

The primary role of business accelerators is to stimulate premature startups through mentorship and training programs. They provide business training and direction to startup enterprises in their early stages, helping new firms succeed by providing them with funding, training and mentoring.

Business accelerators aim to accelerate the lifespan of successful companies by teaching them in a matter of months what would have taken them years of trial and error.

They offer entrepreneurial capital, which includes market research, concept creation and investor connections.

Business accelerators have emerged as an important tool in the entrepreneurial ecosystem, drawing corporations' and governments' attention and increasing startups' demand for acceleration programs.

During my academic journey I came across two different incubators which I personally consider useful for startups to receive the correct support in their initial stage:

- I3P: from Politecnico di Torino
- YES!Delft: from Technische Universiteit Delft

Chapter 3.2.1: I3P

I3P, the Incubator of the Polytechnic of Turin, is an essential catalyst for the birth and development of innovative startups characterized by high technological intensity and notable growth potential. Its mission is anchored in supporting the entrepreneurial ecosystem, generating economic development and employment in innovative industrial supply chains.



Figure 5 - i3P Incubatore Politecnico di Torino

Collaboration with Polytechnic of Turin

I3P plays a central role in the collaboration with the Polytechnic of Turin. The interaction with the University and related research institutions provides a fundamental pool of technical and scientific skills, facilitating the development of the incubated startups and guaranteeing access to highly qualified human resources.

Open Innovation

I3P positions itself as an active intermediary in Open Innovation, acting as a connector between startups, research centers and companies. Through a consolidated track record and an effective methodology, the Incubator offers consultancy services that favor the development and integration of new products or services, enhancing the innovation capacity of companies.

I3P method for Open Innovation

The incubator's Open Innovation team follows a consolidated method to support businesses through needs analysis, solution scouting and implementation of targeted initiatives. The customization of the proposals is a fundamental objective, adapting to the specificities and interests of the companies involved.

Phases of Open Innovation

- Analysis: Directing Open Innovation actions based on internal and external explorations.
- Scouting: Identifying and selecting target solutions to test Proof-of-Concept (PoC).
- Exploitation: Definition and execution of the PoC, followed by the possible adoption of the identified solutions.

Startup Support

I3P provides comprehensive support to entrepreneurial teams through incubation and pre-incubation programs. Through consultancy, training and networks, the aim is to maximize the growth of startups. The services also include consultancy on business models, industrial plans, intellectual property and tax and legislative management.

Fundraising

The Incubator actively supports capital raising, establishing relationships with Business Angels, Venture Capital and corporate funds. They assist entrepreneurs in defining the financing strategy and provide access to support measures managed by local authorities.

Networking and Internationalization

I3P promotes synergies between startups and the community of innovators through a network of contacts with research centers, large companies, associations and bodies. Furthermore, it supports the growth process in foreign markets through a network of partner incubators in Europe, Israel and the United States.

For Investors

The Incubator helps investors in selecting startups of interest, facilitating the exchange of useful information and guaranteeing the necessary confidentiality.

Chapter 3.2.2: YES!Delft

The mission of the YES!Delft incubator is transforming startups and scale-ups with promising ideas into robust tech enterprises that evolve into successful companies. With a foundation laid in 2005, the organization brings years of experience and a solid track record to the table.

Yes!Delft also provides a three months acceleration program designed to consolidate the essential elements of a startup and improve its market positioning.

Additionally, it allows to interact with industry professionals and establish connections with other founders. Within this program, startups will have the opportunity to participate in thematic workshops and masterclasses aimed to provide skills and knowledge relevant to the entrepreneurial context.



Figure 6 - Yes!Delft Technische Universiteit Delft

Philosophy and Impact

The transformative impact of tech companies on society and the economy is firmly believed in at YES!Delft. Facilitating innovation, the organization contributes significantly to these realms. YES!Delft offers a suite of services tailored to convert promising ideas and teams into solid tech startups, propelling them toward success. The commitment to not taking equity underscores the dedication to prioritizing the needs of entrepreneurs.

Ecosystem

Situated at the TU Delft Campus, the heart of technological innovation in the South of Holland, YES!Delft is an integral part of a vast ecosystem. The incubator provide a network for collaboration

with various shareholders such as the University TU Delft, the Municipality of Delft, the Erasmus University, investors, mentors, other municipalities, and incubators. This network creates a dynamic ecosystem which support startups working in Robotics, AI, Quantum, MedTech, and Energy Transition.

Team and Expertise

The team comprises entrepreneurs, innovators and tech enthusiasts many of whom have founded companies themselves. Their collective knowledge is dedicated to connecting entrepreneurs with the right individuals and organizations, ensuring value for all the incubated startups.

Evolution and Growth

Since opening its doors in 2005, YES!Delft has expanded into a vibrant community spread across three locations: Delft, Rotterdam, and The Hague. This growth, combined with unique programs and services, makes it easier for startups and scale-ups to bring disruptive technological innovations to market quickly and effectively.

Differentiation and Focus

What sets YES!Delft apart is its commitment to supporting entrepreneurs dealing with complex products, whether hardware or digital, in difficult markets. The organization stands out as a non-profit organization, without its own capital. Quality takes precedence over quantity and ethics gives priority to the needs of the entrepreneur.

Startup Services

The comprehensive services are designed to support entrepreneurs at every stage of their journey, fostering a vibrant community where startups thrive. The process can be divided into:

- **Get Ready**
 - Co-Lab: Finding a co-founder

- Validation Lab: Validating a business idea
- **Take Off**
 - Accelerator Program: Accelerating traction in the market
 - Fast Track to Funding: Becoming investor-ready
- **Grow**
 - Strategic Funding Support: Finding investors, closing deals
 - HR Support: Job board, staff & recruitment

YES!Delft's purpose is to have a positive impact on the world through entrepreneurship, leveraging the broad ecosystem and services of startups. From start to finish, the organization actively engages with startups, empowering founders to contribute to a better world.

A culture of limitless ambition is fostered, where successes and failures are shared and goals are achieved collaboratively.

Startups can enter the incubator by participating in the Accelerator Program, becoming an integral part of the YES!Delft ecosystem. Alternatively, startups can access specific services tailored to their needs.

CHAPTER 4 – STARTUPS CROSS-COUNTRY EXPLORATION

The entrepreneurial context is characterized by constant evolution and dynamism, a fundamental element that pervades the contemporary entrepreneurial environment.

In this chapter, I will carry out a general analysis of the startup landscape both in Italy and in the Netherlands, two realities which, while maintaining their own peculiarities, share the common denominator of sharpness and competition in the new business sector.

Next, I will focus on some case studies of startups that have captured my attention and sparked fascination throughout my academic journey. These case studies will offer a unique opportunity to explore success stories, obstacles overcome and winning strategies adopted by innovative businesses. Through an in-depth analysis of these great startups, I will seek to extrapolate the lessons learned and identify best practices that can inspire and guide emerging entrepreneurs.

Chapter 4.1: Dutch Startup Landscape

The Netherlands has emerged as a prominent global startup ecosystem, yet the transition of startups into scaleups and unicorns remains relatively low.

Dutch entrepreneurship excels in establishing innovative businesses, but lacks in supporting their substantial growth, hindering the creation of significant economic and societal value.

Addressing this, ambitious entrepreneurs are called to play a more active role in startups, questioning whether the cultural inclination to “just act normal” limits the pursuit of extraordinary achievements. Additionally, the potential impact of homogeneous groups, characterized by similar age, education, and gender, on missed opportunities is explored. The report (How ambitious is the Dutch entrepreneur?, 2021) delves into whether entrepreneurial experience can surmount these cultural challenges, utilizing the extensive Global Entrepreneurship Monitor dataset for empirical evidence within the Netherlands over time and globally.

The analysis reveals that the scaleup ecosystem in the Netherlands falls short of its full potential. Starting a business and self-employment are highly esteemed, especially in this environment where there is not much fear of failing. However, unlike entrepreneurs in benchmark countries such as

Switzerland, Israel, the UK and the US, the Dutch population demonstrates a lower ambition to grow their businesses, contributing to the suboptimal success of the scaleup ecosystem.

To uncover untapped potential for shaping the businesses of the future, the report delves into various demographics.

Findings indicate a general decline in entrepreneurial activity with age, a positive correlation with educational level and a higher prevalence among males compared to females. Notably, the younger generation, particularly those aged 18-24, exhibits a distinctive pattern, participating actively in startups and displaying relatively high ambition, presenting a promising aspect towards broader challenges.

On the other hand, it is crucial to acknowledge the presence of startups within the Netherlands that defy the overarching trend, showcasing the capability to expand successfully.

Amidst the challenges highlighted by the Dutch entrepreneurship paradox, there are instances of startups that have effectively navigated the path to becoming scaleups and even unicorns.

These successful cases underscore the potential for growth within the startup ecosystem, demonstrating that, under the right conditions and strategies, some enterprises can indeed overcome the obstacles outlined in the report. Their achievements provide valuable insights and potential models for aspiring entrepreneurs and policymakers seeking to foster an environment conducive to scalable and impactful businesses.

While the broader cultural landscape may pose challenges, these success stories indicate that a subset of startups has found ways to thrive, possibly by leveraging specific factors such as innovative business models, strategic partnerships or a keen focus on scaling operations. Recognizing and studying these success cases can contribute to a more comprehensive understanding of the dynamics at play within the Dutch entrepreneurial landscape and inform efforts to cultivate a culture that not only fosters startup creation but also encourages and supports their sustained growth.

To delve deeper into this topic I have chosen two Dutch startups that have positively impressed me, whose success stories and business models deserve to be analyzed:

- DeNoise
- Respyre

Chapter 4.1.1: DeNoise

DeNoise was founded in 2018 in response to the growing noise problem in cities and areas surrounding busy highways or airports. The World Health Organization has ranked noise as the second most significant health risk, leading to the implementation of stricter noise regulations on highways, railways and airports.

Windows represent the weakest point of a building's facade and are largely responsible for the noise coming from outside. Currently, the main alternative is to use thicker or multi-layered glass, but this leads to higher costs and greater material consumption. On average, people spend 90% of their time indoors, it seems appropriate to adopt more effective solutions to regain control of the surroundings.

With offices in the Netherlands and France, DeNoise team is made up of passionate people working to make DeNoise the ideal solution for a more peaceful and comfortable future. The goal is to help improve the quality of life by reducing the impact of noise in the spaces where people live and work.



Figure 7 - Denoise Logo

Value Proposition

DeNoise introduces advanced noise reduction technology that effectively addresses low-frequency noise disturbances. The system incorporates actuators, sensors and a sophisticated algorithm to actively suppress the noise. The DeNoise kit focuses on the range of 100 to 1000Hz, this low-frequency noise causes the most annoyance, because these frequencies travel easily through glass surfaces. DeNoise product analyze this noise coming from outside and vibrate the glass with a reverse signal canceling the incoming frequencies.



Figure 8 - DeNoise product: Harmony glass

The result is that most of the harmful noises do not penetrate through the glass, creating an environment free of unpleasant sounds.

The product, called “Harmony glass” is installed inside the window frame and reflects the vibrations of approaching noise, resulting in an effective cancellation mechanism. This innovative approach distinguishes DeNoise’s solution from traditional noise reduction methods, offering discreet and cost-effective integration into existing infrastructure.

Furthermore, through the software supplied with the product, it is possible to select through the app which frequencies to let pass, so as to let in pleasant noises such as birds chirping, wind blowing or rain pouring.

Customer Segment

DeNoize product is intended for people living nearby airports, railways and any other noisy place. There is not a discrimination for age, the company studies conducted in the Netherlands concluded that from the young person studying to the elder person reading a book in their living room, noise is negatively affecting their quality of life.

Stress, the main enemy of people health, increases in proximity of noisy environments, this also can be translated into real diseases caused by the continuous noise to which one is subjected in a day. Even more so during the night hours when the brain, in the REM phase, is bombarded by noises, which contribute to creating stress that worsens the quality of sleep and therefore of life.

In the following image, to better explain the possible customers identified in the customer segment, I created a scheme identifying the Persona that clearly represents a potential customer for DeNoize Harmony glass:


	<p>Biography</p> <p>Robert is an excellent engineer who works for the Schiphol airport. He lives nearby the airport and usually works from home.</p>
<p>Robert Planes</p>	<p>Motivations</p> <p>He is really passionate about his job because he loves airplanes. However, this job require calm and concentration.</p>
<p>Age: 35 Location: Nearby Schiphol Airport (Amsterdam) Job: Management Engineer</p>	<p>Goals</p> <p>Working from home most of the time, Robert needs to have a quiet environment in order to concentrate. He always looks for the best technological solution to solve his problems.</p>

Figure 9 - Own made illustration Persona DeNoize

Competition

Notable competitors of DeNoize's product include acoustic glass, triple-layered windows, sound-absorbing panels and trickle glass, all designed to passively mitigate noise. However, it is important to note that DeNoize's active noise reduction technology is currently a unique offering on the market. There is currently no direct commercial competitor that offers active noise cancellation in a similar way. Although passive solutions address noise issues differently, the absence of a direct competitor in the market positions DeNoize as an innovative and pioneering player in the active noise reduction technology space. This suggests that DeNoize has a distinctive advantage in providing a solution that goes beyond the capabilities of existing passive alternatives.

Market opportunity

The market opportunity for DeNoize product is incredibly large, if it assumed to consider the total addressable market (TAM) of the whole world.

To begin with, it is studied that in Europe 100 million europeans are affected by harmful levels of noise pollution, according to a new assessment published by the European Environment Agency (EEA) today.

Considering a rough cost of 250€ for each Harmony glass there will be a total serviceable addressable market (SAM) of:

$$250\text{€}/\text{pc} * 100 \text{ M} * \text{pc} = \text{€ } 25 \text{ B}$$

Since DeNoize has competitors already present in the market, even though they do not offer an elegant solution as the one DeNoize propose, it is reasonable to consider a 1% of the market share of the SOM, also it is considered only 1% because of all the huge investment in advertisement and protection of the patents that will be needed in the first years and that not every possible customer will switch immediately to the new tech.

$$\text{€}25 \text{ B} * 1\% = \text{€}250 \text{ M}$$

Revenue Model

DeNoize has not launched its product on the market yet. For this reason, investments are the only source of income of the company. In the future, revenue streams will be generated by directly selling the product to the customers and by the maintenance of the system. The founder's main idea for the future is to also offer some customization for the setting of the app in order to always create a better environment full of pleasant sounds.

Financing revenues

In 2020, the company secured €200,000 investment from UNIIQ, a €22 M investment fund specializing in the proof-of-concept phase to support entrepreneurs in West Holland in accelerating the market entry of their distinctive innovations. This funding infusion will empower DeNoize to advance and validate its active noise cancellation technology tailored for residential and office spaces. With this new funding, DeNoize has achieved significant milestones in the commercialization of its innovative technology.

In 2022, Denoise secured more than €1 M in a financing round that saw participation from IQ Capital fund, existing investor InnovationQuarter and several angel investors. Notable investors, Hans Peter Fris and Edwin van Emmerik, express their belief that addressing noise pollution is crucial for creating healthier living and working environments.

Furthermore, investors noted that DeNoize's technology, capable of transforming any glass facade into a noise-cancelling system, enables the construction of lighter facades, reducing construction costs and expanding housing possibilities.

Supported by Schiphol's Living Environment Foundation and Royal Schiphol Group, DeNoize's smart windows offer potential solutions to reduce noise around Amsterdam Schiphol airport. Joost Wagemakers of Schiphol's Living Environment Foundation emphasizes their financial support and hopes to apply the technology to improve the living environment for local residents.

To sum up, here some illustration of the main KPIs of the startup:

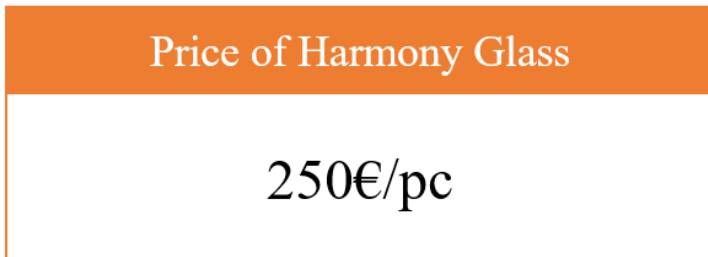


Figure 10 - Own made illustration Harmony Glass price

The estimated price for Harmony Glass should be around 250€, this price is already competitive compared to triple layered glass. A triple layered window start price is around 400€, also the price is bound to increase for bigger windows.

The market size is incredibly large, based on data from the European Environment Agency (EEA) there are around 100 M people that suffer from noise pollution only in Europe, this leading to a serviceable addressable market (SAM) of €25 B.

To obtain the servicable obtainable market (SOM) it is considered a small percentage of the SAM (1%), reasonable percentage considering all the difficulties the startup will have to overcome to penetrate the market.

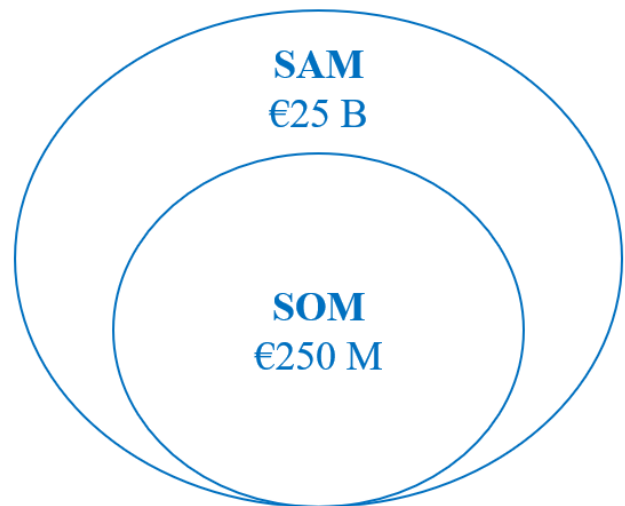


Figure 11 - Own made illustration Market DeNoise

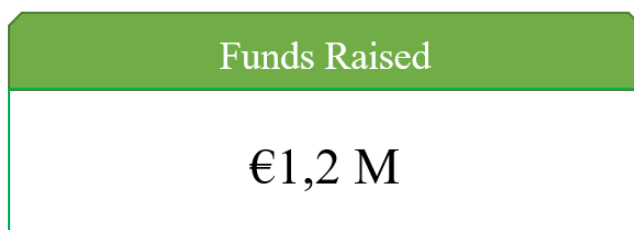


Figure 12 - Own made illustration Funds raised DeNoise

Today DeNoise raised around €1.2 M in funds. This was made possible thanks to angel investors and Venture Capitals. The money raised will be crucial to continue develop the product and finally go to market.

Opportunity Analysis Canvas

The Opportunity Analysis Canvas is a nine-step tool designed to guide the analysis of entrepreneurial opportunities. These nine steps are organized into three macro-sections, each of which focuses on a specific aspect of entrepreneurial thinking, entrepreneurial vision and entrepreneurial action. Here is a brief explanation of each section:

- **Thinking Entrepreneurially:**
 - **Entrepreneurial Mindset:** Involves the development of an entrepreneurial mindset, which includes the predisposition to identify and pursue opportunities, risk tolerance and the ability to learn from mistakes.
 - **Entrepreneurial Motivation:** Refers to the internal drive that motivates entrepreneurs to pursue opportunities, such as passion, vision and determination.
 - **Entrepreneurial Behavior:** Concerns entrepreneurial behavior, which includes the ability to make decisions, manage risks and adapt to rapid changes.

- **Seeing Entrepreneurially:**
 - **Industry Condition:** Involves the analysis of the general conditions of the industry in which is intended to operate, including trends, market dynamics and obstacles.
 - **Industry Status:** Concerns the assessment of the current state of the industry, including existing competitors and unexplored opportunities.
 - **Macroeconomic Change:** Includes consideration of changes at the macroeconomic level that could affect business activity.
 - **Competition:** Involves the study of current and potential competitors, analyzing their strategies, strengths and weaknesses, in order to identify possible competitive advantages.

- **Acting Entrepreneurially:**
 - **Value Innovation:** Involves the development of new solutions or approaches that offer unique value to customers, differentiating themselves from the competition.
 - **Opportunity Identification:** Concerns the ability to identify and exploit business opportunities based on the analysis of industry conditions and macroeconomic trends.

The Opportunity Analysis Canvas provides a comprehensive framework for exploring and evaluating a new business opportunity, covering all key aspects of the entrepreneurial process, from entrepreneurial mindset and motivation to understanding the market environment and strategic action.

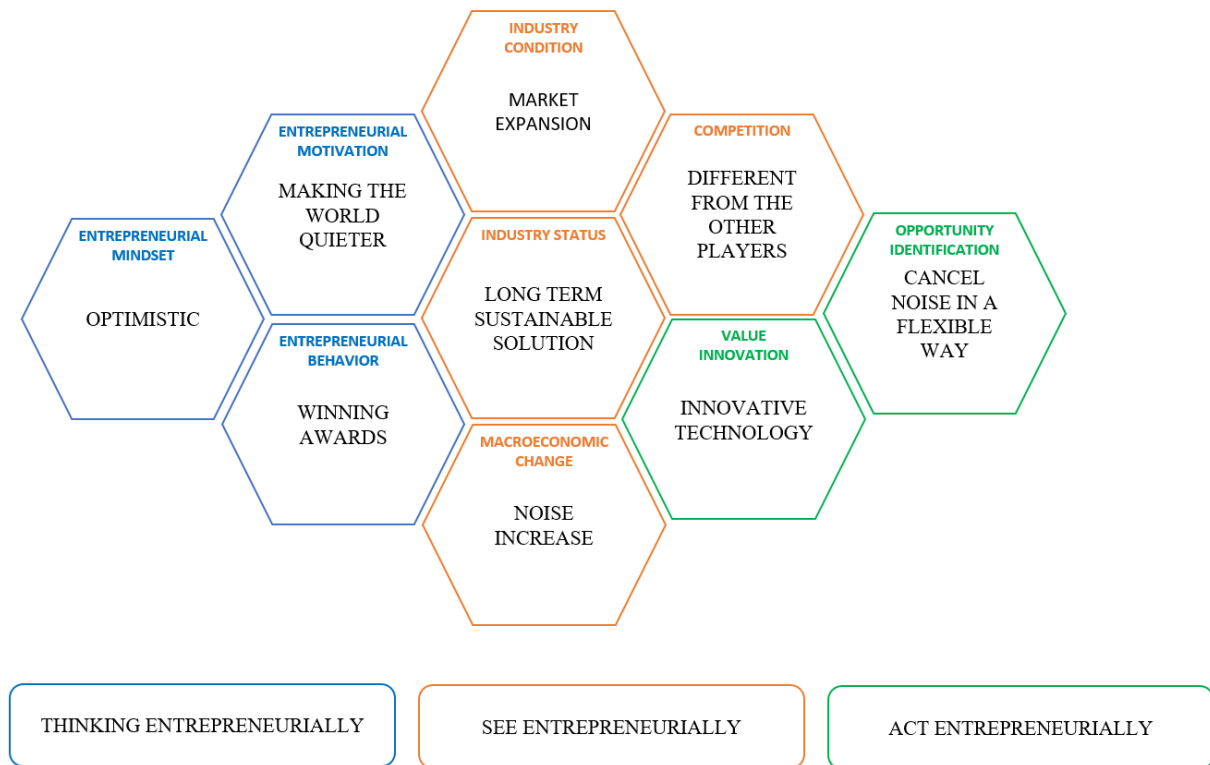


Figure 13 - Own made illustration DeNoise opportunity Analysis canvas

Thinking entrepreneurially

The founders' thoughts clearly reflect the motivation, attitude and behavior of DeNoise as I could state during the interview with the Co-founder Aman Jindal (Interview DeNoise, 2022). The founder is very excited about their innovation, their team and confident that their solution can be useful for making buildings quieter, freeing areas from noise. A quote from Aman Jindal (DeNoise, 2021) makes this entrepreneurial way of thinking more clear: “I want to create a quieter world. Noise is one of the biggest problems in urban life. It affects our mood and our health. With DeNoise we want to enable future-proof and sustainable living in urban areas”.

One of their core strengths is teamwork as Aman Jindal states: “I am most proud of our team members at DeNoise, who are intrinsically passionate about making a difference every day with their

knowledge and experience. I believe the team in this stage is our real asset, so I am proud that we are such a strong team” (DeNoize, 2021).

Even though they have not yet launched a product, they are active, as can be seen in all the awards they’re winning, for example the “Living & Working Blue Tulip Awards” (DeNoize, 2020) and their concept of the product is being recognized by the market since they are receiving funds from VC.

Seeing entrepreneurially

The founder, Aman Jindal, already saw an entrepreneurial opportunity growing up in India, in Financieel Dagblad’s interview (DeNoize, 2021), he explains how this upbringing has led him to aspire for a quieter world before the real company. Nowadays, DeNoize is trying to solve a big problem, as noise-pollution affects every area around the globe. Their alternative to solutions offered by competitors is innovative and ground-breaking, since it is the first system to use active noise cancellation. This makes them an outstanding start-up in the noise-canceling industry. There is still a lot of room to grow however and economies of scale will be crucial to expand their business and help more people to live a quieter life. Thinking outside the box, the market size for their product is already big and it is bound to increase being noise a common factor in the world and their product being a sustainable long term solution.

Acting entrepreneurially

Even though they already have the idea for a valuable product, they can make it even more valuable by investing in technology that is even more effective. Since more and more places are becoming noisier, the issue of noise pollution is becoming more and more significant. A versatile and simple to install product like the one provided by DeNoize is the key to success in the industry. The business strategy is a pull strategy as there is a demand for this type of products and they are meeting the needs of the market. Furthermore, opportunities exist to further innovate the product in terms of affordability and efficiency.

In conclusion, it would be important to adopt economies of scale, that is why it is important to go fast in the market. The concept of the product is already to be competitive in terms of price, but by lowering production costs the company could continue the exploratory phase while increasing its market share at the same time.

Chapter 4.1.2: Respyre

Respyre is a Dutch startup founded in 2020 as a TU Delft spin-off that focuses on maximizing the value of a unique scientific crossing between material science and biology (Thematische Technologie Transfer, 2022). Their aim is to make cities greener in a simple, cost-effective and elegant manner by developing construction materials that promote spontaneous moss growth.

The company's product is an innovative bioreceptive concrete solution: their concrete has several unique characteristics, including porosity, water retention, micropore texture, acidity and nutrients incorporated in the mix (Thematische Technologie Transfer, 2022). Together, these elements provide the ideal environment for moss to develop.



Figure 14 - Respyre logo

The concrete can be applied as a plaster or as prefabricated panels to existing or new building projects.

Respyre's product is aimed at builders and developers of cities who are looking to integrate nature into their projects and solve the problems associated with urbanization like heat stress, increased air pollution, floods and biodiversity loss (e.g. construction companies and municipalities) (Bleij, n.d.).

The Respyre team includes CEO Auke Bleij, a civil engineer and builder, who is responsible for the core team, strategy and stakeholder relations. Technical Advisors: Dr. Ir. Marc Ottelé and Dr. Henk Jonkers who are TU Delft Professors with expertise in bioreceptivity of building materials and mosses. Strategic advisor and Respyre founder Mark de Kruijff provides long-term vision to the team and has startup expertise from his time at Delft Enterprises.

Value proposition

The value proposition for the customer is that Respyre's bioreceptive concrete and moss facades offer a dedicated approach for sustainable development and allow cities to breathe by incorporating more vegetation into the urban environment (Philips, 2022). The product aims to provide a circular, cost-effective, low maintenance and easy-to-apply solution for vertical greening that can be applied to existing or new structures to extend their lifetime and protect them against weathering and deterioration.



Figure 15 - TU Delft building concept & Respyre concrete

The product, named Vertiscape, can improve the liveability and footprint of cities by removing pollutants from water and air, absorbing and retaining excess water, increasing biodiversity, reducing noise pollution, providing cooling and many more sustainable activities.

During its lifetime, VertiScape's facades absorb CO₂, turning it into calcium carbonate and storing it. The product is circular (90-95% recycled materials), supports water retention and fosters bioreceptivity.

The circular design is achieved with granulate rubble and reactivated cement. VertiScape promotes the growth of small organisms on its surface, contributing to a more biodiverse urban environment. The moss layer, anchored by rhizoids, forms with the help of a bio-enhancing gel and bioreceptive concrete. The concrete, applied to a constructive element, provides the optimal environment for moss growth.

Furthermore, the intentional introduction of moss may be pleasing aesthetically, making the urban environment more appealing and inviting for its citizens (Solar Impulse, n.d.).

Customer segment

Respyre's main customer segments include building and construction companies, city developers, architectural and design firms, municipalities and private individuals/households.

These segments are interested in incorporating environmentally friendly and sustainable solutions into their projects, which aligns with Respyre's mission and products.

In the following image, to better explain the possible customers identified in the customer segment, I created a scheme identifying the Persona that clearly represents a potential customer for Respyre:


 <p data-bbox="209 1301 552 1368">Robert Greeny</p> <p data-bbox="209 1451 624 1621">Age: 35 Location: Rotterdam Job: Director of Purchasing for Ecohousing GmbH</p>	<p data-bbox="756 943 1369 1189">Biography Robert is an excellent engineer who works for Ecohousing GmbH, a company that provides eco-sustainable solutions for buildings.</p> <p data-bbox="756 1223 1369 1429">Motivations He is really passionate about his job because believes in creating a world free from pollution.</p> <p data-bbox="756 1462 1369 1709">Goals To provide better services, Robert needs to introduce a supplier that can fulfill his goal to create eco-friendly buildings always in an innovative way.</p>
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Figure 16 - Own made illustration Persona Respyre

Competition

The market for sustainable construction materials is expanding rapidly due to the increased awareness of the environmental impact of construction and the need for eco-friendly solutions.

Competition in the industry has become more intense as new players bring innovative solutions and advanced technologies to the market. This has intensified competition and requires established companies to adapt and differentiate themselves to remain competitive.

Today the most relevant player in the market are:

- Holcim Ltd: Swiss public company
 - Core Business: Holcim is a global building materials and solutions company, primarily focused on cement and aggregates production. They provide construction materials, including cement, concrete and aggregates for various infrastructure and building projects. In the last years there is from the company an increasing concern for eco-friendly topics.
- Betolar: Finnish public company
 - Core Business: Betolar is known for its innovative, low-carbon concrete solutions. They focus on developing alternatives to traditional cement by utilizing industrial by-products and waste materials, aiming to reduce the carbon footprint associated with concrete production.
- HeidelbergCement AG: German based company
 - Core Business: HeidelbergCement is a multinational building materials company, primarily engaged in the production and distribution of cement, concrete, and aggregates. They operate globally and have a significant presence in the construction materials market with, in the last years, an eye towards eco-friendly solutions for construction business.

All the three previously nominated companies are competitors because they all operate in the broader construction materials industry and are offering or have the potential to offer eco-friendly concrete solutions. They share a common market and compete in the development and promotion of sustainable alternatives, including those aimed at reducing CO₂ emissions in construction.

Market opportunity

Respyre's target market consists of organizations and individuals in the Netherlands seeking sustainable construction materials. To determine the market size, it was calculated Respyre's total addressable market (TAM) by examining Europe's green building market, which is expected to grow from €54.1 billion in 2021 to €122.61 billion by 2028 with a compound annual growth rate (CAGR) of 12.4% (The Insight Partners, 2022).

Taking in consideration year 2024 this will result in a total of €74.22 billion.

However, since the area focused are the external of buildings (the façade), it was estimated that 20% of the previous estimate is the portion reserved exclusively for external construction, resulting in a final TAM of : $20\% * €74.22 \text{ billion} = \mathbf{€14.84 \text{ billion}}$.

Next, it was identified the Dutch green concrete market as Respyre's serviceable addressable market (SAM). It is assumed that, in the Netherlands, the green concrete market would have a similar percentage of the general concrete market as in Europe.

The total building materials market in Europe in 2021 was worth €110 billion , which makes the 2021 €54.1 billion of the European green building market, the **49.18%** of the total building materials (Pulidindi & Bhalerao, 2021).

The concrete market in the Netherlands was valued at €5.2 billion (IBISWorld, 2024) and using the previously calculated green building market percentage, the Dutch green concrete market was estimated to be worth:

SAM: $49.18\% * €5.2 \text{ billion} = \mathbf{€2.56 \text{ billion}}$.

Finally, it was considered that for the first years, since it is a wide and competitive market, the other players have an important impact on the market and that not every customers will immediately switch to this new technology, Respyre will get the 1% of this pre-calculated market.

This resulted in a SOM of $€2.56 \text{ billion} * 1\% = \mathbf{€25.57 \text{ million}}$

Revenue model

Respyre at the moment (early 2024) has 6 active projects. Revenues information were not disclosed, anyway Respyre is already announced their first commercially available product, VerstiScape. Their first application was to developed a sustainable and climate-adaptive wall coating. Their product can be attached to the outer layer of the walls, either in prefab or plaster form and will be over its lifetime, CO2-negative. Their revenue model is both direct sale to private households and B2B sales to municipality or construction firms. They also offer both the entire project service or prefab products.

Financing revenues

Respyre has won €50,000 from the Philips Innovation Award in 2022, one of the most prestigious award in the Netherlands, €5,000 from the 2022 AED Pitch Competition and €15,000 from Rabobank impact fund.

On the 24th February 2023, Respyre has secured a convertible note of €300k from the Noord-Holland Innovation Fund (INH) to further develop its groundbreaking moss concrete technology.

Thanks to the financing and the entrepreneurial mindset of the founder Auke Bleij, the company sped up their planning and in the same year they released the product, expand moss cultivation and enhance production facilities. Furthermore, the funds will be utilized to augment the team's technical expertise and intensify moss monitoring (Silicon canals, 2023).

The Noord-Holland Innovation Fund, supported by various institutions and the EU, provides convertible loans for companies in the 'Proof-of-Concept' phase. The circular nature of Respyre's solution, utilizing used concrete, aligns with reducing CO2 emissions in construction projects. Wouter Keij, Fund Manager of INH, recognizes Respyre's contribution to sustainability and circularity in the construction industry (Silicon canals, 2023).

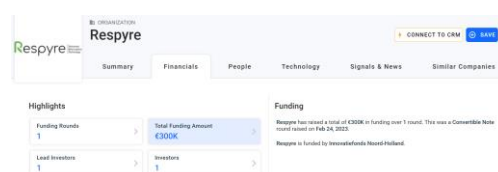


Figure 17 - Crunchbase financing Respyre

To sum up, here some illustration of the main KPIs of the startup:



Figure 18 - Own made illustration Projects Respyre

Respyre has at the moment 6 active projects. Finally the startup is exiting the proof of concept phase, thanks also to the €300k convertible note received. Many other projects are under evaluation and the expansion of their team are good indicators for the future.

Respyre's market potential goes hand in hand with the growing demand for sustainable building materials in the Netherlands. The Total Addressable Market (TAM) is calculated at €14.84 billion, taking in consideration only the building material used on the external surfaces (the façade). With a focus on the Dutch green concrete sector and zooming specifically on the façades, Respyre's Serviceable Addressable Market (SAM) is estimated at €2.56 billion. Considering the competitive landscape, Respyre initially aims to capture 1% of this SAM, resulting in a estimated Serviceable Obtainable Market (SOM) of €25.57 million.

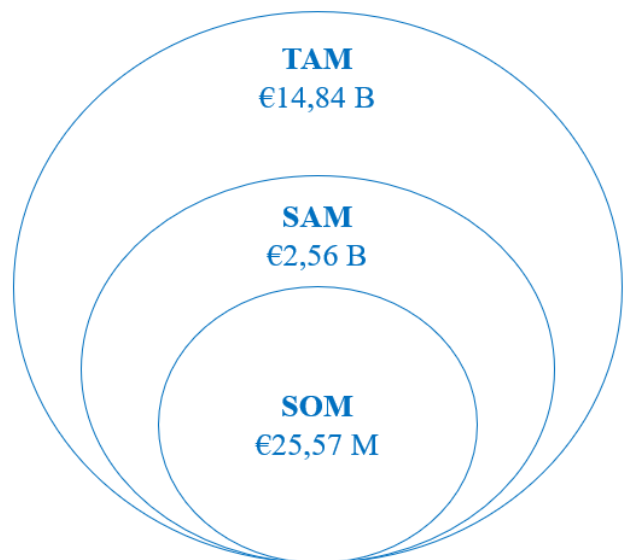


Figure 19 - Own made illustration Market Respyre



Figure 20 - Own made illustration Funds Respyre

Today Respyre raised around €300 K in funds. This was made possible thanks to capital venturing. The money raised will be crucial to continue develop the business and expand in the market.

Opportunity Analysis Canvas

Following the Opportunity Analysis Canvas for Respyre:

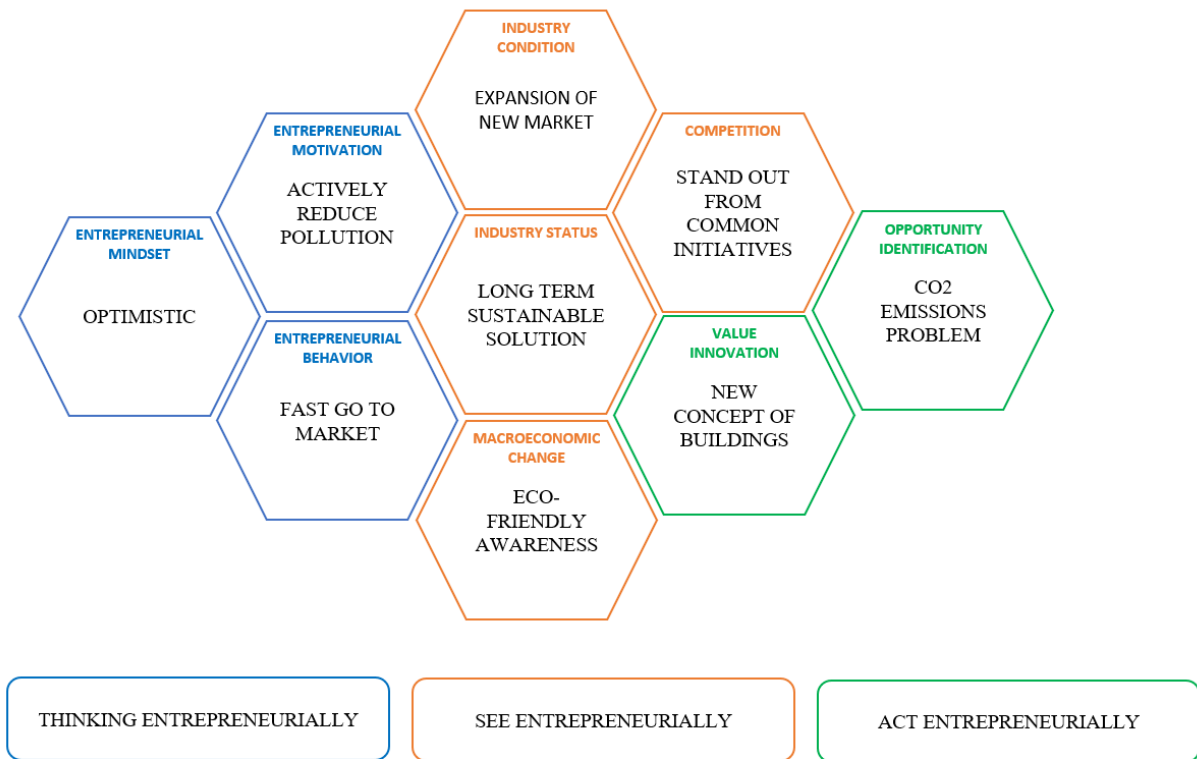


Figure 21 - Opportunity Analysis Canvas Respyre

Thinking entrepreneurially

The founders' thoughts reflect the optimistic vision and motivation that Respyre bring to the environmental forefront. As stated during an interview, the co-founder of Respyre Auke Bleij, highlighted the challenges posed by the growing human population and its environmental repercussions. Auke Bleij argues that the time has come for a turning point in the world that brings us back closer to nature. Expressing optimism, Auke Bleij proposed an innovative solution, introducing moss as the ultimate pioneer species to efficiently reduce greenhouse gases.

In Respyre, they aim to foster collaboration between civil engineering and nature, unveiling a groundbreaking approach with recycled bioreceptive concrete and a bio-enhancing coating.

Focusing on actively reducing pollution, Auke Bleij highlighted the adaptability of technology in redesigning existing structures and building new living spaces. Respyre's mission is to usher in an era of transformation, encouraging people to reconnect with nature and inhabit cities while actively contributing to the reduction of pollution. Their commitment is shown especially after receiving the €300k convertible loan which was immediately used to expand the place where they create their product and to go fast to the market with their first product, Vertiscape, finally exiting the proof of concept stage.

Seeing entrepreneurially

The founder, Auke Bleijb states that there was not a better time to create Reaspyre. Our world is changing, pollution and, in particular, CO₂ emissions represent one of the main concerns for the environment. Cement production is one of the largest sources of carbon emission of the world, so every company is moving towards eco-friendly solutions. Respyre does not stop there, their entire product is made of recycled products and carbon neutral components, making the whole process 90% circular.

Respyre does not stop to offer alternative solutions in the production of eco-friendly cement, but, by integrating moss, they create real bio-diversity structures that not only are carbon free, but contribute to the elimination of pollutants present in the air which make the whole product something sustainable in the long term.

Acting entrepreneurially

As stated before, CO₂ emissions are one of the main concern of all the nations in the world. Everyone is called to give a strong response against the greenhouse effect, governments and companies have a crucial role in supporting the green initiatives.

The use of eco-friendly materials is only the tip of the iceberg, to get out of the status quo, it is necessary to implement substantial changes: buildings will have a central role to the purification of the air, being themselves an active element to reduce pollution.

Chapter 4.2: Italian Startup Landscape

The startup ecosystem in Italy, despite facing a series of challenges, has demonstrated remarkable resilience and adaptability nevertheless the recent economic and health dynamics. In the period from 2013 to the first quarter of 2023, the number of innovative startups in the country grew significantly, exceeding 12,000 units in 2021 and reaching a record 14,000 companies in the first quarter of 2023 (Startup innovative, 2023).

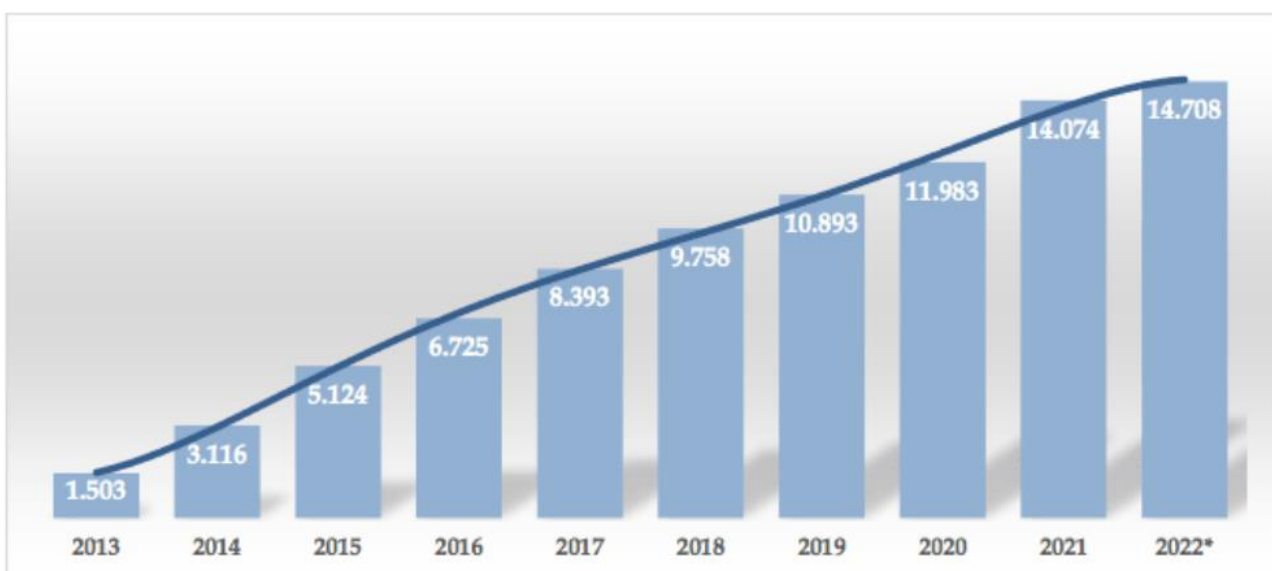


Figure 22 - Growth of innovative startups from 2013 to 2022

This growth was mainly driven by the business services sector, with a strong presence in software production, IT consultancy, research and development activities, and information services, which represent 76.7% of innovative startups.

The geographical distribution of the ecosystem reveals a predominant concentration in the central-northern part of the country, with regions such as Lombardia, Lazio, Veneto, Emilia-Romagna and Piemonte representing the 74.7% of the total. Milano maintains its leadership, hosting 18.4% of innovative startups, followed by Roma, Napoli, Torino and Bologna. These cities not only serve as centers of innovation, but are also catalysts for economic and social development.

From an organizational and economic performance point of view, innovative startups are mainly characterized as micro-enterprises, agile and flexible, with less than two employees in 79.2% of cases and a turnover of less than one million euros in 52.8% of cases.

Investments and financial support have played a crucial role in supporting the growth of innovative Italian startups. An ever-growing interest has been observed on the part of investors, both national and international, in the innovative ideas emerging in the Italian panorama. This flow of capital not only contributed to the birth of new businesses, but also supported the development and maturation of existing ones.

Emerging trends indicate a diversification of startups towards sectors such as medical technology, sustainable energy, artificial intelligence and mobility. This expansion not only broadens opportunities for entrepreneurs but also helps fill gaps in crucial sectors of society. Collaboration and strong networking emerge as key elements for success in the startup ecosystem. Many of these companies are developing strategic collaborations with other companies, academic institutions and research bodies, creating an environment where ideas can thrive and turn into concrete projects.

In parallel with the growth of startups, Italy is investing in educational programs, accelerators and incubators to promote entrepreneurial education. This commitment aims to cultivate the creative minds of the future, generating a new generation of entrepreneurs ready to face global challenges with boldness and innovation.

Sustainability and social responsibility represent distinctive values of Italian startups, many of which adopt business models that promote environmental and social equity. In conclusion, the Italian startup ecosystem is configured as a laboratory of innovation and resilience. While facing future challenges, Italy is shaping a bright future where innovation is at the heart of economic and social development.

However, despite the successes achieved up to this point, the Italian startup ecosystem faces significant challenges as it looks towards the future. The pursuit of sustainable growth will require a continued commitment to efficiently managing resources, adopting ethical business practices and creating innovative solutions to address global challenges, such as climate change and social inequality.

Digitalisation is recognized as a crucial driver for innovation, but ensuring this transformation is inclusive is equally essential. Promoting digital accessibility on a national scale and narrowing the divide between urban and rural areas will be key to ensuring the benefits of innovation reach all communities.

In the context of an ever-changing landscape, continuous training becomes essential to keep pace with global technological developments. Creating training programs for entrepreneurs and operators in the sector will ensure that Italy remains competitive on the international market.

Effective governance and appropriate regulation will be essential to support responsible innovation. Finding a balance between promoting creativity and protecting public interests will be crucial to ensuring that the Italian startup ecosystem grows in a healthy and sustainable way.

Internationalization represents a key path for the further growth of the ecosystem. Facilitating international collaboration and access to foreign markets will allow Italian startups to compete globally, spreading "made in Italy" excellence and innovation throughout the world.

In conclusion, the Italian startup ecosystem is at a crucial point in its evolution. By facing challenges with determination, the future looks bright thanks to the constant commitment to innovation, sustainability and social responsibility. With its rich history and entrepreneurial spirit, Italy is contributing to the global architecture of innovation, going well beyond national borders and shaping a future where innovation is at the heart of economic and social development.

The path towards sustainability of the Italian startup ecosystem implies a proactive vision to face emerging challenges and capitalize on the opportunities that arise. In particular, the management of resources, the adoption of ethical practices and the creation of innovative solutions will be central to ensuring balanced and sustainable growth.

Promoting digital accessibility on a national scale is essential to ensure that all segments of society, including urban and rural areas, can fully benefit from innovation. This commitment to digital inclusivity will be instrumental in avoiding disparities and ensuring that technological solutions reach all communities.

Continuous training, both for entrepreneurs and operators in the sector, represents a key investment to keep Italy competitive on the global market. Through refresher programmes, adaptation to new technologies and market dynamics will be easier, guaranteeing a qualified workforce ready to face the challenges of the future.

Effective governance and balanced regulation are key to supporting responsible innovation. Finding the right balance between facilitating creativity and protecting public interests will be crucial to ensuring a healthy and sustainable development of the Italian startup ecosystem.

Internationalization represents a key step for the growth of Italian startups. Facilitating international collaboration and access to foreign markets will allow them to compete on a global scale, spreading "made in Italy" excellence and innovation throughout the world.

In conclusion, the Italian startup ecosystem is shaping a future in which innovation is at the center of economic and social development. With an ongoing commitment to sustainability, inclusiveness and social responsibility, Italy confirms itself as a global protagonist in the architecture of innovation, helping to shape a landscape in which creativity and audacity thrive.

To delve deeper into this topic I have chosen two Italian startups that have positively impressed me, whose success stories and business models deserve to be analyzed:

- Ecoplasteam
- Vesevo

Chapter 4.2.1: Ecoplasteam

Ecoplasteam originated from the vision of Roberto Lecce, an entrepreneur seeking an economical and eco-friendly plastic material. Identifying poly laminate disposable packaging as a potential solution, he envisioned combining and recycling the aluminum and polyethylene components to create a new, fully ecological, and recyclable material known as EcoAllene.

Under an exclusive global license from Replan Global, the Swiss patent holder, Ecoplasteam produces and markets EcoAllene in Italy and abroad.

The first pilot plant, facilitated by Amut S.p.A., an international leader in plastic extrusion, produces approximately 6000 tons of EcoAllene annually.

Supported by a group of Turin-based entrepreneurs and with funding from Banca Popolare di Milano, Ecoplasteam became an innovative startup in 2017.

The company now operates a production plant in Alessandria and plans to construct five more plants across Europe to meet the demand for recycling over 300,000 tonnes of poly laminates.



Figure 23 - Ecoplasteam logo

Value proposition

Ecoplasteam's flagship product, EcoAllene, has garnered interest from numerous Italian companies for the production of various plastic objects. It proves to be a technically valid and cost-effective alternative to virgin plastic, satisfying European directives on recycled plastic and aligning with the principles of the circular economy.

The company's innovative approach involves generating a new material from waste without separating its components, contributing to a more sustainable and circular production process.

Ecoplasteam emphasizes a comprehensive approach to waste recycling, acknowledging the challenges and opportunities in a sustainable development model.

The innovative material developed by the company, known as ecoallene, is designed with the aim of reusing materials otherwise destined for landfill, with a particular focus on food packaging, particularly cartons used for drinks and liquid foods. These materials are characterized by intrinsic uniformity and constantly maintain their specific properties and unlike plastic, the price of EcoAllene is not affected by volatile fluctuations in oil prices.

The production process created by Ecoplasteam stands out for its innovation and is based on the revolutionary idea of recycling poly laminates. The latter consist of a metal layer and a plastic layer, commonly used in beverage packaging.

Ecoallene is a 100% recyclable product, as it is possible to adopt the same recycling process, restoring the entire life cycle of the product.

The product characteristics of Ecoplasteam are required for the production of a variety of products, for example, in the automotive industry, in the production of rims and door handle bezels.



Figure 24 - Ecoallene – Ecoplasteam product

Customer segment

Ecoplasteam's innovative product, Ecoallene, targets a customer segment that values sustainable production practices and is committed to contributing to a circular economy. Potential sectors in which Ecoallene may find application include:

- **Packaging industry collaborators:**

Ecoplasteam seeks collaborations with companies that favor ethical and environmentally friendly packaging solutions. The flexible and dyeable nature of ecoallene makes it an ideal material for liquid containers and packaging. This is in line with the sustainability standards required by the market, providing an eco-friendly alternative to traditional packaging materials.

- **Toy manufacturers:**

The company targets toy manufacturers who are looking for materials that not only meet high safety standards but also align with environmentally friendly practices. Ecoallene's suitability for use in the toy industry, combined with its eco-friendly properties, positions it as the preferred choice for companies committed to sustainability.

- **Recreational Sector:**

In addition to the toy sector, Ecoplasteam extends its offer to the recreational sector. The versatility of ecoallene makes it an attractive option for creating various recreational accessories, contributing to the development of eco-friendly recreational products. A striking example is their collaboration with the Carioca brand which used Ecoallene for the production of some of its products.



Figure 25 - Ecoplasteam - Carioca collaboration

- **Personal and home accessories manufacturers:**

Ecoplasteam aims to attract manufacturers in the personal and home accessories sector. Ecoallene can be used in the making of accessories for personal use or for domestic environments, offering a sustainable alternative without compromising quality or design.

- **Automotive industry - Rims production:**

Recognizing the demand for sustainable materials in the automotive sector, Ecoplasteam presents an opportunity to collaborate with manufacturers involved in wheel production. The durable and technically sound properties of ecoallene make it a viable material for making rims, contributing to the automotive industry's sustainability goals.

By targeting these different sectors, Ecoplasteam positions itself as a partner for companies seeking environmentally friendly materials while promoting a more sustainable and circular economy.

In the following image, to better explain the possible customers identified in the customer segment, I created a scheme identifying the Persona that clearly represents a potential customer for Ecoplasteam:


 <p data-bbox="320 1608 596 1664">Roberta Preziosa</p> <p data-bbox="320 1731 651 1865">Age: 35 Location: Rivoli Job: Director of Purchasing for Precious game S.p.A.</p>	<p data-bbox="762 1323 1251 1487">Biography Roberta is an excellent engineer who works for Precious game S.p.A., a company that creates toys for kids of all the world.</p> <p data-bbox="762 1547 1251 1711">Motivations She is really passionate about his job because loves giving joy to kids and is always looking for the most cost-effective solutions.</p> <p data-bbox="762 1742 1251 1928">Goals To provide better services, Roberta needs to introduce a supplier that can provide raw materials at a cost-effective price with an eye on eco-sustainable products.</p>
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Figure 26 - Own made illustration Persona Ecoplasteam

Competition

Competition within this sector experiences significant growth, with a major emphasis on the sustainable aspect of production. In this competitive context, Ecoplasteam emerges thanks to considerable success in developing a completely recyclable material, mitigating the environmental impact resulting from the abandonment of residues. Ecoplasteam's next strategic objectives include the application of this technology to the recycling of a wider variety of poly laminate materials, extending the operational scope beyond the exclusive treatment of tetrapack.

In the panorama of companies active in the sustainable development of waste, the presence of LaborPlast S.p.A. stands out, founded in 1958 in the province of Varese. This company stands out for its practice of reusing materials destined for landfill or incineration, with the aim of producing recycled PVC cores and compounds. This commitment is reflected in the CSI Recycled Plastic certification, certifying a percentage of 30% recycled plastic in their products.

A significant initiative of Ecoplasteam is the "Ecoplusfriend" project. This program involves collaboration with partner companies, called "Ambassadors", who integrate ecoallene into their products. A tangible example of this collaboration is represented by companies such as Carioca, which incorporates ecoallene in the production of its articles. Ambassadors act as strategic allies in the adoption of sustainable solutions, contributing to the success and diffusion of the innovation proposed by Ecoplasteam.

On the other hand, the Ecoplusfriend project also involves the category of "Friends", represented by customers who choose products made with ecoallene. These conscious consumers play a crucial role in supporting Ecoplasteam's vision, helping to drive demand and adoption of sustainable products. The collaboration between Ambassadors and Friends creates a virtuous cycle in which companies and consumers come together to encourage more sustainable practices and a positive impact on the environment.

Market opportunity

To determinate the total addressable market (TAM) it was considered that in 2021, the global recycled plastic market reached a valuation of \$46,752.4 million, with a projected compound annual growth rate (CAGR) of 7.4% expected throughout the forecast period (Global Recycled Plastics Market Size Report, 2022). This growth trajectory is expected to lead to a market value of approximately **\$58 billion**.

Recycled plastic includes the practice of reusing and recovering plastic waste to create practical and valuable products. The process involves the selection and cleaning of plastic waste, followed by the identification, extrusion and reprocessing phases. Industry applications have seen an increase in sectors such as packaging, textiles, automotive and construction.

To geographically narrowing this estimate, in order to define the servicable addressable market, it was considered that in Europe the recycled plastic market generate an annual turnover of **\$8.7 billion** (Continued investments lead to exceptional 17% growth in EU plastic recycling capacity).

Lastly, to estimate the servicable obtainable market (SOM), since Ecoplasteam has a groundbreaking technology, but there are several competitors in the market that are focusing on providing new recycled and cost-effective products, it is reasonable to consider a 1% of the market share of the SAM, also it is considered only 1% because of the time and money that will be needed to expand their presence on the market. This resultiving in a SOM of:

1% * \$8.7 billion = \$87 million.

Revenue model

Ecoplasteam revenue model is to sell directly the raw product to manufactures or to produce for them components such as rims, toys or any other product that can be made with Ecoallene.

Revenues increased during the years as presented in the following table:

	Year	Annual Revenue	Growth from previous year
EcoPlasteam	2022	1.317.233,00 €	230%
	2021	399.574,00 €	89%
	2020	211.037,00 €	-

Figure 27 - Own made illustration Ecoplasteam revenues

The startup is following the scale up path, as their goal is to open five more plant across Europe.

The revenue growth is considering noticeable and is expected to grow even more.

Financing revenues

Ecoplasteam successfully secured a financing loan totaling €4.2 million from Banca Popolare di Milano for the construction of their groundbreaking plant in Alessandria with the goal to create the new plastic material, Ecoallene, produced thanks to the recovery of Tetra Pak containers. The financing was facilitated with the assistance of the Swiss Merchant Corporation, led by Francesco Caputo Nasseti, underscoring strategic financial support for Ecoplasteam's visionary project.

The financing has been used to also buy all the machinery needed for the production, the company that supplied all the machines was Amut di Novara.

To sum up, here some illustration of the main KPIs of the startup:



Figure 28 - Own made illustration Revenues Ecoplasteam

Ecoplasteam has totalized revenues for more than €2 million since they started. Finally the startup is going towards the scale up phase, thanks also to the numerous partners who are taking an interest in their technology.

Ecoplasteam market potential follows the the global recycled plastic market, with the growing awareness for this kind of products from all the world. The Total Addressable Market (TAM) is calculated at €58 billion, taking in consideration the world recycled plastic market. Focusing on the european recycled plastic market, the Serviceable Addressable Market (SAM) is estimated at €8.7 billion. Considering the competitive landscape, Ecoplasteam initially aims to capture 1% of this SAM, resulting in a estimated Serviceable Obtainable Market (SOM) of €87 million.

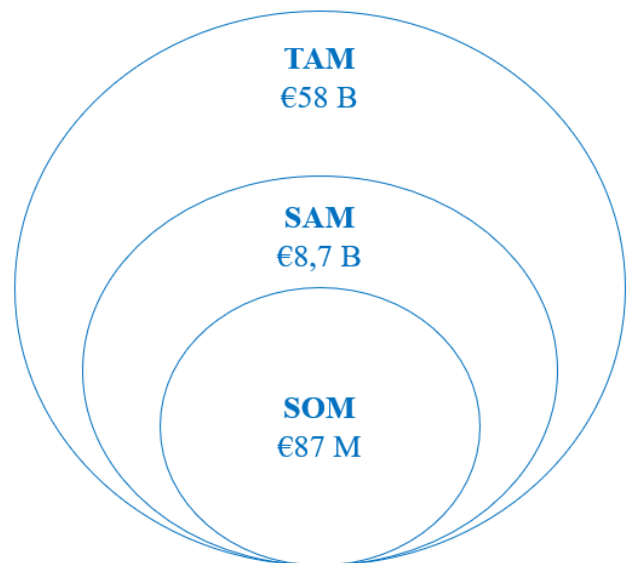


Figure 29 - Own made illustration Market Ecoplasteam



Figure 30 - Own made illustration Funds Ecoplasteam

Today Ecoplasteam raised around €4.2 M in funds. This was made possible thanks to financial loan given by Banca Popolare di Milano. The money raised was crucial to create the plant and to expand in the market.

Opportunity Analysis Canvas

Following the Opportunity Analysis Canvas for Ecoplasteam:

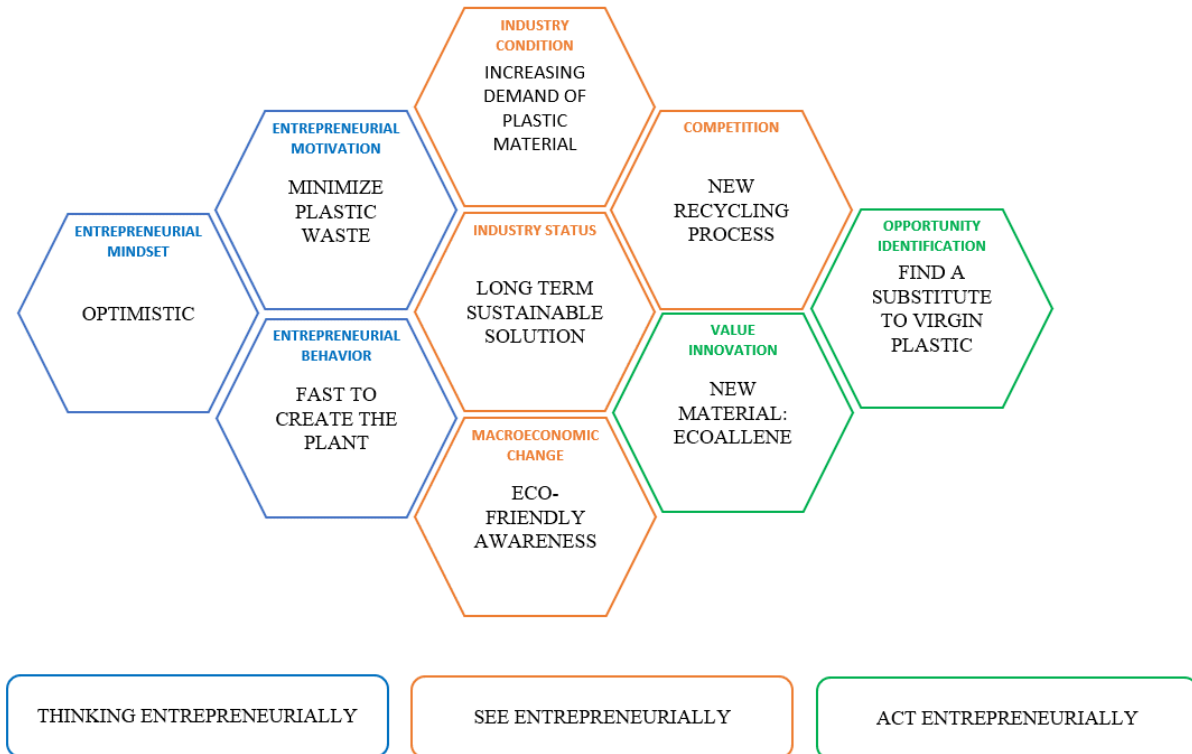


Figure 31 - Opportunity Analysis Canvas Ecoplasteam

Thinking entrepreneurially

The idea proposed by Ecoplasteam is an innovative and cutting-edge initiative, characterized by a long-term vision. This project has the ambitious objective of responding to one of the most relevant challenges that the industrial sector currently faces, namely the need to significantly reduce plastic waste. The plastic material, known for its resistance, accumulates more and more, reaching worrying levels. While it is difficult to precisely quantify the amount of plastic reaching the oceans, estimates indicate that between 5 and 13 million tonnes of plastic end up in the seas every year, contributing to 80% of overall marine pollution (Il problema dell'inquinamento da plastica, 2021).

In this context, it is crucial to promote the recycling of plastic, given its undeniable harmfulness to the environment and marine fauna, especially when it fragments into microplastics.

Ecoplasteam's vision is presented as optimistic and revolutionary, as it aims to address a problem of global relevance with concrete solutions. The project stands out for the implementation of a rapid and efficient process, which fits synergistically within an overall process of sustainable recycling of virgin plastic material.

The approach adopted, in line with the current and future needs of society, contributes to outlining a positive perspective for the industry, oriented towards sustainability and respect for the environment.

Seeing entrepreneurially

The ever-increasing demand for plastic material in industrial production has raised the critical need to develop long-term sustainable solutions, considering the significant environmental impacts associated with the traditional life cycle of plastic products.

In this context, Ecoplasteam has emerged as a pioneer in introducing eco-friendly practices in the production of plastic materials. Through a progressive vision and a commitment to sustainable innovation, Ecoplasteam has conceived a revolutionary recycling process, focused on eliminating waste resulting from the processing of Tetra Pak. Their advanced solution not only dramatically reduces plastic waste from complex packaging, but converts this material back into a fully recyclable product. Ecoplasteam's ability to proactively respond to the growing demand for plastic materials, combining production efficiency and environmental sustainability, translates into a significant contribution to the promotion of responsible industrial practices and the achievement of long-term ecological objectives.

Acting entrepreneurially

Ecoplasteam holds the patent for the innovative recycling process of Tetrapak, extracted from beverage cardboard, made up of layers of paper, plastic and aluminium. The process begins with the differentiation of the components: cellulose is extracted from the paper, leaving a residue of plastic and aluminium.

This residue, otherwise difficult for traditional incinerators and landfills to manage, is the subject of Ecoplasteam's innovative intervention. Through an advanced mechanical washing and volumetric

reduction process, the residue is transformed into plastic granules called Ecoallene. These grains constitute a high-quality raw material, intended for the production of final products by customers.

The benefits of this procedure are notable and varied. First of all, the consistency of quality and continuous supply of Ecoallene offer end users reliability comparable to that of virgin plastic. Furthermore, the colorable nature of Ecoallene makes it suitable for various applications, giving it a versatility that makes it a valid alternative to the traditional one. Efficient waste management through this recycling cycle not only contributes to the reduction of environmental impacts, but also highlights Ecoplasteam's crucial role in the recycling industry and in promoting sustainable practices in the plastics sector.

Chapter 4.2.2: Vesevo

Vesevo is a Campanian startup founded in 2019 by Professor Andrea Genovese, the current CEO. It originated as a spin-off from the University of Naples Federico II, stemming from research conducted by the professor and his collaborators. The specialized team in tire engineering was challenged by a prominent motorsport team to create a device capable of characterizing the behavior of viscoelastic materials in tires. The team's work led to the development of the first Vesevo prototype. The innovation drew attention in the motorsport sector due to Vesevo's ability to perform instant and non-destructive measurements on tires. The gathered information became crucial for race engineering teams to formulate or update their strategies based on the device's data. Over time, Vesevo gained interest from various motorsport categories, leading to initial product sales in 2020-2021, field of application were F1, F2, F3, MotoGP and Moto2.

The startup recently introduced a new version, Vesevo Gen 2, with an improved design and enhanced embedded electronics, making it essential for major motorsport teams. Despite its origins in motorsports, Vesevo's technology has broader applications, as its measurements can be used for analyzing any product made with viscoelastic materials. The great idea the startup is now conducting is to explore different markets, as for example the padel - tennis rackets and everything related to the sport market.



Figure 32 - Vesevo logo

Value proposition

Vesevo's product, known as "Vesevo" is a device capable of measuring the modulus and hysteresis of a viscoelastic material through an instantaneous and non-destructive measurement. The measurement results are processed using an algorithm and subsequently shown on the screen using specially created software.

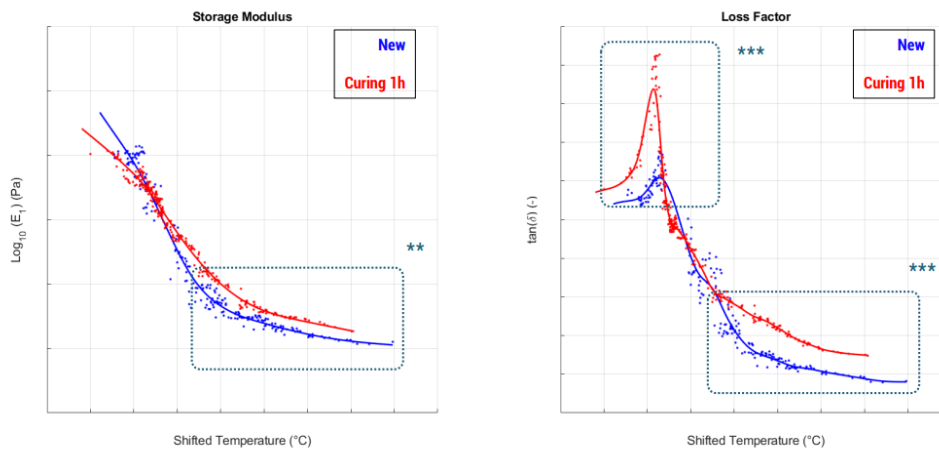


Figure 33 - Vesevo's result on a Tyre

Going into more detail, during the measurement, a titanium rod is bounced a precise number of times on the material to analyze; the height of the rebounds of the titanium tip is measured by the sensors present in the device's hardware and subsequently processed by the software which instantly shows the graphs on the PC screen.

The Vesevo has various characteristics capable of creating value based on the application sector; it was born in the motorsport sector, where it is used to carry out viscoelastic measurements on tyres. The unique selling points of the Vesevo is that it allows to obtain instantaneous, non-destructive measurements without the use of additional machinery.

In motorsport this is fundamental, especially during races and in general in tests, where having immediate and reliable control of the mechanical-physical conditions of the tire is fundamental.

However, the sector where, as will be seen later, Vesevo can generate the most profitable revenues is the sports sector: considering for example sports flooring, padel rackets, tennis rackets and everything that has an elastic deformation that can be measured in order to to obtain reliable data.

In this regard, below is the value proposition of Vesevo for sport flooring:

The sport flooring market and everything related has strict regulations about how the field and or the tennis ball should respond to the application of a force. Vesevo offers an easy and practical device for the sports flooring sector, distinguishing itself through three fundamental pillars:

- Easy and Practical Tool:
 - The small size of the Vesevo device guarantees unmatched practicality. Easy to handle and position, the tool adapts to different applications without taking up excessive space considering its comfortable size.
- Immediate Measurement Result
 - Thanks to the synergy of a highly technological device and advanced software, Vesevo offers an accurate and personalized measurement service for every type of flooring. Near-zero response times ensure immediate condition assessments, with real-time data recording and analysis. This cutting-edge approach ensures fast and precise results, immediately supporting customers' needs.
- Reduced Opportunity Cost (Savings on Staff)
 - Vesevo operations allows measurement and testing with a single operator, differentiating itself from competitors. The small size and ease of use allow companies to save considerable resources in terms of employees. Only one operator required for the operation optimizes efficiency, reducing operating costs and increasing quality control productivity.
- Reduced Opportunity Cost (Transport Savings)
 - Eliminates costs for transporting bulky equipment. Vesevo, thanks to its compact size, can be easily transported in a backpack or dedicated suitcase, together with the connecting laptop. Unlike competitors, the use of Vesevo does not involve additional costs for handling, allowing technical staff to move freely without space constraints. This translates into greater operational flexibility and significant logistics and transport savings.

Customer segment

As mentioned before, the primary customer for the Vesevo value proposition in the sports sector is likely to be businesses involved in sports infrastructure and equipment manufacturing.

One of the most significant trends in the sports flooring industry is the adoption of advanced deformable synthetic materials. These materials offer better impact cushioning and reduce shock the risk of injury. The use of intelligent technologies in this area is essential to monitor the quality of the surface, make changes and predictive maintenance. The Vesevo, in fact, has a crucial role in this context as the measurements detected (vertical deformation and shock absorption) are fundamental in the sports design, installation and maintenance process. Shock absorption and vertical deformation analysis are used to measure and evaluate the effectiveness of a sports floor. They are particularly relevant for high-impact sports, such as basketball or tennis, where athletes experience intense stress during movement and jumping. Adequate measurements reduce the risk of injuries, such as joint trauma and help prevent injuries.

For these reasons possible customers of Vesevo are:

- **Sports Flooring Manufacturers**
 - Companies engaged in the production of sports flooring for various sports such as tennis, basketball or other indoor/outdoor activities.

- **Racket Manufacturers**
 - Businesses manufacturing padel rackets, tennis rackets or any other sports equipment where elastic deformation is a critical factor would use Vesevo in their line of production.

- **Quality Control Departments**
 - Organizations with a strong emphasis on quality control in the sports industry, customers may be the departments that have to perform quality check on the status of sports field that will have to be used to attend important sports events.

- **Sports Facilities Management Companies**

- Entities responsible for maintaining and managing sports facilities, including ensuring that sports flooring meets regulatory standards.

- **Research and Development Teams**

- Companies investing in research and development to enhance the performance and quality of sports-related products.

In the following image, to better explain the possible customers identified in the customer segment, I created a scheme identifying the Persona that clearly represents a potential customer for Vesevo:


 <p data-bbox="272 1346 579 1402">Roberta Aurelia</p> <p data-bbox="272 1480 639 1630">Age: 35 Location: Genova Job: Director of Purchasing for Tapei S.p.A</p>	<p data-bbox="762 1025 1305 1207">Biography Roberta is an excellent engineer who works for <u>Tapei S.p.a</u>, a company that creates sports flooring, an Italian excellence</p> <p data-bbox="762 1252 1305 1433">Motivations <u>She is really passionate</u> about his job because loves <u>sports</u> in general and <u>wants to provide great sporting floors</u> to their customers.</p> <p data-bbox="762 1478 1305 1693">Goals Roberta need to <u>provide better equipment to perform tests before selling their final product</u> and <u>avoid purchasing expensive tests from external suppliers</u>.</p>
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Figure 34 - Own made illustration Persona Vesevo

Competition

Vesevo competitors are the products that are currently being used in the sports sector:

	 Vesevo	 Clegg Hammer & Clegg Turf test	 Atleta Artificiale	 Spara Palline
Versatility for different fields	✓	✗	✗	✗
Lightweight (Under 4 kg)	✓	✗	✗	✗
Instant results	✓	✗	✓	✗
Data accuracy	✓	✓	✓	✗

Figure 35 - Own made illustration Vesevo products competitors

Since the current competitors, who operate in the quality control of flooring, could potentially differentiate their business model consistently with the proposal of this project, an analysis of these players was first carried out. In the figure it is possible to identify 3 different types of competing devices:

- Clegg Hammer & Clegg Turf test
- Artificial Athlete (Berlin Athlete - Atleta Artificiale)
- Balls shooter (Spara palline)

All the devices mentioned offer similar performance to Vesevo, but Vesevo stands out for offering a more complete and customized data measurement service based on customer needs. This is made possible thanks to its sophisticated cutting-edge software. Furthermore, the main strengths of Vesevo are its small size and light weight, which allow for easy and economical transportation and its versatility in measuring the parameters of viscoelastic materials in different sports floorings. These factors combined make Vesevo the ideal device to meet the specific needs of customers in the sports flooring sector.

Market opportunity

The real market where Vesevo is expanding and showing its credibility is that of sports flooring. The market is already an important market in itself, where several players have shown great interest in the startup and the technology it offers.

The sports flooring market is constantly growing and covers various sports where it is necessary to carry out tests in order to certify the conformity of the sports flooring, this is necessary not only for the physical health of the athletes, but also in order to guarantee homogeneity and standard for each field.

In order to carry out the most accurate market analysis possible, it was decided to carry out a Bottom - Up approach.

The following sports disciplines were taken into consideration:

- Football
- Tennis
- Padel
- Basketball
- Atletica

These sports disciplines are practiced on outdoor sports fields, for which certifications are required in order to guarantee compliance with regulatory sports standards.

Given the Bottom-Up approach the first step was determining the data geographically present in Italy.

In Italy are present in 2023:

- 24139 football pitches approved by the FIGC
- 7128 approved padel courts
- 290 FIDAL approved athletics tracks
- 15,000 approved tennis courts
- 10,000 approved basketball courts

In Italy there are 7901 municipalities, however not all municipalities have tennis or basketball courts.

Despite this, some municipalities have more than two fields for both sports.

Tennis and basketball in Italy arouse a different interest, it is necessary to define a multiplier of the number of municipalities to define the actual number of tennis and basketball courts.

In Italy, the average interest in tennis is higher than the interest in basketball, therefore, a **1.9x** multiplier has been estimated for Tennis and a **1.3x** multiplier for Basketball. These 2 values lead to a total number of 15,000 tennis courts and 10,000 basketball courts.

Each field has a cost that concerns the approval and issuing of the relevant certification. Following several interviews with various professionals in the sector and above all with the engineer P. Elisa, an employee of Mapei, an estimate of the average cost of carrying out tests on sports fields was reached.

It has been observed that the average cost of the approval of a sports field amounts to €15,000. Of this amount, €6,000 is intended for tests carried out by specialized laboratories such as Labosport and Sportslab. Assuming that 15% of these tests are performed using Vesevo: this corresponds to an average cost of:

$$€6000 * 0.15 = €900$$

Reformulating the data:

Average cost of measurement equipment	900,00 €
# Total Fields	56557
Hypothetic Market % that Vesevo manages to achieve in the first years	20%

This allows us to estimate the SOM (Serviceable Obtainable Market):

$$\text{SOM} = 0.2 * 56557 \text{ fields} * 900 \text{ €/field} = 10,180,260.00 \text{ €} \approx 10 \text{ M€}$$

In order to determine the SAM (Serviceable Addressable Market), a calculation was carried out to determine the percentage of the Italian population compared to the total population of the European Union. Research has shown that the Italian population makes up 13% of the EU population.

In this case, to calculate the SAM, it is needed to calculate the entire market e not only the 20% previously identified to define the SOM:

$$\text{SAM} = \text{SOM}/(0.13*0.2) = 10 \text{ M€}/(0.13*0.2) \approx 350 \text{ M€}$$

To evaluate the TAM, the population of the States where important sporting events have been hosted and where controls on the conformity of sports fields are in place is considered. Below is the list of the States considered:

Cina	1,412 Billion
Russia	143,4 Million
America	1 Billion
Giappone	125,7 Million
Corea del Sud	51,74 Million
Unione Europea	447 Million
Arabia Saudita	36 Million

TOTALE: 3,22 Miliardi

$$\text{TAM} = \text{SAM} * \text{World population} / \text{UE population} \approx 2,7 \text{ B€}$$

According to research carried out, the construction of sports flooring will undergo a growth of 3.3% from 2023 to 2033, according to the assumptions this will also occur in parallel for the testing market.

$$\text{CAGR (Compound Annual Growth Rate)} = 3.3\%$$

Revenue model

Vesevo revenue model is to sell directly their product “Vesevo” to companies in the motorsport segment, to companies that produce sporting floors and to producer of tennis / padel rackets.

Revenues increased during the years as presented in the following table:

	Year	Annual Revenue	Growth from previous year
Vesevo	2022	426.189,00 €	149%
	2021	170.929,00 €	120%
	2020	77.800,00 €	-

Figure 36 - Own illustration Revenue Vesevo

The startup is now exploring these new customer segments, as their goal is widen their market since, even if the motorsport sector is profitable, it is not sustainable in the long run.

The revenue growth is considering noticable and is expected to grow even more thanks to new partnership such as Mapei S.p.a.

Financing Revenues

Vesevo adopted a prudent strategy that prioritized revenue generation through sales of its innovative device, avoiding the use of external financing. To date, the company has not requested any type of financing and has not sold any equity stake in the company. This decision allowed Vesevo to maintain full control over its business vision and financial results.

However, it is important to note that this choice does not exclude the possibility of exploring financing opportunities in the future. The Company's accelerated growth may require additional resources to fully exploit its market potential. In particular, approaching a venture capital firm could give Vesevo

access to the capital needed to rapidly expand its operations and reach new markets. This approach could allow the company to accelerate its pace of growth and capitalize on emerging opportunities in the industry.

Despite its financial autonomy, Vesevo has nevertheless established strategic partnerships with important startup incubators. The company's presence within the Polytechnic of Turin incubator: i3P and the Campania New Steel incubator highlights the recognition of its promising value proposition and its commitment to collaboration with innovative ecosystems. These partnerships offer Vesevo the opportunity to access additional resources and expertise, as well as benefit from an environment conducive to growth and sharing best practices.

To sum up, here some illustration of the main KPIs of the startup:



Figure 37 - Own made illustration Revenues Vesevo

Vesevo has totalized revenues for more than €600 thousand since they started. The revenues comes for the majority from the motorsport segment, now the startup is expected to increase their revenues by exploring the new markets.

Vesevo's market potential goes hand in hand with the growing demand for testing on sports floors and on the line fo production of elastic materials manufacturer. The Total Addressable Market (TAM) is calculated at €2.7 billion, taking in consideration the whole market worldwide. With a focus on the european market, Vesevo's Serviceable Addressable Market (SAM) is estimated at €350 million. Considering to start in a niche and obtaining the Italian market, the Serviceable Obtainable Market (SOM) is estimated at €10 million.

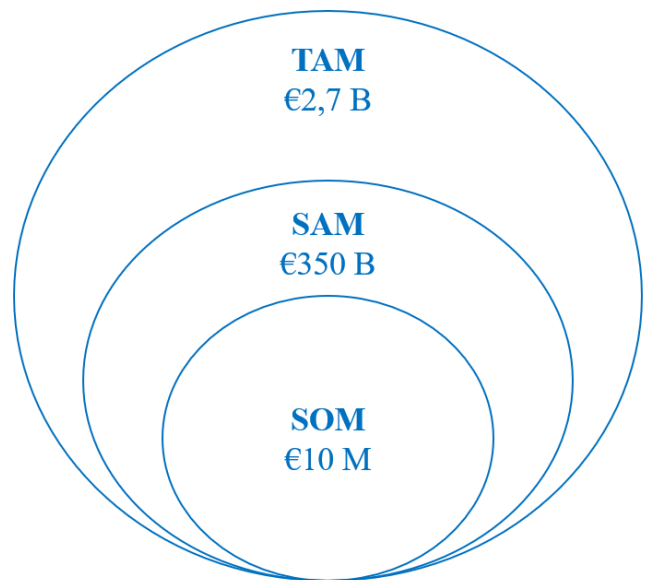


Figure 38 - Own made illustration Market Vesevo

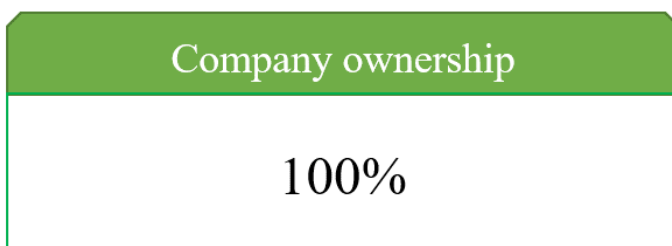


Figure 39 - Own made illustration company ownership Vesevo

The CEO of Vesevo currently owns 100% of the company, having achieved all their progress without external financial aid.

However, selling equity to a venture capital firm could accelerate their business development.

Opportunity Analysis Canvas

Following the Opportunity Analysis Canvas for Vesevo:

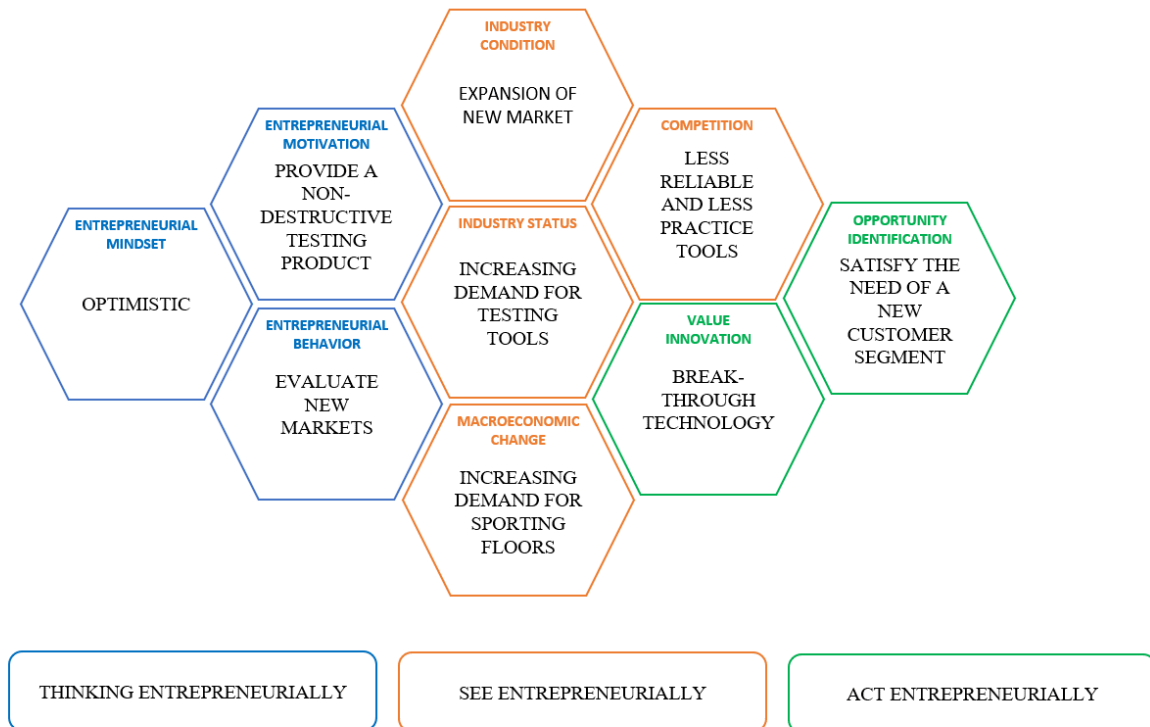


Figure 40 - Opportunity Analysis Canvas Vesevo

Vesevo stands out as an optimistic company through its entrepreneurial mindset, motivation and behavior. The company embodies optimism in several aspects of operations, from strategic decision making to the employee culture and customer relationships. They can be defined as optimists for their ability to identify new opportunities and have a particular approach that pushes them towards growth and success, Vesevo sees the upcoming challenges as an opportunity and not as a threat.

Aside from the positive outlook that Vesevo maintains, the company is moving towards progress, thanks to the learning they are doing from the external environment. They take into account all the experiences made to adapt and evolve in order to be able to face new situations coming from the outside world such as the possibility of penetrating a different market outside the initial motorsport

segment. The company is agile and adaptive, with a strong focus on the details of the market dynamics prioritizing the change towards customer satisfaction.

Furthermore, Vesevo has developed a product that has no similar competitors since it is a product for non-destructive testing, a disruptive idea in the current scenario considering that to date the tests carried out in the manufacturing lines are all destructive.

Seeing entrepreneurially

Vesevo is skilled at identifying opportunities in the market and capitalizing on them. The company keeps an eye on emerging trends, consumer preferences and industry developments, allowing it to seize opportunities for growth and expansion.

Vesevo has an exceptional drive in adapting their product to different sectors, in particular they are managing to penetrate the sports flooring market, where there is a growing demand for testing equipment to verify the adequacy of the field to the standards defined by the bodies certifiers. Thanks to Vesevo's ability to measure in a practical and comfortable way the viscoelastic properties of each material on which it is used without carrying out any destructive tests, it proves to be a precious instrument which therefore differentiates itself from the competition.

The company's vision is to recognize and seize opportunities, proactively address challenges.

Acting entrepreneurially

The Vesevo is an innovative product that is a breakthrough in every sector in which it finds application. Thanks to its practicality, its immediacy of results and its ability to obtain reliable results, it represents a product that can enter the market in a disruptive way. Vesevo also offers a simple alternative for sports flooring manufacturers or sports flooring owners who want to detach themselves from third-party bodies to carry out measurements aimed at issuing certifications, even if it will take some time to reach that level.

Chapter 5 - CONCLUSION

The comparative analysis of entrepreneurial approaches between Italian and Dutch entrepreneurs highlights distinct characteristics and strategic preferences that shape the trajectories of startups in these two ecosystems. The findings highlight the dynamics that influence entrepreneurs' aspirations and actions, shedding light on cultural, economic and strategic factors.

Chapter 5.1: Italian entrepreneurial approach

A relevant aspect deserving of particular attention is represented by the high mortality rate of Italian start-ups, as attested by an analysis conducted by StartupGenome. According to this study, within the first 18 months of foundation, as many as 92% of Italian start-ups find themselves in a state of entrepreneurial failure, with only 8% managing to survive. The causes of this high failure rate are multiple and include the inability of the start-up to identify and conquer the appropriate market, the rapid exhaustion of financial resources, the incorrect definition of pricing or costs, as well as the adoption of an inadequate business. However, to fully understand this phenomenon, it is essential to also consider objective factors, among which the prevailing dependence on family-based sources of financing in Italy stands out (Workinprogress, 2023).

For this reason, an important observation is that the Italian entrepreneur's inclination is to consider a conservative path. Through my interviews and the case studies presented, it becomes evident that a significant subgroup of Italian entrepreneurs adopt the strategy of creating startups with the goal to make them grow into larger companies. Another approach, often called an exit strategy, positions startups as attractive entities for acquisition, leveraging innovative solutions to capture the attention of established players. This trend is in line with a perspective that sees entrepreneurship as a means to generate value quickly, with exit as a profitable outcome.

However, if on the one hand the policies to support startups in Italy exist, on the other hand the slow and extensive bureaucracy present in the country discourages the entrepreneur from aiming to scale up his startup.

Chapter 5.2: Dutch entrepreneurial approach

In contrast, the Dutch entrepreneurial approach seems to be more in line with a brave approach to entrepreneurship. From what I have seen, reflecting a mindset reminiscent of the American dream, Dutch entrepreneurs, similar to their American counterparts, take risks and are not worried about the risk of failing, they aspire to transform startups into sustainable businesses that have the potential to grow into substantial, independent entities.

This ambition is highlighted in the strategic choices made by Dutch entrepreneurs, emphasizing long-term feasibility and scalability. There is an overriding focus on creating businesses that can evolve into significant players within their respective industries. This perspective is in line with the vision of entrepreneurship as a journey towards self-sufficiency and the realization of ambitious goals.

Chapter 5.3: Considerations

While the patterns observed highlight general trends, it is critical to recognize the diversity within each business community. Individual motivations, goals and strategies can vary widely, even within the broadest categorizations of Italian and Dutch entrepreneurs. Furthermore, external factors such as the regulatory environment, access to finance and market conditions contribute to the complexity of the entrepreneurial decision-making process.

In Italy and the Netherlands, the roles of the startup entrepreneur present substantial similarities and differences. In Italy the startup ecosystem is growing but still developing, with Milan and Rome as the main centres, but challenges include market size and limited resources. In contrast, in the Netherlands the ecosystem is mature and well-developed, with cities such as Amsterdam and Rotterdam considered significant hubs and a favorable environment for new businesses.

In the context of financing Italian entrepreneurs often struggle to obtain financing, with limited sources and a less developed risk culture, while their Dutch counterparts enjoy better access to financing, both through private investors and government programs.

Bureaucracy represents an obstacle for startups in Italy with complex procedures and long registration times, while in the Netherlands the simplified business structure and less burdensome bureaucracy make business easier.

Regarding the culture of risk and innovation, in Italy it is less rooted, with a cautious approach to innovation in some traditional industries, while in the Netherlands there is a more consolidated risk culture and an openness to innovation that encourages the growth of new businesses.

Finally, regarding government support, Italy has shown a growing interest in supporting startups through incentives and programs, but additional effort have to be implemented. On the contrary, the Dutch government already offers various incentives and supports, creating a more favorable environment for entrepreneurial growth.

Italian entrepreneurs, rooted in a tradition of firmness and prudence, show a propensity to cultivate and preserve their startups, opting for conservative strategies in the face of challenges.

In contrast, their Dutch counterparts perceive failure not as an obstacle, but as a stepping stone to embark on new business ventures, reflecting a culture that celebrates risk-taking and resilience.

The business landscape is not exclusively shaped by individual inclinations, but is also deeply intertwined with the regulatory environments in which these businesses operate. Italian entrepreneurs find themselves operating in a context that values conservation and stability, where adherence to traditional methodologies is often appreciated.

In contrast, Dutch entrepreneurs are encouraged to adopt a bolder and more experimental approach, driven by an ecosystem that promotes innovation and risk appetite.

Financial and government support structures further highlight the disparities between Italian and Dutch entrepreneurs, shaping their risk management strategies and investment decisions.

In the Netherlands, a strong support infrastructure provides entrepreneurs with a complex net, encouraging them to face challenges with confidence, even in the face of potential failure. In contrast, Italian entrepreneurs often find themselves navigating a landscape where access to resources is more limited, leading to a more cautious approach to risk-taking.

Beyond external influences, the personal and professional experiences of Italian and Dutch entrepreneurs play a significant role in shaping their entrepreneurial trajectories. Dutch entrepreneurs, often exposed to a risk-oriented culture from the early stages of their careers, are ready to embrace uncertainty and volatility as inherent aspects of the entrepreneurial journey.

In contrast, Italian entrepreneurs can draw on a legacy of stability and tradition, shaping their attitudes towards risk and innovation in distinct ways.

Despite their different approaches, both Italian and Dutch entrepreneurs contribute to global entrepreneurship, each bringing unique perspectives and insights to the table.

Italian startups, with their emphasis on stability and tradition, often excel in sectors where longevity and reliability are key, such as manufacturing and craftsmanship. On the other hand, Dutch startups, fueled by their appetite for risk and innovation, thrive in dynamic sectors such as technology and finance, where disruption and agility are prized.

However, while each approach has its merits, it is essential to recognize that entrepreneurship is a fluid and evolving phenomenon. Italian entrepreneurs can find opportunities to infuse their ventures with elements of experimentation and risk-taking, leveraging the stability of their foundations to explore new horizons. Likewise, Dutch entrepreneurs can draw inspiration from the principles of conservation and tradition, building their ventures on solid foundations while embracing change and adaptation.

The findings prompt consideration of the broader implications for policymakers, investors and aspiring entrepreneurs. Understanding these differences in entrepreneurial approaches can inform targeted support mechanisms, educational initiatives and investment strategies aligned with the aspirations of entrepreneurs in each context.

In conclusion, the Italian and Dutch entrepreneurial landscapes present unique narratives, which reflect different approaches to innovation and startup development.

These considerations are valid for what I was able to observe, obviously it is clear that, as in every area, there are exceptions.

By appreciating these distinctions, stakeholders can help cultivate vibrant and responsive entrepreneurial ecosystems that meet the aspirations of diverse entrepreneurs.

Considerations for the future: even though Italy is making giant strides, I believe it is essential to continue to instill an increasingly lively entrepreneurial mentality and culture in young minds.

It is important to increase access to capital for funding because this is what is really needed in all start-ups.

And the main advice for governments and institutions, of course, is to provide infrastructure, promote subsidies and try to accommodate entrepreneurs as much as possible in the embryonic stages of their businesses.

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