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Licenciatura em Ciências da Engenharia e Gestão Industrial

Understanding the Trends of European Startup Ecosystems

Dissertação para obtenção do Grau de Mestre em
Engenharia e Gestão Industrial

Orientador: Professor Aneesh Zutshi, Professor Auxiliar
Convidado, FCT-UNL

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*In memory of my beloved grandmother Nelita
and my uncle Casimiro*

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Abstract

The world faces numerous crises, being the economic and financial crisis, the more worrying crisis and which people become more aware, to find solutions to various problems, namely unemployment, especially youth unemployment. Throughout the evolution of the world, entrepreneurship phenomenon went hand in hand with economic and technological development, providing new businesses with innovative concepts, responding to people's needs.

Today, entrepreneurship continues to be important to the economies, as it adds new companies with value by presenting people with talent, with creative sense and innovative products and services. With technological development and financial assistance from investors or government, we have witnessed an exponential growth of startups over the past few years. Entrepreneurial education also encouraged this development, presenting conferences and workshops, calling students to innovation, creating your own startup.

In reply to the growth and development of European ecosystems, this research work was developed to analyze the reality of European ecosystems. The aim is to understand whether there are trends in choosing economic sectors, business models and pricing models. This investigation is composed by an extensive literature review to startups and startup ecosystem and by an empirical study to startups' perception concerning to this subject. To acquire empirical data it was conducted an online questionnaire directed to a sample of startups registered on online platform.

This study confirmed the existence of trends by information gathered from online platform and the online questionnaire. It is proposed a recommendation, which will help to continue the investigations concerning to this subject.

Keywords: Entrepreneurship, Economic Sectors, Business Models, Pricing Models, European Startup Ecosystems

Resumo

Atualmente, o mundo enfrenta inúmeras crises, sendo a crise económico-financeira, a mais preocupante e da qual, as pessoas se tornam mais atentas, no sentido de encontrar soluções para vários problemas, nomeadamente, o desemprego, destacando-se o desemprego jovem. Ao longo da evolução do mundo, o fenómeno empreendedorismo andou de mãos dadas com o desenvolvimento económico e tecnológico, proporcionando assim novas empresas com conceitos inovadores, dando resposta às necessidades da sociedade.

Hoje, o empreendedorismo continua ser importante para estimular o desenvolvimento da economia, visto que, novas empresas são criadas, apresentando pessoas com talento, com sentido criativo e produtos ou serviços inovadores. Com o desenvolvimento tecnológico, informação disponível e apoios financeiros por parte de investidores ou governamental, assistimos a um crescimento exponencial de *startups*, ao longo dos últimos anos. A educação empreendedora também incentivou este desenvolvimento, através de conferências e *workshops*, apelando os alunos à inovação, criando a sua própria *startup*.

Em resposta ao crescimento e desenvolvimento dos ecossistemas europeus, este trabalho de pesquisa foi desenvolvido para analisar a atualidade dos ecossistemas europeus. O principal objetivo é analisar as tendências relativas à escolha dos sectores económicos, modelos de negócios e modelos de pagamento. Esta investigação é composta por uma extensa revisão da literatura para conceito de *startups* e ecossistemas de empreendedorismo e por um estudo empírico com a compreender a perceção dos *startups* relativa a este assunto. Para adquirir dados empíricos foi realizado um questionário on-line dirigida a uma amostra de *startups* registados na plataforma online.

Este estudo confirmou a existência de tendências através informações recolhidas a partir de plataforma on-line e o questionário online. Propõe-se uma recomendação, o que ajudará a continuar as investigações relativas a este assunto.

Palavras-chave: Empreendedorismo, Sectores Económicos, Modelos de Negócio, Modelos de Pagamento, Ecossistemas de Empreendedorismo Europeus

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Acronyms

AMS	Amsterdam
ARN	Stockholm
ATH	Athens
B2B	Business To Business
B2C	Business To Consumer
C2C	Consumer To Consumer
EU	European Union
GDP	Gross Domestic Product
HEL	Helsinki
ICT	Information and Communications Technology
IPO	Initial Public Offering
IT	Information Technology
LX	Lisbon
KPI	Key Performance Indicator
MAD	Madrid
OECD	Organisation for Economic Co-operation and Development
PT	Portugal
RM	Rome
R&D	Research and Development
SaaS	Software as a Service
SME	Small and Medium Enterprises
S&T	Science and Technology
U.K.	United Kingdom
U.S.A	United States of America
VC	Venture Capital

Chapter 1

Introduction

This section aims to introduce the context of this dissertation, and to depict the *raison d'être* of this research work. It will also provide the reader with a description about this work's objectives and research questions. Finally, the organization of the dissertation will be presented, where a brief preview to each the following chapters is provided.

1.1. Context

More than ever, we hear words like, entrepreneurship, startups and ecosystems. Entrepreneurship has been recognized as the “engine” that drives an economy to create new businesses, new jobs and well-being (Drucker, 1985; Gorman et al., 1997). It facilitates the economy by stimulating the growth in innovation and competition. Innovation includes the creation of new businesses, new products/ services, or new operation processes of a firm (Thurik & Wennekers, 2004). According to Hebert and Link (1989), the relationship between entrepreneurship and economic growth reflects the innovative role of entrepreneurship in new entry and economic regeneration.

Entrepreneurship is “at the heart of national advantage” (Porter, 1990, 125). Concerning the role of entrepreneurship in stimulating economic growth, many links have been discussed. It is of the utmost importance in carrying out innovations and enhancing rivalry. This directs our attention to two related phenomena of the 1980s and 1990s: the resurgence of small businesses and the revival of entrepreneurship. Both Acs and Audretsch (1993) and Carlsson (1992) provide evidence concerning manufacturing industries in countries in varying stages of economic development. Carlsson advances two explanations for the shift toward smallness. The first deals with fundamental changes in the world economy from the 1970s onward. These changes relate to the intensification of global competition, the increase in the degree of uncertainty and the growth of market fragmentation. The second deals with changes in the character of technological progress. He shows that flexible automation has various effects, resulting in a shift from large to smaller firms. Also, Piore and Sable (1984) argue that the instability of markets in the 1970s

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resulted in the demise of mass production and promoted flexible specialization. This fundamental change in the path of technological development led to the occurrence of vast diseconomies of scale. This is supported by Acs et al. (1992) who argued that entrepreneurship is an important source of innovative activities and job opportunities and thus has an important impact on economic development. Thus, entrepreneurs play an important role in transforming inventions and ideas into economic activities (Baumol, 2002).

Since the late 1980s, we have witnessed many studies examining the consequences of entrepreneurship in terms of economic performance. This literature is generally restricted to two units of observation – that of the firm (or establishment) and that of the region. It is clear that an increased economic performance by firms and regions will positively affect aggregated economic growth at the country level. A sizeable body of literature analyzing the impact of entrepreneurship on economic performance at the level of the firm (or establishment) emerged. These studies typically measure economic performance in terms of firm growth and survival (Audretsch, 1995; Caves, 1998; Davidsson et al., 2006; Sutton, 1997). The compelling stylized fact emerging from this literature is that entrepreneurial activity, measured in terms of firm size and age, is positively related to growth.

New and (very) small firms grow, on average, systematically larger than large and established incumbents. These findings hold across Western economies and across time periods. The link between entrepreneurship and performance is also extended beyond the firm as unit of observation to focus on geographic regions. A small body of literature developed linking measures of entrepreneurial activity for regions to the economic performance of those regions (Acs & Armington, 2004; Audretsch & Fritsch, 2002). Studies considering the impact of entrepreneurship on performance where the country is the unit of observation are notably scarce, despite the efforts of the Global Entrepreneurship Monitor (GEM) research program (Reynolds et al., 2005).

More recently, it appears that technological change, globalization, deregulation, shifts in the labor supply, variety in demand, and resulting higher levels of uncertainty have shifted industry structure away from greater concentration and centralization and toward lesser concentration and decentralization (Thurik, 2009). A series of empirical studies find two systematic responses in the industry structure to the changes in the underlying determinants. The first is that the industry structure is generally shifting toward an increased role for small firms. The second is that the extent and timing of this shift varies across countries.

Apparently, institutions and policies in select countries facilitate a greater and more rapid response to technological change and globalization, along with the other underlying factors, by shifting to a less centralized and more dispersed industry structure than is present in other countries. The question of whether countries that have shifted toward a greater role for entrepreneurship enjoy stronger growth is of great importance to policymakers (Audretsch et al., 2007).

We now proceed to concentrate upon empirical contributions that detail the impact of entrepreneurship on subsequent economic performance at the regional level. The unit of observation for these studies is spatial: either a city, a region or a state. These studies try to link various measures of entrepreneurial activity, most typically startup rates, to subsequent performance.

Europe tends to be a less friendly environment for entrepreneurship in general, and for youth entrepreneurship in particular, than in other comparable economies. Therefore, promoting an entrepreneurial culture, mindset and attitudes among Europeans is of paramount importance in fostering entrepreneurship. Approaches fostering a more entrepreneurial culture among young people may include a wide range of activities.

- Providing entrepreneurship education not only fosters youth entrepreneurship but is also a means to acquire technical and soft skills, attitudes and knowledge necessary to set up and run a business; for example, creating a business plan, critical thinking, problem solving, self-awareness, and creativity. These attributes are also important in developing a future workforce more open to creative thinking and innovation. Whether or not entrepreneurial education is offered as a part of formal education, evidence shows that these skills are better acquired at an early age (ILO, 2014), and when they are embedded in the formal education system with the involvement of entrepreneurs, educational actors and young people themselves in the education delivery.
- Carrying out promotional campaigns: awareness-raising campaigns to foster the social legitimacy of entrepreneurship, as well as events which can introduce young people to entrepreneurship, youth business fairs, competitions and awards.
- Improving the image of entrepreneurship: Promoting entrepreneurs as role models can be helpful because successful entrepreneurs are the best ambassadors for

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entrepreneurship. Their personal experience and image of independence, success and achievement can motivate young people to consider exploring the option of entrepreneurship and self-employment.

As we have seen in recent years the EU Member States, has encouraged this phenomenon, through financial support (Dee *et al.*, 2015), startup events, entrepreneurial education, online platforms, business angels, investor groups, incubators and accelerators, it's important to investigate the startups in a more concise way. This dissertation aims to identify the trends of each ecosystem, analyzing each startup by economic sector, business model and pricing model and on the other hand, intends to recognize the strengths and the weaknesses of each ecosystem and provide some insights about entrepreneurial ecosystems, by focusing in future thinking.

There are now a number of models of entrepreneurial ecosystems. In recent years a particularly influential approach has been developed by Daniel Isenberg at Babson College who has started to articulate what he refers to as an 'entrepreneurship ecosystem strategy for economic development (2011a, p.1).

With this research work we also expect to reach the ultimate objective of proposing conclusive solutions by showing a map with economic sector, business model and pricing model by European entrepreneurial ecosystem, adding the motivations that led to the choice of the economic sector.

1.2. Research Objectives

With this academic research work we intend to reach the ultimate goals of acquiring knowledge about the trends currently existing between the different ecosystems around Europe, and of proposing a list of conclusive strengths and weaknesses and get some insights about future thinking from some European entrepreneurial ecosystem.

In order to achieve the above mentioned goals, first it will be conducted a literature review about startups and startup ecosystems in order to discern the important aspects behind the concepts and the entities addressed in this dissertation. By addressing these topics, we expect to obtain a solid foundation of knowledge, which will support and contribute to better define the overall direction of the subsequently developed research work.

Initially, it was necessary to determine the entrepreneurial ecosystems to be selected for the study. The selection criteria consisted primarily on ecosystems which are not any or less reports and

information about them. Then was proceeded to the collection of information from an online platform, which this information was fed into a pre-prepared framework.

Having fulfilled this objective and based on the findings and on the collected feedback from startup in this field, it will be elaborated a questionnaire where we aim to evaluate startup's data about the current stage, economic sector the economic sector as well as the motivation that led to this choice, business model and pricing model as the ecosystem entrepreneurial insight about the entrepreneurial ecosystem and what they are expecting for the future.

Finally, following the questionnaire data collection, an analysis of the results will be conducted, where we will attempt to identify in which aspects the compare the collected information platform with the information gathered directly to startup, with the aim of providing answer to the research questions of this dissertation and of reaching the objective in order to obtain insights have helped to understand the current trends, strengths and weaknesses of the several European entrepreneurial ecosystems.

1.3. Research Questions

This research will revolve around the acquisition of knowledge about the trends of the entrepreneurial ecosystems, with particular focus on the economic sector, business model and pricing model and to realize if the cities belonging to the same European region, have the same trends as strengths and weaknesses.

In order create value to these two elements by understanding the trends, strengths and weaknesses of the entrepreneurial ecosystems, we will seek to answer the following four research questions:

1. Are there significant differences between European Startup Ecosystem with regards to the Business Models in focus?
2. Are there significant differences between European Startup Ecosystem with regards to the Pricing Models in focus?
3. Are there significant differences between European Startup Ecosystem with regards to the Economic Sectors in focus?

1.4. Organization of the Dissertation

The present dissertation is organized into nine chapters. The first chapter consists of a brief introduction to the topic of this research, as well as to the objectives and research questions. The second and third chapters will provide a theoretical review of the literature related to the scope of this study, where it will be discussed several concepts pertinent to the topic of startups, startup ecosystems, and the startup ecosystems. The fourth chapter describes the methodology used to address the research questions. In the fifth and sixth chapters the results of the empirical research will be presented and analyzed, and the research questions will be answered. The seventh chapter compares the results obtained by fifth and sixth chapters. Finally, the ninth will be dedicated to the conclusions of the research about the trends, strengths and weaknesses of the several European entrepreneurial ecosystems.

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Results from the Questionnaire	Questionnaire Results
Chapter 7 Analysis	Resume – Madrid (Spain)
	Resume – Amsterdam (Netherlands)
	Resume – Rome (Italy)
	Resume – Lisbon (Portugal)
	Resume – Helsinki (Finland)
	Resume – Stockholm (Sweden)
	Resume – Athens (Greece)
	Resume – Malmo (Sweden)
Chapter 8 Conclusions and Recommendations	Overall Conclusions
	Recommendations
	Limitations and future research

Table 1.1 - Organization of the dissertation

Chapter 2

Defining Startups

The present section intends to introduce to the literature considered to be relevant to the scope of the dissertation, in order to provide to the reader a proper background in terms of concepts related to startups. In this theoretical review, it will be given an overview to the definition of startup, economic sector distribution, the several type of business models and pricing models.

2.1. Startup Definition

“A Startup is a team of entrepreneurial talent with innovation in process, in identifiable and investable form, in progress to validate and capture the value of the innovation - with target to grow fast with scalable business model for maximum impact.” – Startup Commons

It all started during the time that we call the Internet bubble between 1996 and 2001 in the USA. Nowadays, startups have assumed an increasingly important role on the global scene, being considered the dynamos of our society (Malone, 2003) and there are those who confuse the SME concept with the startup concept. Actually investors treated startups as smaller versions of large companies; this was problematic because there is a vast ideological (and organizational) difference between a startup, small business, and large corporation, which necessitates different funding strategies and KPIs (Emile Pope, 2014).

According to serial entrepreneur and Silicon Valley legend Steve Blank, a startup is a “temporary organization designed to search for a repeatable and scalable business model.” (Steve Blank, 2010). A startup, which he argues in the context of the tech industry should be short for “scalable startup,” which searches to not only prove their business model, but to do so quickly, in a way that will have a significant impact on the current market.

Defining Startups

This stands in stark contrast with the definition of a small business, which the U.S. Small Business Administration (SBA) describes as “independently owned and operated, organized for profit, and not dominant in its field.”

A startup is temporary and is funded differently from a SME – “a startup is an organization formed to search for a repeatable and scalable business model.” (Blank, 2010). According to Blank, this means that a startup founder has three main functions:

1. To provide a vision of a product with a set of features;
2. To create a series of hypotheses about all the pieces of the business model: Who are the customers? What are the distributions channels? How do we build and finance the company, etc;
3. To quickly validate whether the model is correct by seeing if customers behave as your model predicts (which he admits they rarely do).

While both a startup and small business will likely start with funding from the founder’s savings, friends and family, or a bank loan; if a startup is successful, it will receive additional series of funding from angel investors, venture capitalist, and eventually, an initial public offering (IPO). With each series of funding, the startup founder’s equity is eroded, while ownership of the company diversifies (Blank, 2012).

2.2. Startup Development Stages

Since the very first researches, researchers mostly use "organizational life cycle theory" to investigate the issue of startup development. In summary, this type of theory assumes that the startup development process follows predictable patterns, and these patterns can be developed into several sequential stages (Smith et al., 1985).

Organization life cycle theory takes organizational growth to be a consistent and predictable process, similar to the human life cycle of birth, maturity, aging, and death. This theory's basic argument is like this: The organizational growth process consists of different stages, and an organization faces different problems in each stage. An organization must therefore possess different management skills, make different decisions, and have a different structure during each stage (Adizes, 1989; Greiner, 1972; Kazanjian, 1988; Miller and Friesen, 1984). While diverge greatly concerning how many stages there are in an organizational life cycle, all hope that life cycle models can be used as long-term planning and forecasting tools (Scott and Bruce, 1987).

MODEL	RESEARCHERS	STAGE CONTENT
Ten-stage (Milestone Model)	Block and MacMillan (1985)	<ol style="list-style-type: none"> 1. Development of concept, completion of product testing 2. Completion of product prototype 3. Initial financing 4. Completion of initial plant testing 5. Market testing 6. First batch production 7. Early sales 8. First competitive activities 9. First redesign or adjustment of direction 10. First major adjustment of prices
Five-stage	Galbraith (1982)	<ol style="list-style-type: none"> 1. Proof of principle/Prototype stage 2. Model shop 3. Start-up 4. Natural growth 5. Strategic maneuvering
Four-stage	Kazanjian (1988)	<ol style="list-style-type: none"> 1. Conception and development 2. Commercialization 3. Growth 4. Stability
Three-stage	Bhave (1994)	<ol style="list-style-type: none"> 1. Opportunity stage 2. Technology setup and organization stage 3. Exchange stage

Table 2.0.1 - Comparison of Accounts of Startup Development According to the Life Cycle Theory

Despite the years, several researchers have shown concern, about the different stages of startup development. In this sense, it is important to clarify what is the startup lifecycle model what is being use, regarding the various stages, in order to understand, what each stage requires and what are the challenges for the organization.

The lifetime of a startup company, from idea conception to the maturity level, has been identified and reported from different perspectives (e.g. market (Blank, 2011) and innovation (I. Heitlager, S. Jansen, R. Helms, S. Brinkkemper, 2006). A prominent contribution, is the model presented by (Crowne, 2006) who synthesized the startup lifecycle in four stages. The startup stage is the time when startups create and refine the idea conception, up to the first sale. This time frame is characterized most from the need to assemble a small executive team with the necessary skills to start to build the product. The stabilization phase begins from the first sale, and it lasts until the product is stable enough to be commissioned to a new customer without causing any overhead on product development. The growth phase begins with a stable product development process and lasts until market size, share and growth rate have been established. Finally, the startup evolves to a mature organization, where the product development becomes robust and predictable with proven processes for new product inventions.

2.2.1. Customer Development Model

Proposed by Steve Blank in his book “The Four Steps to the Epiphany” (2005), and later complemented in “The Startup Owner’s Manual” (Blank & Dorf, 2012) - Customer development is focused on collecting continuous feedback that will have a material impact on the direction of the product and business, every step of the way.

This model, depicted in the Figure 2.1, is comprehended by four iterative steps: Customer Discovery, Customer Validation, Customer Creation, and Company Building. In this methodology, a startup shall keep iterating through each step, until it generates enough success to carry the organization out into the next step.

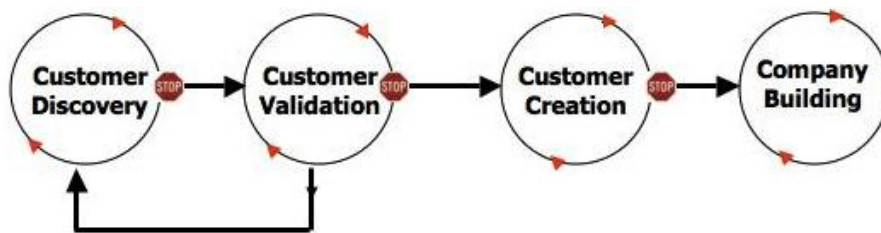


Figure 2.1 - Customer Development model (Blank, 2005)

Customer Development focuses on understanding customer problems and needs, Customer Validation on developing a sales model that can be replicated, Customer Creation on creating and driving end user demand, and Company Building on transitioning the organization from one designed for learning and discovery to a well-oiled machine engineered for execution.

- *Customer Discovery*: The goal is to find out who the customers for the product are and whether the problem that a startup wants to solve. More formally, this step involves discovering whether the problem, product and customer hypotheses in your business plan are correct;
- *Customer Validation*: The goal of this step is to build a repeatable sales road map for the sales and marketing teams that will follow later. The sales road map is the playbook of the proven and repeatable sales process that has been field-tested by successfully selling the product to early customers;
- *Customer Creation*: The goal is to create end-user demand and drive that demand into the company's sales channel. This step is placed after Customer Validation to move heavy marketing spending after the point where a startup acquires its first customers, thus allowing the company to control its cash burn rate and protect its most precious asset.
- *Company Building*: is where the company transitions from its informal, learning and discovery-oriented Customer Development team into formal departments with VPs of Sales, Marketing and Business Development. These executives now focus on building mission-oriented departments that can exploit the company's early market success.

“A startup is a company designed to grow fast. Being newly founded does not in itself make a company a startup. Nor is it necessary for a startup to work on technology, or take venture funding, or have some sort of “exit.” The only essential thing is growth. Everything else we associate with startups follows from growth.” – Blank, 2010

Defining Startups

Steve Blank on his blog presented another perspective of a startup's lifecycle. Along with the customer development model, Blank explained this new approach is composed of three phases:

1. **Search:** "a startup is an organization formed to *search* for a repeatable and scalable business model". It typically take multiples iterations and pivots to find the product or market fit – the match between what you are building and who will buy it. (Blank, 2015).

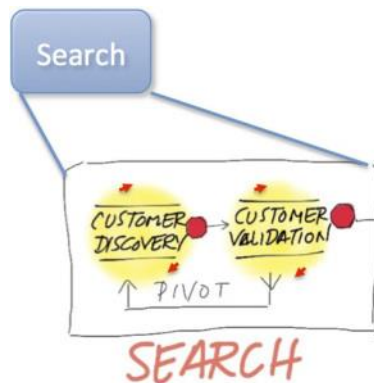


Figure 2.2 - Phase "Search" - Startup's lifecycle (Blank, 2015)

According to the author, the startup is ready to exit the *Search* when it has customer validation: The sales channel matches how the customer wants to buy and the costs of using that channel are understood; Sales (and/or customer acquisition in a multi-sided market) becomes achievable by a sales force (or network effect or virality) without heroic efforts from the founders; Customer acquisition and activation are understood and Customer Acquisition Cost (CAC) and Life Time Value (LTV) can be estimated for the next 18 months. Company size is typically less than 40 people.

2. **Build:** At about north of 40 people a company needs to change into one that can scale by growing customers/users/payers at a rate that allows the company to: achieve positive cash flow and/or generate users at a rate that can be monetized. In this stage, the organization needs to put in place culture, training, product management, processes and procedures. (Blank, 2015).

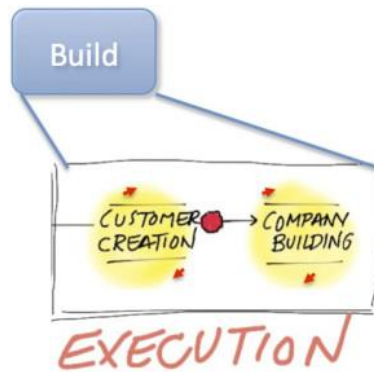


Figure 2.3 - Phase "Build" - Startup's lifecycle (Blank, 2015)

3. **Grow:** In the *Grow* phase the company has achieved liquidity (an IPO, or has been bought or merged into a larger company event) and is growing by repeatable processes. The full suite of Key Performance Indicators (KPI's) processes and procedures are in place.

Steve Blank is one of the founders of a well-known incubator worldwide in the Silicon Valley. He defines the so called start-ups as: “a company designed to grow fast. Being newly founded does not in itself make a company a startup. Nor is it necessary for a startup to work on technology, or take venture funding, or have some sort of "exit." The only essential thing is growth. Everything else we associate with startups follows from growth.”

2.2.2. *Lean Startup*

Startup Commons Global work on scaling entrepreneurship and innovation by working with startup ecosystem cornerstone organizations like governments, higher education, financial organizations and big companies, with long term development perspective, on empowering and enabling to create and develop startup ecosystems with startup ecosystem development consulting, knowledge tools & resources and shared source digital infrastructure platform to connect, measure and coordinate startup ecosystems, with focus on enabling, developing and improving the volume and/or quality of the ecosystems key elements: innovation, entrepreneurship, talent, finance, policy and international connections.

Defining Startups

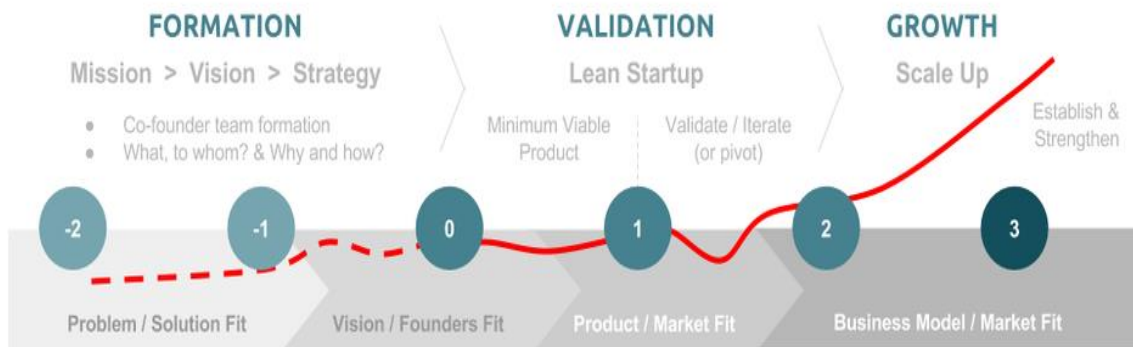


Figure 2.4 - Startup's lifecycle (Startup Commons Global)

According to this organization, the startup's lifecycle has three stages (Figure 2.4): formation that consists in establishing the mission and the vision and the strategy to reach the goals outlined; validation that consists in applying the tool "Lean Startup" and the final stage, growth. In parallel with the three stages, there are 6 sub stages:

- Ideating (-2): Entrepreneurial ambition and/or potential scalable product or service idea for a big enough target market. Initial idea on how it would create value. One person a vague team; no confirmed commitment or no right balance of skills in the team structure yet;
- Concepting (-1): Defining mission and vision with initial strategy and key milestone for next few years in how to get there. Two or three entrepreneurial core co-founders with complementary skills and ownership plan. Maybe additional team members for specific roles also with ownership;
- Committing (0): Committed, skills balanced co-founding team with shared vision, values and attitude. Able to develop the initial product or service version, with committed resources, or already have initial product or service in place. Co-founders shareholder agreement (SHA) signed, including milestones, with shareholders time and money commitments, for next three years with proper vesting terms;
- Validating (1): Iterating and testing assumptions for validated solution to demonstrate. Initial user growth and/or revenue. Initial KPI's identified. Can start to attract additional resources (money or work equity) via investments or loans for equity, interest or revenue share from future revenues;

- Scaling (2): Focus on KPI based measurable growth in users, customers and revenues and/or market traction and market share in a big or fast growing target market. Can and want to grow fast. Consider or have attracted significant funding or would be able to do so if wanted. Hiring, improving quality and implementing process;
- Establishing (3): Achieved great growth that can be expected to continue. Easily attract financial and people resources. Depending on vision, mission and commitments, will continue to grow and often tries to culturally continue “like a startup”. Founders and/ or investors make exit(s) or continue with the company.

Eric Ries is a Silicon Valley entrepreneur and follower of the lean startup movement. He was one of the first to apply a scientific method to building sustainable businesses. He defines start-up as human institution designed to create new products and services under conditions of extreme uncertainty. The vital part of a start-up is to learn how to build a sustainable business.

Ries affirms that one cannot do entrepreneurship if one does not have a vision. Having strong vision helps you see better the hypothesis. Most of the people fail if they do not have hypothesis or they cannot explain it. We have to learn better the rule of causality to better explain the whole process. According to Ries, a startup was a small company that takes on a hard technical problem. That is the most common recipe but not the only one as we will explain on the next definition which is at the origins of Ries.

Steve Blank has been involved with eight high-tech start-ups, as either a founder or an early employee. He invested in a startup founded by Eric Ries with a single requirement for Ries to take Blank’s course. With the time Ries recognized that the traditional system had to be replaced. Eric dubbed the combination of customer development and agile practices the “Lean Startup.” This method is now taught at more than 25 universities.

The Lean Startup is a new methodology that is making the process of starting a startup less risky and “favors experimentation overelaborate planning, customer feedback over intuition, and iterative design over traditional big design up front development”. (Blank, 2013)

According to Blank we have been wrong for the last half a century about the entrepreneurial world. We have erroneously believed that new ventures are smaller versions of large companies and that they have to apply technology analogically as their “bigger siblings”. Now we see the

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importance of the business models in startup. They do not have a clearly defined business model and are seeking for the most appropriate one. Breaking up with the old-fashioned way of starting a business, Steve Blank proposed new approach before even starting with the business plan. The lean startup consists of three components:

- Founders need to summarize their hypotheses in the “business model canvas”
- Founders have to “get out of the building” and test the hypotheses by feedback of the end users, partners, etc.
- Founders have to create ‘minimum viable model’: developing products incrementally and iteratively, with agile engineering.

One of the critical differences is that while existing companies execute a business model, startups look for one. This distinction is at the heart of the lean start-up approach. It shapes the lean definition of a startup as a temporary organization designed to search for a repeatable and scalable business model. The lean start-up methodology focuses on the importance to constant customer feedback.

The idea behind the lean startup is not only about the entrepreneurs themselves, but it has bigger approach. Blank does not rely only on this method for companies to get successful since there are much more factors to be cautious about. However, he claimed that “Using lean methods across a portfolio of start-ups will result in fewer failures than using traditional methods.”

2.2.3. Marmer Development Stages

Max Marmer proposed a startup’s development stages framework in his work in “Startup Genome Report” (Marmer *et al.*, 2011), named Marmer Stages. This model it’s based on Blank’s Customer Development model and explains the startup lifecycle by describing how startups evolve through stages of development, and by characterizing the different set of milestones, challenges and metrics of each stage (Figure 2.5). Although Marmer’s model was built on Blank’s work, both frameworks differ in some aspects, with the most noticeable difference being that the Marmer stages are product centric rather than company centric.

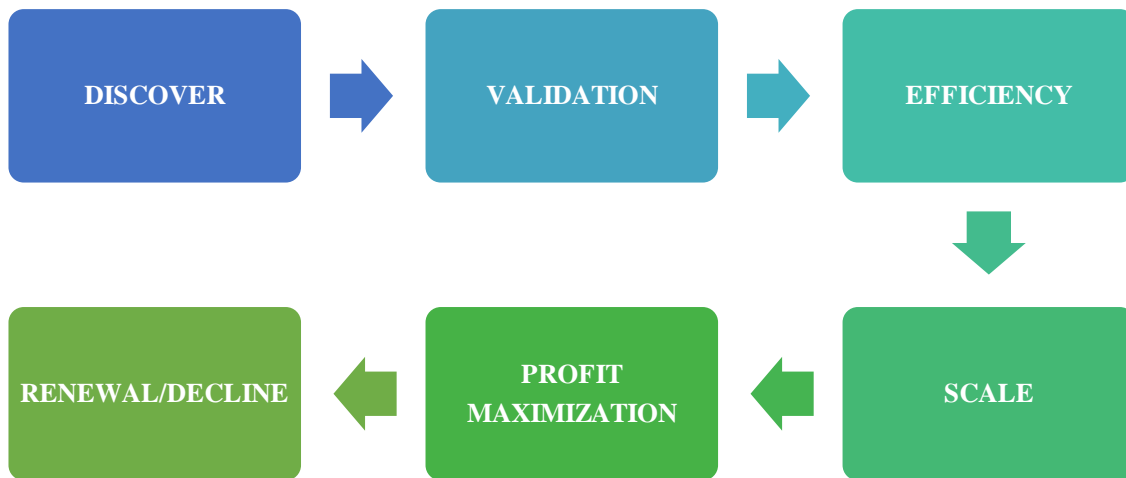


Figure 2.5 - Marmer's Development Stages (adapted from: Marmer et al., 2011)

2.3. Business Models

Since the mid-1990s, the concept of business model has spread with the development of the Internet and various studies began to define the concept of a business model on the basis of the Internet business (Christoph Zott, Raphael Amit, Lorenzo Massa, 2010). A business model refers to a description of various participants in a business, including their roles, the flow of the goods and services, and the profit (Timmers, Paul, 1998). Also, some studies were conducted to define the business models in general industries and non-Internet business, and the business models in general industries may refer to a concise description of methods to make the close relations of decision-making factors the sustainable competitive advantage in the strategy, structure, and economy (Alexander Osterwalder, Yves Pigneur, Christopher L. Tucci, 2005).

With this, there were many studies and efforts to define the business models in various industries and viewpoints. In the study by Zott et al. (2010), the concepts of business models defined by these various viewpoints were arranged, which can be summarized as the informative description of business (Linda M. Applegate, Peter Weill, Michael R. Vitale, 2001), the explanation of business (Osterwalder, Pigneur, Tucci), the conceptual tool (David J. Teece, 2010), the template of structure (Raphael Amit, Christoph Zott, 2001) and the framework (Allan Afuah, Christopher L. Tucci, 2001). Although there are differences in explanation of the business model among

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diverse industries and viewpoints, a business model is a blueprint of a business that explains how the business is carried out.

According to Cohan (2014) a business model explains which consumer pain your startup chooses to relieve, why the solution works better than competing ones and how big a wedge a company can drive between what customers are willing to pay and the costs.

2.3.1. Business Model Canvas

Previous publications by Osterwalder & Pigneur include an international conference participation with “An e-business model ontology for modeling e-business” (Osterwalder & Pigneur, 2002). In this publication these authors state that business models “can help companies understand, communicate and share, change, measure, simulate and learn more” about their businesses (Osterwalder & Pigneur, 2002). Four pillars support their theory and these are product innovation (including the company’s value proposition to the target customer segment), customer relationship (involving the information strategy with target customers to develop their trust and loyalty), infrastructure management (involving resources in a partner network and the performance of infrastructure and logistics issues) and financials (encompassing the revenue model and the cost model and consequently profit and loss) (Osterwalder & Pigneur, 2002). Business models are seen to bridge the gap between strategy (the positioning, objectives and goals of the company) and business processes (involving the understanding and implementation of strategic information), indeed there often exists “quite a substantial gap between these two “worlds” (Osterwalder & Pigneur, 2002).

In 2010, Osterwalder & Pigneur, they present a several scientific publications leading up to “Business Model Generation”. In this book, a new business model is presented – Business Model Canvas - as “a shared language for describing, visualizing, assessing, and changing business models”.

“A business model describes the rationale of how an organization creates, delivers, and captures value.”- (Osterwalder & Pigneur, 2010).

The authors affirm that a business can be better explained through nine build blocks that show all the dimensions involved in the process of generating revenue in a company (Figure 2.6). The nine build blocks are comprehended by the following:

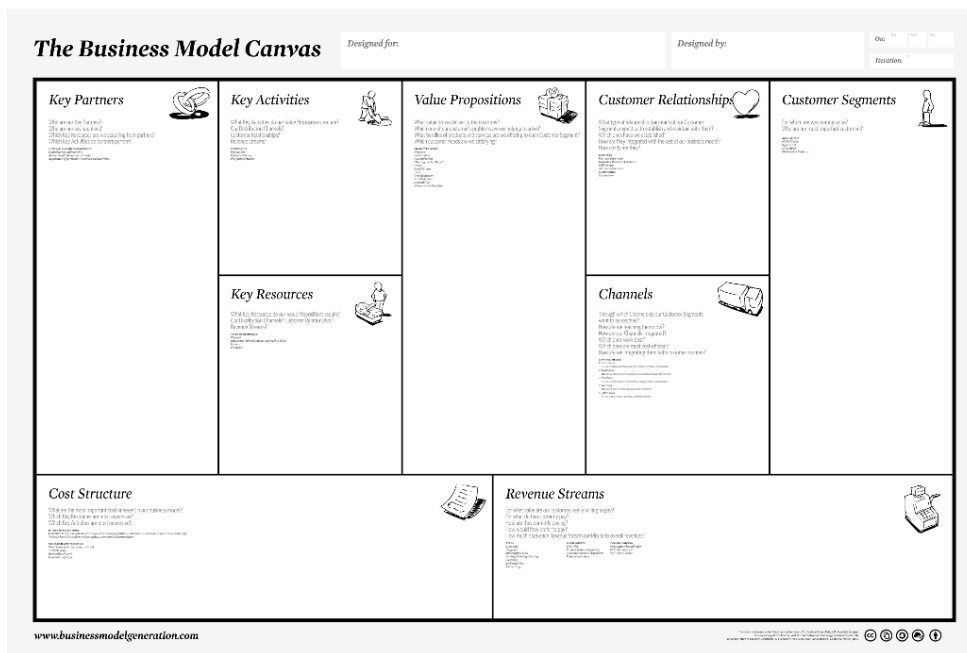


Figure 2.6 - Business model canvas (Osterwalder & Pigneur, 2010)

- Customer Segments:** The Customer Segments block defines the different groups of people that a company aims to reach and serve (e.g. mass market, niche market, segmented, diversified, multi-sided platforms). Each segment is composed by groups of people with common needs, common behaviors, or other common attributes. A company must decide which segments to serve, and which segments to ignore, and then design a business model based on the specific customer needs of each segment;
- Value Proposition:** The Value Propositions block describes the bundle of products and services that create value for a specific customer segment, by solving a specific customer problem or satisfying a customer need. A Value Proposition creates value for a Customer Segment through a distinct mix of elements catering to that segment’s needs. The value creation can be quantitative (e.g. price, speed of service, performance) or qualitative (e.g. design, customer experience, brand);
- Channels:** The Channels block describe how a company communicates and reaches its customer segments to deliver a value proposition. A company’s interface with customers is constituted by communication, distribution, and sales channels;

- ***Customer Relationships***: The Customer Relationships block describes the types of relationships that a company establishes with specific customer segments. Customer relationships may be aimed to acquire customers, to retain customers, or to boost sales. It can distinguish between several categories of customer relationships, which may co-exist in a company's relationship with a particular Customer Segment: Personal assistance, dedicated personal assistance, self-service, automated services, communities and co-creation;
- ***Revenue Streams***: The Revenue Streams block represents the cash flow of a company, generated from each customer segment. Each Revenue Stream may have different pricing mechanisms, such as fixed list prices, bargaining, auctioning, market dependent, volume dependent or yield management. A business model can involve two different types of revenue streams: transaction revenues resulting from one-time customer payment; and recurring revenues, resulting from ongoing payments;
- ***Key Resources***: The Key Resources block describes the most important assets required to make a business model work. These resources allow a company to create and offer a value proposition, reach markets, maintain relationships with customer segments, and earn revenues. Key resources can be physical, financial, intellectual, or human;
- ***Key Activities***: The Key Activities block describes the most important activities that a company must perform to make its business model successful. Like key resources, these activities allow a company to create and offer a value proposition, reach markets, maintain relationships with customer segments, and earn revenues. Key activities can be categorized into three different types: production; problem solving; and platform/network;
- ***Key Partnerships***: The Key Partnerships block describes the network of suppliers and partners that make a business model work. Partnerships are extremely important for business models, as they allow companies to optimize their business models, reduce risk, or acquire resources. Key partnerships can be classified into four different categories: strategic alliances; cooperation; joint ventures; and buyer-supplier relationship. It can be useful to distinguish between three motivations for creating partnerships: optimization

and economy scale, reduction of risk and uncertainty, acquisition of particular resources and activities;

- **Cost Structure:** The Cost Structure block describes all the costs resulting from the business model execution. Business model cost structures can be categorized into two different types: cost-driven, where the business model focus on minimizing costs as much as possible; and value-driven, where the business model focus on value creation instead of cost minimization. Cost structures can have the following characteristics: fixed costs, variable costs, economies of scale and economies of scope.

A key strategic question for any business, established or startup, is which target market(s) should it serve with a new product or service. At the highest level of market aggregation, a basic choice for businesses offering finished products or services is whether to target the business market (organizations) or the consumer market (individuals and households).

2.3.2. *Business to Business (B2B)*

“These customers are typically buying on behalf of a business or for a business, which means more than one person may be involved.” – (Brad Shorr, 2013)

Business to Business or B2B applies to those companies who want to market their goods or services exclusively to other businesses and not to consumers. Provides the gateway for an enterprise’s employees, managers, customers (clients) and all trusted suppliers and trading partners (TPs) to access electronic data applications and all information they need (Akoh, 2001). First, from a communication perspective, B2B is the delivery of goods, services, information, or payments over computer networks or by any other electronic means. Second, from enterprise’s functions and activities perspective, B2B is enterprise’s process such as buying, selling, transferring, or exchanging products, services and/or information electronically by completing functions, activities and procedures over electronic networks. Third, from a commercial perspective, B2B provides the capability of buying and selling products, services and information on the Internet and via other online services. Lastly, from a service perspective, B2B is a tool that satisfies the need of governments, enterprises, trading partners (TPs) and suppliers to cut costs of services while improving the quality of partners’ services (Turban, et al. 2004). Previous studies such as Sahawneh (2005), Davies (2003), and Gulati (2000) have shown that the adoption of Information Technology (IT) has created significant effects on enterprises, specifically

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concerning high profitability, performance, and efficiency. In addition, Gulati (2000) noted in his study that adoption of B2B systems by enterprises may improve the efficiency of process, reduce cost of product, improve information, reduce rogue purchases, streamline the supply chain, and improve service (Devaraj & Kohli, 2003).

B2B is described as the form of relationship with the company on the side of supplier and another business company on the customer side. This business company could be represented by sole trader, company, or institution. (Kumar & Reinartz 2012, s.261). B2B market includes big number of transactions, and is usually more complex (Davis et al. 2012; Saini et al. 2010; Hutt & Speh 2012, s.38). The complexity leans on number of people responsible for the transaction and number of steps in these transactions. (Payne & Frow 2013, s.56).

2.3.3. Business to Consumer (B2C)

“These customers are completely in control of what they are going to buy, so it’s simple: learn about the product or service, make a decision, and buy.” – (Brad Shorr, 2013)

The idea of value in B2C is rooted primarily in philosophy and economics (Sanchez-Fernandez and Iniesta-Bonillo, 2007). Philosophical approaches to value, especially via axiology (Fronzizi, 1971), are characterized by substantial work on the foundations of individual valuation. This thinking has influenced some of the research into value perceived by consumers (Holbrook, 1999). In economics, although value has been addressed with respect to the idea of exchange value and use value (Smith, 1776), economists have also pondered the measurement of value in its objective (labor value) and subjective (utility value—scarcity) conceptions with the aim of providing a theoretical account of prices (Debreu, 1959). These approaches have shaped certain conceptions of value adopted in marketing (Dodds et al., 1991; Monroe, 1990; Zeithaml, 1988).

While value may have many meanings in B2C (Woodall, 2003), two criteria can be used to structure the definitions proposed in the literature: the time at which value is studied and the way it is conceptualized.

The first criterion refers to the time at which value is studied in the process of purchase and consumption (Woodall, 2003). Three types of perceived values can be made out, corresponding to the moments when value is examined: purchase value, shopping value and consumption value. Purchase value is defined by Zeithaml (1988) as the outcome of comparing the perceived benefits

and sacrifices associated with the purchasing of a product. Value of this kind, arising before what is on offer is actually acquired, is rooted in exchange value in economics and reflects an essentially utilitarian form of valuation. In the specific context of retail distribution, numerous academic works have looked at a specific value: shopping value (Babin et al., 1994; Mathwick et al., 2001). Value of this type arises from the shopper's experience of visiting the store, which is thought to be a form of valuation in itself. It stands apart from the other kinds of value in terms of the moment when consumers experience the value. Consumption value has been defined by Holbrook (1999) as a relative preference, characterizing the experience of interaction between subject and object. Holbrook proposed a typology articulated around the following three key dimensions: an ontological dimension (intrinsic or extrinsic orientation), a praxeological dimension (active or passive orientation) and a social dimension (individual or interpersonal orientation). This approach originates in use value and leads to a more hedonic or symbolic conceptualization of value.

Alongside this, the various approaches developed in B2C may be classified by the way in which value is conceptualized (Sanchez-Fernandez and Iniesta-Bonillo, 2009). The analytical criterion adopted is also useful for value measurement models. In the first instance, perceived value may be represented by an aggregate approach articulated around a trade-off between benefits and sacrifices (Zeithaml, 1988). This approach, consisting of obtaining an overall appraisal of the level of valuation of an offer, has long addressed the value of a product by means of a simple notion of 'value for money' and has, therefore, been thought of as a one-dimensional construct (Dodds et al., 1991; Rajendran and Hariharan, 1996). However, because the nature of perceived benefits and sacrifices taken into account has become diversified, multidimensional aggregate measures of perceived value have also been proposed (Lai, 1995).

Secondly, the perceived value has also been conceptualized as part of an analytical approach (Holbrook, 1999). This approach consists not of ascertaining some overall level of value but of identifying various components within value that are so many separate dimensions of the construct. However, despite this splitting of the theoretical aspect, several characteristics of value are generally accepted in the B2C literature. First of all, value is the result of a relative judgment made by a consumer with respect to an object (Sinha and DeSarbo, 1998). This judgment is based on a comparative process that may pursue an intra-product (benefits–costs) or inter-product rationale (Oliver, 1999). Furthermore, many commentators agree that perceived value varies with the type of good and the characteristics of the context of purchase/consumption (Holbrook, 1999; Zeithaml, 1988). Finally, the value customers perceive is not static but changes over time (Hansen et al., 2013; Parasuraman and Grewal, 2000).

2.3.4. Consumer to Consumer (C2C)

“C2C, or customer-to-customer, or consumer-to-consumer, is a business model that facilitates the transaction of products or services between customers.” – (Eliane J. Hom, 2013).

According to Hom, the goal of a C2C is to enable this relationship, helping buyers and sellers locate each other. Customers can benefit from the competition for products and easily find products that may otherwise be difficult to locate. Thanks to the Internet, intermediary companies have fostered more C2C interaction. Some examples of C2C include eBay, an online auction site, and Amazon, which acts as both a B2C and a C2C marketplace. eBay has been successful since its launch in 1995, and it has always been a C2C. Anybody can sign up and begin selling or buying, giving an early voice to consumers in the e-commerce revolution. Sites like eBay and Amazon use PayPal to mitigate any payment processing risks.

2.4. Pricing Models

New businesses often start either from a market vision or from a technological capability. In both cases, the initial idea must be exploited with the aid of a business model (Chesbrough & Rosenbloom, 2002) through value creation and capture activities (Teece, 2010; Zott, Amit, & Massa, 2011). However, practice often shows that not every business model is designed and employed for the purpose of exploitation and growth from the beginning (Massa & Tucci, 2013).

The example of Google illustrates this perfectly. The firm started merely with a new technology for Internet search that was free and proved wildly successful with users due to its extraordinary utility, but with no idea whatsoever of how to make money from that. This was solved after some time when the firm invented yet another clever technology for selling space to advertisers on the users' search result web pages. The advertisers became Google's paying customers and the main source of revenues, and Google users enjoying the free service turned out to be a part of Google's value proposition (Kesting & Günzel-Jensen, 2015). This realization led eventually to a successful business model, which was not envisioned from the beginning (Baden-Fuller & Haefliger, 2013). After more than 15 years of existence, Google has become one of the most influential, profitable, and fastest growing companies in the world (Google Inc., 2013).

2.4.1. *Freemium*

Freemium model (a mix of “free” and “premium”) has been gathering steam since 1994 when Esther Dyson, a prominent technology analyst, envisioned a world where intellectual property would cost nearly nothing to distribute. Back then, most providers of “creative content” had to shell out substantial sums to reproduce and deliver each additional copy of their products. Indeed, the Internet has all but eliminated those so-called marginal costs—increasing overall supply of stuff like software, media and advice, and driving consumer prices to zero. Meanwhile, pesky fixed costs like equipment, buildings and people remain.

A business model pioneered by one company in one space may be adopted by another company in another space. The ‘freemium’ model has been adopted by Adobe (for its PDF reader), Skype and MySpace, while Outshouts Inc (www.outshouts.com) has applied Flickr’s multiple revenue streams model to online Web videos, allowing users to personalize and disseminate videos for business or consumer purposes. While it is common with Internet startups, the multiple revenue stream approach is by no means new.

Freemium business models are also deployed by a large number of software companies (such as Linux, Firefox, and Apache) who operate in the open source marketplace. The standard form (or ‘kernel’) of the software is licensed under an open source license and then a premium version with additional features and/or associated services is made available under commercial license terms. One theory is that ‘vendors’ get customers (often, and ideally with the IT organization bypassing Procurement Departments altogether because, after all, the software is ‘free’) hooked on the free product, and then subsequently convert them into paying customers through the sale of complementary software and/or service. However, conversion rates to paying customers have been poor, and it’s not clear the model works.

As in the case of Google, the logic of ‘free’ implies that ventures offer (parts of) their products or services for a price equalling zero, earning money elsewhere. Some authors claim that zero is the only reasonable price in the digital world (e.g. Andersen, 2009), while others point out that various young entrepreneurial companies have failed to convert ‘free’ into a sustainable business (Teece, 2010).

“Freemium has become one of the most prominent ways to earn money – giving a majority of users access to a basic version of the offering while charging few for a premium product or service” –
(Teece, 2010)

Some of the most commonly encountered freemium models are feature-limited and time-limited as well as hybrids hereof (Anderson, 2009). Although previous research has investigated various alternative revenue streams or more generic different patterns around freemium business models (McGrath, 2010; Osterwalder & Pigneur, 2010), the value and implication of the free offering for the growth and profitability of young entrepreneurial ventures are largely unexplored although freemium business models are largely applied in the internet.

2.4.2. Premium

According to Emma Butin (2014) Free or Freemium is no longer perceived as really free. We live in an era where companies want much more in return for providing us a free a product. In today's world, a free use of product is understood as "free of cash payment," not free from other payments. We do pay for "Free", but with other means; with information for example, often valued much higher than a cash payment. When companies offer a product at a "freemium", they're hitching a ride on the use of the word "Free". They expect users have the product for assessment purposes. But user's basic conscious understanding is that they pay for "free." Alas, the problem of Freemium/Premium is rooted when companies use the word "freemium." By doing so, they inadvertently ask users to change their acquired belief of the word "Free". Once users use the Freemium version of the product, it is in their mindset that they paid for it. When companies are attempting to upgrade us to their premium package, suddenly a shift of mindset is not really received favorably. This is because we already paid with our information and maybe also shared our knowledge. When a company wants us to take real dollars out of our pockets, a premium price seems expensive and maybe even unfair. It's not about the price. It is the shift of the quid pro quo consciousness that occurs.

That leads companies to begin a process of "funneling," meaning targeting and re-targeting those potential users that show some type of intent of using the product's premium features. The purpose: converting as many users as possible to paying customers through any means necessary and at the lowest cost possible. We are used to seeing this through pop ups, targeted ads, re-target ads, emails, banners and friend suggestions. This is essentially saying to the user, 'I will do anything in my power to chase you down until you give up and upgrade.' Users who finally upgrade do so more often than not because they succumb to the chasing, not because they really enjoyed the product or service. Others, become banner blind and pop up rejecters.

“Give your service away for free, possibly ad supported but maybe not, acquire a lot of customers very efficiently through word of mouth, referral networks, organic search marketing, etc., then offer premium priced value added services or an enhanced version of your service to your customer base.” – Fred Wilson (2006)

2.4.3. Subscription

During the Internet boom, a vast number of websites attracted Internet surfers by offering them with large amounts of free information ranging from news, business data to sports statistics. However, the once well-sold business model of offering free content to secure advertisement revenues yielded rather disappointing results for most of the e-service providers. Increasingly, advertising revenues alone are insufficient to meet the bottom-line needs of a company for survival (Addison 2001, Dewan et al. 2003, Turban et al. 2002). Forced by the harsh business reality to seek alternative sources of revenue, many of these web operators have begun charging users a subscription fee for access to online information and/or services (Olsen 2001, Goldman 2001, Prasad et al. 2003, Taylor 2001). For instance, when advertising rates plummeted, companies such as Encyclopedia Britannica and NetZero had to diversify their sources of revenue by moving into a pay-for-content model (DiCarlo 2001, Streitfeld & Cha 2001). If this continues, the era of totally free content might eventually diminish. Instead, free content will be used primarily as a marketing ploy: a complementary trial period is strictly used for purposes of enticing customers to subscribe to a service or buy a product online. Alternatively, some sites attract customers by offering a limited amount of free content. They then hope to convince their customers to shift to a variety of “premium,” fee-based content (Outing, 2002).

2.5. Classifying Startups

Recently, the concept of startup ecosystem has been receiving greater attention from governments, through the intensification of initiatives and policies focused on the promotion of entrepreneurship (Hospers, 2006; OECD, 2010; Ernst & Young, 2011). Therefore, some researches have been developed, for broad vision of the evolution of entrepreneurial phenomenon and the consequent increase of the number of startup in Europe.

In “Youth Entrepreneurship in Europe: Values, Attitudes, Policies” (Cornell University ILR School) presents an overview of youth entrepreneurship in the context of the European policy agenda and individual Member States. It looks at factors that influence the decision to become

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self-employed and examines the individual and social attitudes of young people towards entrepreneurship, comparing Europe with other comparable parts of the world.

The Figure 2.7 presents the sectors where young entrepreneurs are most active are construction (16.3% of total youth self-employment), the wholesale and retail trade (13.7%), and the primary sector (12.9%), followed by ‘other service activities’ (8.1%), accommodation and food service activities (6.3%), and professional, scientific and technical activities (5.9%). Some authors suggest that the high level of bogus self-employment practices (see above) in some of these sectors (such as construction and trade) is also at the root of this sector specialization in youth self-employment (European Employment Observatory, 2011).

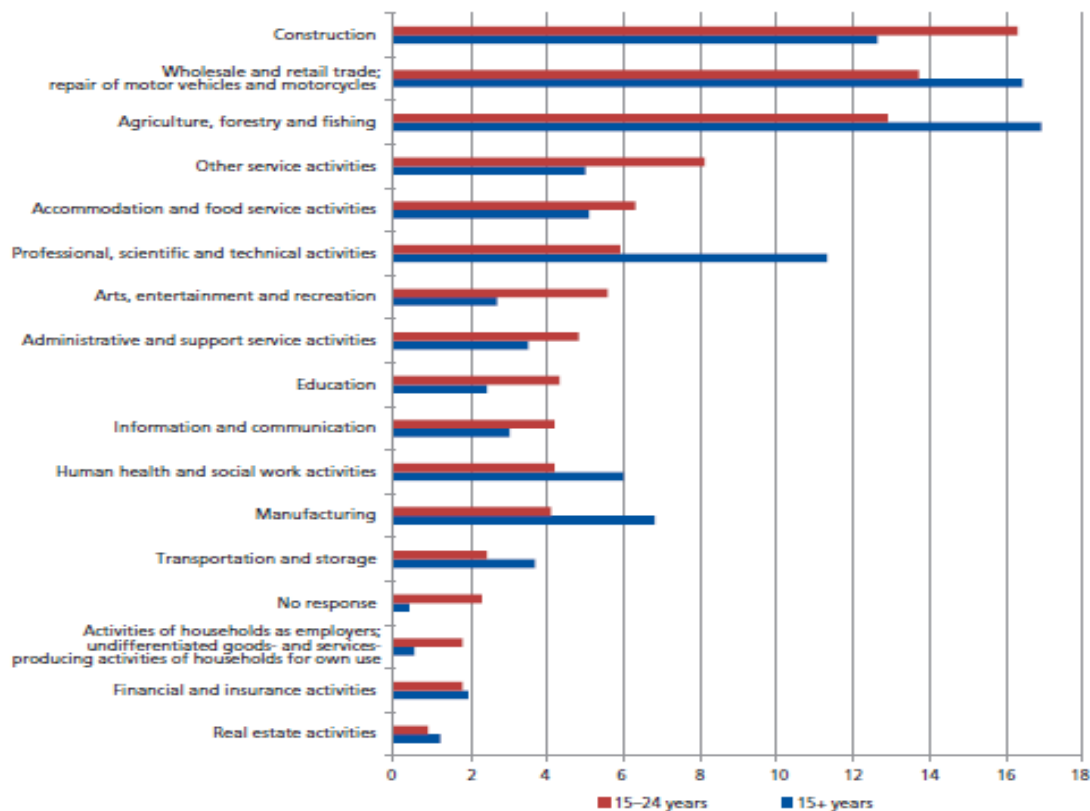


Figure 2.7 - Main economic branches where young self employed are engaged in comparison to total self employed, EU28, 2013 (Source: Eurostat, Labour Force Survey)

Another study conducted by Imperial College Business School “ICT innovation in Europe: Productivity gains, startup growth and retention” declares that information and communication technologies (ICTs) are a core driver of the economy. The accelerating pace of technological progress continues to challenge our individual, societal and institutional responses and this adaptation process – or lack thereof – is responsible for the wide variation of ICT impact across

countries. In this report we assess the relative impact of ICT innovations within Europe, identify regional champions, and highlight the path to grow and nurture innovative ICT businesses in Europe.

According the authors, Europe therefore is catching up to the U.S.A. in idea creation and risk capital but is lacking the means to retain its talent at home. There are two main reasons for this, which also influence the relative scarcity of VC in Europe compared to the U.S.A.: First, the fragmented European digital market poses substantial legal, regulatory, linguistic and cultural barriers for promising startups to scale. Second, the scarcity of skills and in some cases VC create real growth constraints for smaller firms residing in the region. If this trend is not tackled and reversed, the region will continue to supply the US with an extremely scarce resource – individuals capable of creating high-growth firms. The process of growth through internationalization of innovative young ICT firms is another area where further analysis of the European market would be valuable.

European tech startups have attracted more than USD\$28 billion by U.S.A. investors in the first 8 months of 2014. The economic value created by these firms is appropriated outside Europe given the difficulties to scale at home. Moreover, engineers and programmers are often better off joining an established ICT firm instead of proceeding with a new venture. This further reinforces the misallocation of talent to less high-impact activities. Therefore, ensuring sufficient VC and IPO markets in European countries is a high-priority policy initiative. (P. Koutroumpis, A. Leiponen, L.D. W. Thomas).

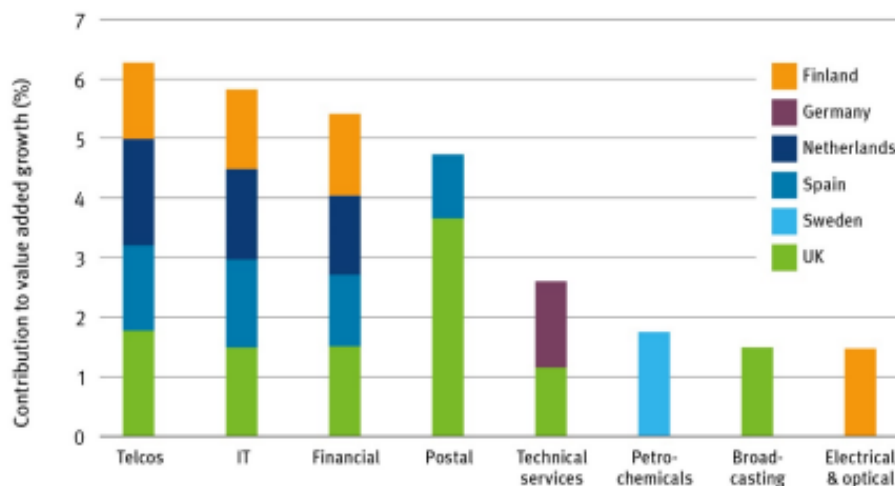


Figure 2.8 – Industries benefiting from ICT investments (1996-2010) (Source: ICT innovation in Europe: Productivity gains, startup growth and retention)

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The Figure 2.8 presents the analysis of the industries benefiting from ICT investments. Clearly the ICT-producing industries lead in this ranking with telecommunications, IT and other related services capturing the first two positions. Financial and insurance services come third indicating the dramatic effects new computing facilities and real time communications have for this – ICT-using – sector. Other affected industries include logistics (or “postal and courier activities”), services and processing (“professional, scientific, administrative and support”), media and publishing (“publishing, audiovisual and broadcasting”) and “electrical and optical equipment”.

Nevertheless the range of sectors and countries where spillover effects are identified is remarkable: petroleum and petrochemicals, wholesale and retail trade, agriculture, machinery, textiles, financial services, transport equipment and others appear in this mix. Grouping this information by country we clearly see that Sweden, Finland and to a lesser extend Germany have experienced productivity growth over and above the EU average. In fact, Sweden and Finland have been global leaders for the period (1995-2010) surpassing the US and Japan in productivity gains. In the post-2005 period only Sweden maintained its lead above the US. The slower adopting countries like France, Italy and Spain appear to have substantial benefits for their ICT-producing sectors only (telecommunications) whereas these countries have also excessively invested in ICT without getting back comparable returns to the rest of the EU. More information about the industries benefiting from productivity gains, on Figure 2.9.

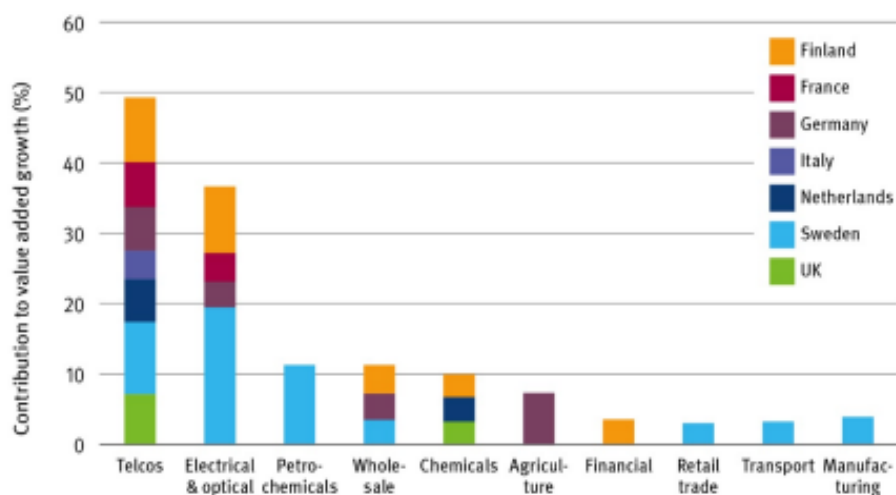


Figure 2.9 - Industries benefiting from productivity gains (1996-2010) (Source: ICT innovation in Europe: Productivity gains, startup growth and retention)

Chapter 3

Defining Startup Ecosystems

The present section intends to provide to the reader an analysis to the concept of startup ecosystem, followed by an overview to the top startup ecosystems in the Europe. Finally, the main actors in startup ecosystems will be identified, and consequently overviewed concerning their characteristics and role within the ecosystem.

3.1. Defining Startup Ecosystem

The concept of entrepreneurial ecosystems has received increasing attention over the past decade as governments, private enterprises, universities, and communities have started to recognize the potential of integrated policies, structures, programs and processes that foster regional entrepreneurship activities and can support innovation, productivity and employment growth.

The term ecosystem was originally coined by James Moore in an influential article in Harvard Business Review published during the 1990s. He claimed that businesses don't evolve in a 'vacuum' and noted the relationally embedded nature of how firms interact with suppliers, customers and financiers (Moore, 1993. Prahalad (2005) and Cohen (2006) describes entrepreneurial ecosystem as conditions in which the individual, business, governments, civil society, and development partners come together regionally to support entrepreneurial activities with the objective to generate economic wealth and prosperity.). It is argued that in dynamic ecosystems new firms have better opportunities to grow, and create employment, compared with firms created in other locations (Rosted 2012).

“a set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organizations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth

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rate, numbers of high growth firms, levels of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sellout mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment" - (Mason & Brown, 2014, p. 5)

There are now a number of models of entrepreneurial ecosystems. In recent years a particularly influential approach has been developed by Daniel Isenberg at Babson College who has started to articulate what he refers to as an 'entrepreneurship ecosystem strategy for economic development (2011a, p.1). He identifies six domains within the entrepreneurial system: a conducive culture (e.g. tolerance of risk and mistakes, positive social status of entrepreneur); facilitating policies and leadership (e.g. regulatory framework incentives, existence of public research institutes); availability of dedicated finance (e.g. business angels, venture capital, micro loans); relevant human capital (e.g. skilled and unskilled labor, serial entrepreneurs, entrepreneurship training programs); venture-friendly markets for products (e.g. early adopters for prototypes, reference customers), and a wide set of institutional and infrastructural supports (e.g. legal and accounting advisers, telecommunications and transportation infrastructure, entrepreneurship promoting associations). More information on Figure 3.1.

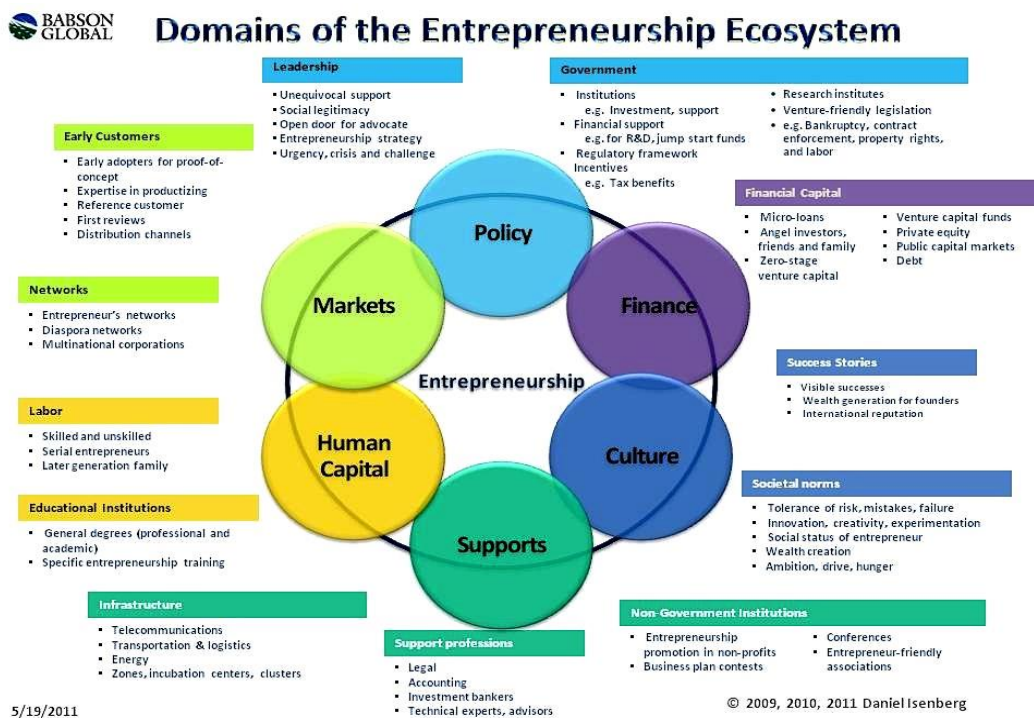


Figure 3.1 - Isenberg's model of an entrepreneurship ecosystem (adapted from: Isenberg, 2011a)

The startup ecosystems have a critical role in the startups themselves and, direct and indirectly in the local and global economy. According to Motoyama and Watkins' research article for the Kauffman Foundation (Motoyama & Watkins, 2014), research has shown that the potential that startups have in creating jobs is vital for the economy in the U.S.A. The startup ecosystems are vital because of the connections they enable. The authors affirmed there are four types of connections enabled by the ecosystem: connections between entrepreneurs; connections between support organizations; connections between entrepreneurs and key support organizations; and miscellaneous support connections.

- *Entrepreneur-to-Entrepreneur Connections:* These connections are extremely important and valuable. The entrepreneurs can support, train and practice with each other, they can build a learning community among them, and by observing their peers they can provide important feedback to each other's businesses. The relationships and connections that young and novice entrepreneurs can establish with more experienced ones is very valuable as they can serve as mentors for young entrepreneurs as people who already have experience and have passed by similar obstacles as the young entrepreneurs are passing now.
- *Support Organizations-to-Support Organizations Connections:* These organizations are connected through several different ways. There are organizations that attend other's events, or jointly organize events, some organizations have shared board members, and organizations sometimes share the same strategic view and long-term goal. With the recent proliferation of such organizations there has to be a close relationship between them to avoid unintentional and unnecessary overlapping for support of *startups*. It is clear now, that the most important aspect of the support organizations in the ecosystems is the relationships, understanding and cooperation between them.
- *Entrepreneur-to-Support Organizations Connections:* The support that is more public and observed is the connection between the young entrepreneurs and their businesses, and the support organizations. It is here identified two forms that the support organizations have to assist the entrepreneurs: 1) a broad form, which is comprised of supports such as mentoring and connecting; and 2) a functional form, which encompasses assistance in the business model, pitch practice and incubation, for example. Among this supports, several studies point out that, perhaps surprisingly, it is the mentoring support that the young entrepreneurs most desire.

- *Miscellaneous Support Connections*: Interactions that go beyond entrepreneurs and support organizations to include other miscellaneous entities in the ecosystem. These connections is mainly comprised by periodic entrepreneurship-oriented events, and other miscellaneous organizations. The ultimate goal of these connections is to connect entrepreneurs, that otherwise might not meet, mostly through open events where entrepreneurs have the opportunity to interact with its peers.

Startup ecosystems are very dynamic entities – They are initially in formation stages and once established are subject to periodic disturbance as financial bubbles. Withal, they are controlled by external and internal factors. Within the external factors that influence the startup ecosystems, there is the financial climate, and market and big companies disruption and transition.

3.2. Startup Ecosystem Actors

“A startup ecosystem is formed by people, startups in their various stages and various types of organizations in a location (physical and/or virtual), interacting as a system to create new startup companies.” – Startup Commons

As startup ecosystems are generally defined by the network of interactions among people, organizations and their environment, they can come in many types but are usually better known as startup ecosystems of specific cities or online communities.

In addition, resources like skills, time and money are also essential components of an startup ecosystem. The resources that flow through ecosystems are obtained primarily from the people and organizations that are active part of those startup ecosystems. By events and meetings with and between organizations and different people, these interactions play a key role in the movement of resources through the system helping to create new potential startups or strengthening the already existing ones and hence influencing the quantity of startups build.

According to Mason & Brown (2014), a startup ecosystem can be described as a set of interconnected entrepreneurial actors, entrepreneurial organizations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies), and entrepreneurial processes. These entities, which shall be called simply of ecosystem actors, have the main goal of providing assistance to entrepreneurs over the course of their

development stages through the provision of added value holistic support in areas such as business advice, networking, mentoring, and finance (Miller & Bound, 2011; Roper & Hart, 2013).

As illustrated in Figure 3.2, startup ecosystems are composed by the following actors: Entrepreneurs; Support organizations and individuals; Government; Service providers; Large companies; and Educational institutions (Mota *et al.*, 2016).

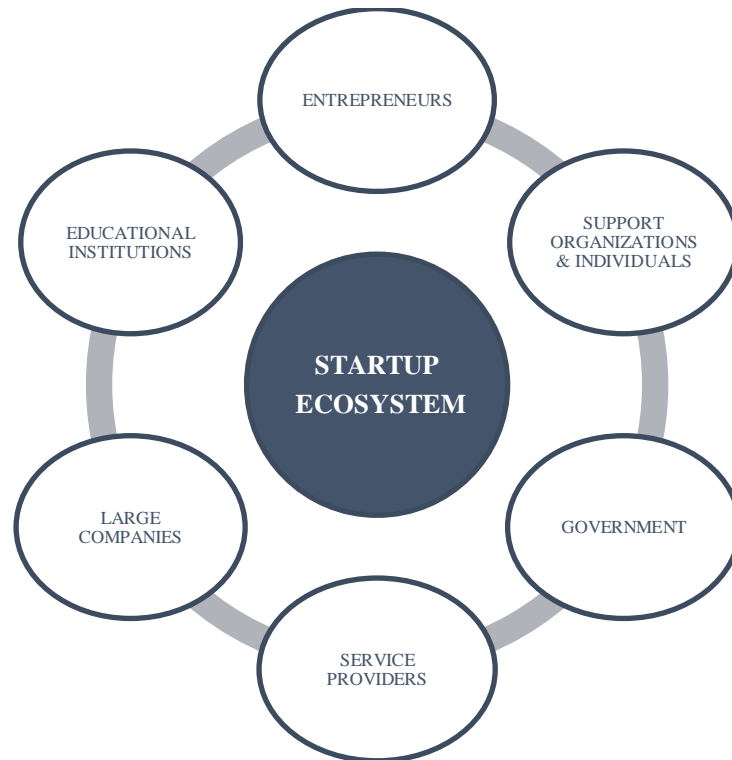


Figure 3.2 - Startup ecosystem actors (adapted from: Mota *et al.*, 2016)

- *Entrepreneur*: People who take initiative by creating and organizing a venture to exploit the opportunity found who decide what, how and how much a product or service to commercialize.
- *Support Organizations & Individuals*: Entities focused on developing, supporting and encouraging entrepreneurial activities. This is by far the most diverse actor, being comprised by several different organizations and individuals, who support startups at different stages of development, with different goals and different needs. Given the large number of different entities encompassed by this actor, we will consider two different groups: Ecosystem builders; and Investor groups.
- *Government*: In the past few decades have witnessed increased activism among state governments aiming to transform entrepreneurial talent and resources into high-growth

companies that remain in the state, therefore diversifying the employment and tax base. Although such public interventions are often justified by the theoretical arguments of mitigating market frictions, often their more direct aim is to create jobs within state borders. To achieve this goal and to stimulate the longer-term development of innovative clusters, state governments strive to retain local companies with high growth potential. A related concern is one of “brain drain,” the loss of valuable human capital to other states and regions. To achieve these objectives, state initiatives use public funding in various ways. For example, they may provide funding directly to for-profit companies to help them overcome liquidity constraint and bridge the “valley of death,”² or to research institutions to support research in leading technology areas and facilitate the technology transfer process. They may also allocate funding to establish intermediary organizations (e.g., catalytic enterprises or incubators), or establish a “fund of funds” program or tax credit program to encourage venture capital investment in the private sector. According to Neck, Isenberg and Mason & Brown, by supporting and financially fund such initiatives, governments can strengthen the entrepreneurial talent pool in those markets, and hence create a favorable environment for the creation and scale up of startups.

- *Service Providers*: These organizations are extremely important for the ecosystem and *startups*. They provide several services for *startups* at a very affordable cost or, in many cases even for free (Mota et al., 2016). These entities, such as venture-friendly lawyers, accountants, business consultants, investment bankers, recruitment agencies, among others, are seen as important actors in the entrepreneurial scene, as they understand the needs of entrepreneurial businesses, and focus on assisting these ventures. Such firms are often willing to offer their support to start ups at no charge with the expectation that long term business relationships will emerge in due course (Mason & Brown, 2014). These organizations are often willing to offer their support to startups at very affordable prices or even at no charge, either with the expectation that long-term business relationships emerge from such cooperation, or due to being paid by other entities, such as the government or large companies, who sponsor specific entrepreneurship programs, or even the entire ecosystem (Isenberg, 2011a; Mason & Brown, 2014; Mota et al., 2016).
- *Large Companies*: Initially Isenberg (2013) said “you simply cannot have a flourishing entrepreneurship ecosystem without large companies to cultivate it, intentionally or otherwise.” Large companies makes a variety of other contributions, including the provision of space and resources for local startups, the creation of programs to encourage start-ups and the development of companies that enhance their own ecosystems (Mason & Brown, 2014). Large companies play a major role in developing startup ecosystems,

especially in peripheral regions, being able to impact regional ecosystems in several different ways. First and foremost, they are seen as “talent magnets” within the ecosystem, as they recruit large numbers skilled people from outside the region, thus strengthen the workforce talent pool in their regions. Large companies are also sources of new businesses, as typically some staff from those organizations come to feel motivated to leave their jobs in order to start their own ventures. This motivation is often justified by the technological base that large companies set in their regions that, by offering to entrepreneurs the opportunity to take advantage of their local environment to get insights about specific technologies, and increase awareness about emerging trends, reduces uncertainty on entrepreneurs, and hence stimulates the creation of companies within those areas.

- *Educational Institutions*: Developing and promoting entrepreneurship education has been one of the key policy objectives for the EU and Member States for many years as the all world. There is a growing awareness of the potential of young people to launch and develop their own commercial or social ventures thereby becoming innovators in the areas in which they live and work. Entrepreneurship education is essential not only to shape the mind-sets of young people but also to provide the skills, knowledge and attitudes that are central to developing an entrepreneurial culture (Eurydice Report, 2014).

“Entrepreneurship education is about learners developing the skills and mind-set to be able to turn creative ideas into entrepreneurial action. This is a key competence for all learners, supporting personal development, active citizenship, social inclusion and employability. It is relevant across the lifelong learning process, in all disciplines of learning and to all forms of education and training (formal, non-formal and informal) which contribute to an entrepreneurial spirit or behavior, with or without a commercial objective.” – (ETF, GIZ, ILO, UNESCO and UNEVOC, 2012).

As is noted Europe and the Member States are investing in entrepreneurship education and in this sense, institutions possess the abilities to enable the initiation and promotion of the venture-creation process, as it is possible see in the next Figure 3.3, the percentage of people at receive an entrepreneurial education. These institutions, especially universities, are particularly important during the early development stages of startups, as they build capabilities and provide a diverse range resources, such as infrastructures, mentoring and support, that promote the development of young entrepreneurs and nascent startups. Universities are also a rich source of skilled people, possessing a large pool of diverse, talented people, as well as a source of innovative technological

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opportunities, with basic research being conducted in these institutions. However, despite being a source of high potential scientific discoveries, universities (Agueda *et al.*, 2016).

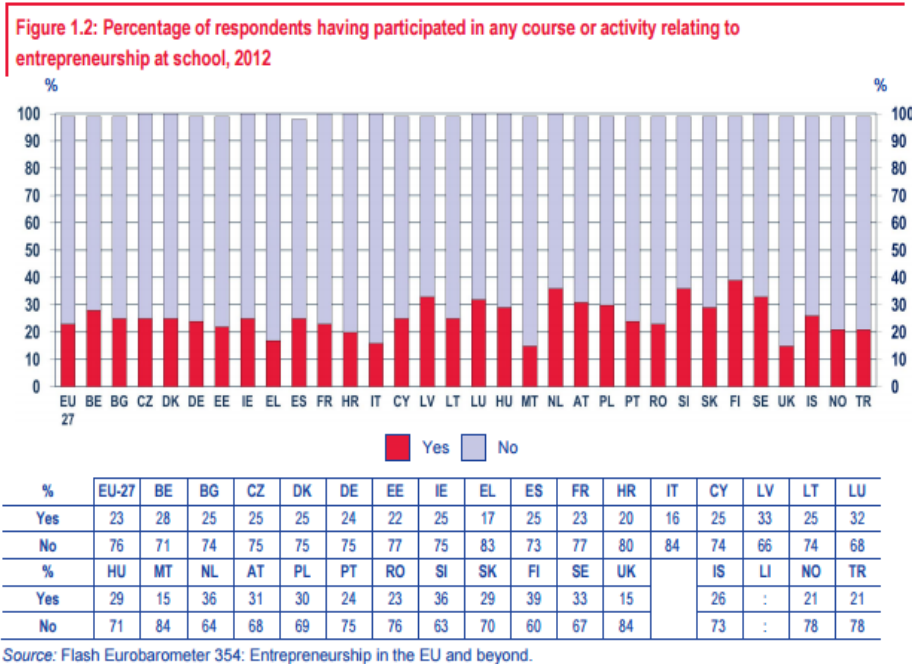


Figure 3.3 - Percentage of respondents having participated in any course or activity relating to entrepreneurship at school, 2012. (Source: *Entrepreneurship Education at School in Europe, 2016*)

In a few words, within the startup ecosystem there are some very important elements like ideas, inventions and researches, entrepreneurs, startup team members, angel investors, startup mentors, startup advisors, other entrepreneurial minded people, third people from other organizations with startup activities. Therefore, universities, advisory and mentoring organizations, startup incubators, startup accelerators, co-working spaces, service providers, event organizers, startup competitions, investor networks, venture capital companies, crowdfunding portals and startup blogs, are organizations and activities focus on specific parts of the ecosystem function and/or startups at their specific development stage(s).

3.2.1. Ecosystem Builders

The creation of new ventures is an uncertain endeavor, in which entrepreneurs pursue the construction of new artifacts by addressing information asymmetries in markets that more often than not have to be built (Knight, 1921; Sarasvathy, 2001; Schumpeter, 1934; Tasic & Andreassi, 2008). This effort typically leads to liabilities of newness that have to be overcome by aspiring entrepreneurs wanting to create enduring organizations (Hallen, Bingham, & Cohen, 2014).

In order to support entrepreneurs in this challenge, incubation and acceleration programs traditionally have been created, providing entrepreneurs with a number of resources that aim to increase the odds of a startup survival, while de-risking the entrepreneurial venture (Clarysse, Wright, & Hove, 2015; Hoffman & Radojevich-Kelley, 2012).

- *Incubators*: The first set of studies deals with the theory of the incubators and the incubator model and seeks answers to questions, such as how incubators are formed, what their aims are, how they are planned and how they are managed (e.g., Similor and Gill, 1986; Allen and McCluskey, 1990; Nowak and Grantham, 2000; Grimaldi and Grandi, 2003; Aernoudt, 2004; Leblebici and Shah, 2004; Becker and Gassmann, 2006). The second set of studies evaluates incubators regarding certain factors that define success indicators. These papers mainly focus on whether incubators have achieved their economic and technological goals in supporting entrepreneurs and small companies and their wider goals in encouraging creation of new firms and jobs and establishing an entrepreneurial society (e.g., Mian, 1996a; Colombo and Delmastro, 2002; Peters et al., 2004; Rothaermel and Thursby, 2005a,b; Aerts, Matthyssens and Vandembemt, 2007; McAdam and McAdam, 2008).

Therefore, an incubator is an organization designed to accelerate the growth and success of entrepreneurial companies through an arrangement of business support resources and services that could include physical space, capital, coaching, common services, and networking connections. The aim is to help create and grow young businesses by providing them with necessary support and financial and technical services.

A concept which has helped to engender understanding about how incubators are managed was discussed in Allen's (1988) analysis of incubator life cycles. The focus of management attention during the "start-up" stage is establishment of the physical facility, be that through renovation of an existing building or construction of purpose built accommodation. Because of incubator cash flow requirements, early tenants are likely to be chosen on their capacity to pay rent rather than their growth potential. This stage ends around the time that the facility achieves financial break even.

During the second or "business development" phase, attention is redirected towards the nurturing of new businesses. More emphasis is placed on developing a business advisory function and business network. Another characteristic of the business development stage is the incubator manager working to build synergies through dialogue and trading between tenants. When demand for space is appreciably greater than space available for tenants, and sophisticated, responsive

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business advisory arrangements are functioning well, the incubator is ready to move into the "maturity" phase.

Maturity is when the incubator spreads its span of influence throughout its region, becoming a focus for entrepreneurial endeavour. The excess of demand for tenancy over available space allows the incubator to become more discerning with its entrance criteria and accelerate the graduation of firms. At this stage, the program may consider expanding to accommodate the demand for its services. As the incubator moves through the three phases of the life cycle, it would be expected that the quality and quantity of development outcomes (eg, in terms of firms graduated) would be higher.

The interaction of the "stages of evolution" of an incubator facility with the three areas of responsibility which must be covered by an incubator manager (incubator stakeholders, the building and incubator tenants) gives rise to an incubator time/function matrix as set out in Table 3.1.

	STAKEHOLDERS	FACILITY	TENANT COMPANIES
STARTUP	<ul style="list-style-type: none"> - Create core group of sponsors; - Assemble mission statement; - Determine needs and resources of sponsors. 	<ul style="list-style-type: none"> - Perform cost/benefit analysis of building rehabilitation; - Rehab initial space to be rented; - Admit first tenant companies. 	<ul style="list-style-type: none"> - Provide basic shared tenant service; - Offer flexible, inexpensive space; - Provide access to professional assistance.
BUSINESS DEVELOPMENT	<ul style="list-style-type: none"> - Enlist aid of sponsors to market facility; - Enlist aid of sponsors to provide business support service; - Expand base to include more stakeholders 	<ul style="list-style-type: none"> - Attract one or more anchor tenant companies - Renovate space on as needed basis - Provide space for shared tenant service 	<ul style="list-style-type: none"> - Assist firms in capital acquisition; - Create programs to encourage the mixing of companies - Market the collected products and services of tenants
MATURITY	<ul style="list-style-type: none"> - Reassess levels of commitment to original plan; - Evolve programs to reflect changing needs of stakeholders; - Construct alliances. 	<ul style="list-style-type: none"> - Manage cash flow; - Construct specialised lease hold components; - Leverage physical plant for future interest opportunities. 	<ul style="list-style-type: none"> - Take equity in tenant companies; - Sub-contract to private service providers; - Coordinate seed capital pool.

Table 3.1 - Incubator Time/Function Matrix Source: Allen et al (1987) *Small Business Incubators - Phases of development and the Management Challenge, Economic Development Commentary, Volume 11/Number 2/Summer 1987, pp 6 - 11*

- *Accelerators*: Accelerators are programs that help entrepreneurs bring their products into the marketplace. They typically operate by inviting a cohort of startup companies to work intensively on their technologies for a period of time. Early articles on the accelerator phenomenon defined them by the unique services they provide to entrepreneurs. For example, experts at the Kauffman Foundation explain that accelerators are organizations offering a suite of professional services, mentoring, and office space in a competitive program format (Fishback et al. 2007).

Cohen (2013) and Cohen and Hochberg (2014) defined accelerator as a fixed-term, cohort-based program, including mentorship and educational components, that culminates in a public pitch event or demo day. In addition to this definition, Dempwolf *et al.* (2014) stress the differentiator aspect that accelerators are private, for-profit organization with a clear business model: Innovation accelerators are business entities that make seed-stage investments in promising companies in exchange for equity as part of a fixed term, cohort-based program, including mentorship and educational components, that culminates in a public pitch event or demo day.

As the number of accelerator programs has grown substantially, scholars have since observed that a more precise definition is needed, especially to distinguish accelerators from business incubators. Both incubators and accelerators can be broadly characterized as groups of experienced businesspersons who provide nascent firms with advice, businesses services, financing on occasion, and often office space to help them develop and launch their businesses with greater success than if the startups had not received assistance (Bøllingtoft and Ulhøi 2005; Hoffman and Radojevich-Kelley 2012; Isabelle 2013). Yet, business incubators have been a popular means to support startups since at least the early 1980s (Allen and Rahman 1985).

Another emerging perspective on how to differentiate such programs is provided by Dee *et al.* (2015), categorizing it according to the business model used (growth driven, fee driven or independent) and the stage in the entrepreneurial journey at which it best supports entrepreneurs (Figure 3.4).

1. STRATEGIC FOCUS

- Key objectives
- Sector focus (diversified vs specialisation)
- Geographic focus (local vs global)

2. PROGRAMME PACKAGE

- Standardised Curriculum
- Mentoring Package

3. FUNDING

- Funding of the accelerator
- Funding of startups

4. SELECTION PROCESS

- Screening criteria
- Selection processes

5. ALUMNI SERVICES

- Alumni interaction

Figure 3.4 - Accelerator's Model Source: Clarysse, Wright & Hove (2015)

Although Dee et al. (2015) agree with such definitions, they advocate for a broader working typology that positions accelerators among other startup support programs in terms of their business model (seek financial returns based on startup growth and exit) and stage at which founders are accepted to the program (startup or early-stage).

Incubators, in contrast, are usually associated a business model more similar to a tenant / service provider relationship with startups. They are typically nonprofit organizations, frequently associated with universities, provide office space at reasonable rates for the startups they support, target local startups and do not invest in the startups (Dempwolf et al., 2014). On Figure 3.5 a brief summary of these key differences with the acceleration model.

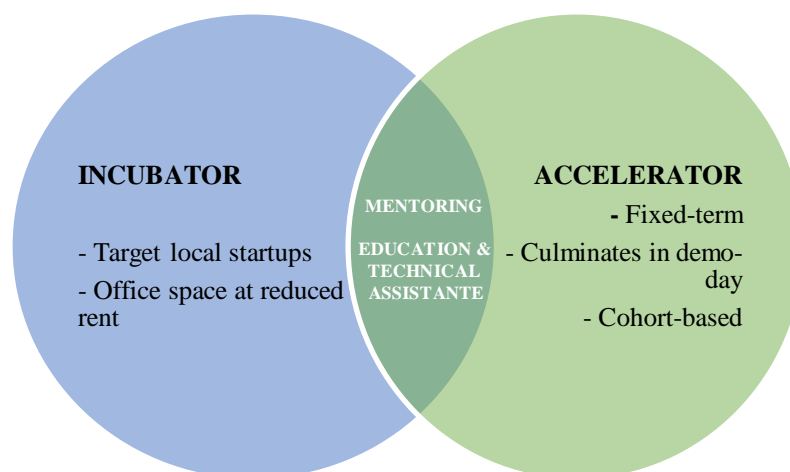


Figure 3.5 - Incubator and Accelerator Characteristics. (Source: Dempwolf et al.2014)

Another emerging perspective on how to differentiate such programs is provided by Dee et al. (2015), categorizing it according to the business model used (growth driven, fee driven or independent) and the stage in the entrepreneurial journey at which it best supports entrepreneurs (Figure 3.6).

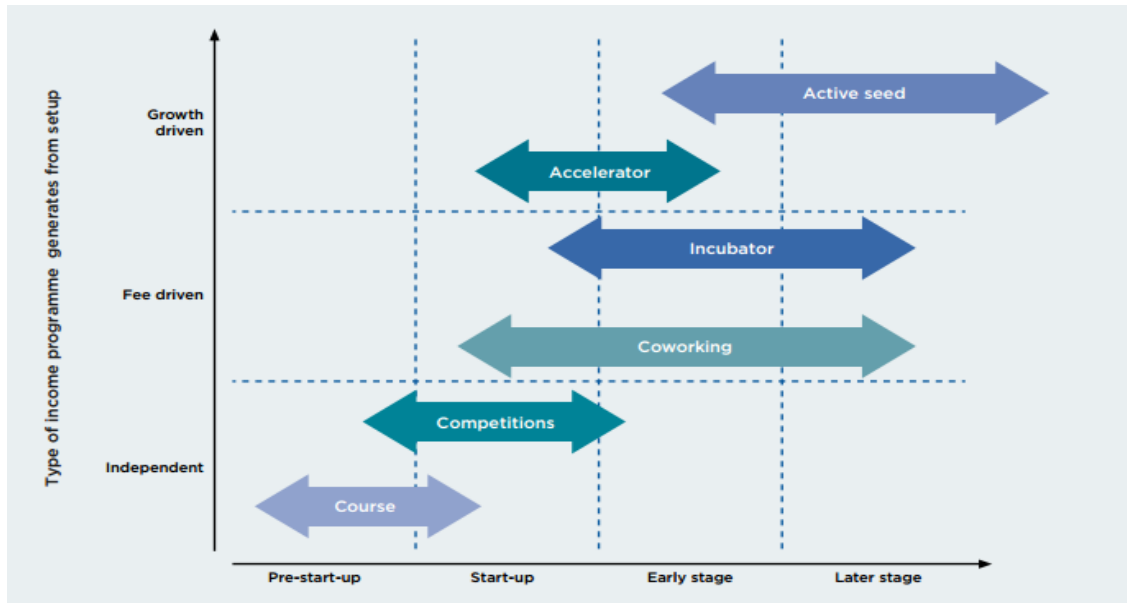


Figure 3.6 - Typology of Startup Support Programs. Source: Dee, Gill, Weinberg & McTavish (Nesta, 2015a)

- *Coworking Places:* Coworking spaces are workplaces conceived to promote inter-firm collaboration and are considered to offer optimal research contexts for several reasons, namely for their reduced physical scale, for the micro-organizations involved, for the intensity of the social interaction and also for the predisposition towards collaboration of all involved agents (Capdevila, 2014). According to Nesta Report the payment of membership fees explain the tendency for coworking spaces to have as tenants ventures that already have revenue sources (Dee *et al.*, 2015). More information on Figure 3.7.

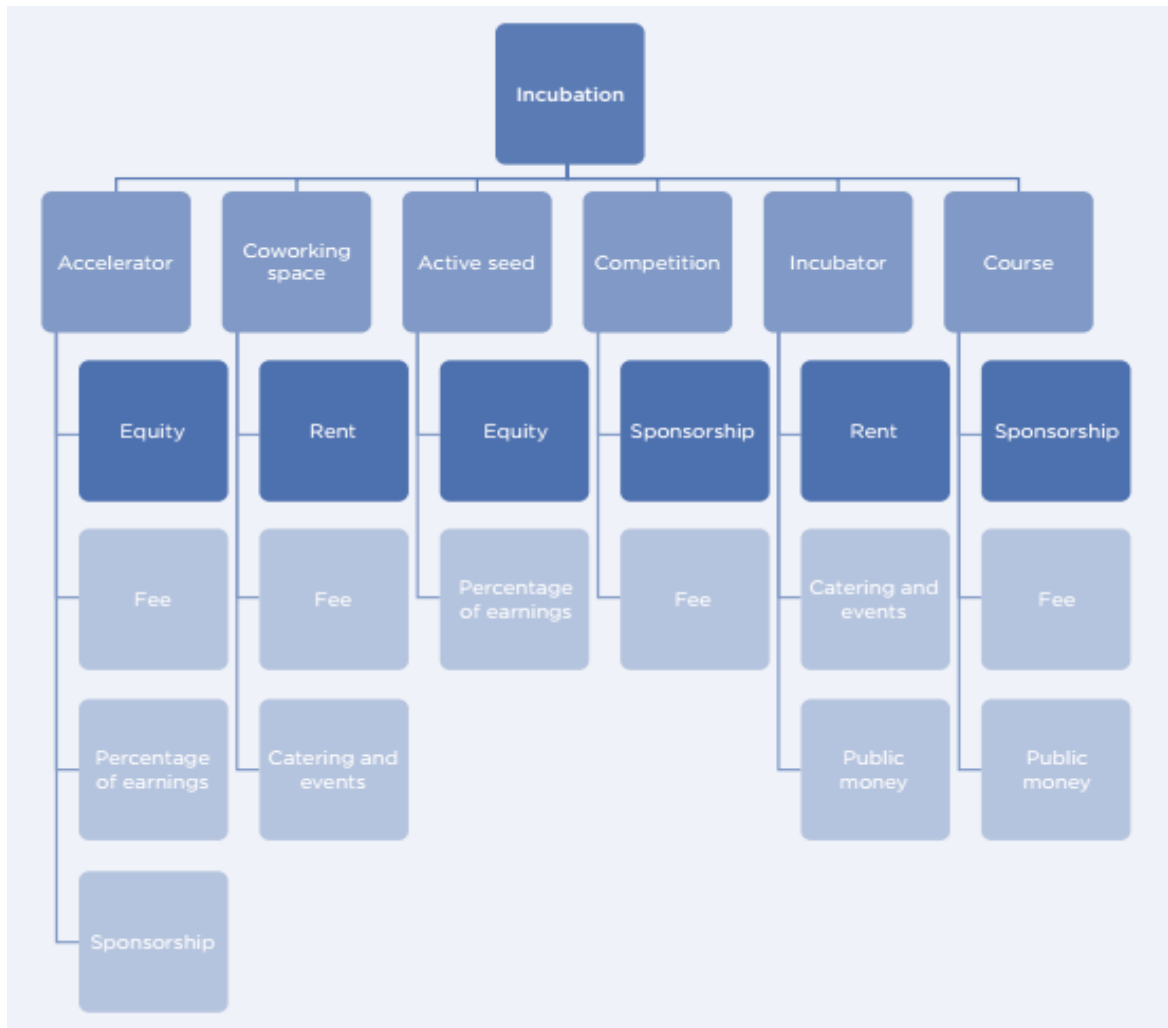


Figure 3.7 - Key sources of revenue for startup programs. Source: Dee, Gill, Weinberg & McTavish (Nesta, 2015)

With regard to the global number of coworking spaces, in 2014 were reported to exist around 5.800 coworking spaces worldwide, from which around 2.400 of these coworking spaces were located in Europe. These coworking spaces possess a global number of almost 300.000 members. Worldwide, of which around 100.000 members are located in Europe (Coworking Europe, 2015).

- *Courses and Competitions:* Entrepreneurship competitions are time-limited programs, often promoted by other ecosystem actors such as universities, the government, or corporates, whose aim is to provide organizational efficiency, a sense of urgency as well as a feeling of camaraderie and peer-to-peer learning from being in a cohort (Dee *et al.*, 2015). Through these programs the contestants, typically in teams, present a venture idea before a panel of judges for the chance of winning awards and cash prizes (Sá *et al.*, 2014). According to Miller & Stacey (2014), the typical features of a competition include:

- Widespread publicity for the prize and its aims;
- An online application process;
- Shortlisting by the competition organizers;
- A pitch or face-to-face “final” where ventures meet a group of judges;
- Follow-up support and publicity for the winners.

Like entrepreneurship courses, typically competitions do not need to rely on startups for income, usually assuring their revenues from sponsorships, although sometimes a fee may be charged directly to individuals, especially in the case of courses (Dee *et al.*, 2015).

3.2.2 Investor Groups

- *Venture Capital*: Innovation is considered since long time as a critical driver of economic growth and value creation. An important channel through which innovation is in developed economies is venture capital funds (Kortum and Lerner, 2000). These are specialized in innovative, high-growth ventures, and contributed to the success of many of the most successful new firms of the last few decades such as Microsoft, Google, Dell, Intel Computer and Apple. Indeed, they have all received venture capital in their initial stage of development (see, e.g., Gompers and Lerner, 1999, and Da Rin *et al.*, 2006).

However, venture capital funds invest in startup companies with the clear desire of exiting after 4-7 years. Since most high-tech startups initially do not generate profits to pay dividends or buy back shares, the exit route is the primary way the venture capitalist can realize a positive return on the investment. Exit conditions are therefore crucial for financing. The type of exit is an important issue not only for the venture capitalist, but also for the entrepreneur. The latter must understand that the venture capitalist will eventually want to exit the venture, and that very often this means the venture will be sold to another company. An entrepreneur who wants to retain control of the company afterward will need to find the funds required to buy out the venture capitalist or bring the company public (Black and Gilson, 1998). Otherwise, the venture will be sold after a few years to another firm. The two main exit routes are a trade sale (or “acquisition”) and an initial public offering (IPO). In contrast to a trade sale, an IPO keeps the firm independent, and allows entrepreneurs to remain in control of their company after the venture capitalists exit. Many entrepreneurs therefore prefer an IPO over a trade sale, as they tend to enjoy staying at the company in a management role (Dyck and Zingales, 2004).

Defining Startup Ecosystems

Venture capital is a subset of private equity (i.e. equity capital provided to enterprises not quoted on a stock market) and refers to equity investments made to support the pre-launch, launch and early stage development phases of a business (EVCA, European Private Equity and Venture Capital Association).

In the Figure 3.8, it's possible to see that 28,4% of the VC's investments were applied on "Life sciences", then the categories "Others" (20,0%), "Computer and consumer electronics" (19,0%), "Communications" (18,2%) and finally, "Industrial/Energy" (13,5%) and in the Figure 3.9, it's possible to observe the venture capital investments in percentage by sector selected by European countries. More information about venture capital investments by sector on Figure 3.9.

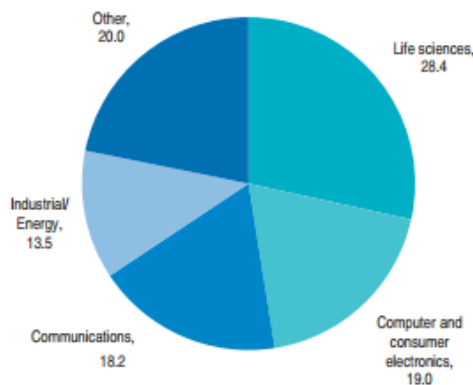


Figure 3.8 - Venture capital investments by sector, selected European countries (Percentage), Europe (OCDE, 2013)

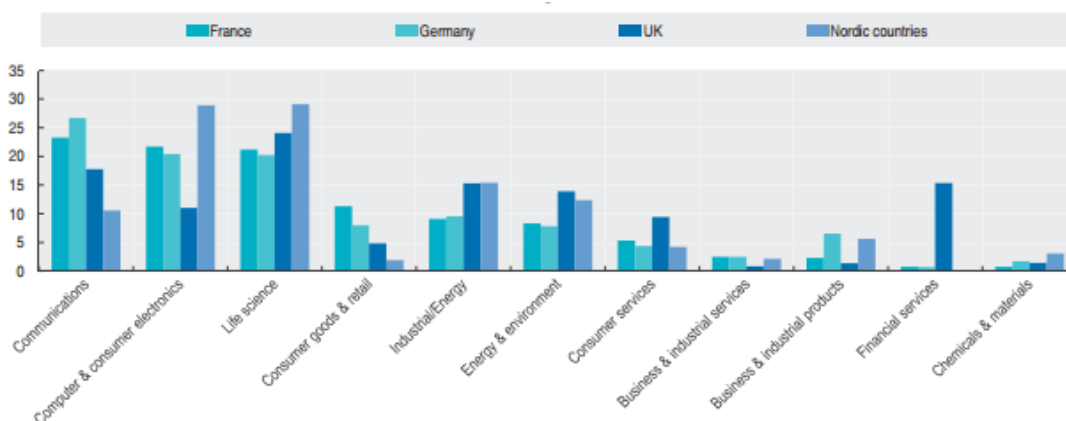


Figure 3.9 - Venture capital investments by sector (Percentage), Europe (OECD, 2013)

- **Business Angels:** Business angels have been highlighted as important stakeholders for potential high growth ventures. Extant empirical research provides evidence that they not only contribute with money but also bring added value to the ventures in which they have invested. Today it is widely acknowledged that business angels play a vital role in the

development and growth of new ventures, in terms of both the financial capital they invest as well as offering their business skills and personal networks they have acquired throughout their professional lives (Mason 2006; Kelly 2007).

Business angels are often defined as high-net-worth individuals who invest their own money in private companies seeking for seed, start-up or early stage capital (Haar et al. 1988; Feeney et al. 1999; Van Osnabrugge 2000; Mason 2007). Business angels are a type of investor reputed for often being the first source of significant outside funding of startup companies (Wiltbank, 2009). Business angels provide risky capital for start-up and early stage companies (e.g. Wetzel 1983; Haar et al. 1988). They also provide seed financing, but that to a lesser extent (Mason and Harrison 2002). This contrasts to venture capitalists that provide funds for more mature businesses at later stages (e.g. Sohl 2003), usually seeking for expansion financing (e.g. Morrissette 2007). Venture capitalists also engage in leveraged transactions such as LBOs and MBOs (Sohl 2003).

Due to investing in later stages, the deal sizes are also much larger for venture capitalists (Van Osnabrugge 2000). As a result of their complementary role in the venture capital market, business angels are argued to be filling the ‘equity gap’ (Mason and Harrison 1995; Mason 2007). Although there exists extensive research and literature about business angels, a uniform, definitive definition of angel investors is yet to be found (Avdeitchikova, 2008; Preston, 2011).

3.3. Startup Ecosystem Stages

According to Startup Compass, there are 4 stages of startup ecosystem development (Figure 3.10). Firstly, the presence of resources such as capital, investors, talent, customers interested in innovation, encourages the emergence of new startups and development of existing startups. The second phase is the Activation phase by “Catch Up Growth”, increasing the productivity of their organic (local) resources by attracting know-how through interactions with stakeholders from the world’s best ecosystems. During this phase local stakeholders increasingly learn and use global best practices specific to tech startups such as Silicon Valley-style venture financing and Steve Blank’s Customer Development methodology. After the ecosystem have maximized their local resources through best practices tends to grow and develop further, which leads to increased production and subsequent expansion to other cities and regions. These exits act as the trigger that graduates the ecosystem to the Integration phase. From here, its growth accelerates to an inorganic rate as external resources (entrepreneurs, talent, and investors) start moving to the ecosystem from all over the region or country—and, if it produces several internationally exciting exits and unicorns, from all over the world. It has become a pole of attraction for startup resources.

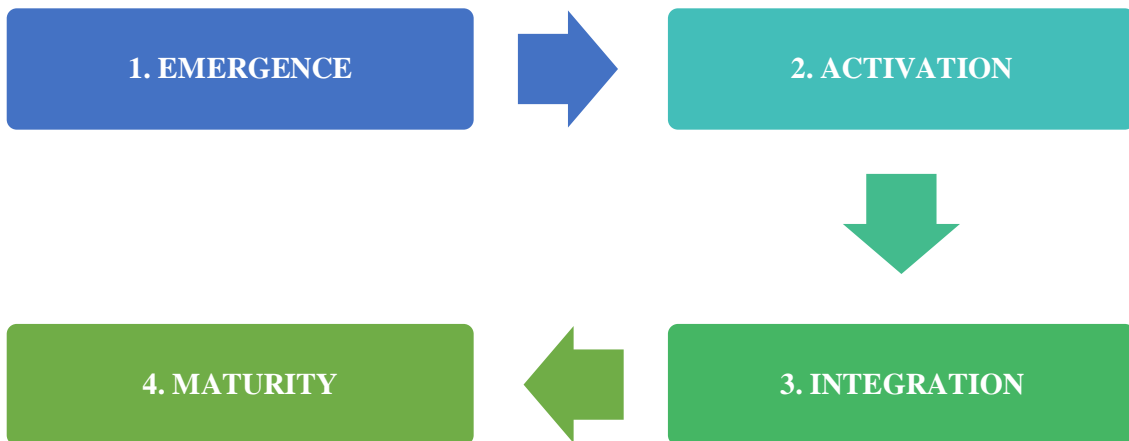


Figure 3.10 - Startup's Ecosystem Stages - Adapted from Startup Compass, 2015

3.4. Digital Ecosystems

According to Briscoe G. and Wilde P. (2006) digital Ecosystems are a novel optimization technique where the optimization works at two levels: a first optimization, migration of agents (representing services) which are distributed in a decentralized peer-to-peer network, operating continuously in time; this process feeds a second optimization based on evolutionary computing that operates locally on single peers and is aimed at finding solutions to satisfy locally relevant constraints. We created an Ecosystem-Oriented Architecture of Digital Ecosystems by extending Service-Oriented Architectures with distributed evolutionary computing, allowing services to recombine and evolve over time, constantly seeking to improve their effectiveness for the user base. Individuals within our Digital Ecosystem will be applications (groups of services), created in response to user requests by using evolutionary optimization to aggregate the services. These individuals will migrate through the Digital Ecosystem and adapt to find niches where they are useful in fulfilling other user requests for applications. Simulation results imply that the Digital Ecosystem performs better at large scales than a comparable Service-Oriented Architecture, suggesting that incorporating ideas from theoretical ecology can contribute to useful self-organizing properties in digital ecosystems.

Briscoe, compares digital ecosystem to a biological ecosystem (Figure 3.11). An ecosystem is a natural unit made up of living (biotic) and non-living (abiotic) components, from whose interactions emerge a stable, self-perpetuating system. It is made up of one or more communities of organisms, consisting of species in their habitats, with their populations existing in their respective micro-habitats. A community is a naturally occurring group of populations from different species that live together, and interact as a self-contained unit in the same habitat. A habitat is a distinct part of the environment, for example, a stream. Individual organisms migrate through the ecosystem into different habitats competing with other organisms for limited resources, with a population being the aggregate number of the individuals, of a particular species, inhabiting a specific habitat or micro-habitat. A micro-habitat is a subdivision of a habitat that possesses its own unique properties, such as a micro-climate. Evolution occurs to all living components of an ecosystem, with the evolutionary pressures varying from one population to the next depending on the environment that is the population's habitat. A population, in its micro-habitat, comes to occupy a niche, which is the functional relationship of a population to the environment that it occupies. A niche results in the highly specialized adaptation of a population to its micro-habitat.

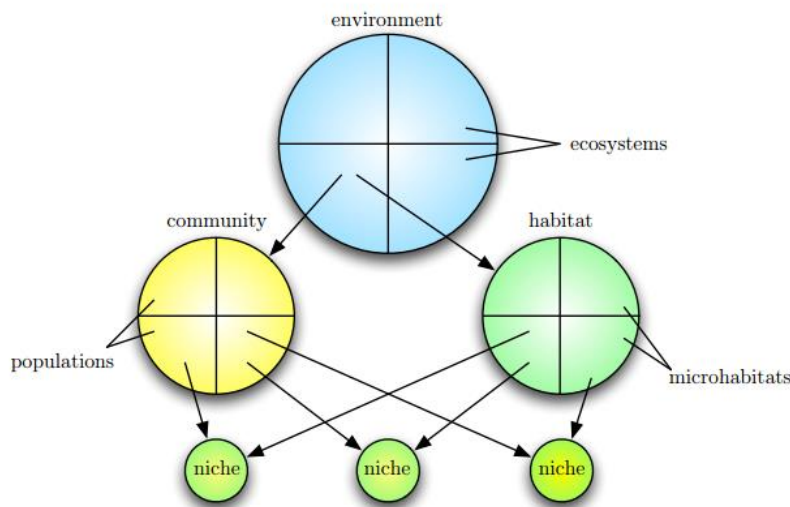


Figure 3.11 - Ecosystem Structure Adapted from: Briscoe, 2009)

3.4.1. Digital Entrepreneurship

Entrepreneurship can be divided into different categories. The digital entrepreneur, -he who uses the Internet as a tool to create business opportunities-, falls into one of these categories. According to the European commission, digital entrepreneurship; “embraces all new ventures and the transformation of existing businesses by creating and using novel digital technologies. Digital

enterprises are characterised by a high intensity of utilisation of novel digital technologies to improve business operations, invent new business models, sharpen business intelligence and engage with customers and stakeholders” (European Commission, 2013). Furthermore, two types of digital entrepreneurs can be distinguished. The first category of digital entrepreneurs is the pure player, who is operating on a hundred per cent digital base. The second category of digital entrepreneurs is the one that mixes a digital with a physical presence (Andrés, 2013). To keep this thesis specific and defined, the research shall only consider pure players.

3.5. Global Startup Ecosystem

Throughout the world, there are several ecosystems with various industries, but definitely that an ecosystem stands apart from all other: Silicon Valley. Silicon Valley is one entrepreneurial ecosystem of those few places in the world whose name has become shorthand for an entire industry. For half a century, this cluster of suburban communities in northern California has produced successive waves of globally significant innovation in electronics and computer technology, and been an incubator for countless entrepreneurial enterprises and a generator of astounding levels of wealth (O’mara, 2006).

The Silicon Valley’s success has spawned a powerful creation mythology whose iconic figures are quirky but brilliant “garage entrepreneurs”, a type embodied by HP founders William Hewlett and David Packard, who began their company in a Palo Alto garage in 1939. Nowadays, it’s seen as mainly a mecca for startups, but in many ways it is the coexistence of large firms as Google and other powerful and successful companies, which provide markets for startups’ offerings, a source of human capital, and often expertise, along with startups that make the ecosystem viable.

According to the Global Startup Ecosystem Ranking (Herrmann *et al.*, 2015), the startup ecosystem’s top 20 is composed by the following: Silicon Valley (U.S.A.); London (U.K.); Los Angeles (U.S.A.); Tel Aviv (Israel); Berlin (Germany); Boston (U.S.A); Chicago (U.S.A.); New York City (U.S.A); Amsterdam (Netherlands); Seattle (U.S.A.); Austin (U.S.A), Paris (France); Singapore (Republic of Singapore); Vancouver (Canada); Sao Paulo (Brazil); Montreal (Canada); Bangalore (India); Toronto (Canada); Sydney (Australia) and Moscow (Russia).

As witnessed in Figure 3.12, where the startup ecosystem’s top 20 ranking is depicted, North America leads with ten ecosystems, Europe contributes with six ecosystems, while Asia presents three ecosystem, and Latin America with only one ecosystem in the top 10. From this analysis it’s possible to conclude that the largest startup ecosystems are located mainly in North America

and Europe, with the North Americans showing a higher entrepreneurial development than its European equivalents.

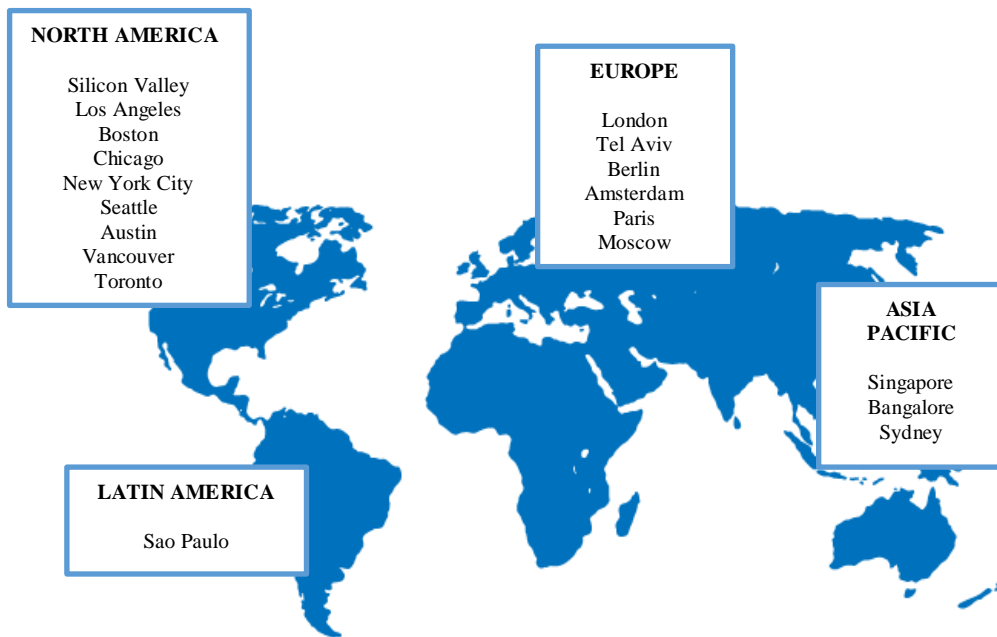


Figure 3.12 - Top 20 Startup Ecosystems (adapted from: Herrmann et al., 2015)

This development is even more perceptible when analyzing the total exit volume in 2013 & 2014. As illustrated in Figure 3.13, Silicon Valley dominates the global scene with an astonishing 47.3% of the value of all startup exits in the top 20, while the North American ecosystems total 72% of the total exit volume, against the more modest 26.6% registered by the European ecosystems. However, by analyzing at the value volume evolution over the last three years, it is possible to claim that the global ecosystem landscape is maturing, with non-Silicon Valley ecosystems of the top 20 capturing 14% more of the exit value volume.

Defining Startup Ecosystems

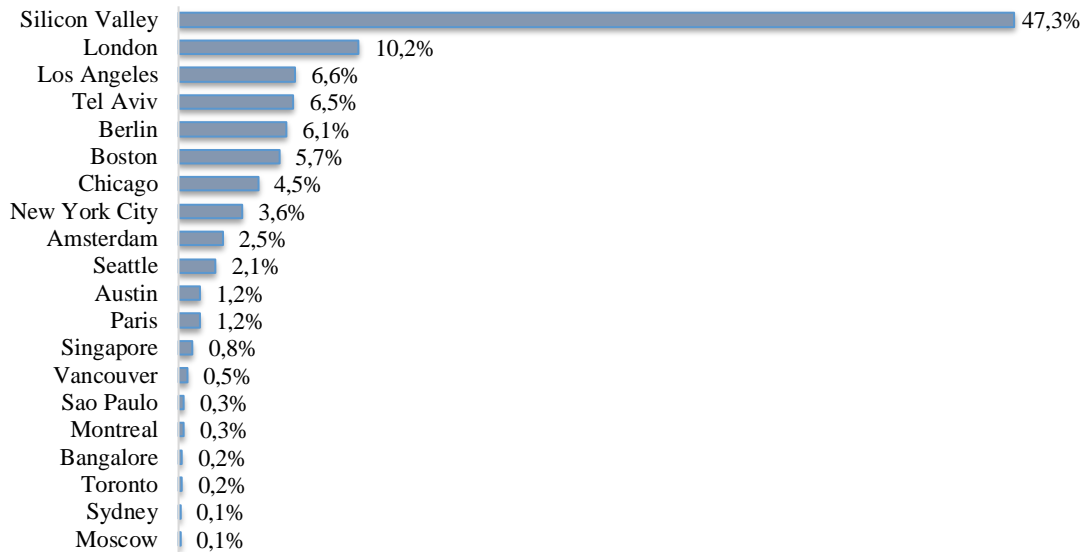


Figure 3.13 - Total Exit Volume 2013 & 2014 (adapted from: Herrmann et al., 2015)

Looking at the relative growth rates of exit value based on a 2013-2014 two year moving average, depicted in Figure 3.14, one can see that Canada showed no growth, while U.S.A.'s ecosystems registered a 46% growth in their exit values, its European counterparts showed a much more notable growth, growing a 314% rate, whereas Latin America ecosystems grew 209%, Asia-Pacific grew 99%. As for the exit value, it grew much faster in the top European ecosystems than in the top U.S.A ecosystems: 4.1x in Europe against 1.5x in the U.S.A., yet the exit values are still on average 82% higher in the U.S.A than in the European ecosystems.

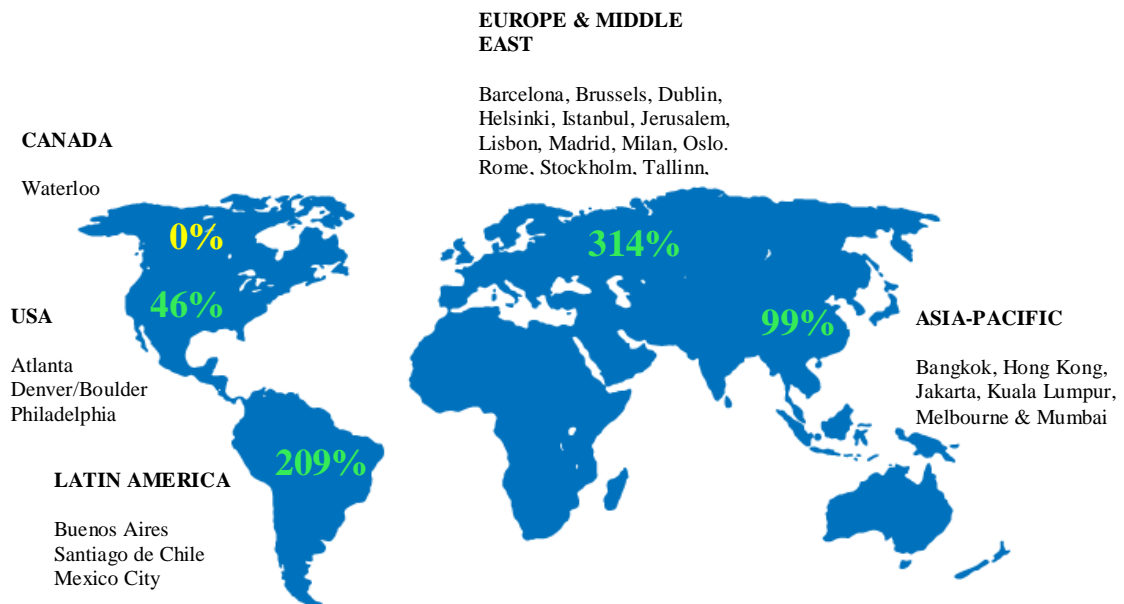


Figure 3.14 - Global relative growth rates of exit value and the runners-up (adapted from: Herrmann et al., 2015)

3.6. European Startup Ecosystems

Taking a closer look at the European ecosystems in the startup ecosystem’s top 20 ranking — Tel Aviv, London, Berlin, Paris, Moscow and Amsterdam — Tel Aviv in the other hand has seen its rank drop in the last two years, having fallen from 2nd to 5th; London showed a slight improvement, moving one position in the ranking from 7th to 6th in 2015; Berlin was the ecosystem that grew the most, moving from 15th in 2013 to 9th in 2015, which is notable since, in all ecosystems present in the top 20 this ecosystem has the more positively developed within 3 years, from the pass 9th position to 3rd position in 2015; Paris keep the last position at 11th position in 2015; Moscow moving one position in the ranking from 14th to 13th in 2015 and lastly, Amsterdam is a premiere in the top 20, coming it has seen its efforts rewarded, debuting in this list in the 19th position.

3.6.1. Tel Aviv – Israel

This ecosystem, which dropped from 2nd in 2013 to 5th in 2015, due in large part to improvements in the evaluation methodology which de-emphasized the metric of density of startups per capita, is a powerhouse in the global startup scene, being the second largest European ecosystem only behind London, as well as the third fastest growing ecosystem in the top 10, having the highest startup density in the world. Startups in Tel Aviv traditionally focused on enterprise IT, security, and networking technology, being often based on the technology developed by the Israeli army, however in recent years this ecosystem transitioned to far more diverse sectors, such as Ad-tech, e-Commerce, Big Data, SaaS, among others. While this ecosystem possesses some difficulties in attracting international talent, startups in Tel Aviv have had great success in reaching customers in the U.S.A., Europe, and Asia. Tel Aviv is expected to continue expanding, especially in looming sectors such as the Internet of Things, Big Data, and Bitcoin.

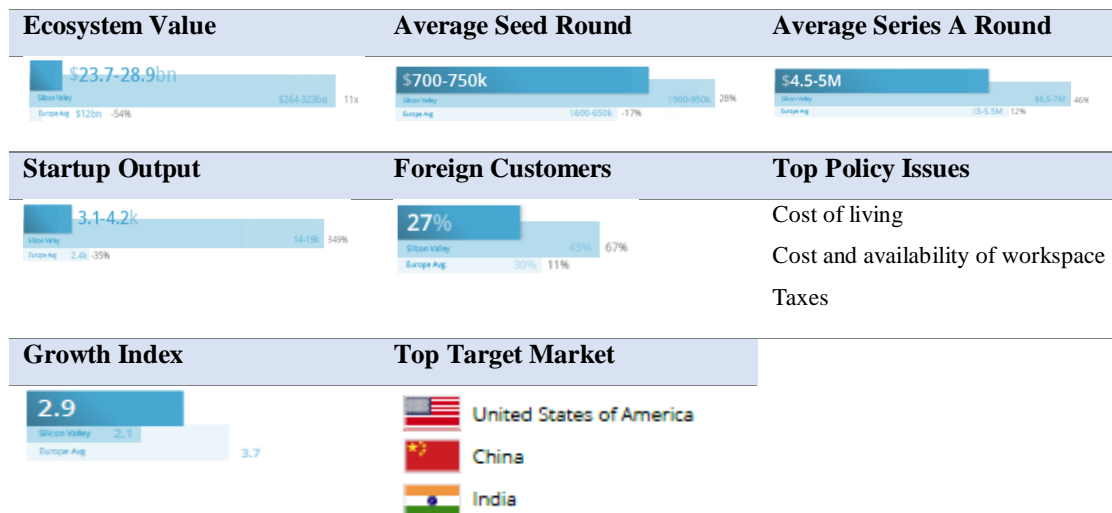


Figure 3.15 - Selected data on Tel Aviv’s ecosystem (adapted from: Herrmann et al., 2015)

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3.6.2. London - The United Kingdom

London, which moved one position in the startup ecosystem's top 20 ranking, from 7th in 2013 to 6th in 2015, is one of the most prominent ecosystems in the world, reporting the second fastest growth index in the top 10, and also being the fourth largest ecosystem in the world, and the biggest ecosystem in Europe, with this performance resulting from London's privileged location, being considered the cultural and business capital of Europe, but also from its solid funding landscape and its ambitious government initiatives. This ecosystem is also the most diverse in the world, with over 50% of foreign employees, although this value is explained by its sub-optimal hiring conditions, resulting from the costs of living, and from London's lack of entrepreneurial spirit. London specializes in various sectors, such as Media, Fashion, FinTech, and e-Commerce, and it stands out for having as target market its own market (U.K.), U.S.A., and China. More information on London's startup ecosystem is presented in Figure 3.16.

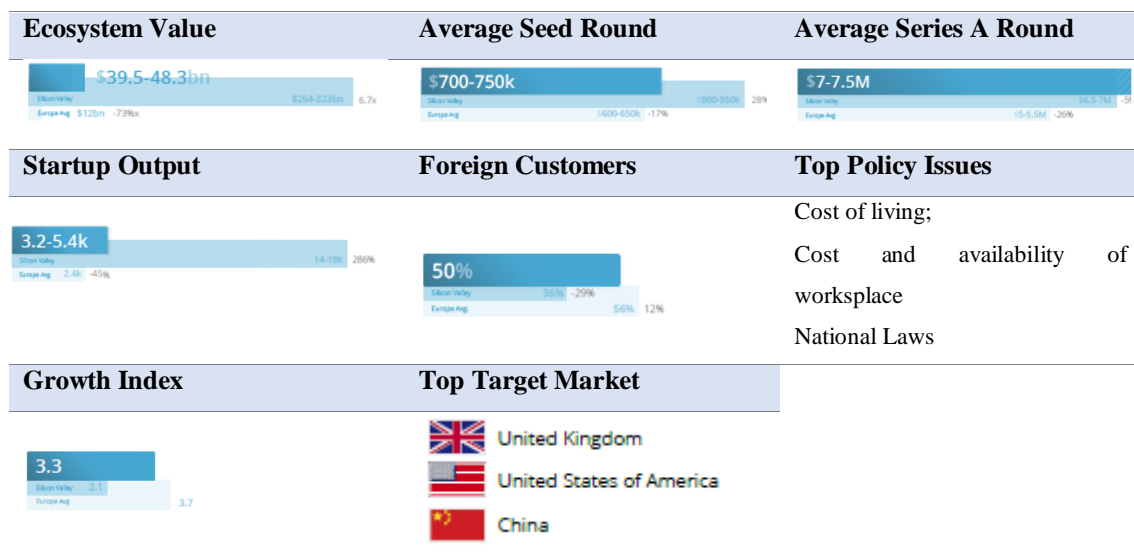


Figure 3.16 - Selected data on London's ecosystem (adapted from: Herrmann et al., 2015)

3.6.3. Berlin - Germany

Ranked 9th in 2015 from 15th in 2013, Berlin was the fastest growing ecosystem in this ranking, with its growth being justified by the explosion in VC investment, by the high profile IPOs valued in more than \$6 billion of Rocket Internet and Zalando, and by the exponential growth in exit volume due to startups such as Sociomantic, Wunderlist, and Quandoo. This German ecosystem has as its main markets the U.S.A, U.K. and Germany, and traditionally it specialized in e-Commerce, Gaming, and Marketplaces, yet recently it has started to showing potential in other sectors such as SaaS, and Adtech. Though Berlin has been benefiting from a soaring inflow of

international talent, mainly due to the low living cost and to the strong creative scene, its rigid regulatory investment environment, as well as its weak local exit market have been restraining this ecosystem’s growth. More information on Berlin’s startup ecosystem is presented in Figure 3.17.

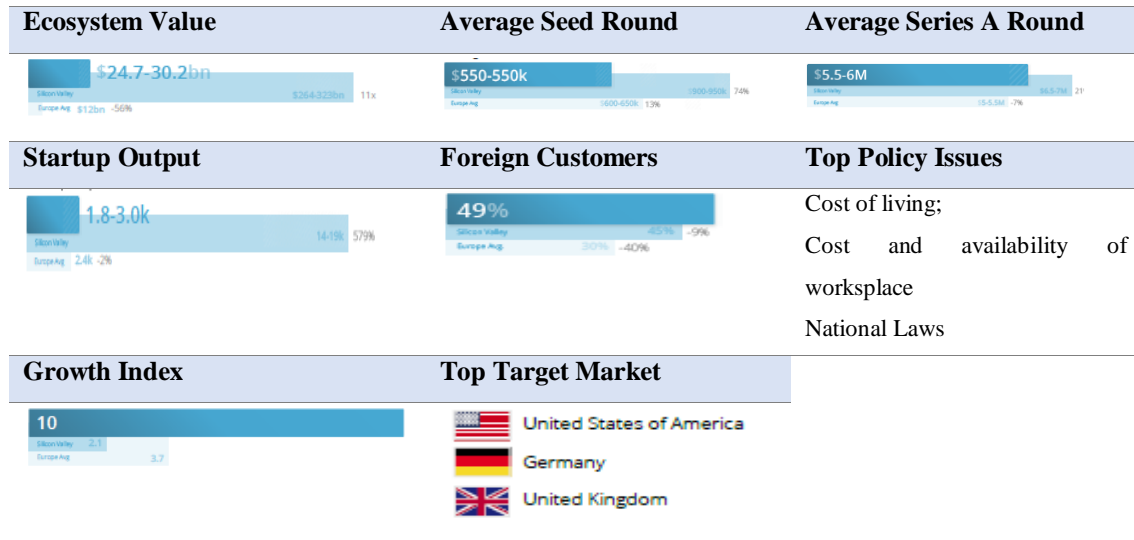


Figure 3.17 - Selected data on Berlin’s ecosystem (adapted from: Herrmann et al., 2015)

3.6.4. Paris - France

Ranked with 11th in 2013 and in 2015, however Paris has the second largest GDP for any metropolitan region in Europe and incorporates one of the continent’s largest dedicated business district: *La Défense*. The French capital boasts of between 3 000 active tech startups such as EdTech, the sharing economy, collaborative consumption, and artificial intelligence and this ecosystem has as its main markets the U.S.A, France and China. More information on Paris’ startup ecosystem is presented in Figure 3.18.

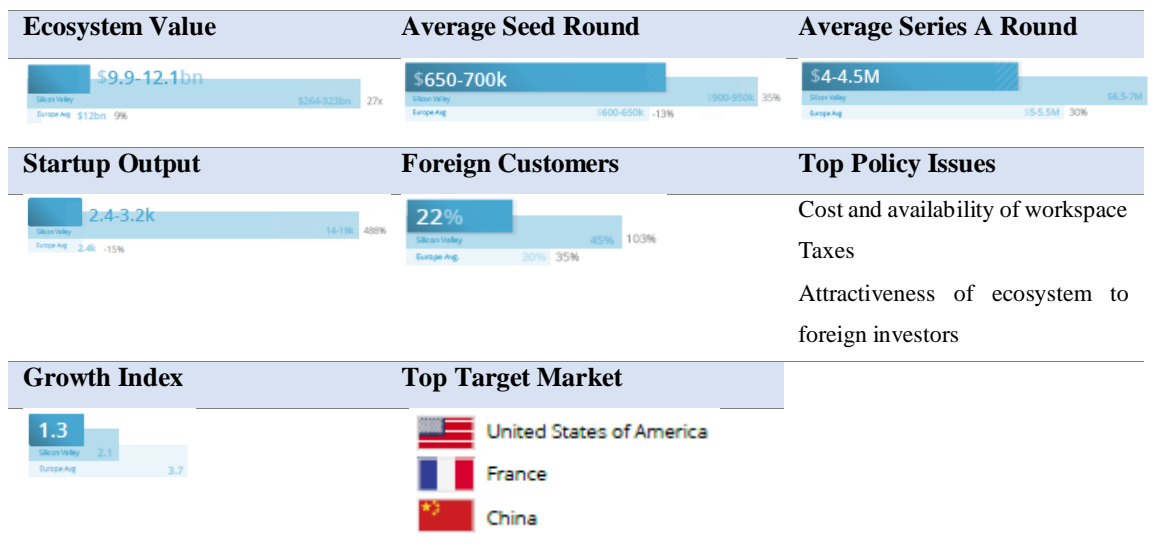


Figure 3.18 - Selected data on Paris’ ecosystem (adapted from: Herrmann et al., 2015)

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3.6.5. Moscow - Russia

Moscow increased a position, rising to 13th in 2015 and accounts for about 22% of the Russian GDP and is home to 2 300 to 3 800 active tech startups. Moscow's higher education infrastructure feeds the ecosystem with some of the best software engineers in the world. Stands out for the annual software engineer salaries are just a fraction of those in mature ecosystems. With salaries averaging less than \$40,000 per year, employing a software engineer in Moscow is 75% cheaper than in Silicon Valley. It is one of the fastest ecosystems to hire, another fact which justifies its ranking. This ecosystem has as its main markets the U.S.A, Russia and China. More information on Moscow's startup ecosystem is presented in Figure 3.19.

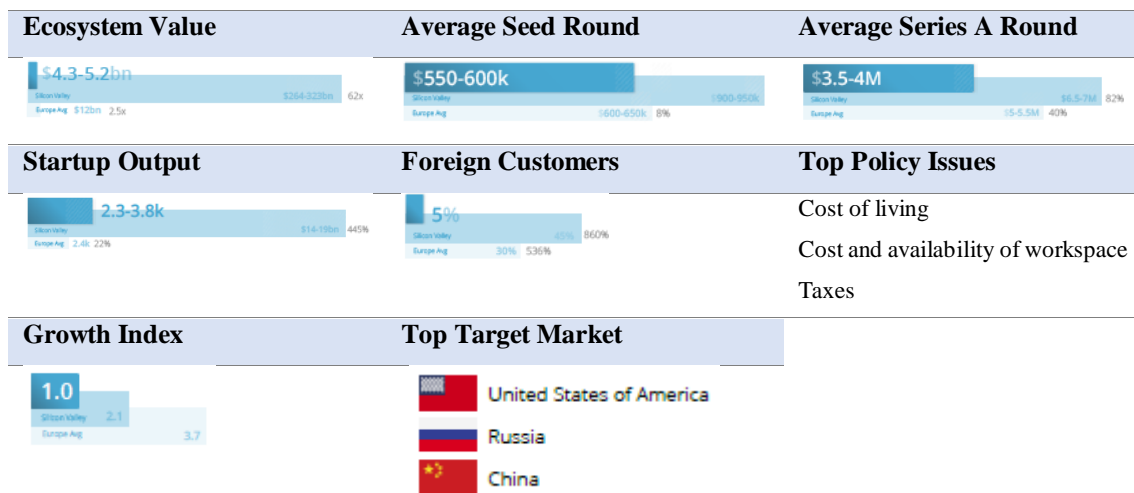


Figure 3.19 - Selected data on Moscow's ecosystem (adapted from: Herrmann et al., 2015)

3.6.6. Amsterdam - Netherland

Amsterdam, the European newcomer, enters the ranking at 19th with more than 1,900-2,600 tech startups and the 5th highest Growth Index of the top 20, previously presented. This ecosystem is an attractive location for tech startup founders due to its unique lifestyle aesthetic and great startup infrastructure, and while it's not as big of a startup ecosystem as more prominent European counterparts like London or Berlin, it certainly has the ambitions to become like them. The government provides funds to invest in the ecosystem, which provides the development of accelerators and incubators programs. The government itself created *StartupDelta*, Which is trying to unite and better allocate resources the startup of the Netherlands que are currently scattered across the country. This ecosystem has as its main markets the U.S.A, Russia and China. More information on Amsterdam's startup ecosystem is presented in Figure 3.20.

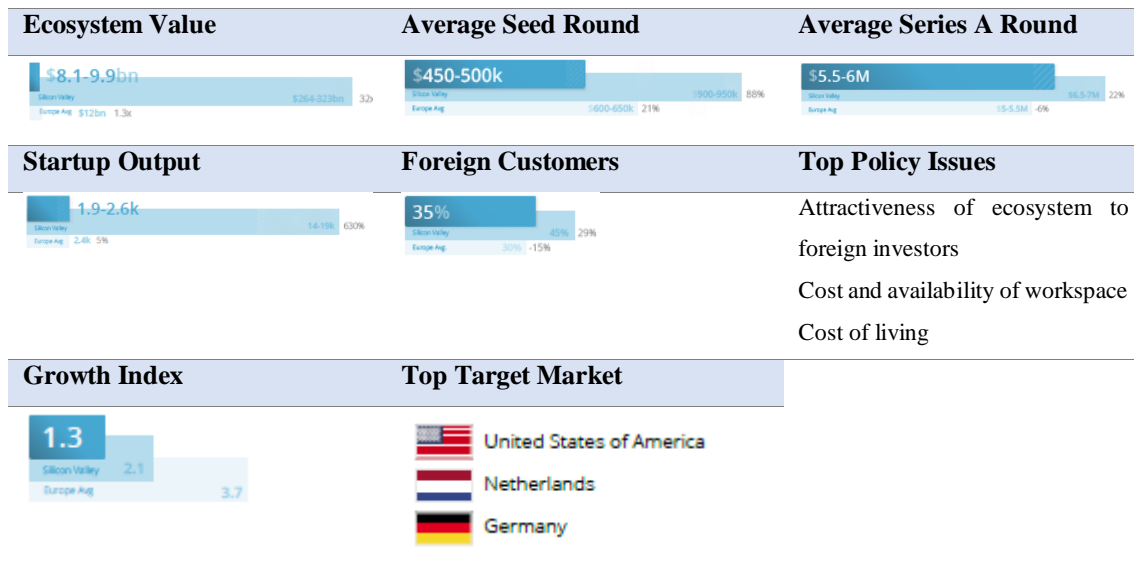


Figure 3.20 - Selected data on Amsterdam's ecosystem (adapted from: Herrmann et al., 2015)

There are other highly relevant ecosystems. According to the Global Startup Ecosystem Ranking (Herrmann *et al.*, 2015) the ecosystems in high growth in Europe are: Barcelona, Brussels, Dublin, Helsinki, Istanbul, Jerusalem, Lisbon, Madrid, Milan, Oslo, Rome, Stockholm, Tallinn. For the present study, of this set of ecosystems, were investigated the following ecosystems: Helsinki (Finland), Lisbon (Portugal), Madrid (Spain), Rome (Italy) and Stockholm (Sweden), apart from Athens (Greece) and Malmo (Sweden), which similarly are of utmost importance for this study.

3.6.7. Lisbon – Portugal

Lisbon is the capital of a country with 10.4 million habitants and center of a Metropolitan area with a population of 2.8 million, exploiting its geographical location as a gateway to the Americas, Africa and the EU. This a region where it's possible to find the decision-making centers of the country's economy , accounting for around 37% of national GDP and employs around 1 386 thousand people (29% of the jobs in the country), expressing a apparent productivity of work 1.3 times greater than that of the country. Lisbon concentrates a large number of companies with a high degree of technology and R&D, being the space where they are located approximately 317 000 companies, since, the city has been undertaking strategies to promote entrepreneurship and spread innovation among SMEs, to position the city as an Atlantic business hub and an Atlantic startup city. It is also in the region of Lisbon that the staff in foreign companies and in high technology companies has more weight, compared with the national average. Economically, Lisbon has about 5 839 companies in ICT specific sector with 4.3% of Lisbon Region GD, has More than 53 000 people employed in the ICT sector, since 2004 annual average employment

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rate in ICT 3,6%, the number of ICT patent applicants with about 9.39 applications made to the European Patent Office, the overall turnover of 8.096 M€ in 2012 and finally about 8 740 Graduates from tertiary education in S&T areas in 2012/13.

3.6.8. Madrid – Spain

Capital and largest city of Spain, with the population of the city being almost 3.2 million and that of the Madrid metropolitan area, around 6.3 million and known for the quality of its technical talent. The Madrid urban agglomeration has the third-largest GDP in the European Union and its influences in politics, education, entertainment, environment, media, fashion, science, culture, and the arts all contribute to its status as one of the world’s major global cities. Due to its economic output, high standard of living, and market size, Madrid is considered the major financial center of Southern Europe and the Iberian Peninsula; it hosts the head offices of the vast majority of the major Spanish companies. According to Foundum, currently, has about 185 entrepreneurs, 23 advisors, 78 service providers and 54 investors. More information on Madrid’s startup ecosystem is presented in Figure 3.21.

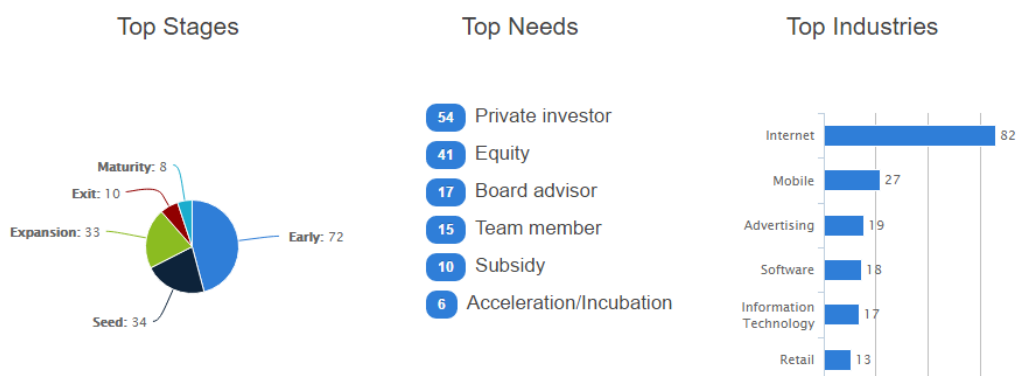


Figure 3.21 - Madrid’s startup ecosystem – Startup Statistics (Source: <http://foundum.com/>)

3.6.9. Rome – Italy

Capital of Italy, with the population of the city being almost 4 million and the most important center for startups in Italy. Offering entrepreneurs and investor the chance to build new companies from the ground up and to connect with one another, in order to build a powerful ecosystem for developing new businesses and the most startups in Italy are oriented to succeeding firstly in Rome, and then to scale up European-wide and globally. The Rome startup scene has seen a significant progression in the last years, mostly driven by the new opportunities connected with

the boom in the mobile application sector. Being a solid ICT/creative industries and aerospace Italian hub, Rome has an incredible potential to exploit links to hubs across the EU and worldwide. According to Foundum this ecosystem has 7 accelerators and incubators, 29 coworking spaces, 6 fab-labs, 4 institutional investors, 3 crowdfunding platforms and 316 innovative startups. More information on Rome’s startup ecosystem is presented in Figure 3.22.

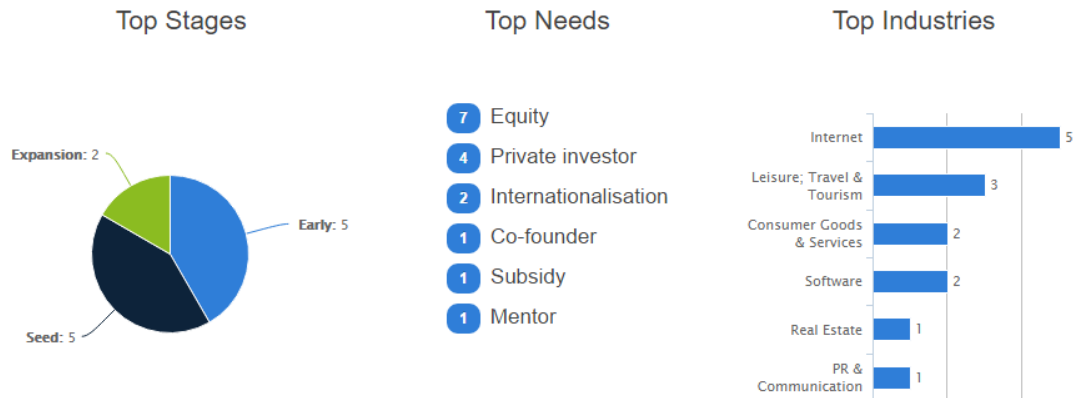


Figure 3.22 - Rome’s startup ecosystem – Startup Statistics (Source: <http://foundum.com/>)

3.6.10. Athens – Greece

Athens is the capital of Greece, and the wider Attica area (Athens city center and Athens’ suburbs) is home to around 4-5 million people (almost half of Greece’s population). Greece is located at the crossroads of three continents: Europe, Asia and Africa. It’s the southernmost point of the Balkan Peninsula and the southeastern most point of Europe. The geographical position of Athens has helped develop a civilization of commerce and entrepreneurship since ancient times that was passed to modern Greece. Indeed, owning and running a business is nothing new to Greek economy, as more than 99% percent of all companies in the country are small or medium-sized.

3.6.11. Helsinki – Finland

Capital of Finland, with the population of the city being around 600 000 and the most important center for startups in Finland and it’s the country with the third highest R&D and GDP ratio (3.8%) in the world. Its unique combination of high-end research, education, innovation and technology makes it stand out in the European Union and the world at large. Both the Finnish government and Nokia (one of the largest Finnish company) have contributed immensely to the fact that Finland has become one of the major tech hubs outside of Silicon Valley. Together helped both local and foreign startups grow through funding and beneficial policies, such as

Defining Startup Ecosystems

government incentives to foster and promote innovation. Another contributor to this success is the rich collaboration and knowledge transfer between startups and Finland's higher education institutions and R&D centers. Finland is widely known for the success of its gaming startups such as Rovio and Supercell, but other sectors including cleantech, health and mobile are also doing remarkably well. This ecosystem is characterized for comprises most high-level startups in gaming and health and wellness startups are becoming a close second (Figure 3.23).

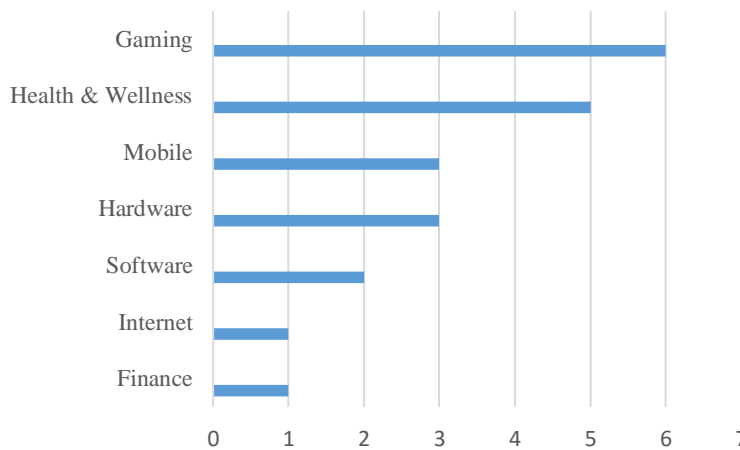


Figure 3.23 - Count of company by sector (Adapted: <http://www.geektime.com/>)

An average angel investment was 49 000 € for 8% of equity in the company, making the average early stage valuation – 612 500 €. Sweat equity is also on the rise, with 57% of deals including some sort of sweat equity, compared to just 25% in 2012. Most of that is either in marketing and sales (32%) or financial consulting (29%). As observed, investors prefer gaming (\$54.9 million) over health and wellness (\$36.94 million). After health and wellness, the mobile sector also raised a significant amount of capital: \$30.5 million. Manufacturing also saw a rise from 6% to 11%. The ICT and Mobile industry investments dropped from 47% to 21% and from 10% to just 3% respectively. The drop spread somewhat into Retail, Finance, Logistics and Biotech. Actually, Finland has 34 active angels, 13 VC management companies and 19 accelerators and incubators.

3.6.12. Stockholm – Sweden

Stockholm is the capital of a country with 790 000 habitants and center of a Metropolitan area with a population of 9.59 million. Its noteworthy seeing Stockholm as one of the most booming entrepreneurial cities in Europe and the tech industry finds it really easy to find talent and potential in Sweden's capital. Around Stockholm, startup hubs, activities, spaces and accelerators are now emerging, matching innovative companies with big industries' need for innovation and new talents and about \$330 million invested in Stockholm startups in 2013, more 60% from 2012.

3.6.13. Malmo – Sweden

Malmo is the 3rd largest town in Sweden with 300 000 habitants and located only 20 minutes away from Copenhagen airport with direct lines to most European cities and the innovation hubs in USA, Asia and the Middle East. During the past 5 years it has become one of Scandinavia’s most dynamic places for startups in ICT, mobile, biotechnology, clean-tech and design. Forbes ranked its potential city as 3rd most innovative city, since two of largest universities (Lund and Malmö) have in total over 70 000 students. Malmo has the privilege of hosting several Sweden’s largest companies like Ikea, Ericsson, Sony Mobile, Tetra-Pak, Axis and Qlicktech.

In brief, Sweden has 22 000 tech companies and 33% of the world’s over \$ 1 billion exits. Actually, there are about 850 active startups, 30 incubators, coworking spaces and accelerators. Skype, MySQL, Klarna, Spotify, Soundcloud are examples of notable Swedish founded companies. More information on Sweden’s startup ecosystem is presented in Figure 3.24.

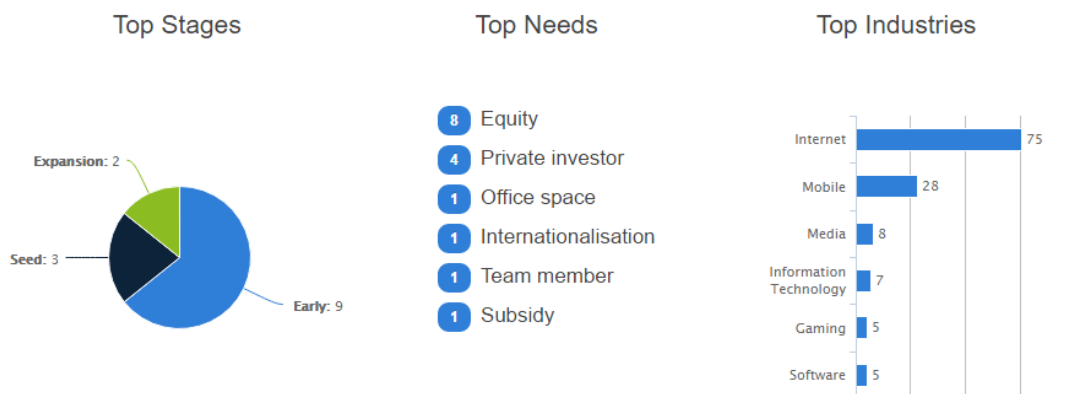


Figure 3.24 - Sweden’s startup ecosystem – Startup Statistics (Source: <http://foundum.com/>)

Chapter 4

Methodology

Throughout the following section the methodology used to conduct this study will be briefly outlined. In this chapter we will start by providing an overview to the research design, followed by a discussion about the research questions that this study will address, a description of the data collection methods, and finally by the characterization of the sample selection.

4.1 Research design

This dissertation aims to identify the trends of each ecosystem, analyzing each startup by economic sector, business model and pricing model and on the other hand, intends to recognize the strengths and the weaknesses of each ecosystem and provide some insights about startup ecosystems, by focusing in future thinking. In order to reach the objective of identify and understand the startup ecosystems, firstly a suitable methodology should be outlined. The methodology will assume an important role in the outcome of the study, as it will describe and justify the set of methods to be used throughout the research, data collection and results analysis of the dissertation. To accomplish the development of an appropriate methodology to the subject of this research, an action plan comprised by three stages was defined:

1. Literature Review
2. Research on Online Platform
3. Questionnaire Development

With regard to the first stage of the action plan, the literature review, following the definition of the topic to be analyzed we sought to acquire knowledge on the scope of study and establish a solid theoretical foundation for the upcoming stages of the research. In this process a descriptive review about the concepts related to startups, startup ecosystems and ecosystem actors is provided. Concerning to the specific topic of startup ecosystem, a more detailed analysis of the

actors central to the subject of study is provided, with business model, pricing model and economic sector being the focus of this study.

After the initial theoretical analysis to the scope of the study, we intended to identify the trends, strengths weaknesses, map startup ecosystem by economic sector and bring some insights from startups.

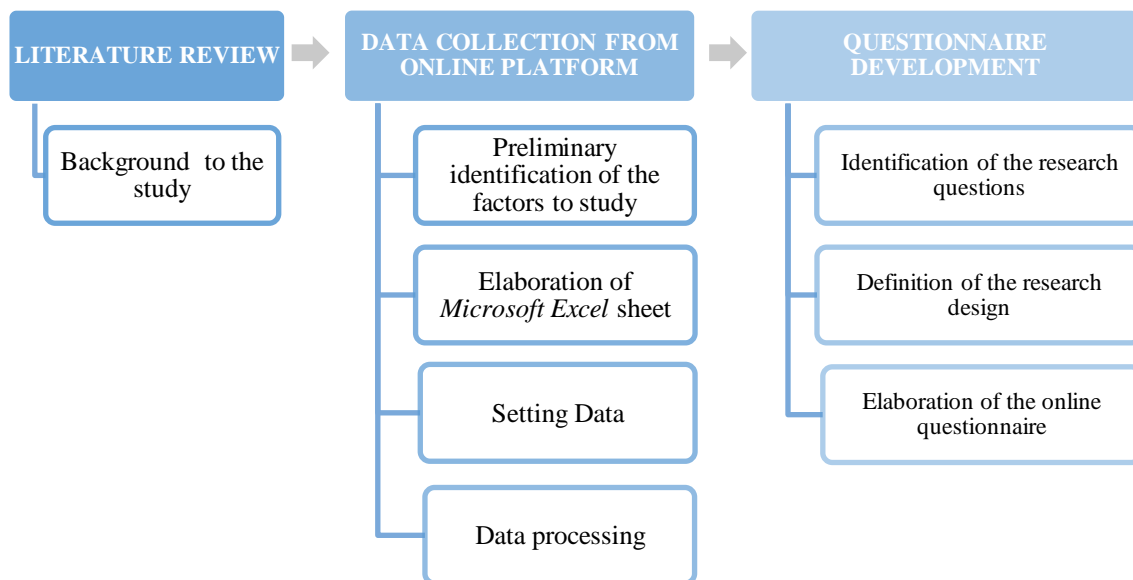


Figure 4.1 - Conceptual model of the research design

4.2 Research questions

Over the years, it has seen a fast growth, regarding of the number of startups and the consequent development of startup ecosystems, and in that sense, it is significant to understand certain choices and that lead to the success of the same. With the aim of studying the trends of the entrepreneurial ecosystems, with particular focus on the economic sector, business model and pricing model and to realize if the cities belonging to the same European region, have the same trends as strengths and weaknesses, and based on our findings from the conducted literature study and interview, we identified two main research questions to which we aim to answer:

- 1. Are there significant differences between European Startup Ecosystem with regards to the Business Models in focus?**

According to Nesta, there's no preference regarding the choice of business model. Actually, opinions differed on whether to focus on B2B or B2C ventures, and some

managers suggested additional categories such as 'B2startup' i.e. where a startup's initial customers are other startups. The majority had a focus on B2B; 90 per cent of Hub:raum's startups were B2B. Rocket Internet is a notable exception: 70–80 per cent of its startups were B2C. In this sense, we intend to find out which is the predominant model in each ecosystem studied in order to understand the current preferences.

2. Are there significant differences between European Startup Ecosystem with regards to the Pricing Models in focus?

Based on the literature study conducted earlier in this research, it is possible to note that some actors have performed general studies on the pricing models "Freemium" and "Subscription", models very common in business models of startups. Thereby, we intend to continue these studies, adding value to study various European ecosystems and identify the pricing models most used.

3. Are there significant differences between European Startup Ecosystem with regards to the Economic Sectors in focus?

All information collected for literature review address this issue, were selected of reports prepared by the EU, more specifically by the OECD. This entity has recently produced a report, in order to understand the phenomenon "Young Entrepreneurship", presenting an overview of youth entrepreneurship in the context of the European policy schedule and individual Member States. It looks at factors que influence the decision to self-employed Become and examines the individual and social attitudes of young people towards entrepreneurship, comparing Europe with other comparable parts of the world. Were presented a several classifications that helped to understand what economic sectors are more preferred by the Member States. Therefore, the present study aims to add value, particularly studying each European ecosystem, giving more detailed information.

These research questions will be answered with resort to a questionnaire which will be used to collect empirical data and thus to draw conclusions. From the answers to the research questions some insights from European startups ecosystems will be provided on the last chapter of the dissertation.

4.3 Data collection methods

With the aim of collecting empirical data for the research work, several sources were used throughout the course of the dissertation. Being the research methodology of this study comprised by three main stages, different data collection methods were used for each of these stages. The diverse methods used to conduct this study are summarized in Figure 4.2.

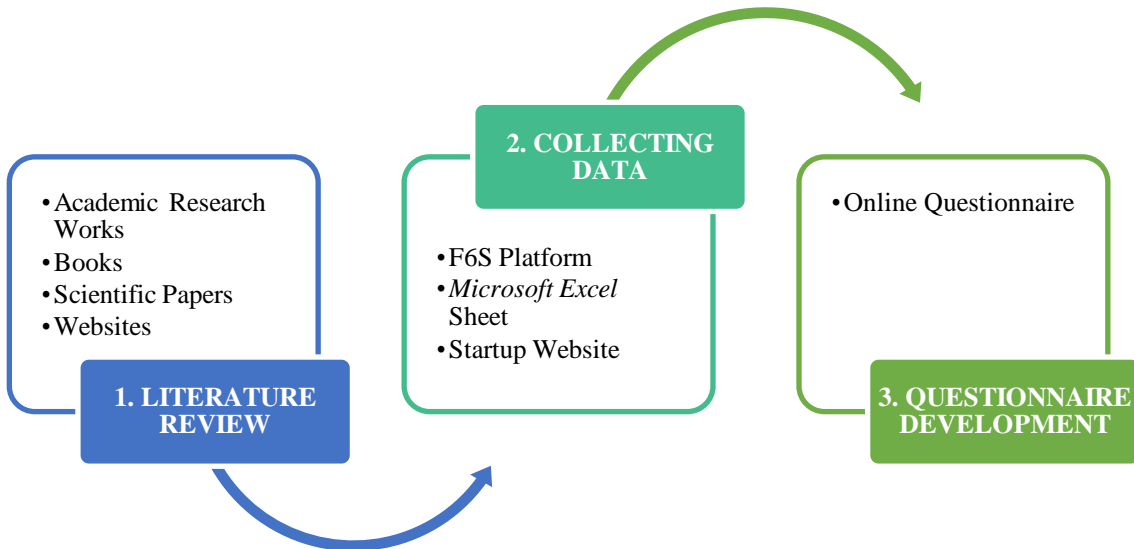


Figure 4.2 - Research data collection methods

In a first stage, comprehended by the literature review, our aim was to acquire a solid theoretical foundation on startups, startup ecosystems and ecosystem actors. This data collection process comprised the in-depth use of several sources, such as academic research works, books, scientific papers from organizations focused on entrepreneurship and also, at a more reduced scale, websites. These sources were mostly collected through the databases of B-on and Google Scholar, but also from blogs and other websites. Considering the large amount of theoretical information on the field of entrepreneurship, naturally we were confronted with the challenge of filtering the reliable information from all of the information available. In that sense, we were particularly careful in the collection of data, having selected information exclusively from reputed authors and institutions that gave us some assurance on the quality of their studies. While several sources contributed to the development of this research work, a special remark should be made about the valuable contribution that the reports from Nesta and from the European Commission had in the overall direction of this study.

Following the development of the theoretical foundation of the research, we proceeded to determine the most relevant startup ecosystem to study according to the scope of the dissertation. In this stage we selected 8 ecosystems: Amsterdam (Netherlands), Athens (Greece), Helsinki (Finland), Lisbon (Portugal), Madrid (Spain), Malmo (Sweden), Rome (Italy) and Stockholm (Sweden). Then drew up a *Microsoft Excel* sheet to record the name of each of the startups, website, email, economic sector, business model and pricing model – Figure 4.3.

N.	STARTUP	WEBSITE	E-MAIL	ECONOMIC SECTOR	BUSINESS MODEL	PRICING MODEL
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						

Figure 4.3 - Amsterdam's Microsoft Excel Sheet

This information was gathered from an online platform - F6S. F6S is an online platform which is the leading startup community. In this platform startups grow together through startup programs, deals, jobs, discussion and events. Actually, is the home for founders and startup programs globally with over a hundred thousand jobs and talent looking for jobs, thousands of startup organizations, 490 000 startups and millions in free founder benefit and founders apply to accelerators, pitch investment funds, post or apply for jobs, get free deals and grow every day. Currently, 99% of accelerators choose startups on F6S, about 1.3 million founders use F6S benefits. With this platform it's possible connect people with startups that need talented people and about 132 432 users are looking for opportunities at recruit talent.

Methodology

After the necessary information collecting, we used the analysis tools in *Microsoft Excel*, for all organized and processed information, through graphics and tables for each startup ecosystem.

Finally, after having acquired information through the online platform about the startups, we proceed to the analysis tool in *Microsoft Excel*. This was the method chosen because of the set of tools available to quantify and evaluate the data the parameters under study – economic sector, business model and pricing model - for the future to have an effective method of comparison for the next stage – Questionnaire.

The questionnaire used on our study was fully conducted in English, and consisted of 14 questions divided into two main sections. The first section, aimed to analyze the startup profile of the respondent, was composed by 11 questions. These questions were used to understand certain aspects related to the startup's profile since where is located, the foundation year, the current stage, the economic sector, the business model, the pricing model and the investment. The second section was composed for 3 questions, and its objective was of collecting data about the ecosystem profile and startup's perception of startup ecosystem. The questions comprised in this section focused on assessing the respondent's perspectives and receive some feedback from economic sectors that they expect will grow in the coming years. When designing the questions used in the questionnaire we were careful not to design questions that might led to confusion or misinterpretation by the respondent, either due to non-comprehensive language or by inappropriate answer format.

4.4 Sample selection

This work is part of the Digistart project is an EU funded research project in the area of startup ecosystems. The project aims to support European-wide digital ecosystems through a set of coordinated activities targeting Lisbon and Malmo. Since the Swedish city Malmo, is included in this project, it was felt relevant to add the Swedish capital, Stockholm. According to Herrmann, London, Paris, Berlin, Moscow and Amsterdam are European ecosystems that are in the Top 20. It is the first time that Amsterdam was inserted in this top also added this ecosystem, the set of ecosystems to be studied. Madrid, Rome, Athens and Helsinki were selected because they belong to the same geographic region to set out above, thus dividing this set into two subsets: the Mediterranean region constituted by Lisbon, Madrid, Rome and Athens and the northern region constituted by Malmo, Stockholm, Amsterdam and Helsinki.

Chapter 5

Results from Data Analysis

The following chapter will present the results of the empirical study. First, the characterization of the startup ecosystems sample of respondents will be provided, where the dimension and profile of the sample will be analyzed. Afterwards, the overall results from the questionnaire will be presented, and finally the individual results by country and by type will be presented.

5.1 Sample Characterization

As mentioned previously the online platform F6S was a central tool for data collection, to know the background the startup ecosystem. Only were selected digital startup and each one was characterized by economic sector, business model and pricing model.

Table 5.1, represents the total number of startup logged on the platform, from the time of beginning the survey

STARTUP ECOSYSTEM	NUMBER OF STARTUPS
Amsterdam – Netherlands	1192
Athens – Greece	525
Helsinki – Finland	558
Lisbon – Portugal	619
Madrid – Spain	1420
Malmö – Sweden	78
Rome – Italy	648
Stockholm - Sweden	533

Table 5.1 - Research startup ecosystem participants

As can be seen, Madrid – Spain, is the largest ecosystem in the present study, classified as the first. Then, comes Amsterdam – Netherlands, Rome – Italy, Lisbon – Portugal, Helsinki – Finland, Stockholm – Sweden, Athens – Greece and finally Malmö – Sweden.

5.2 Data Analysis Results

In this subchapter, the data analysis results will be presented and discussed, where based on the collected data from the online platform. The main objective is to identify digital startups and then analyze them to identify the economic sector, its business model, its pricing model - key factors in the research.

The results of this research will be presented in graphic form: first for each ecosystem, representing the economic sectors such as the business models and the most relevant pricing models, concluding with a summary, with the most interesting and important aspects.

5.2.1. Data Analysis – Madrid (Spain)

Madrid, capital of Spain and the largest ecosystem of this study. According to F6S platform there are about 1420 startups registered, which makes this ecosystem requires special attention, since it is the largest ecosystem in the Iberian Peninsula. Currently, there are 30 different economic sectors, which are in the Top 10: Education, Lifestyle, Social Networking, E-commerce, Travel & Tourism, SaaS, Data & Analytics, Health/Medical, Finance and Entertainment. More information on Madrid's startup ecosystem is presented in Figure 5.1.

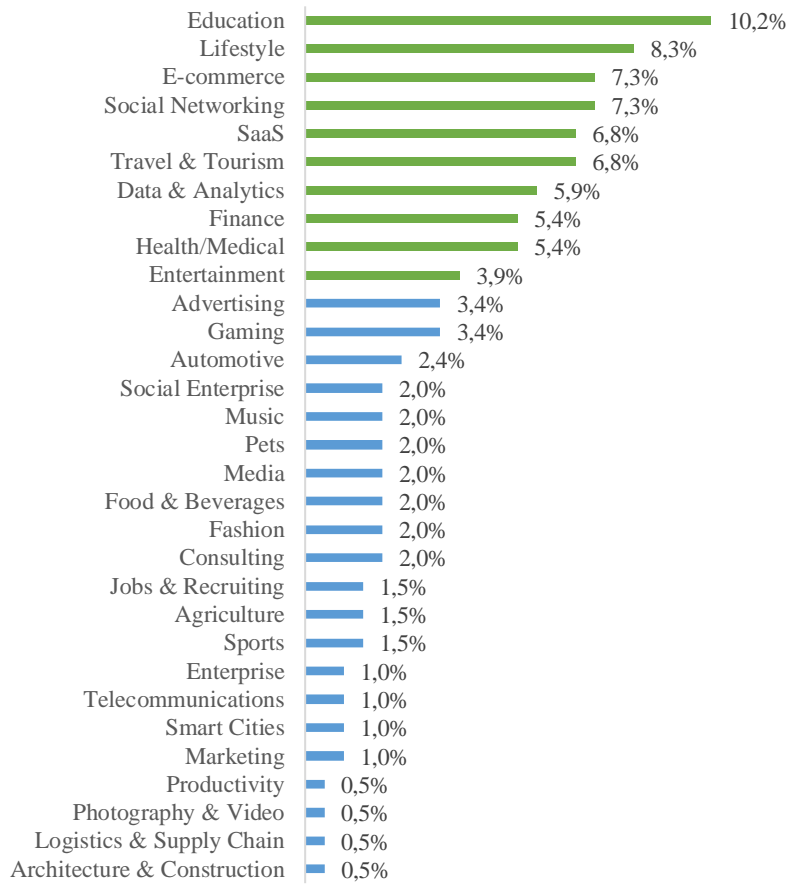


Figure 5.1 - Madrid's ecosystem by economic sector

With regard to business model, is the B2C what stands out, being then the B2B and at last, C2C. Finally, regarding to the pricing model, half of Madrilenian startups have the pricing model "Freemium" followed by "Pay per use" and finally, "Subscription". More information on Madrid's startup ecosystem is presented in Figure 5.2.

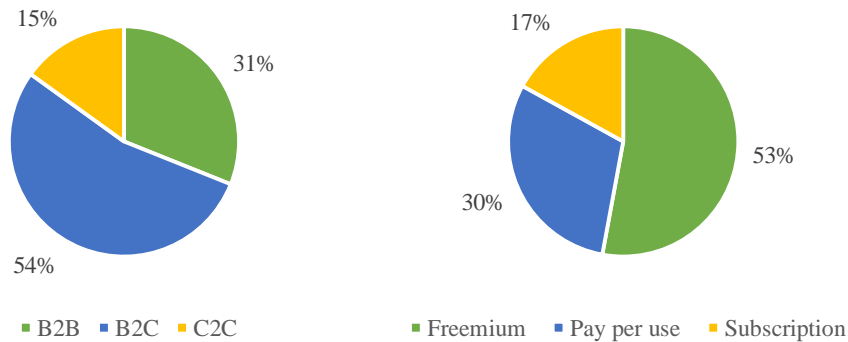


Figure 5.2 - Madrid's ecosystem by business model and pricing model

5.2.2. *Data Analysis – Amsterdam (Netherlands)*

Amsterdam, capital of Netherlands and the second largest ecosystem of this study. According to F6S platform there are about 1 192 startups registered, and this ecosystem is an attractive location for tech startup founders due to its unique lifestyle aesthetic and great startup infrastructure which makes this ecosystem requires special attention, as this ecosystem stands out by its own government that provides funds to develop accelerators and incubators programs. Currently, there are 32 different economic sectors, which are in the Top 10: SaaS, E-commerce, Travel & Tourism, Fashion, Food & Beverages, Education, Data & Analytics, Lifestyle, Health/Medical and Media. More information on Amsterdam’s startup ecosystem is presented in Figure 5.3.

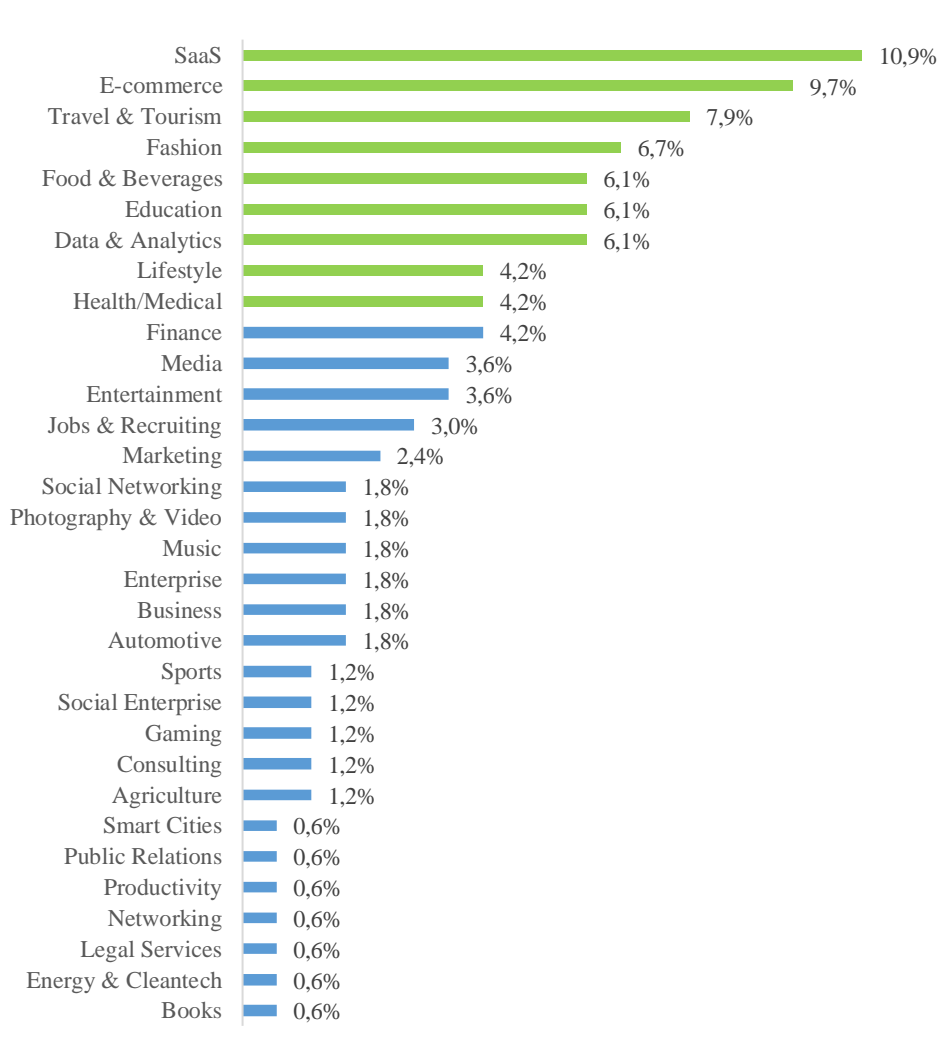


Figure 5.3 - Amsterdam’s ecosystem by economic sector

With regard to business model, the B2C business model is selected by the majority of startups, then by 6 points of differences, B2B is the second business model adopted and finally, C2C. Concerning to the pricing model, almost half of Amsterdam’s startups adopted for “Freemium” as the pricing model, followed by "Subscription" and finally, "Pay per use". More information on Amsterdam’s startup ecosystem is presented in Figure 5.4.

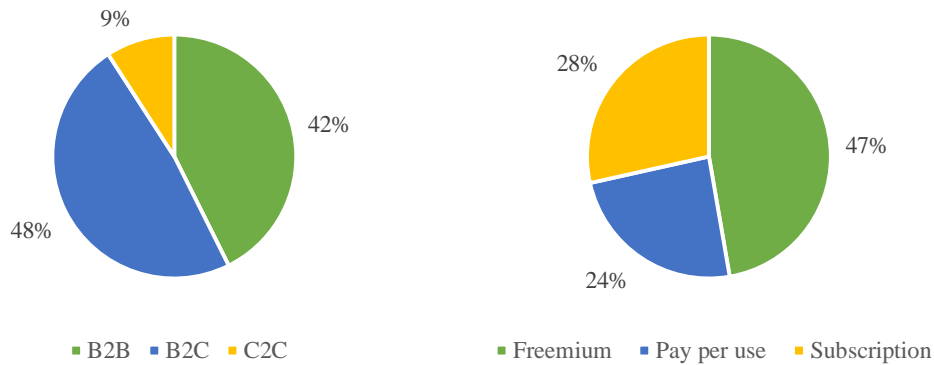


Figure 5. 4 - Amsterdam’s ecosystem by business model and pricing model

5.2.3. Data Analysis – Rome (Italy)

Rome, capital of Italy and the third largest ecosystem of this study. According to F6S platform there are about 648 startups registered. This startup ecosystem has seen a significant progression in the last years, mostly driven by the new opportunities connected with the boom in the mobile application sector. Currently, there are 24 different economic sectors, which are in the Top 10: E-commerce, Food & Beverages, Gaming, Entertainment, Travel & Tourism, Media, Sports, Health/Medical, Social Networking, Lifestyle, Finance, Education and Automotive. More information on Rome’s startup ecosystem is presented in Figure 5.5.

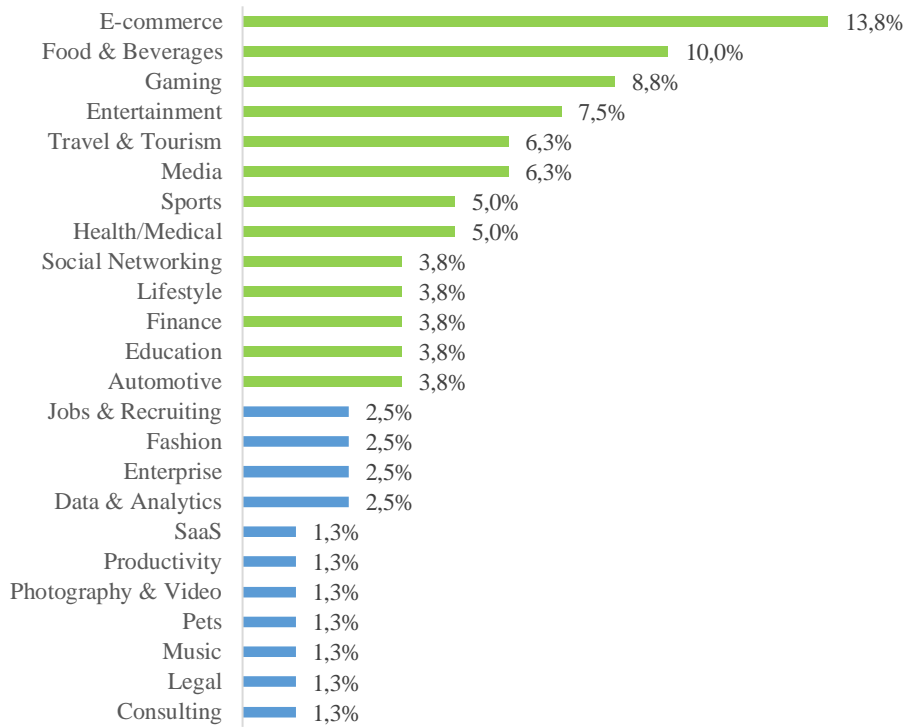


Figure 5.5 - Rome's ecosystem by economic sector

With regard to business model, the B2C business model is selected by the majority of startups, C2C is the second business model adopted and finally, B2B. Concerning to the pricing model, three-quarter of Rome's startups adopted for "Freemium" as the pricing model followed by "Pay per use" and finally, "Subscription". More information on Rome's startup ecosystem is presented in Figure 5.6.

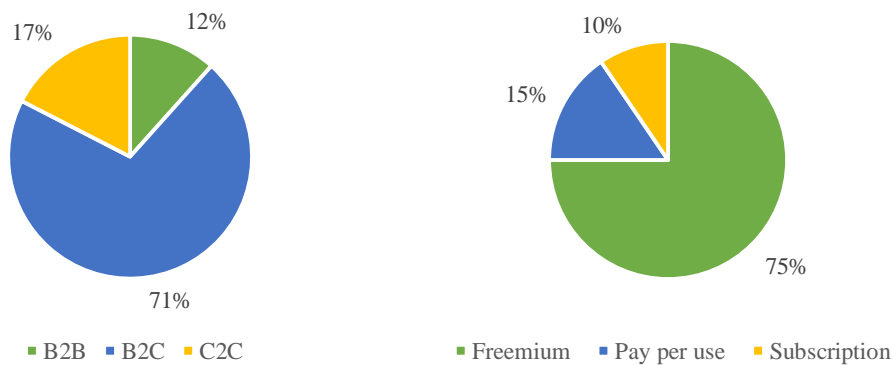


Figure 5.6 - Rome's ecosystem by business model and pricing model

5.2.4. Data Analysis – Lisbon (Portugal)

Lisbon, capital of Portugal and the fourth largest ecosystem of this study. According to F6S platform there are about 619 startups registered. This startup ecosystem it's been exploited by its geographical location as a gateway to the Americas, Africa and the EU. Currently, there are 24 different economic sectors, which are in the Top 10: SaaS, Education, Travel & Tourism, Social Networking, Data & Analytics, Entertainment, E-commerce, Fashion, Food & Beverages, Lifestyle and Consulting. More information on Lisbon's startup ecosystem is presented in Figure 5.7.

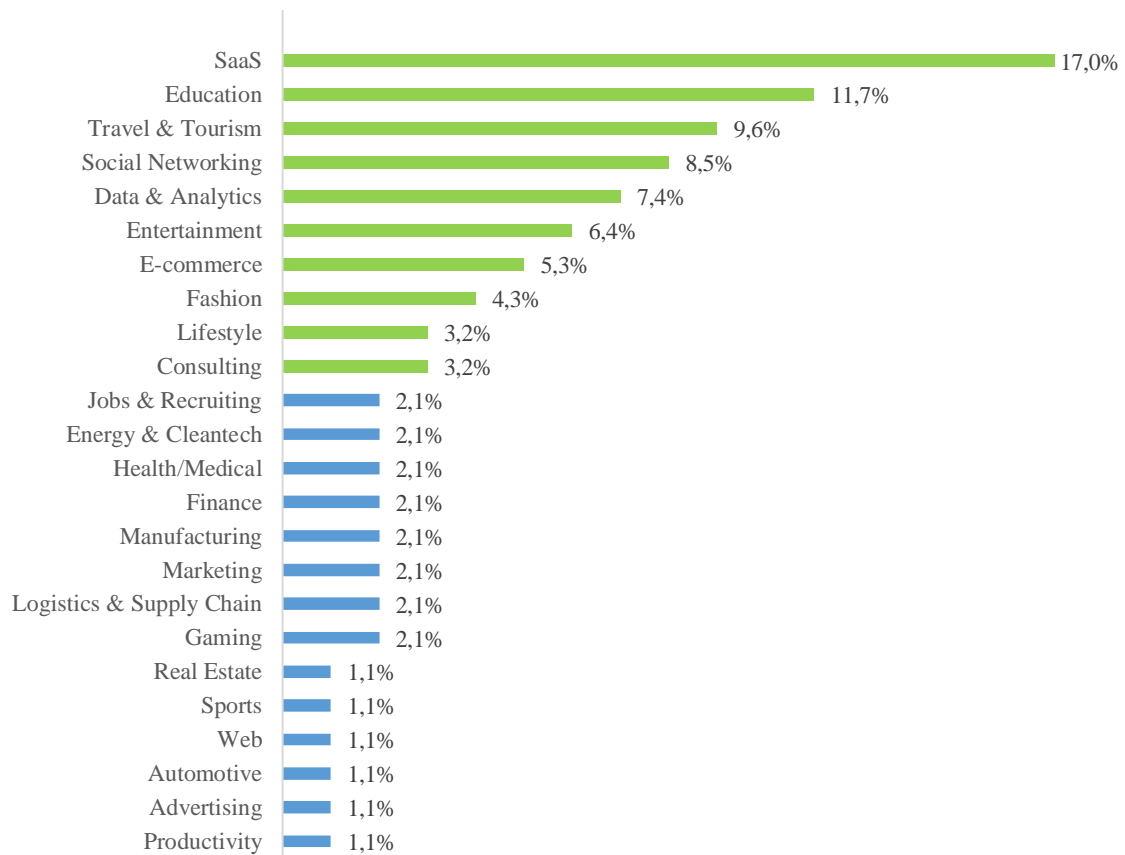


Figure 5.7 - Lisbon's ecosystem by economic sector

With regard to business model, the B2C business model is selected by the majority of startups, C2C is the second business model adopted and finally, B2B. Concerning to the pricing model, more than a half of Lisbon's startups adopted for "Freemium", then "Pay per use" and finally, "Subscription". More information on Lisbon's startup ecosystem is presented in Figure 5.8.

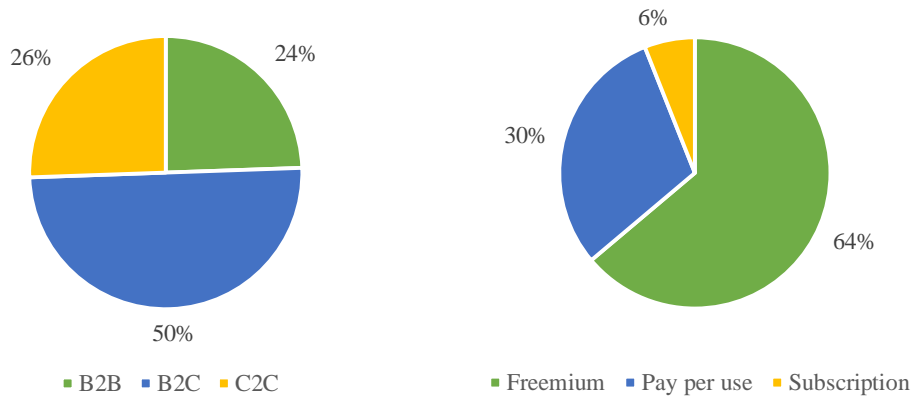


Figure 5.8 - Lisbon's ecosystem by business model and pricing model

5.2.5. Data Analysis – Helsinki (Finland)

Helsinki, capital of Finland and the fifth largest ecosystem of this study. According to F6S platform there are about 558 startups registered. This startup it's a unique combination of high-end research, education, innovation and technology. Currently, there are twenty four different economic sectors, which are in the Top 10: Lifestyle, Media, Health, Gaming, Music, Jobs & Recruiting, Data & Analytics, Travel & Tourism and Education. More information on Helsinki's startup ecosystem is presented in Figure 5.9.

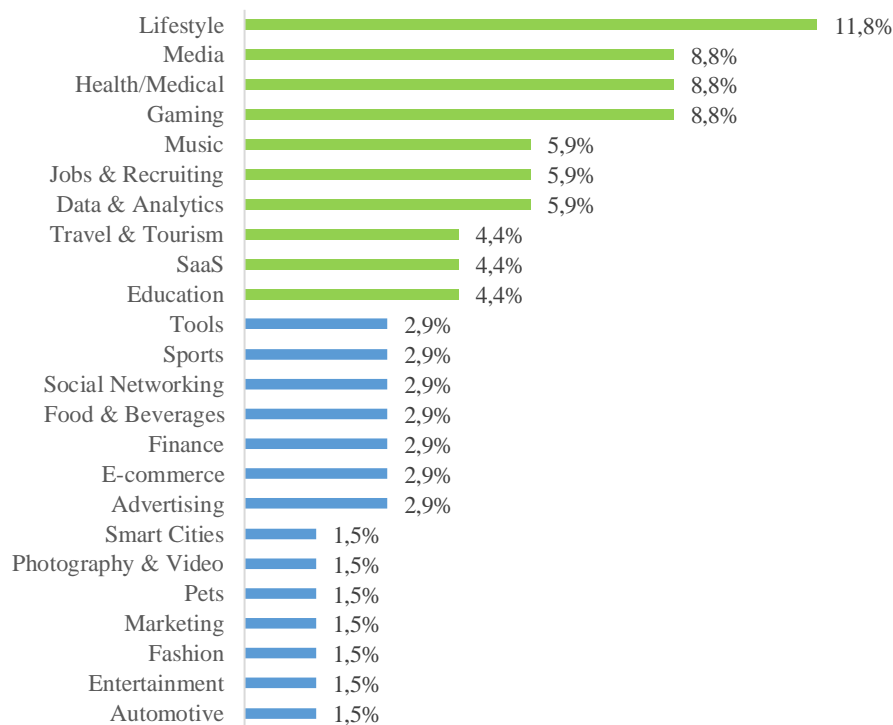


Figure 5.9 - Helsinki's ecosystem by economic sector

With regard to business model, the B2C business model is selected for almost half of startups, B2B is the second business model adopted and finally, C2C. Concerning to the pricing model, more than a half of Lisbon’s startups adopted for “Freemium”, then "Pay per use" and finally, "Subscription". More information on Helsinki’s startup ecosystem is presented in Figure 5.10.

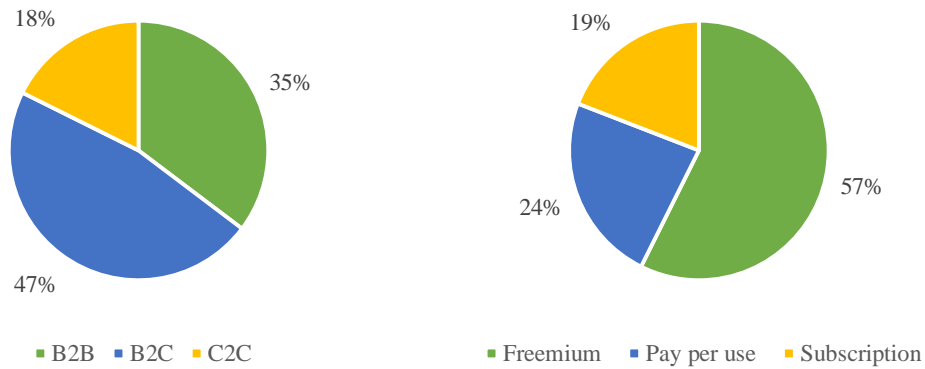


Figure 5.10 - Helsinki’s ecosystem by business model and pricing model

5.2.6. Data Analysis – Stockholm (Sweden)

Stockholm, capital of Sweden and the sixth largest ecosystem of this study. According to F6S platform there are about 558 startups registered. This startup it’s unique combination of high-end research, education, innovation and technology. Currently, there are seventeen different economic sectors, which are in the Top 10: Health / Medical, Gaming, SaaS, Enterprise, Social Networking, Media, Food & Beverages, E-commerce, Lifestyle and Education. More information on Stockholm’s startup ecosystem is presented in Figure 5.11.

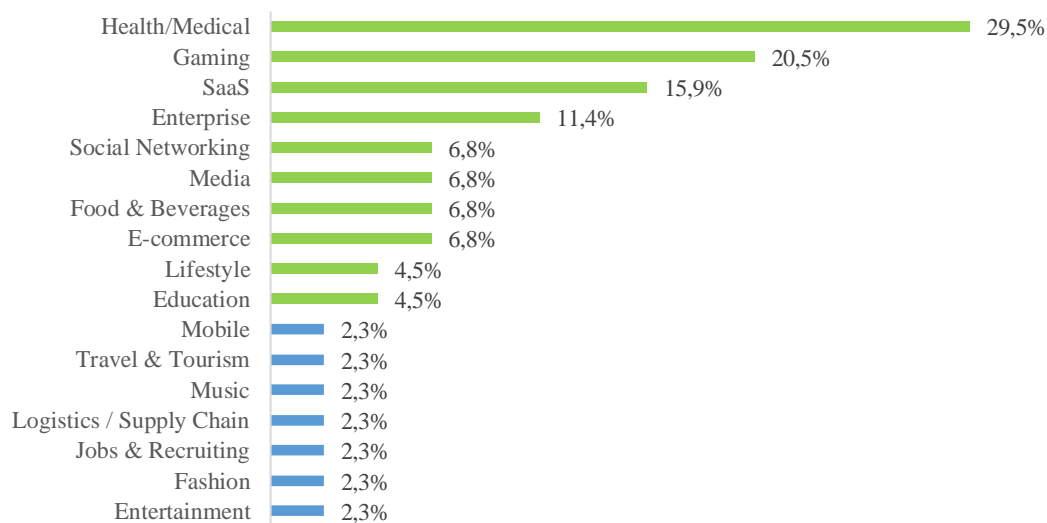


Figure 5.11 - Stockholm’s ecosystem by economic sector

With regard to business model, the B2C business model is selected for more than half of startups, then B2C is the second business model adopted and finally, C2C. Concerning to the pricing model, more than a half of Stockholm’s startups adopted for “Pay per use”, then "Freemium" and finally, "Subscription". More information on Stockholm’s startup ecosystem is presented in Figure 5.12.

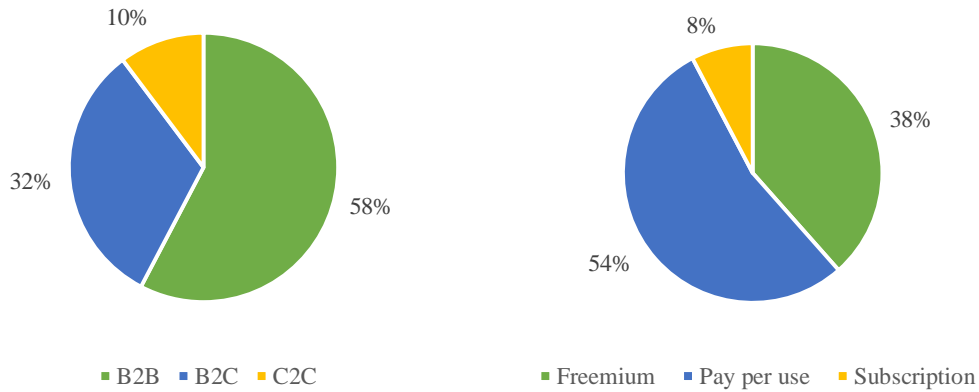


Figure 5.12 - Stockholm’s ecosystem by business model and pricing model

5.2.7. Data Analysis – Athens (Greece)

Athens, capital of Greece and the seventh largest ecosystem of this study. According to F6S platform there are about 525 startups registered. This startup ecosystem has the advantage of being located at the crossroads of three continents: Europe, Asia and Africa. Currently, there are 17 different economic sectors, which are in the Top 10: SaaS, Travel & Tourism, Media, Entertainment, Data & Analytics, E-commerce, Social Networking, Lifestyle, Sports, Gaming, Marketing, Health/ Medical and Food & Beverages. Denoted this particular case of this classification, because this top 10 have more than 10 economic sectors, because the last 4 sectors have the same percentage. More information on Athens’ startup ecosystem is presented in Figure 5.13.

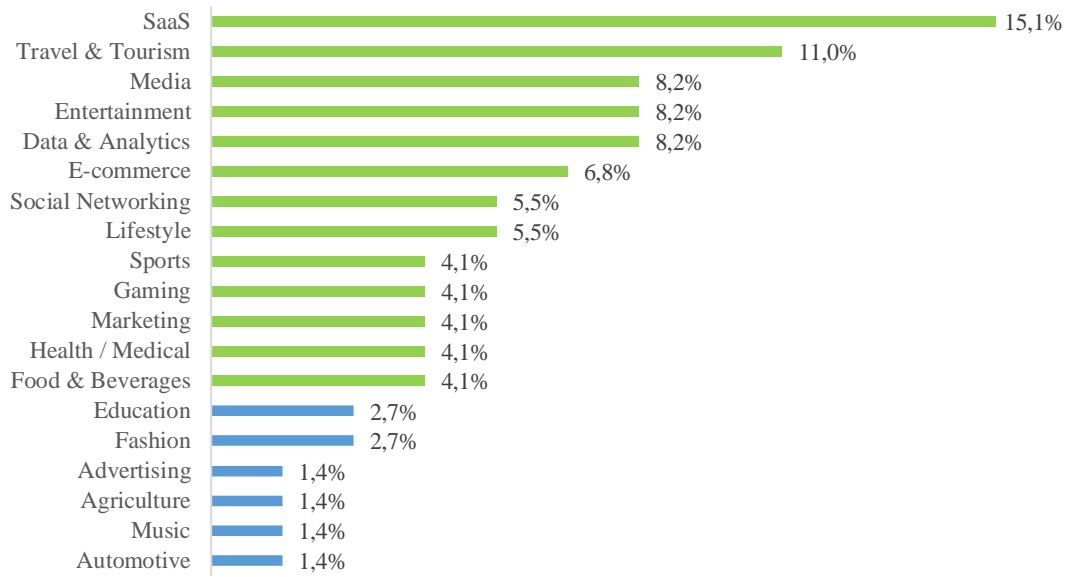


Figure 5.13 - Athens' ecosystem by economic sector

With regard to business model, the B2B business model is selected for more than half of startups, this is particularly the ecosystem with the highest percentage with this business model of the study, then C2C is the second business model adopted and finally, B2C. Concerning to the pricing model the percentages are identical, but the pricing model that comes first on ranking is “Freemium”, then “Subscription” and finally, “Pay per use”. More information on Athens' startup ecosystem is presented in Figure 5.14.

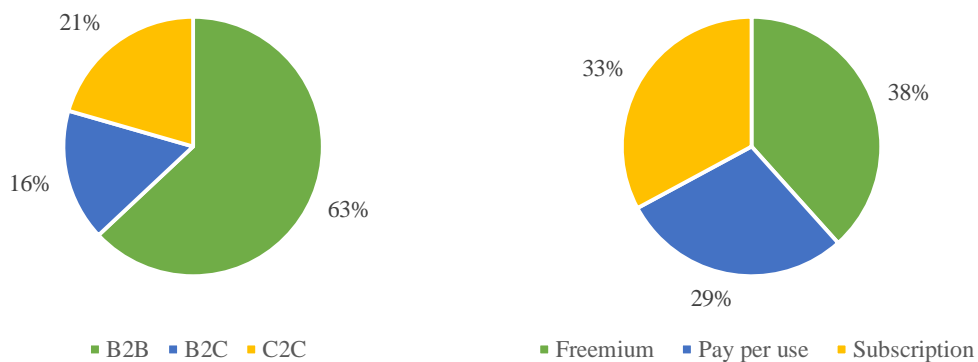


Figure 5.14 - Athens' ecosystem by business model and pricing model

5.2.8. *Data Analysis – Malmo (Stockholm)*

Malmo, the 3rd largest town in Sweden and during the past 5 years it has become one of Scandinavia’s most dynamic places for startups in ICT, mobile, biotechnology, cleantech and design; although it is the smallest ecosystem of the present study. There is no need to highlight the 10 most powerful sectors in the ecosystem, because there are only 7 different economic: Social Networking, Health/Medical, Travel & Tourism, SaaS, Media, E-commerce and Computer Networking. More information on Malmo’s startup ecosystem is presented in Figure 5.15.

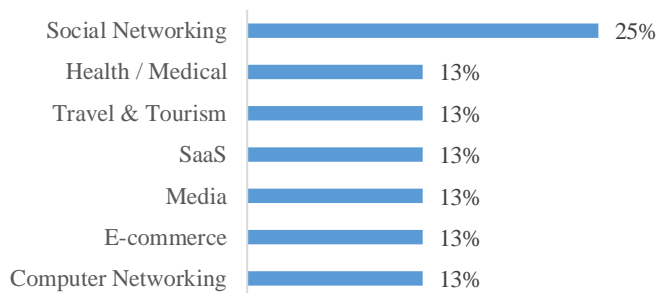


Figure 5.15 - Malmo’s ecosystem by economic sector

Malmo, despite being the smallest ecosystem of this study, it is unique because it is the startup ecosystem where the dominant business model is the C2C, followed by a tie between B2B and B2C models. With regard to the pricing model, there is also a tie between the "Freemium" and "Pay per use" models which are the most selected and finally, follows the "Subscription" model. More information on Malmo’s startup ecosystem is presented in Figure 5.16.

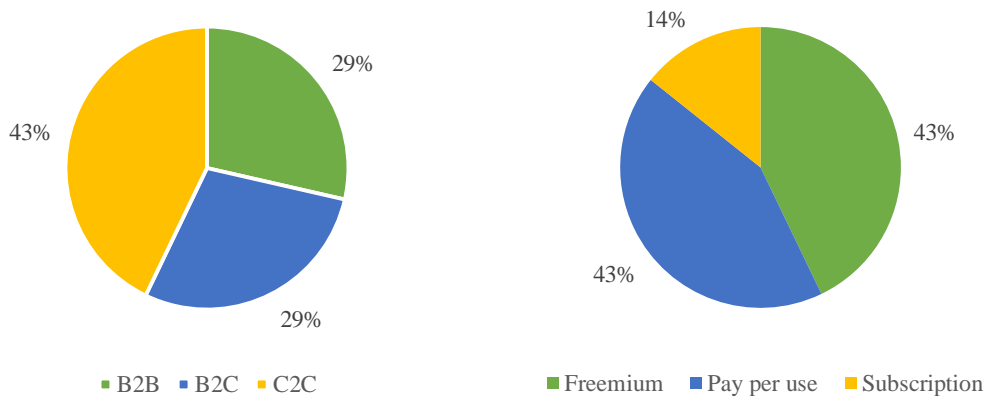


Figure 5.16 - Malmo’s ecosystem by business model and pricing model

5.3 Data Analysis Results Resume

After addressing the prevailing economic sectors in each ecosystem, such as the business models and the pricing models more selected by the startups, this subchapter is dedicated to give a brief summary. First of all, will present a table resume by startup ecosystems, secondly, a graph with all the economic sectors within ecosystems under the study, as well as the most prevailing economic sectors in general, then similarly to the business models and so to the pricing models in order to obtaining a micro and a macro picture of each of the subjects.

5.3.1. Startup Ecosystems

Ecosystem	Economic Sectors Top 10	Business Model	Pricing Model
Madrid	Education	B2C	Freemium
	Lifestyle		
	E-commerce		
	Social Networking		
	SaaS		
	Travel & Tourism		
	Data & Analytics		
	Finance		
	Health/Medical		
	Entertainment		
Amsterdam	SaaS	B2C	Freemium
	E-commerce		
	Travel & Tourism		
	Fashion		
	Food & Beverages		
	Education		
	Data & Analytics		
	Lifestyle		
	Health/Medical		
	Finance		
Rome	E-commerce	B2B	Freemium
	Food & Beverages		
	Gaming		
	Entertainment		
	Travel & Tourism		
	Media		
	Sports		
	Health/Medical		
	Social Networking		
	Lifestyle		
	Finance		
	Education		
	Automotive		
	SaaS		
Lisbon	Education	B2C	Freemium
	Travel & Tourism		
	Social Networking		
	Data & Analytics		
	Entertainment		
	E-commerce		
	Fashion		

	Lifestyle		
	Consulting		
Helsinki	Lifestyle	B2C	Freemium
	Media		
	Health/Medical		
	Gaming		
	Music		
	Jobs & Recruiting		
	Data & Analytics		
	Travel & Tourism		
	SaaS		
	Education		
Stockholm	Health/Medical	B2B	Pay per use
	Gaming		
	SaaS		
	Enterprise		
	Social Networking		
	Media		
	Food & Beverages		
	E-commerce		
	Lifestyle		
	Education		
Athens	SaaS	B2B	Freemium
	Travel & Tourism		
	Media		
	Entertainment		
	Data & Analytics		
	E-commerce		
	Social Networking		
	Lifestyle		
	Sports		
	Gaming		
	Marketing		
	Health/Medical		
	Food & Beverages		
Malmö	Social Networking	C2C	Freemium & Pay per use
	Health/Medical		
	Travel & Tourism		
	SaaS		
	Media		
	E-commerce		
Computer Networking			

Table 5.2 - Startup ecosystem resume

5.3.2. Economic Sectors

As regards the economic sectors, will be presented two graphs. First, a micro view, through a graphical representation of all economic sectors identified by each ecosystem throughout the study, as shown in the Figure 5.17. To get a macro view of the economic sectors, in order to know what are the economic sectors that actually predominate in a comprehensive manner, we proceeded to an arithmetic average and obtained a graph that shows the predominant economic sectors. More information presented in Figure 5.18.

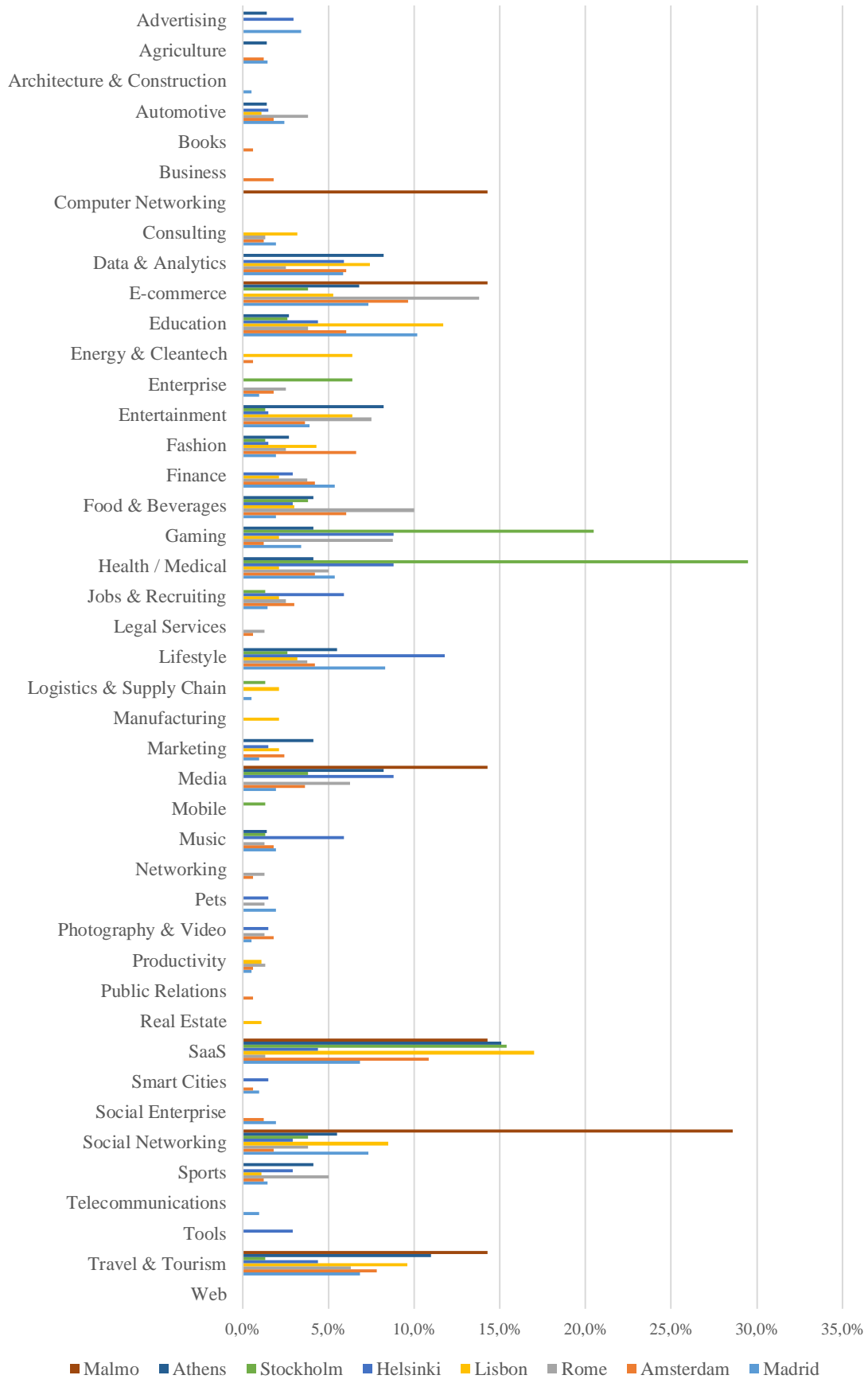


Figure 5.17 - Macro overview of the economic sectors

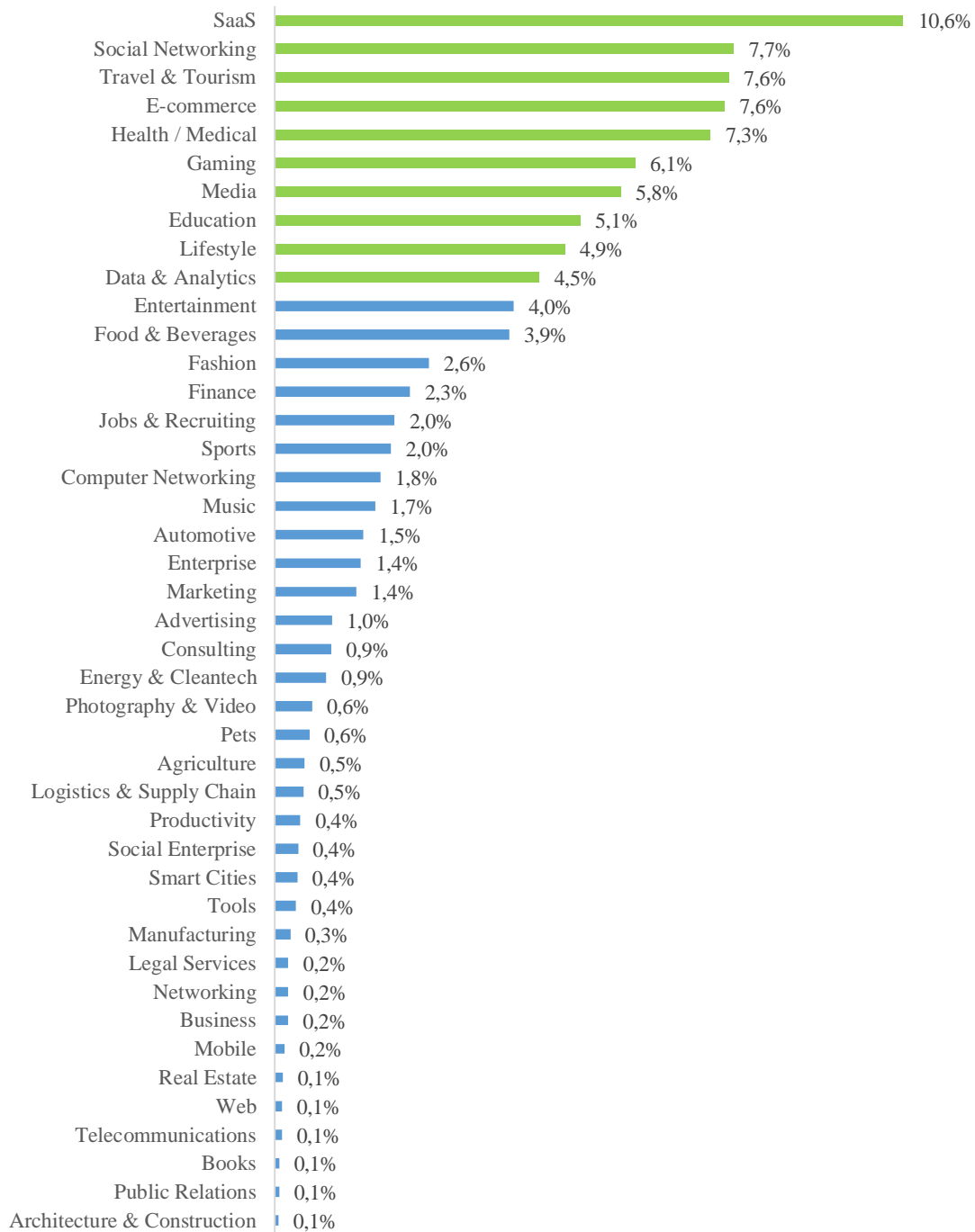


Figure 5.18 - Micro overview of the economic sectors

As seen in the figure above, are represented all economic sectors identified throughout the study. In this set there are 10 sectors that stand out: SaaS, Social Networking, Travel & Tourism, E-commerce, Health/Medical, Gaming, Media, Education, Lifestyle and Data & Analytics.

5.3.3. Business Models

Concerning to the economic sectors, will be presented two graphs. Firstly, a micro view, through a graphical representation of all business models identified by each ecosystem throughout the study, as shown in the Figure 5.19.

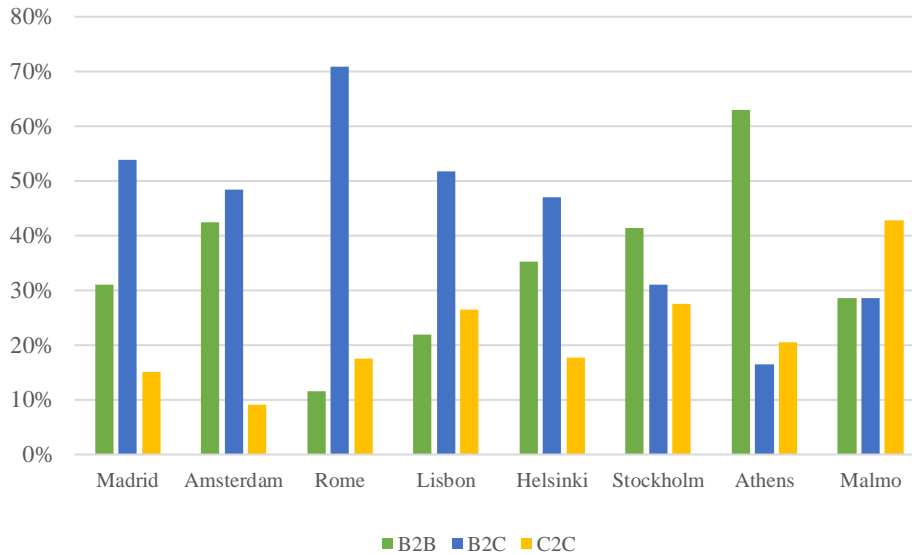


Figure 5.19 - Overview of the business models by startup ecosystem

Whereby, each startup ecosystem has its predominant business model and it's unable to get an overview of the current trend. To this end, in order to understand what the business models are actually predominate in a comprehensive manner and to acquire a rating, we proceeded to an arithmetic average and obtained a graph that shows the predominant economic sectors. More information about a macro overview of the business models presented in Figure 5.20.

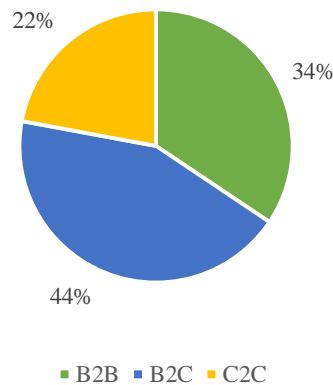


Figure 5.20 - Macro overview of the business models

5.3.4. Pricing Models

Finally, with regard to pricing models will be presented two graphs with the same structure as previously presented. First, a chart that relates the pricing models for each startup ecosystem studied. As observed, it is the payment model "Freemium" that stands out. For more information about the pricing models for ecosystem is presented in Figure 5.21.

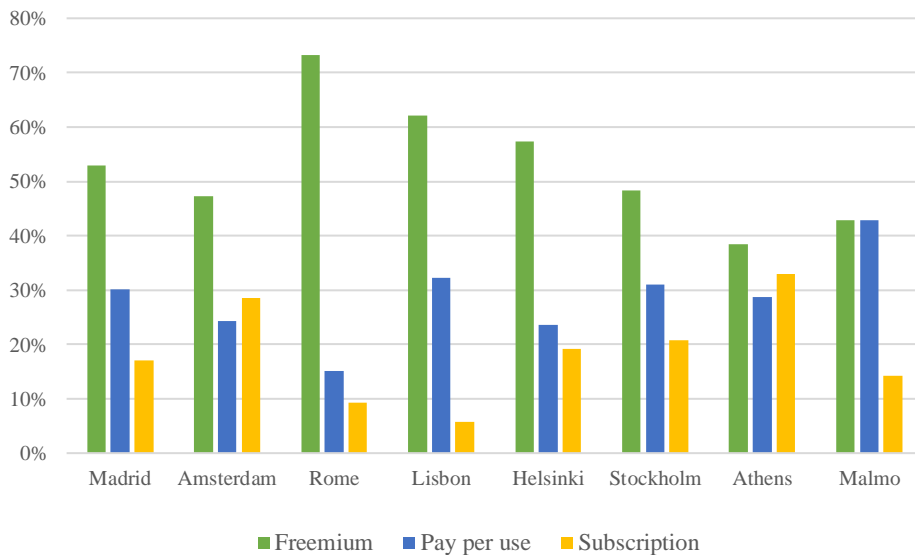


Figure 5.21 - Overview of the pricing models by each ecosystem

As discussed above, the pricing model that stands out from the others, is the "Freemium". By not being clear which comes in second and third, we proceeded in the same way, it was held an arithmetic mean to obtain an overall rating for the pricing models. More information about a macro overview of the pricing models presented in Figure 5.22.

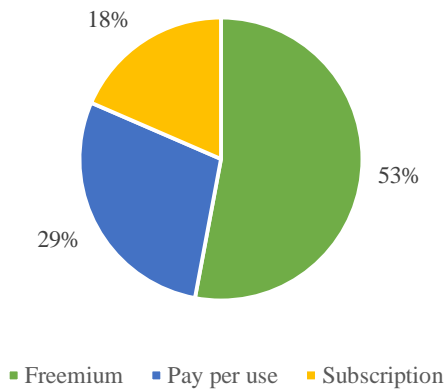


Figure 5.22 - Macro overview of the pricing models

Chapter 6

Results from Questionnaire

The following chapter will present the results of the survey the empirical study. First, the characterization of the startup ecosystems sample of respondents will be provided, where the dimension and profile of the sample will be analyzed. Afterwards, the overall results from the questionnaire will be presented, the individual results by country and by type will be presented and finally, some insights collected by the startups.

6.1. Sample Characterization

As previously explained, the main research tool was the online platform F6S, which is an online database where each startup is free to register and create a profile, mentioning to the name, the startup's goal, the economic sector and the website. To take full advantage of the information collected on the online platform F6s, was also registered the email of every startup on *Microsoft Excel* sheet, in order to in the future, be contacted to answer a short questionnaire. Questionnaire this, that has as main objective, to collect information in three distinct phases: First, identify the profile of startup, understand the startup ecosystem in which they are located and finally comprehend the future perceptions, in particular economic sectors that will grow in the coming years . The survey carried out to startups is attached. The following table is represented the universe answers, represented the weight of each startup ecosystem in this questionnaire.

STARTUP ECOSYSTEM	PERCENTAGE OF RESPONSES (%)
Amsterdam – Netherlands	13
Athens – Greece	13
Helsinki – Finland	9
Lisbon – Portugal	7
Madrid – Spain	41
Malmö – Sweden	0
Rome – Italy	9
Stockholm - Sweden	8

Table 6.1 - Weight of each startup ecosystem (percentage)

6.2. Questionnaire Results

On the following paragraphs the questionnaire results will be presented and discussed, where based on the collected data we aim to assess on startups' opinions and perspectives concerning the several subjects deemed to be relevant for the scope of the research.

Three main subjects will be evaluated through the course of this section: Startup profile, Startup Ecosystem profile and Future perceptions' startup ecosystems by startups.

6.2.1. Year Startup Founded

The first element was asked about the startup profile was the year it was founded. According to respondents, in 2009 the ecosystem in which were created more startups was the Madrid ecosystem, whereas the remaining ecosystems there was no response. Regarding the year 2010, respondents did not create startups. Since the year 2011 is beginning to be an increase in the percentage of startups founded. Regarding the year 2011, 25% of surveyed Stockholm startups created the startup in this same year. This ecosystem has the peculiarity of having the same percentage of startups founded in the remaining years, except the year 2012. Considering the results of respondents, 40% of Helsinki startups were founded in 2012, highlighting again the following year in 2013, with the largest percentage of startups founded compared to the others ecosystems. In 2014, ecosystems that stand out were Lisbon and Rome with 75% and 80% respectively, the percentage of startups founded given the answers of respondents. In 2015, Athens and Amsterdam have the highest percentage of startups founded by completing Stockholm

with the highest percentage of startups founded. For more information about the year startup foundation is presented in Figure 6.1.

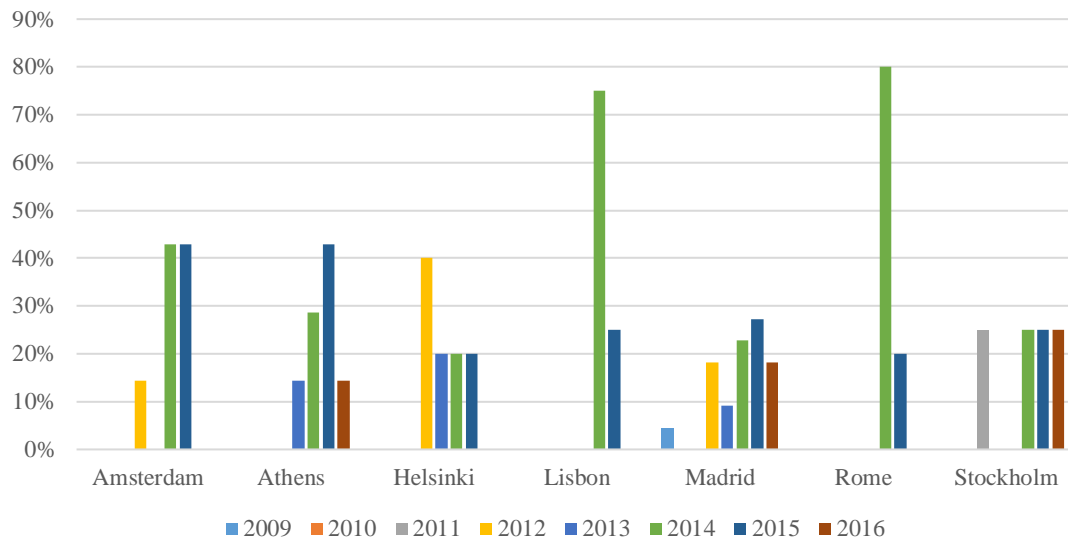


Figure 6.1 - Questionnaire: Year startup founded

6.2.2. Current Stage

Regarding to the stages of startups, according of what has been discussed in the literature review for this survey were determined five stages in the startup lifecycle: Idea Stage, Market Prototype Stage Achieved Local Sustainability Stage, Scaling Up Stage and Unicorn. There are any startups on stage "Idea Stage" in any ecosystem, instead of remaining stages. Regarding to the "Market Prototype Stage", the ecosystems that stand out are Helsinki and Stockholm, although Amsterdam, Lisbon and Madrid, are not far from the higher percentage of startups on "Market Prototype Stage". Amsterdam, Lisbon and Rome stand out for having the highest percentages in relation to the stage "Achieved Local Sustainability Stage" and finally, Athens is the only ecosystem with startups on stage "Unicorn". For more information about the current stage is presented in Figure 6.2.

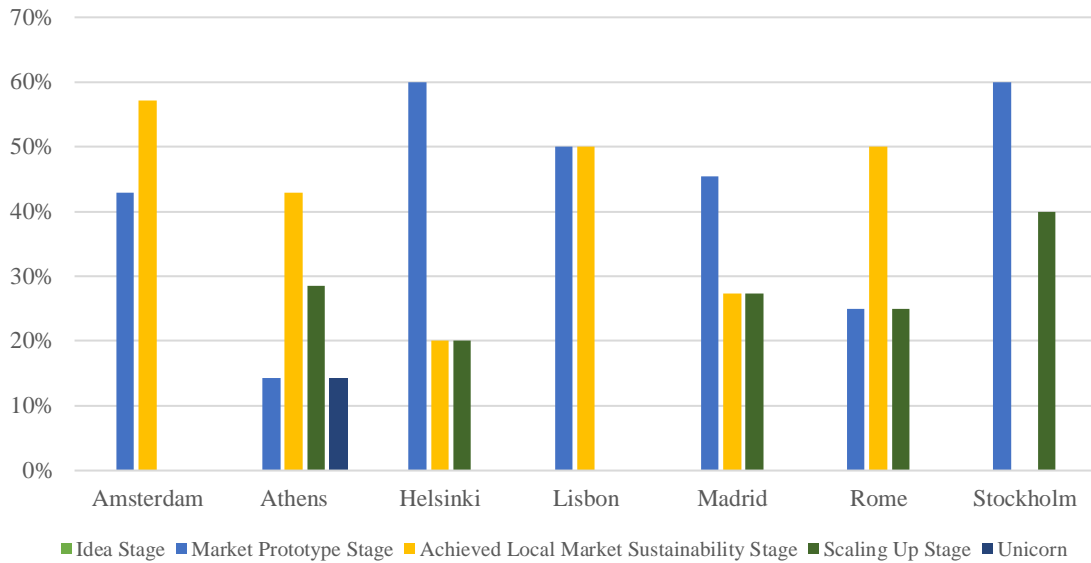


Figure 6.2 - Questionnaire: Current Stage

6.2.3. Economic Sectors

As already mentioned, mapping the main economic sectors of each ecosystem is one of the main aims of this dissertation. According with the research previously done on the online platform F6S, selected a set of predominant economic sectors: Advertising, Agriculture, Automotive, Consulting, Data & Analytics, Education, Energy & Cleantech, Entertainment, E-commerce, Fashion, Finance, Food & Beverages, Gaming, Government, Health / Medical, Jobs & Recruiting, Lifestyle, Logistics & Transports, Manufacturing, Marketing, Media, Music, Productivity, SaaS, Smart Cities, Social Networking, Software Tools, Sports and Travel & Tourism. In this sense, it was asked to all respondents startups, to select the economic sector of the startup. If the economic sector, are not listed in the previous list, the answer should be "Other." The three economic sectors that stand out and are more present in all ecosystems studied are SaaS, Social Networking and Travel & Tourism. For more information about the economic sectors is presented in Figure 6.3.

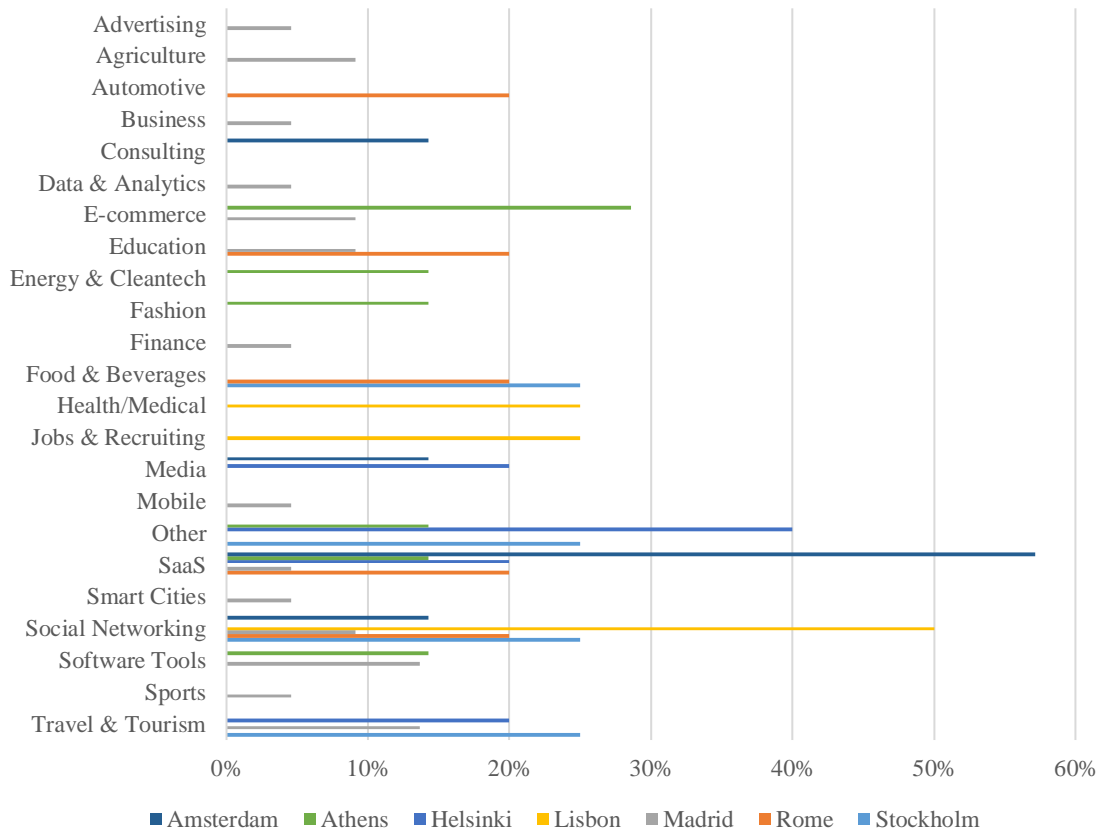


Figure 6.3 - Questionnaire: Economic Sectors

6.2.4. Business Models

Business models are other study elements in this dissertation. After analyzing the responses of the surveyed startups, no doubt that the business model that stood out was the model "B2B", predominantly 100% in Lisbon, following, Amsterdam, Rome, Athens and Madrid. Regarding to the business model "B2C" is the model that stands out in Stockholm, following, Helsinki, Rome and Amsterdam and Athens. Finally, the business model "C2C" does not stand out as the predominant model in any ecosystem, but according to the surveyed sample is the second most chosen business model in Stockholm. For more information about the business models is presented in Figure 6.4.

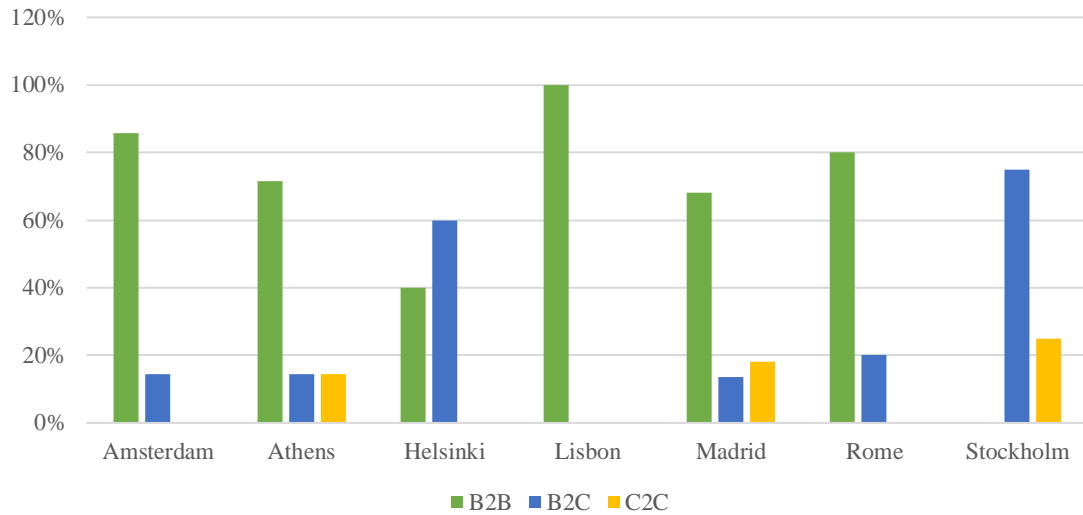


Figure 6.4 - Questionnaire: Business Models

6.2.5. Pricing Models

Regarding to pricing models, the highest percentage values corresponds to the pricing model "Pay per use". The ecosystem that has the highest percentage is Stockholm, followed, Helsinki and Rome. Lisbon has the highest percentage regarding to the pricing model "Freemium" following Helsinki and Amsterdam. Finally, the pricing model "Subscription", Lisbon stands out again with the highest percentage, followed, Amsterdam and Madrid. For more information about the pricing models is presented in Figure 6.5.

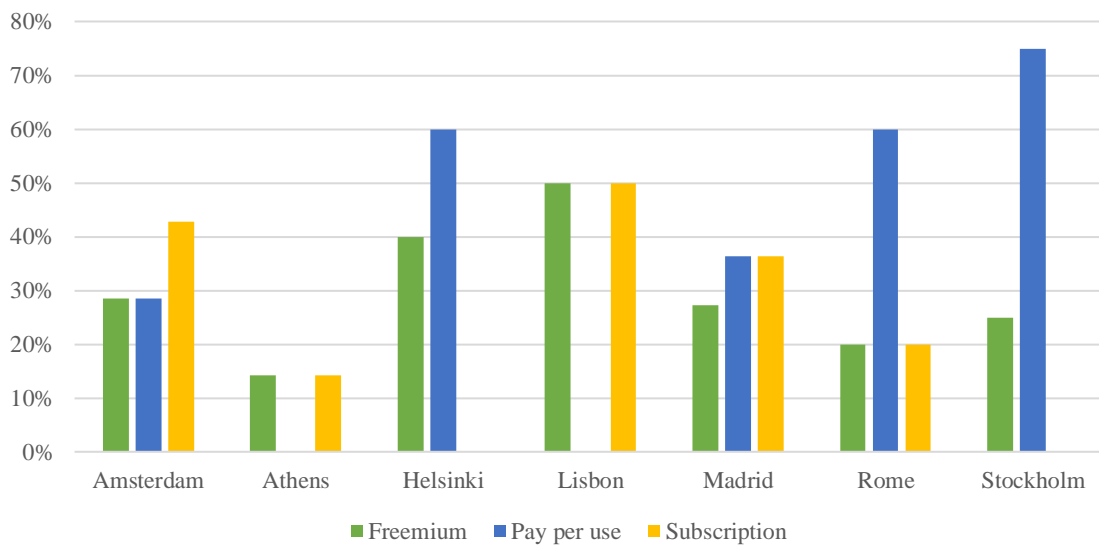


Figure 6.5 - Questionnaire: Pricing Models

6.2.6. Investments

The last topic that was asked about the startup profile was about the amount of money that is already invested up to the present day. Startups were asked to select the investment in 7 different categories: 0-20K €, 20-50K €, € 50-100K, 100-500K €, 1-10M € and more than 10M €. None of startups surveyed presented investments of more than 10M €. Regarding results, the peaks of the percentages are related to investments of € 0-20K, 20-50K €, 50-100K € and 100-500K €. Amsterdam and Athens, have peaks 0-20K €, wherein more than 40% of surveyed startups, invested up until 20K € but, Athens has an additional peak, of which more than 40% of startups already invested between 100-500K €. Regarding Helsinki, 40% of startups have already invested 50-100K €, with the remainder invested 0-20K €, 20-50K € and € 1-10M €. Lisbon is the ecosystem that has the same percentages for various investments, including 20-50K €, 50-100K €, 100-500K € and 500K-1M €. Madrid is the only ecosystem analyzed, which has investments in 6 different categories, with the peak in investments below 20K €. For Rome, the peak corresponds to investments of 50-100K €, where 40% of the surveyed startups invested € 20-50K. Finally, Stockholm has the highest peak in 50% of startups, have invested 100-500K €. For more information about the investments is presented in Figure 6.6.

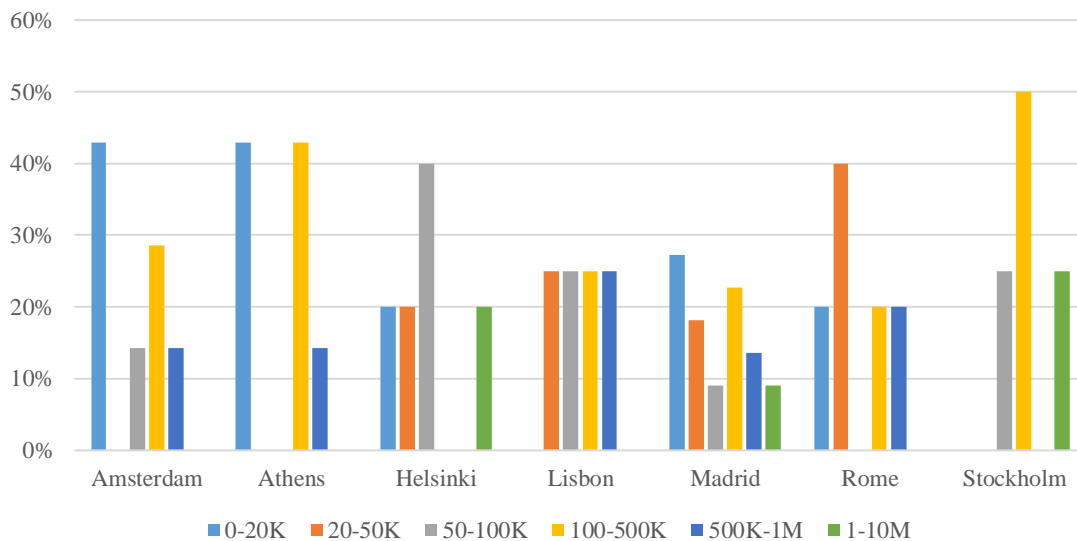


Figure 6.6 - Questionnaire: Investments (€)

6.2.7. Economic Sectors by Startup Ecosystem

As previously stated, with the questionnaire also sought to obtain feedback from startups to understand the perception they have of the ecosystem where they are inserted. In this sense, given

the list that was presented previously in subchapter 6.2.3, was asked to rate each of the economic sectors, with 1 being the least important economic sector for the ecosystem and the five most important economic sector for the ecosystem. The results will be presented by ecosystems.

- *Amsterdam – Netherlands*

For the sample of startups surveyed in this ecosystem, and only admitting the three highest scores, the most important economic sectors are: Business, Data & Analytics, E-commerce, SaaS and Software Tools. On the other hand, economic sectors such as Manufacturing, Agriculture, Music, Automotive and Sports, are considered less important in the ecosystem. For more information about the economic sectors scored by Amsterdam is presented in Figure 6.7.

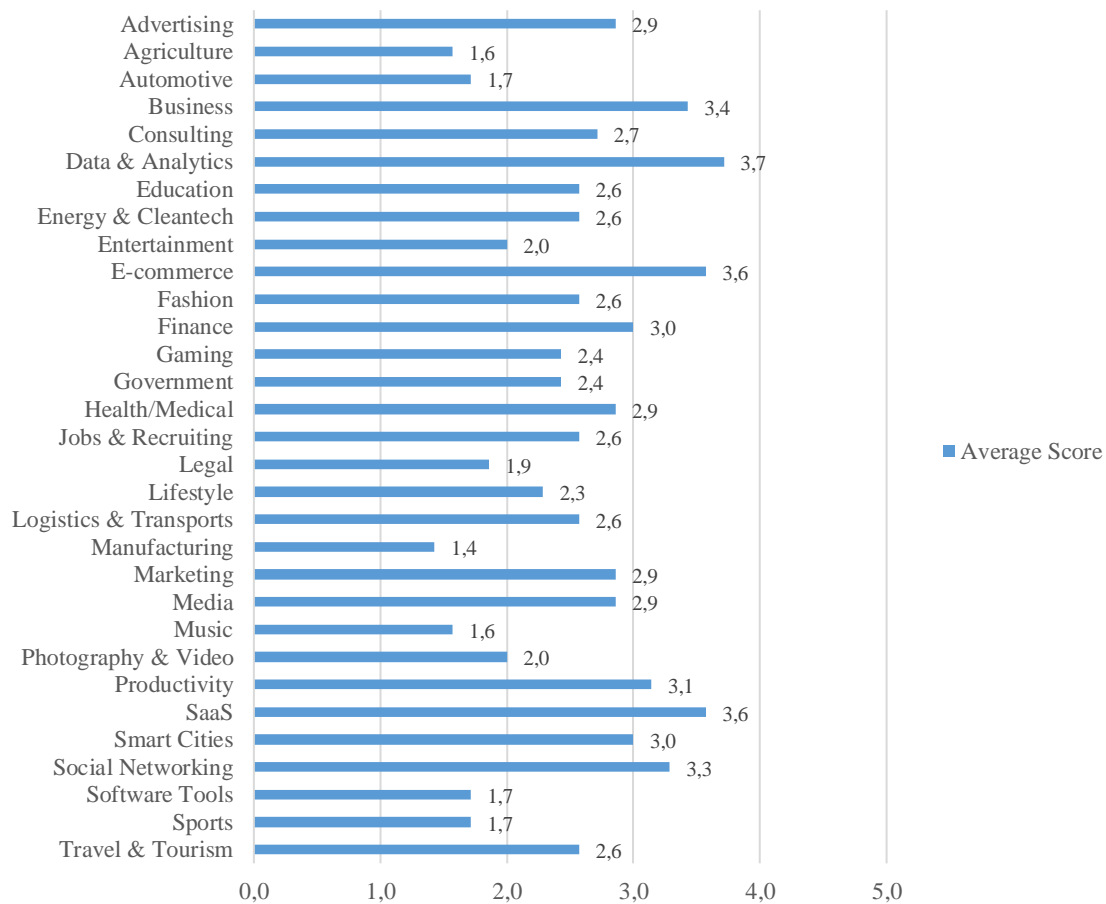


Figure 6.7 - Questionnaire: Economic sectors ranked by Amsterdam

- *Athens – Greece*

For the sample of startups surveyed in this ecosystem, and only admitting the three highest scores, the most important economic sectors are: Data & Analytics, SaaS, Business, Marketing and

Software Tools. On the other hand, economic sectors such as Automotive, Photography & Video and Lifestyle, are considered less important in the ecosystem. For more information about the economic sectors scored by Athens is presented in Figure 6.8.

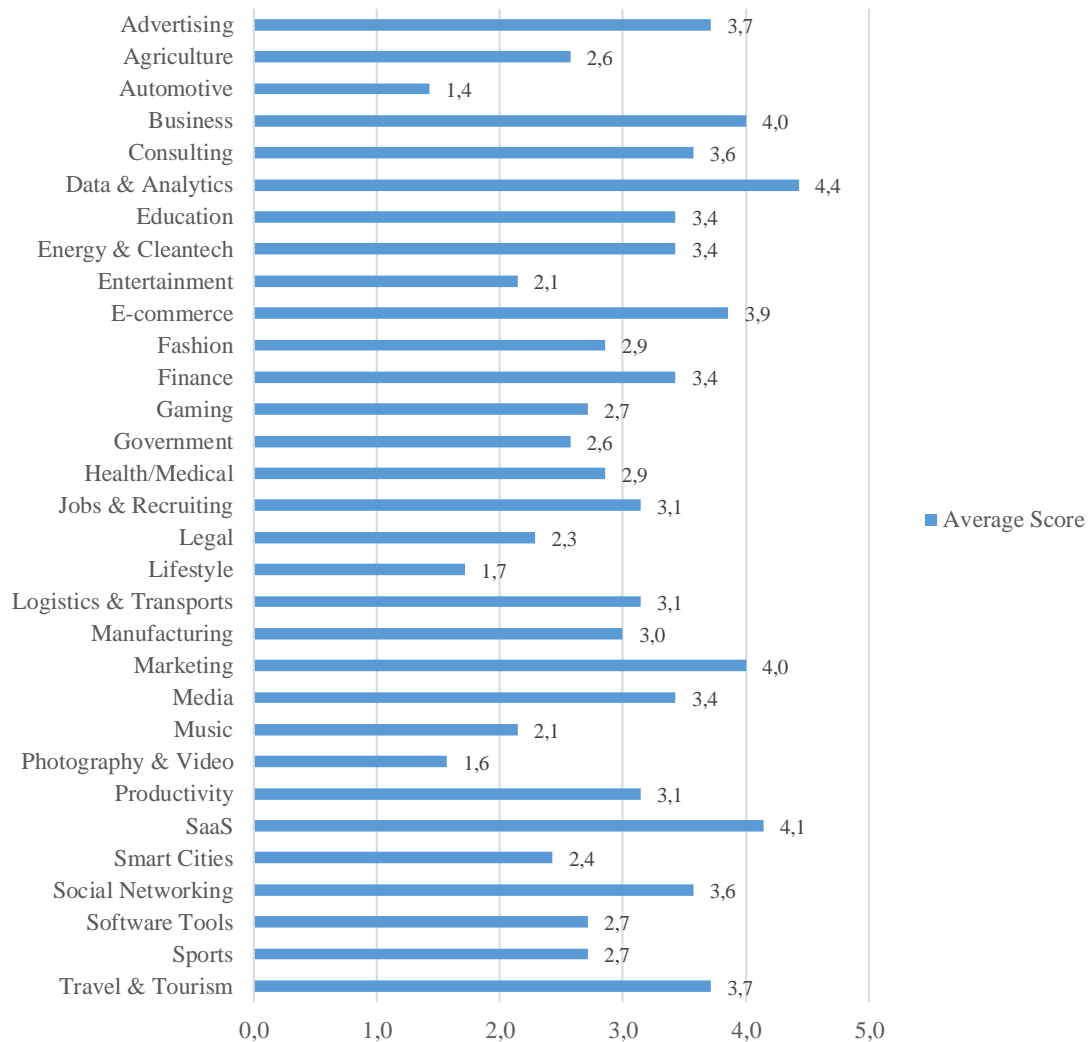


Figure 6.8 - Questionnaire: Economic sectors ranked by Athens

- *Helsinki – Finland*

For the sample of startups surveyed in this ecosystem, and only admitting the three highest scores, the most important economic sectors are: SaaS, Entertainment, Gaming, Energy & Cleantech, E-commerce, Marketing, Media and Smart Cities. On the other hand, economic sectors such as Agriculture, Government, Manufacturing and Music are considered less important in the ecosystem. For more information about the economic sectors scored by Helsinki is presented in Figure 6.9.

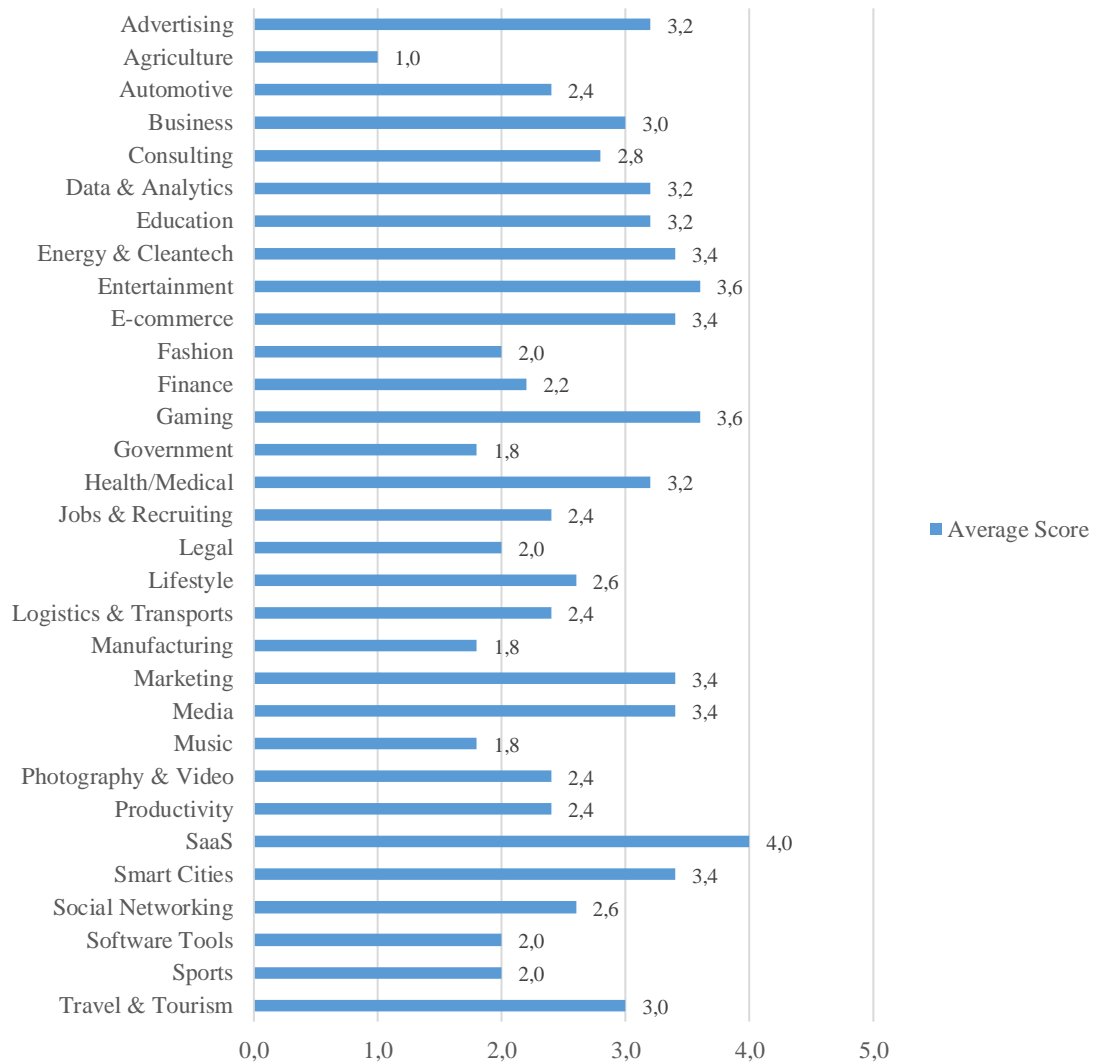


Figure 6.9 - Questionnaire: Economic sectors ranked by Helsinki

- *Lisbon – Portugal*

For the sample of startups surveyed in this ecosystem, and only admitting the three highest scores, the most important economic sectors are: Travel & Tourism, Advertising, Data & Analytics, Social Networking, Lifestyle, Marketing, Software Tools and Sports. On the other hand, economic sectors such as Manufacturing, Automotive, Agriculture and Legal are considered less important in the ecosystem. For more information about the economic sectors scored by Lisbon is presented in Figure 6.10.

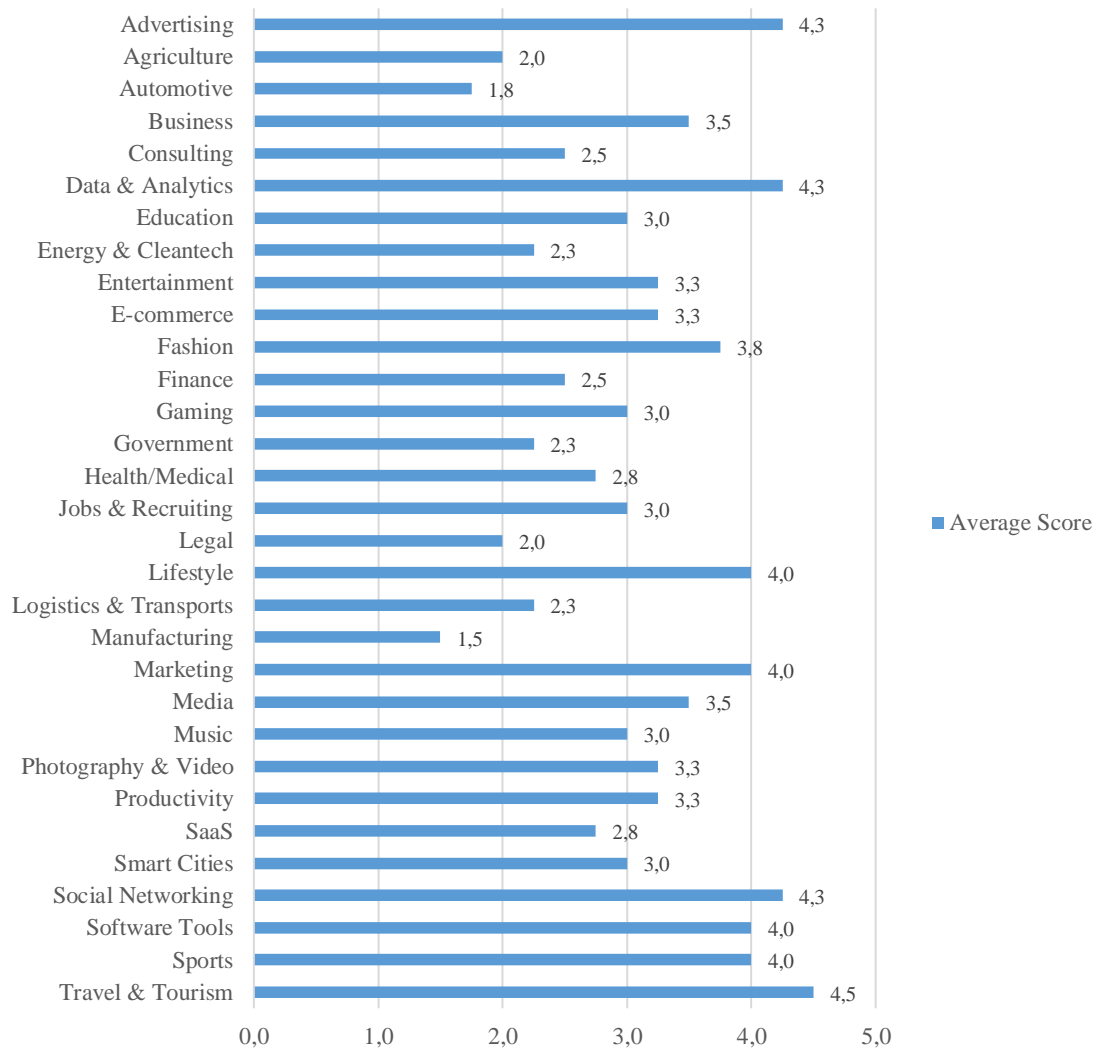


Figure 6.10 - Questionnaire: Economic sectors ranked by Lisbon

- *Madrid – Spain*

For the sample of startups surveyed in this ecosystem, and only admitting the three highest scores, the most important economic sectors are: Data & Analytics, Marketing, SaaS, Business, E-commerce, Social Networking and Travel & Tourism. On the other hand, economic sectors such as Agriculture, Automotive and Manufacturing are considered less important in the ecosystem. For more information about the economic sectors scored by Madrid is presented in Figure 6.11.

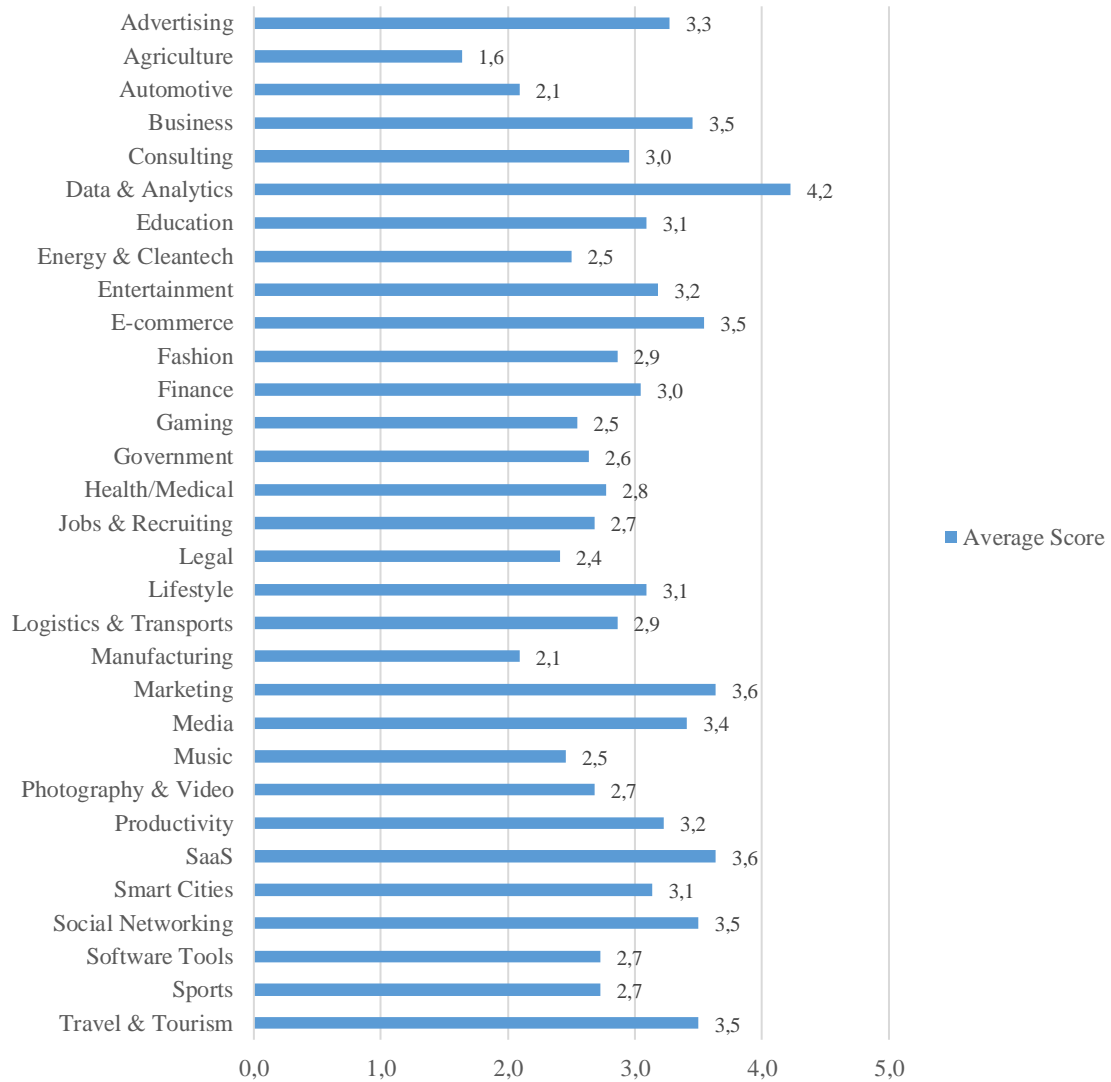


Figure 6.11 - Questionnaire: Economic sectors ranked by Madrid

- *Rome – Italy*

For the sample of startups surveyed in this ecosystem, and only admitting the three highest scores, the most important economic sectors are: Travel & Tourism, Advertising, Media e Social Networking. On the other hand, economic sectors such as Manufacturing, Fashion, Agriculture, Gaming, Music and Productivity are considered less important in the ecosystem. For more information about the economic sectors scored by Rome is presented in Figure 6.12.

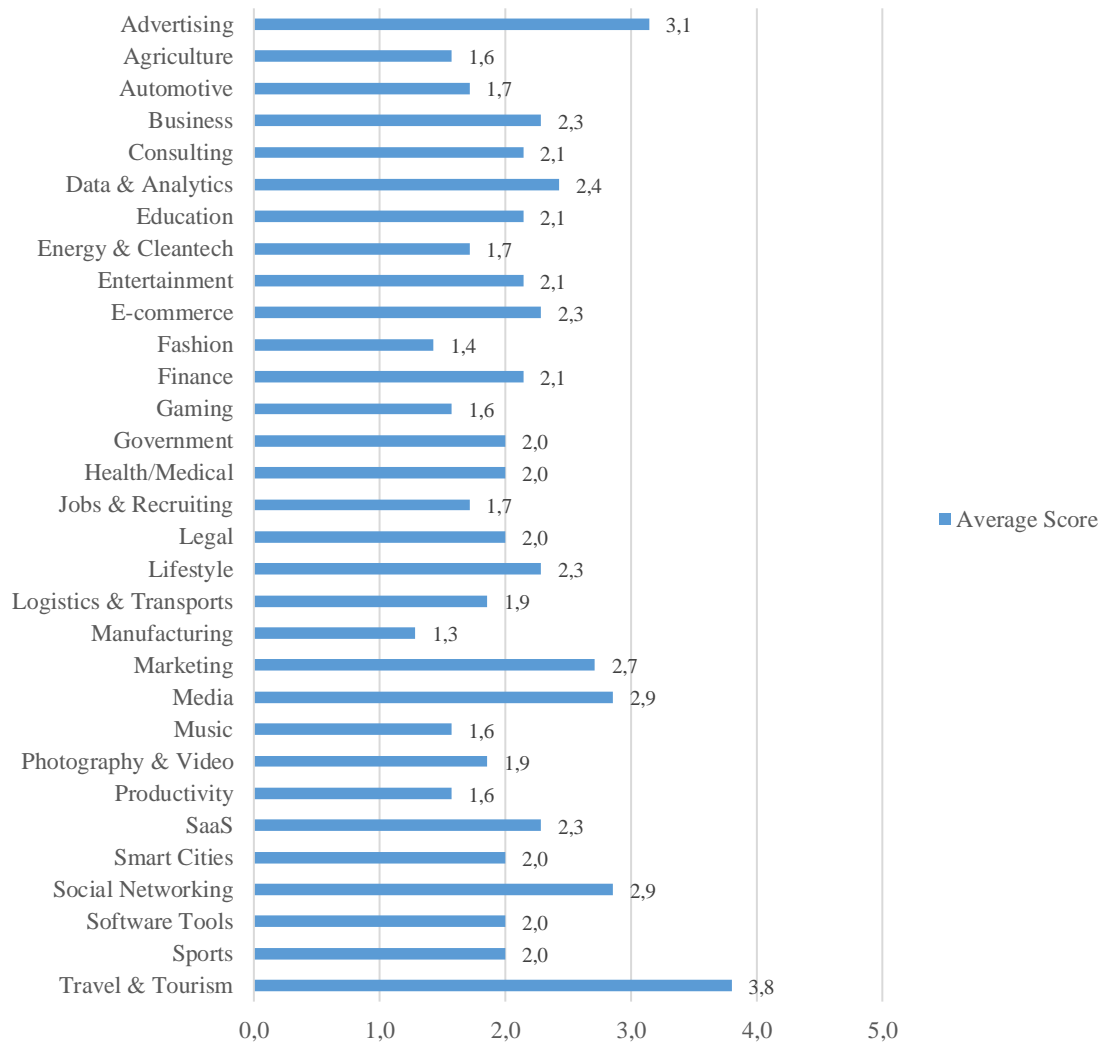


Figure 6.12 - Questionnaire: Economic sectors ranked by Rome

- *Stockholm – Sweden*

For the sample of startups surveyed in this ecosystem, and only admitting the three highest scores, the most important economic sectors are: Data & Analytics, Jobs & Recruiting, Finance, Gaming, Advertising, E-commerce, Legal, Media and Social Networking. On the other hand, economic sectors such as Agriculture, Automotive, Manufacturing and Smart Cities are considered less important in the ecosystem. For more information about the economic sectors scored by Stockholm is presented in Figure 6.13.

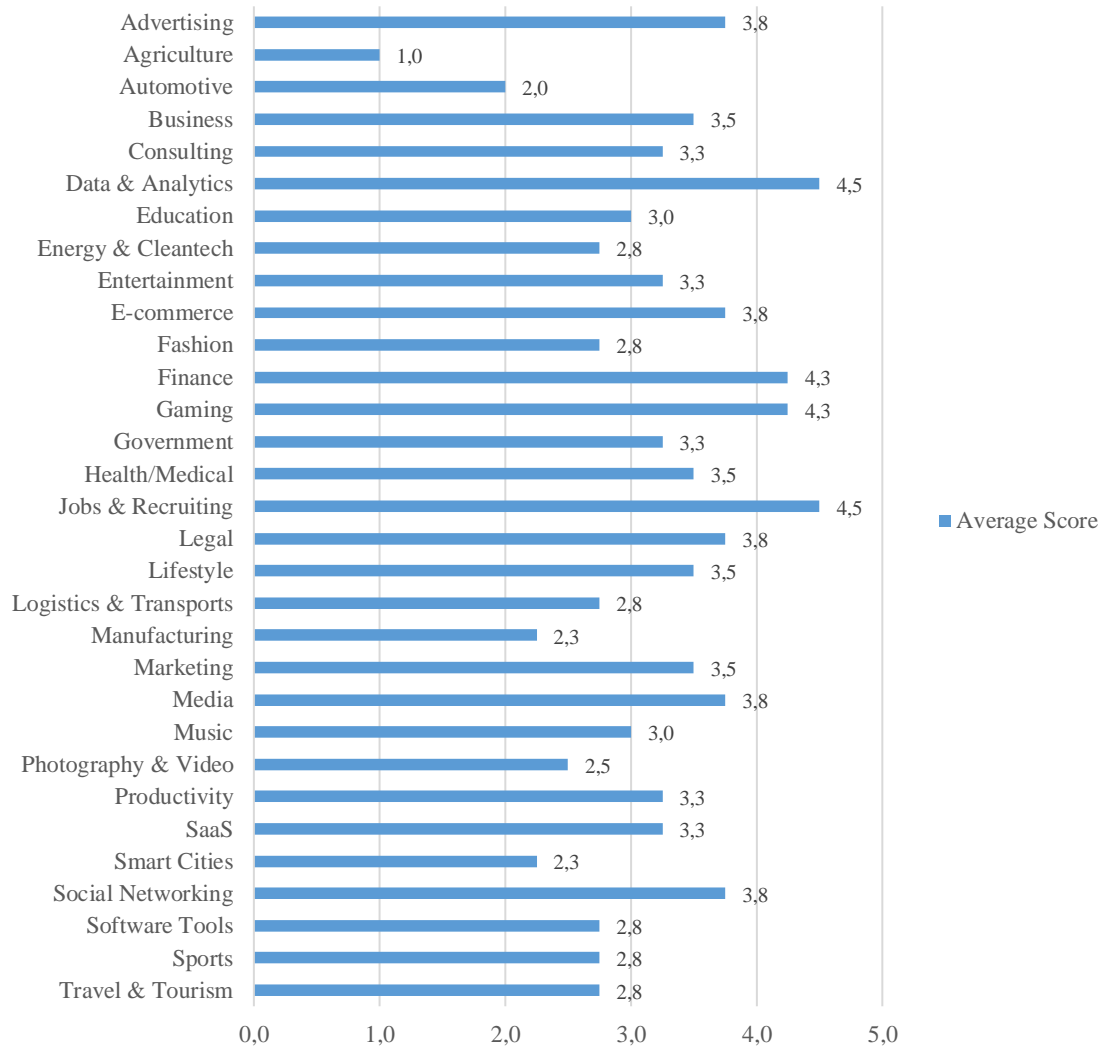


Figure 6.13 - Questionnaire: Economic sectors ranked by Stockholm

6.2.8. Growth Development Factors

One of the main goals of the survey is to analyze the ecosystem from the perspective of the inserted startups. In this sense, were asked to rate a series of factors that can promote the development of the ecosystem, as hinder the development: Accelerators & Accelerator Events, Business Angel Networks, Cost of Living, Crowdfunding Sites, Entrepreneurial Education, Existing Legal Framework, Geographic Location, Incubators, Mentors Available, Social Network Platforms, Startup Events, State Investment, Tax Benefits and Universities. Each startup ranked 1 as the least important factor for the development of the ecosystem and 5 as the most important factor for the development of the ecosystem.

As is to be expected, the classification differs from ecosystem to ecosystem, for several reasons. Cultures are different, the policies are specific and ecosystem actors also have unique mindsets.

According to the sample startup questioned, Amsterdam considered "Mentors Available" as the most important factor for the development of the ecosystem, on the other hand, "Existing Framework Legal" was reported as a factor that contributes least to the development of the ecosystem. Then, Athens, which considered "Startup Events" as the most important factor for the development of the ecosystem whilst "Tax Benefits" was considered a factor that contributes least to the development of the ecosystem. It follows Helsinki that rated "Universities" as the most important factor for the development of the ecosystem, unlike factor "Cost of Living" that less contributes to the development of the ecosystem. The Lisbon's startups rated "Accelerators & Accelerator Events" as the most important factor for the development, opposing "Existing Legal framework" as a factor that contributes least to the development of the ecosystem, along with the factor "Tax Benefits", as the ecosystem of Athens. Madrid stands out for having two factors that most contribute to the development of the ecosystem, "Accelerators Accelerator & Events" and "Startup Events", and "Cost of Living" as the factor that least contributes to the development of the ecosystem. The Roman ecosystem is similar to the Lisbon ecosystem, it also ranked "Accelerators Accelerator & Events" as the factor that most contributes to the ecosystem and "Existing Framework Legal" as the factor that least contributes to the development of the ecosystem. Finally, Stockholm, is the only ecosystem that ranked "Business Angel Networks" as the factor that most contributes to the development of the ecosystem, along with the "Startup Events" factor, and "Cost of Living" the factor that contributes least to ecosystem development. For more information about the growth development factors is presented in Figure 6.14.

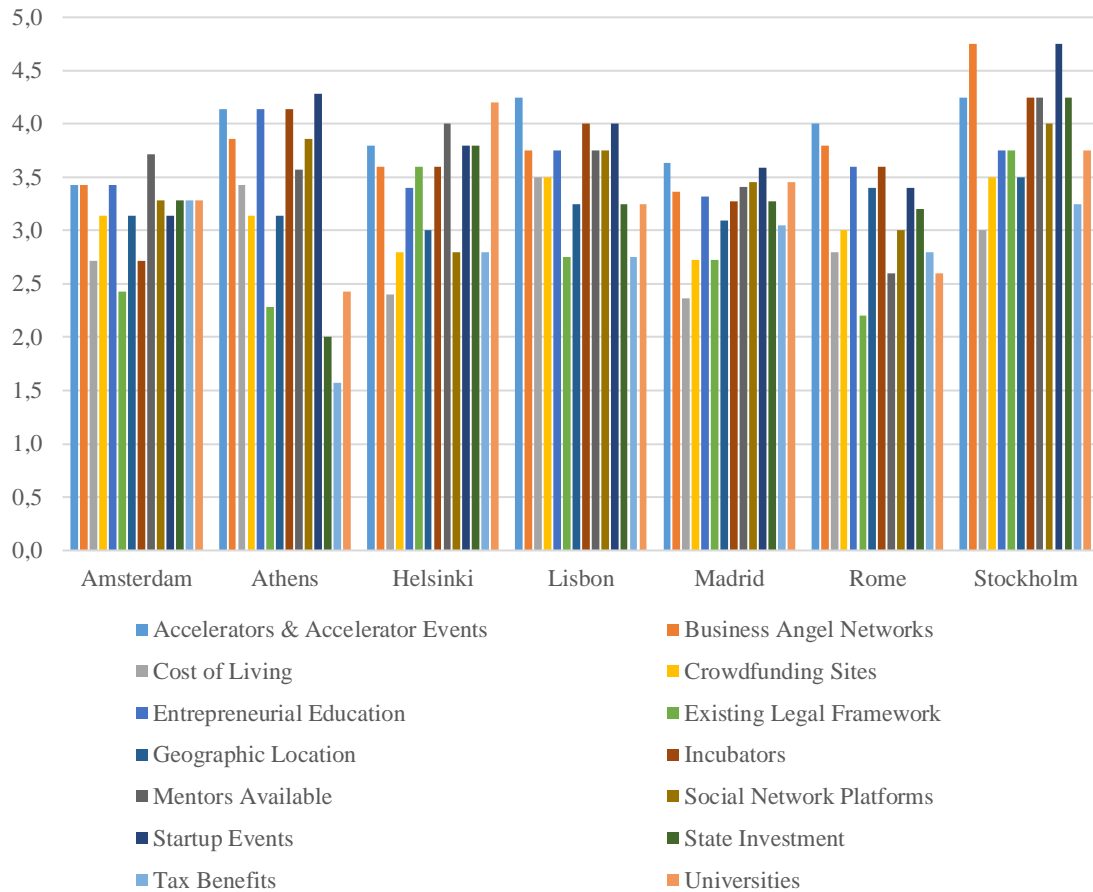


Figure 6.14 - Questionnaire: Growth Development Factors

6.2.9. The Future Projection of the Economic Sectors

The last question of the questionnaire was developed in order to understand the three economic sectors that will grow in the next five years. Therefore, each surveyed startup selected three sectors, with the ability to select the "Other" and write the name of sector specifically. The only economic sector that was added was "Fintech". Attending to answers, it is concluded that the economic sector that all ecosystems expect to grow in the next five years, is undoubtedly " Data & Analytics", although sectors such as "Finance", "Energy & Cleantech", "Health/ Medical", "SaaS ", " Smart Cities" and "Agriculture" stand out from other economic sectors. For more information about the economic sectors that will grow in the next five years is presented Figure 6.15.

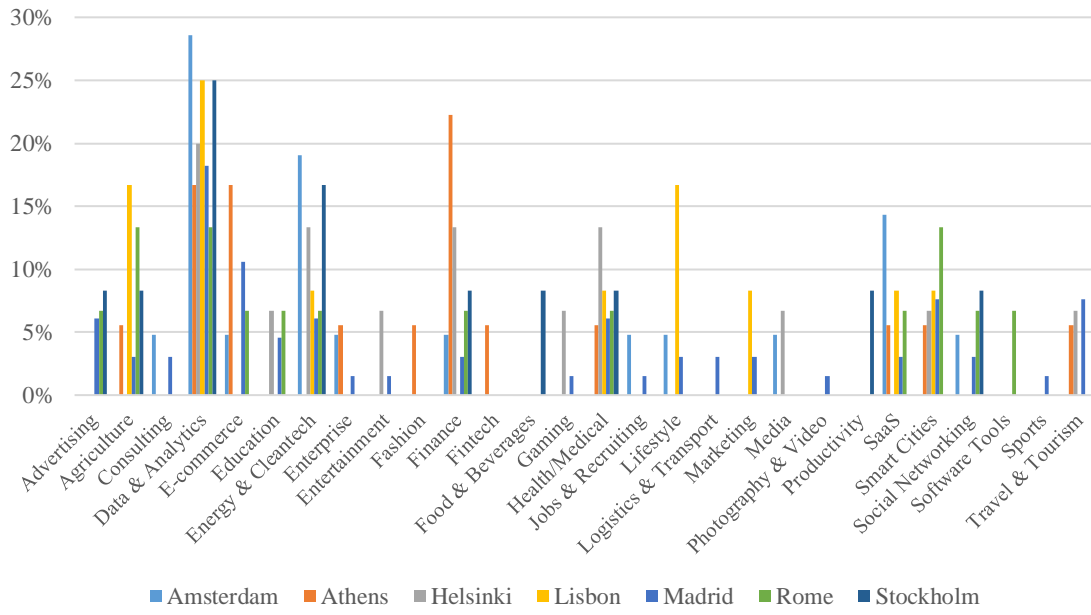


Figure 6.15 - Questionnaire: The Future Projection of the Economic Sectors

Chapter 7

Final Analysis

The following chapter will present the summary of results of the survey the empirical study. For each ecosystem will be compared the results obtained by the online platform with the results obtained in the questionnaires, focusing on three key topics of this study: Economic Sectors, Business Models and Pricing Models.

The previous chapters were exclusive to the presentation of the results obtained by the online platform F6S and the questionnaire carried out the collected database through F6S platform. Then the information will be compared by ecosystem in order to understand the trends of the ecosystems studied.

In each summary, a set of graphics is displayed. First, a graph summarizing the information collected about the economic sectors, with the weight percentage of the 10 economic sectors that stand out in the ecosystem, called "Top 10 (F6S)" and the percentage of startups surveyed by economic sector, called by "Scenario based on Questionnaire" and finally, the economic sectors of the future, according with the startups surveyed -"Future Projection". Then a set of graphs about business and pricing models, comparing the percentages of each model, given the data collected on the platform identified by "Data from F6S" and the questionnaires identified by "Scenario based on Questionnaire".

7.1 Resume - Madrid (Spain)

Madrid, capital of Spain and the largest ecosystem of this study. According to F6S platform there are about 1 420 startups registered, which makes this ecosystem requires special attention, since it is the largest ecosystem in the Iberian Peninsula. Currently, there are 30 different economic sectors, which are in the Top 10: Education, Lifestyle, Social Networking, E-commerce, Travel

Final Analysis

& Tourism, SaaS, Data & Analytics, Health/Medical, Finance and Entertainment. As economic sectors of the future are appointed: Data & Analytics, E-commerce, Travel & Tourism, Smart Cities, Energy & Cleantech, Advertising, Health/Medical, Education, Agriculture, Logistics & Transport, Finance, SaaS, Lifestyle, Social Networking, Consulting, Marketing, Photography & Video, Gaming, Enterprise, Sports, Jobs & Recruiting and Entertainment. For more information on Madrid's ecosystem resume about the economic sectors is presented in Figure 7.1.

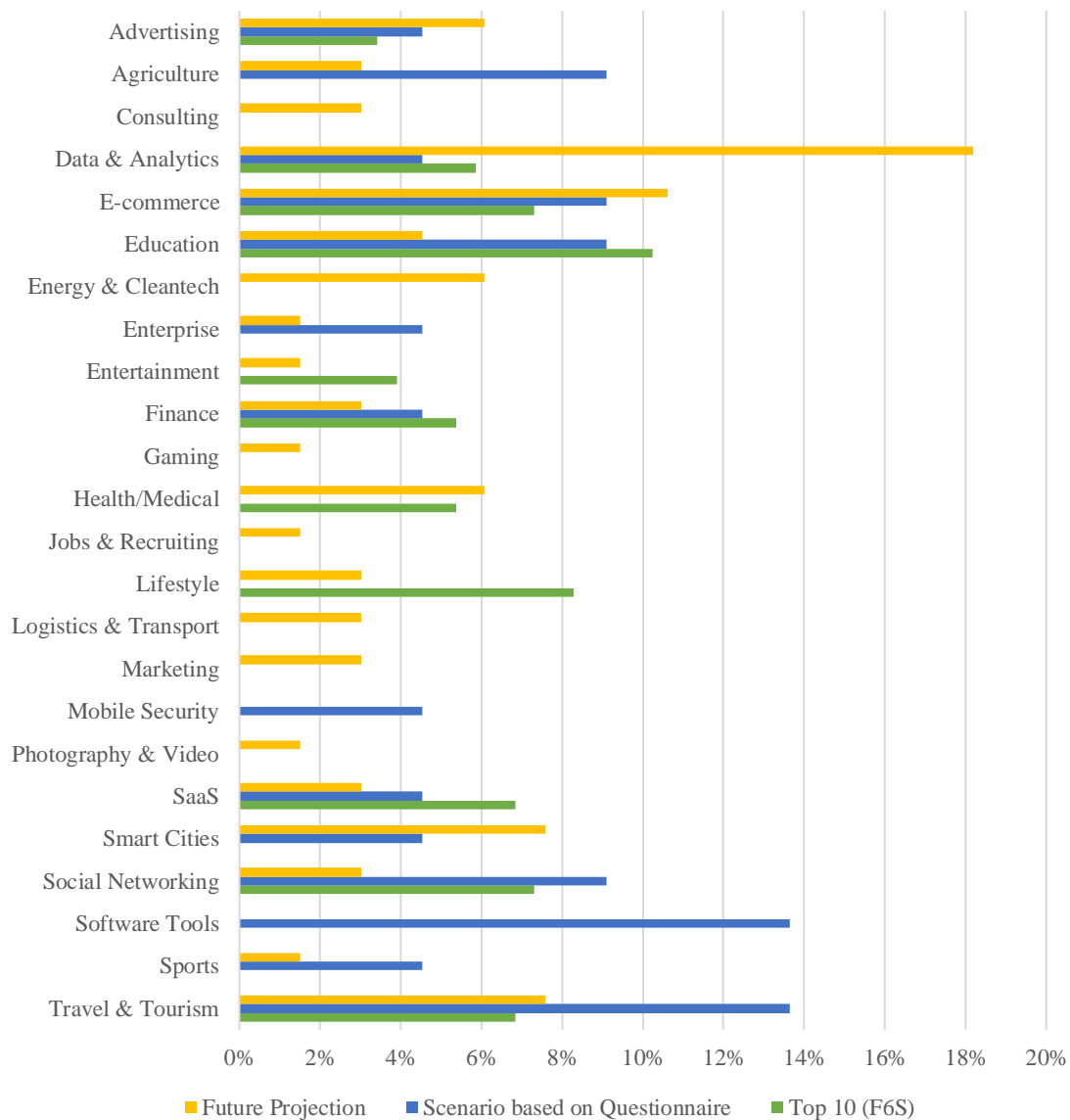


Figure 7.1 - Madrid's ecosystem resume: Economic Sectors

According to the online platform F6S, the business model that is the most selected by startups is the "B2C" business model, with about 50%, following the "B2B" model with about 30% and lastly, "C2C" model a little less over 10%. Comparing to the scenario based on questionnaire, the business model that stands out is the "B2B" model with close to 70%, following the "C2C" model with a little less 20% and lastly, "B2C" model, following "B2C" model and at last "C2C" model.

More information on Madrid’s ecosystem resume about the business models is presented in Figure 7.2.

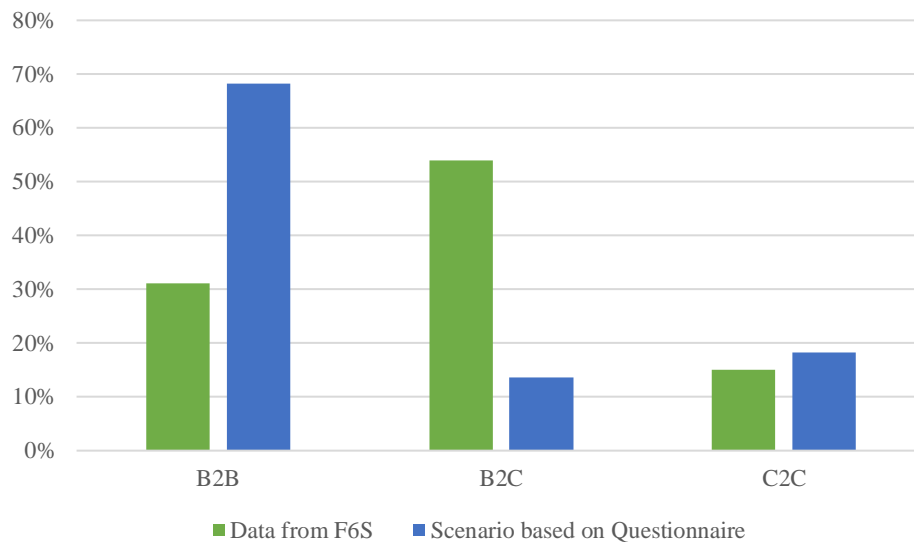


Figure 7.2 - Madrid’s ecosystem resume: Business Models

According to the online platform F6S, the pricing model that is the most selected by startups is the "Freemium" pricing model, with a little over 50%, following the "Pay per use" model with 30% and lastly, "Subscription" model. Comparing to the scenario based on questionnaire, the pricing models that stands out are "Pay per use" and "Subscription" models with almost 40%, following the model "Freemium". More information on Madrid’s ecosystem resume about the pricing models is presented in Figure 7.3.

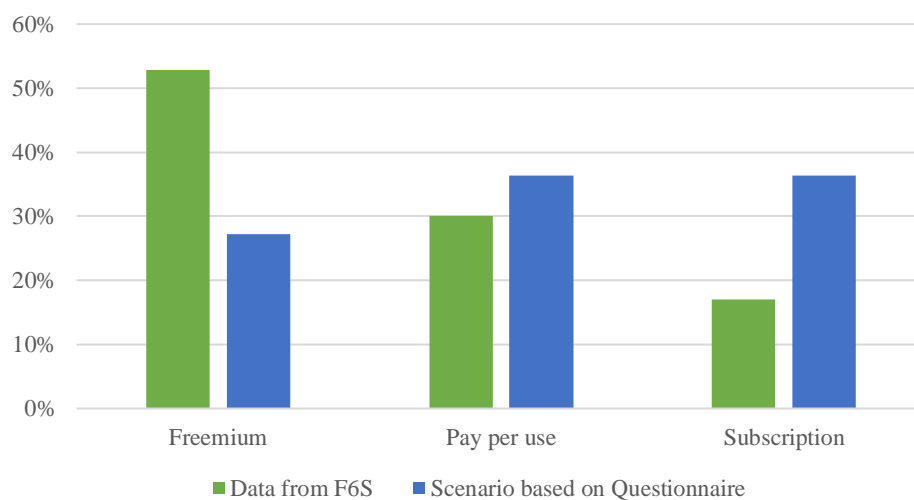


Figure 7.3 - Madrid’s ecosystem resume: Pricing Models

7.2 Resume - Amsterdam (Netherlands)

Amsterdam, the European newcomer, enters the ranking at 19th with more than 1,900-2,600 tech startups and the 5th highest Growth Index of the top 20, according Global Startup Ecosystem Ranking (Herrmann *et al.*, 2015). In the online platform F6S are registered 1 192 startups and currently, there are 32 different economic sectors, which are in the Top 10: SaaS, E-commerce, Travel & Tourism, Fashion, Food & Beverages, Education, Data & Analytics, Lifestyle, Health/Medical and Media. As economic sectors of the future are appointed: Data & Analytics, Energy & Cleantech, SaaS, Consulting, Enterprise, E-commerce, Finance, Jobs & Recruiting, Lifestyle, Media and Social Networking. For more information on Amsterdam’s ecosystem resume about the economic sectors is presented in Figure 7.4.

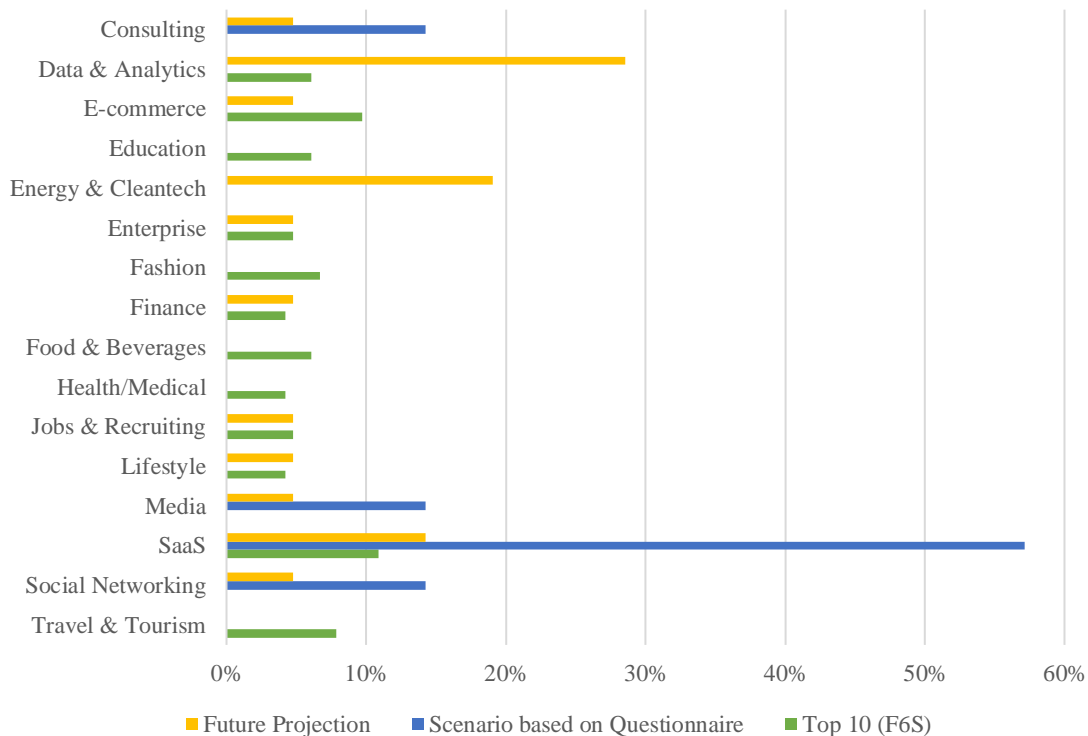


Figure 7.4 - Amsterdam’s ecosystem resume: Economic Sectors

According to the online platform F6S, the business model that is the most selected by startups is the "B2C" business model, with almost 50%, following the "B2B" model with a little over 40% and lastly, "C2C" model a little less than 10%. Comparing to the scenario based on questionnaire, the business model that stands out is the "B2B" model with close to 90%, following the "B2C" model with a little over 10%, not having been highlighted the "C2C" model. More information on Amsterdam’s ecosystem resume about the business model is presented in Figure 7.5.

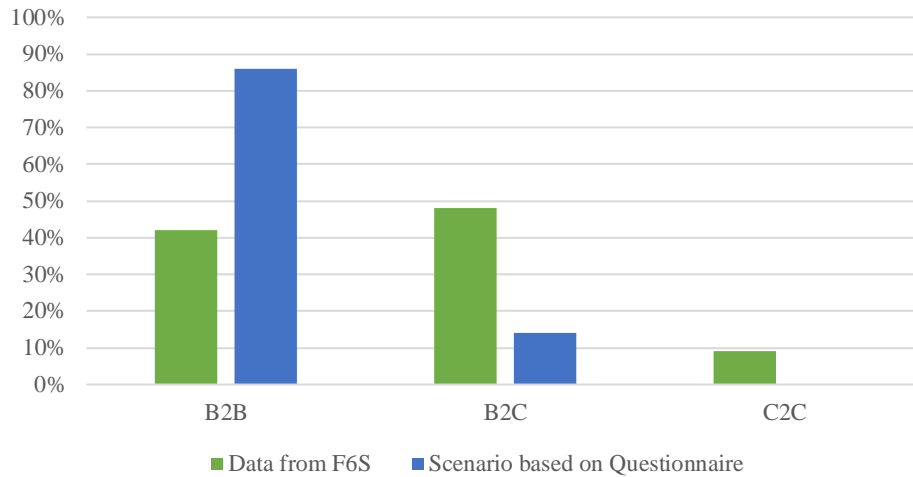


Figure 7.5 - Amsterdam’s ecosystem resume: Business Models

According to the online platform F6S, the pricing model that is the most selected by startups is the "Freemium" pricing model, with almost 50%, following the "Subscription" model with a little less than 40% and lastly, "Pay per use" model. Comparing to the scenario based on questionnaire, the pricing model that stands out is the "Subscription" model with a little over 40%, following the "Freemium" and "Pay per use" models. More information on Amsterdam’s ecosystem resume about the pricing models is presented in Figure 7.6.

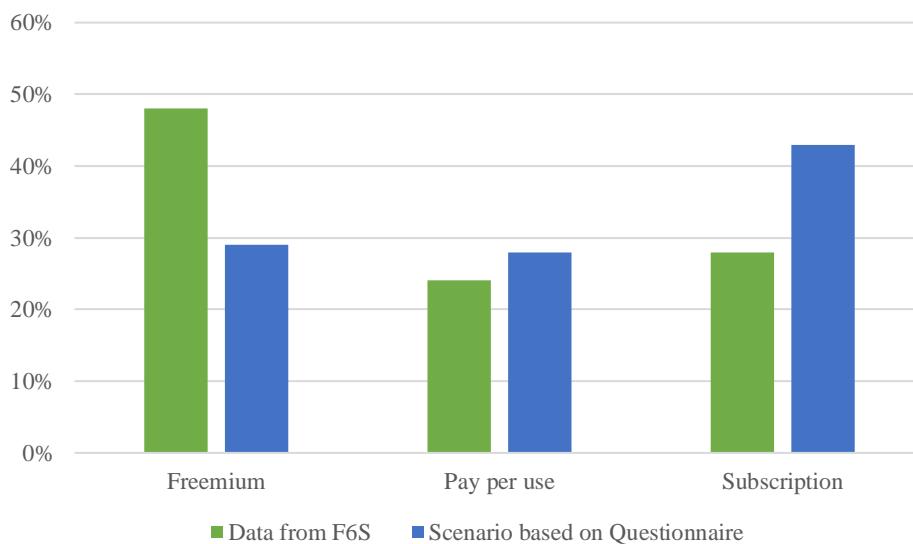


Figure 7.6 - Amsterdam’s ecosystem resume: Pricing Models

7.3 Resume - Rome (Italy)

Rome, capital of Italy and the third largest ecosystem of this study. According to F6S platform there are about 648 startups registered and currently, there are 24 different economic sectors, which are in the Top 10: E-commerce, Food & Beverages, Gaming, Entertainment, Travel & Tourism, Media, Sports, Health/Medical, Social Networking, Lifestyle, Finance, Education and Automotive. As economic sectors of the future are appointed: Agriculture, Data & Analytics, Smart Cities, Advertising, E-commerce, Education, Energy & Cleantech, Finance, Health/Medical, SaaS, Social Networking and Software Tools. For more information on Rome’s ecosystem resume about the economic sectors is presented in Figure 7.7.

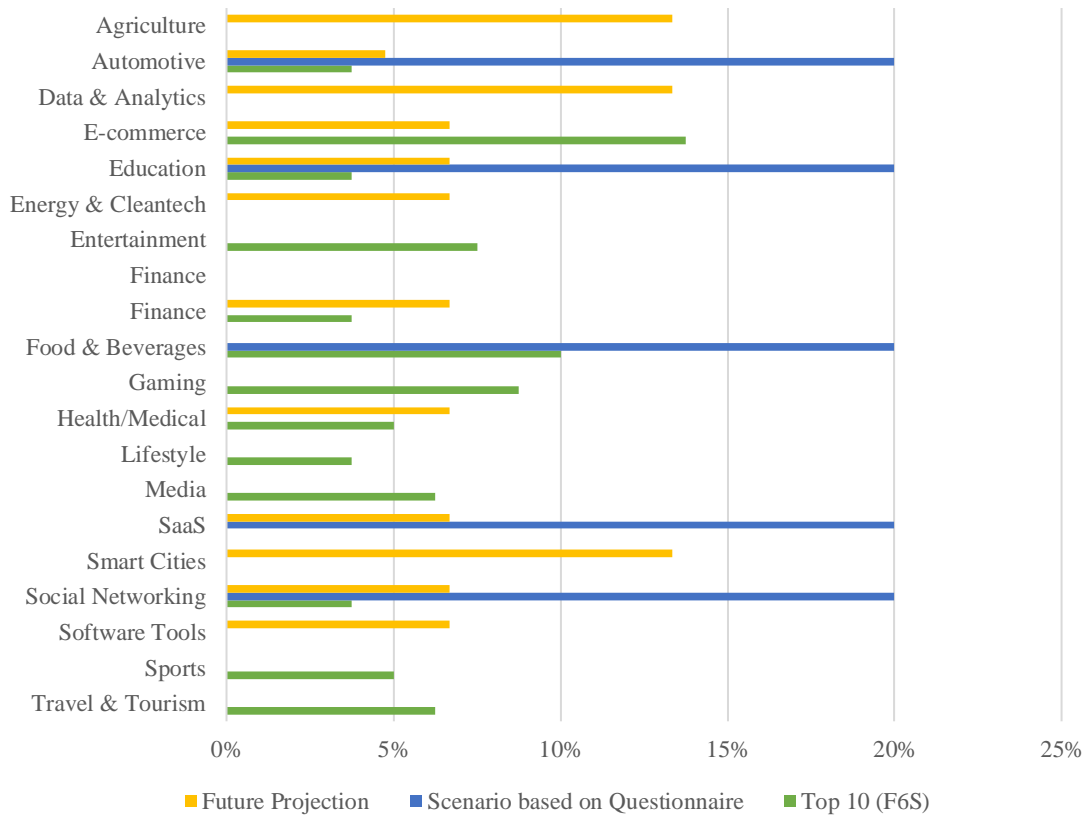


Figure 7.7 - Rome’s ecosystem resume: Economic Sectors

According to the online platform F6S, the business model that is the most selected by startups is the "B2C" business model, with a little over 70%, following the model "B2B" model with 20% and lastly, "C2C" model with a little less than 20%. Comparing to the scenario based on questionnaire, the business model that stands out is the "B2C" model with 80%, following the "B2B" model with 20%, not having been highlighted the "C2C" model. More information on Rome’s ecosystem resume about the business model is presented in Figure 7.8.

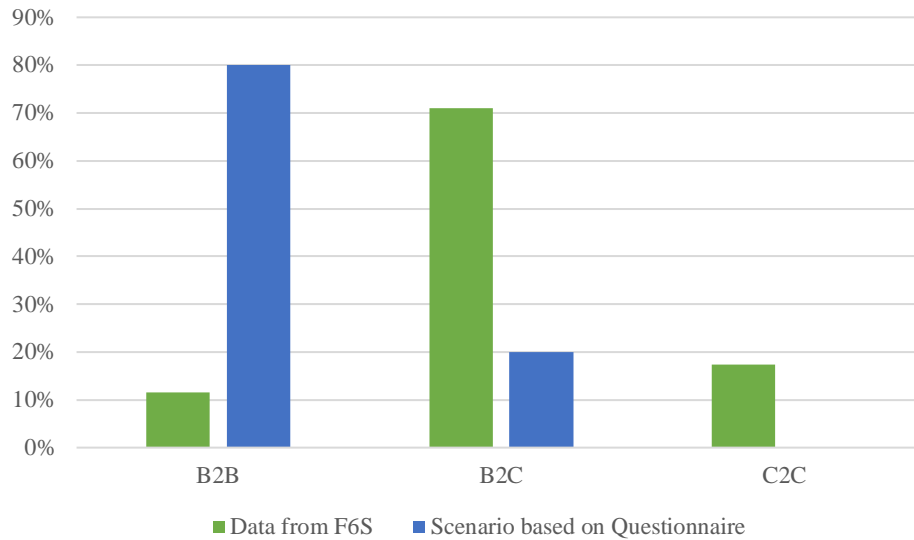


Figure 7.8 - Rome’s ecosystem resume: Business Models

According to the online platform F6S, the pricing model that is the most selected by startups is the "Freemium" pricing model, with a little over 70%, following the "Pay per use" model with a little over 10% and lastly, "Subscription" model. Comparing to the scenario based on questionnaire, the pricing model that stands out is the "Pay per use" model with 60%, following the "Freemium" and "Subscription" model. More information on Rome’s ecosystem resume about the pricing models is presented in Figure 7.9.

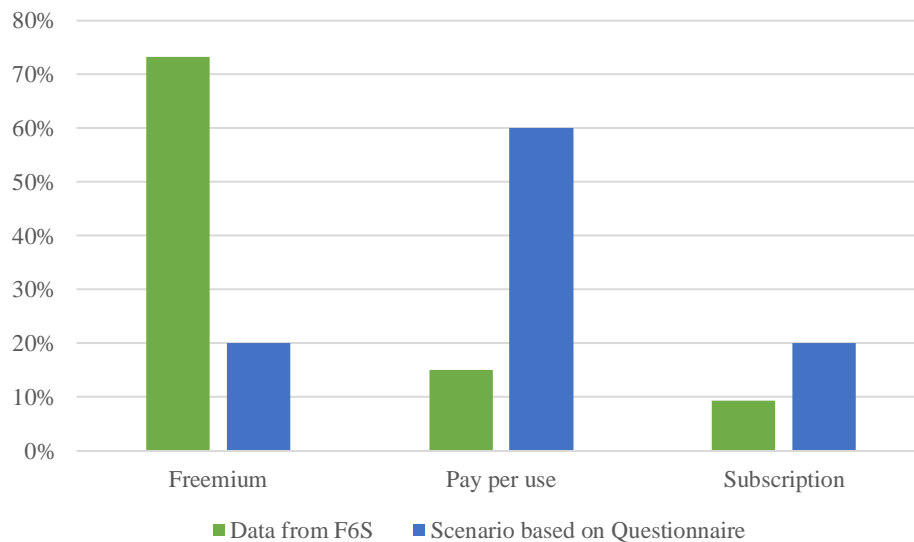


Figure 7.9 - Rome’s ecosystem resume: Pricing Models

7.4 Resume – Lisbon (Portugal)

Lisbon, capital of Portugal and the fourth largest ecosystem of this study. According to F6S platform there are about 619 startups registered and currently, there are 24 different economic sectors, which are in the Top 10: SaaS, Education, Travel & Tourism, Social Networking, Data & Analytics, Entertainment, E-commerce, Fashion, Food & Beverages, Lifestyle and Consulting. As economic sectors of the future are appointed: Data & Analytics, Lifestyle, Agriculture, Energy & Cleantech, Health/Medical, SaaS, Marketing and Smart Cities. For more information on Lisbon’s ecosystem resume about the economic sectors is presented in Figure 7.10.

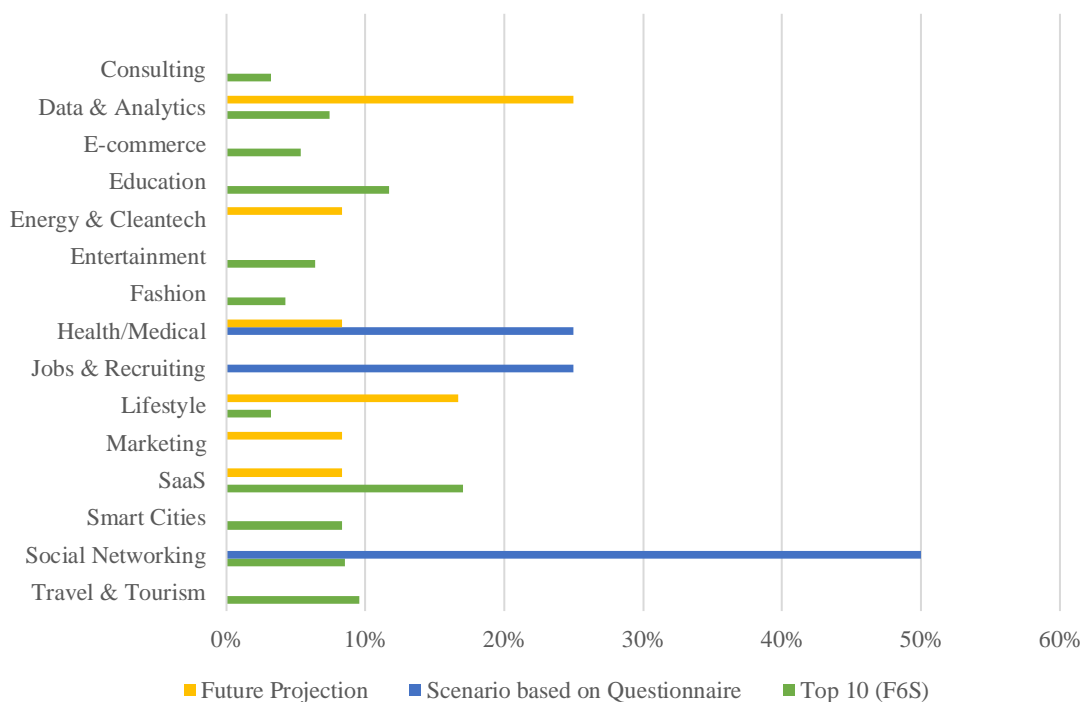


Figure 7.10 - Lisbon’s ecosystem resume: Economic Sectors

According to the online platform F6S, the business model that is the most selected by startups is the "B2C" business model, with a little less than 60%, following the "B2B" model with 20% and lastly, "C2C" model with a little less than 30%. Comparing to the scenario based on questionnaire, the business model that stands out is the "B2B" model with 100%, since all startups that answered the questionnaire use the "B2B" business model. More information on Lisbon’s ecosystem resume about the business model is presented in Figure 7.11.

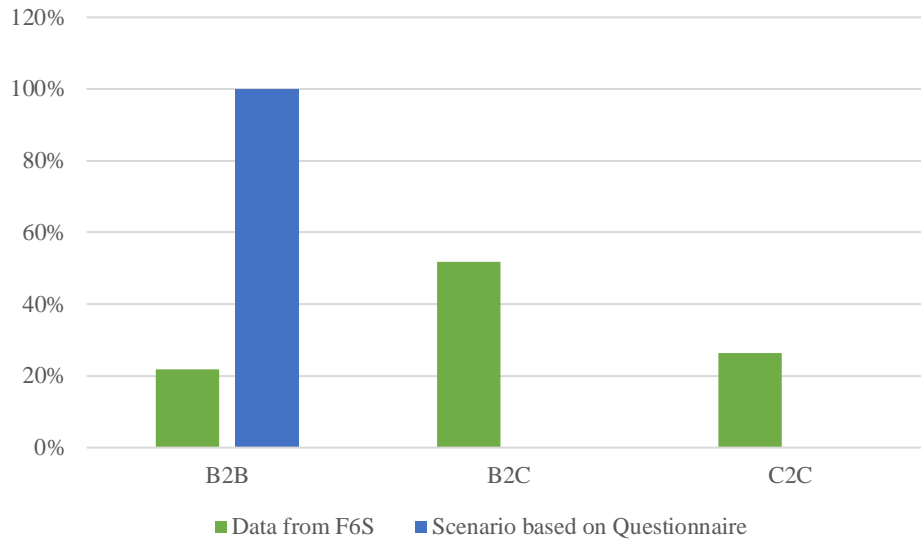


Figure 7.11 - Lisbon’s ecosystem resume: Business Models

According to the online platform F6S, the pricing model that is the most selected by startups is the "Freemium" pricing model, with 70%, following the "Pay per use" model with a little over 30% and lastly, "Subscription" model. Comparing to the scenario based on questionnaire, the pricing model that stands out is the "Pay per use" model with 60% and following the "Freemium" model with 40%, not having been highlighted the "Subscription" model. . More information on Lisbon’s ecosystem resume about the pricing models is presented in Figure 7.12.

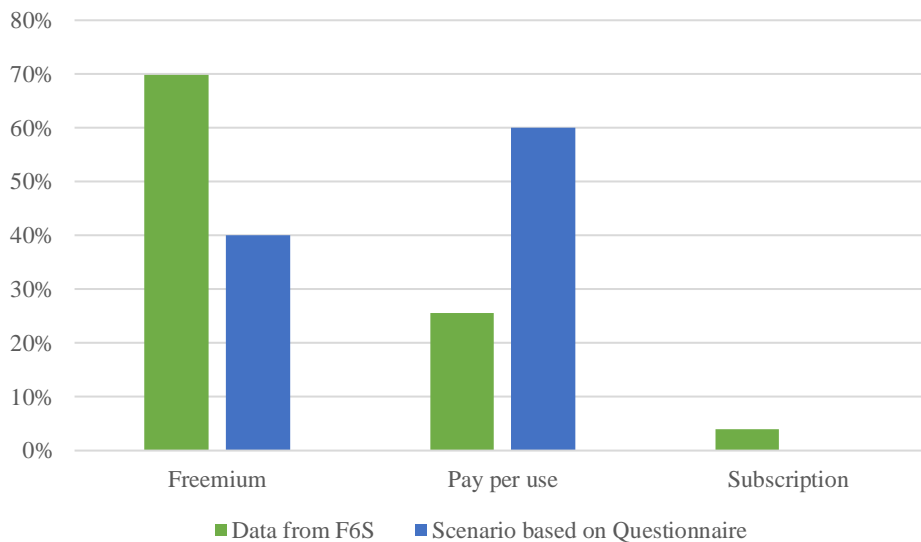


Figure 7.12 - Lisbon’s ecosystem resume: Pricing Models

7.5 Resume – Helsinki (Finland)

Helsinki, capital of Finland and the fifth largest ecosystem of this study. According to F6S platform there are about 558 startups registered and currently, there are twenty four different economic sectors, which are in the Top 10: Lifestyle, Media, Health/Medical, Gaming, Music, Jobs & Recruiting, Data & Analytics, Travel & Tourism and Education. As economic sectors of the future are appointed: Data & Analytics, Energy & Cleantech, Finance, Health/Medical, Education, Entertainment, Gaming, Media, Smart Cities and Travel & Tourism. For more information on Helsinki’s ecosystem resume about the economic sectors is presented in Figure 7.13.

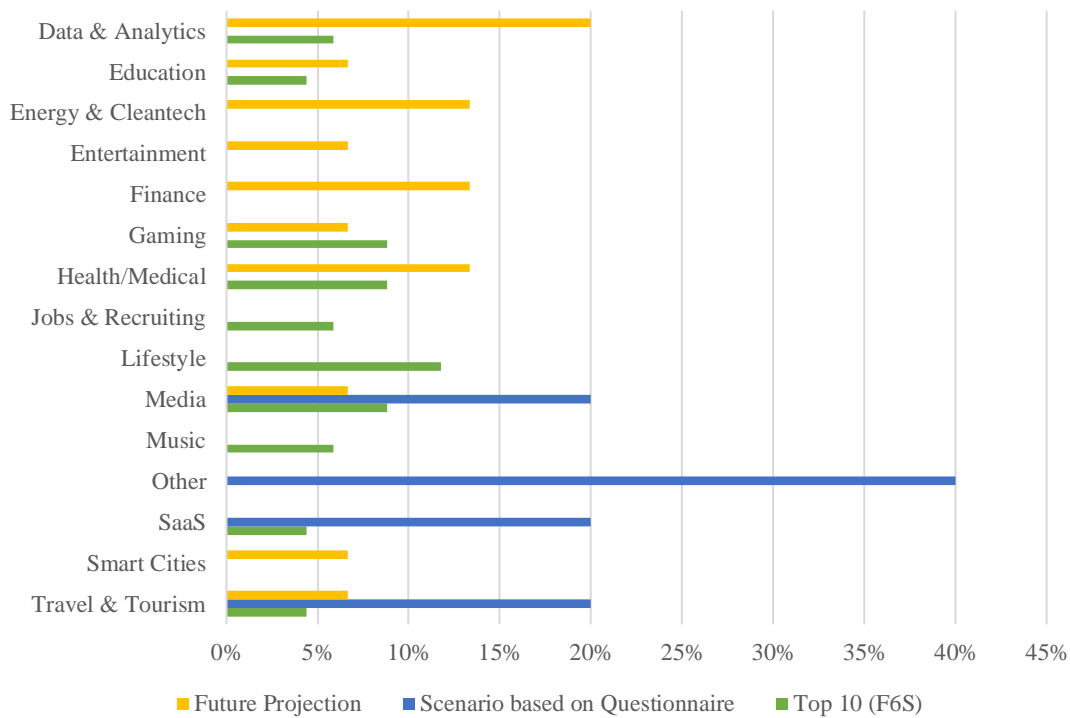


Figure 7.13 - Helsinki’s ecosystem resume: Economic Sectors

According to the online platform F6S, the business model that is the most selected by startups is the "B2C" business model, with a little less than 50%, following the "B2B" model with 40% and lastly, "C2C" model with a little less than 20%. Comparing to the scenario based on questionnaire, the business model that stands out is the "B2C" model with 60% and following the "B2B" model, not having been highlighted the "C2C" model. More information on Helsinki’s ecosystem resume about the business model is presented in Figure 7.14.

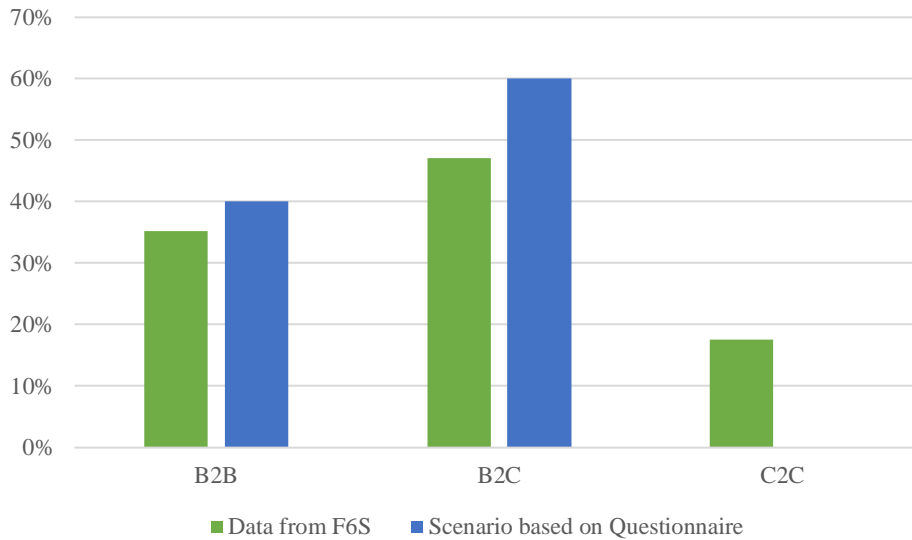


Figure 7.14 - Helsinki's ecosystem resume: Business Models

According to the online platform F6S, the pricing model that is the most selected by startups is the "Freemium" pricing model, with almost 60%, following the "Pay per use" model with a little over 20% and lastly, "Subscription" model. Comparing to the scenario based on questionnaire, the pricing model that stands out is the "Pay per use" model with 60% and following the "Freemium" model with 40%, not having been highlighted the "Subscription" model. More information on Helsinki's ecosystem resume about the pricing models is presented in Figure 7.15.

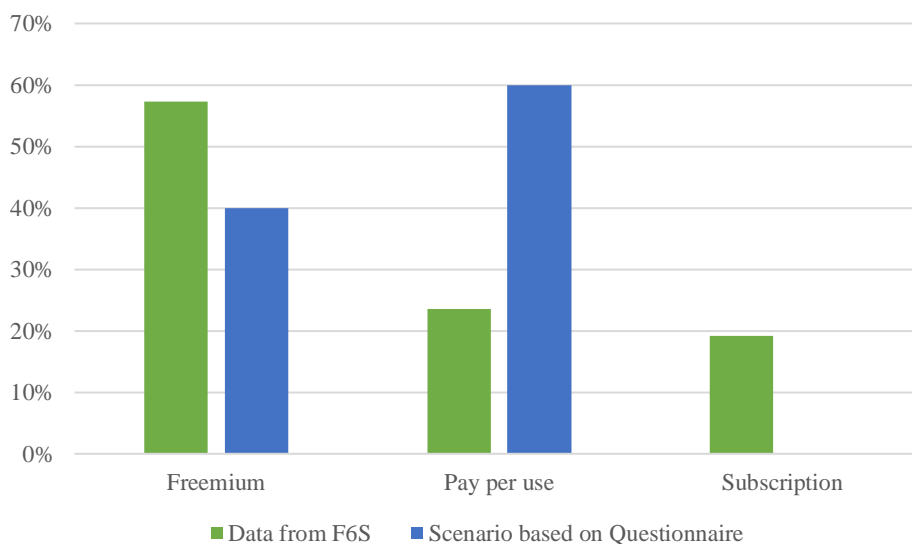


Figure 7.15 - Helsinki's ecosystem resume: Pricing Models

7.6 Resume – Stockholm (Sweden)

Stockholm, capital of Sweden and the sixth largest ecosystem of this study. According to F6S platform there are about 558 startups registered and currently, there are seventeen different economic sectors, which are in the Top 10: Health / Medical, Gaming, SaaS, Enterprise, Social Networking, Media, Food & Beverages, E-commerce, Lifestyle and Education. As economic sectors of the future are appointed: Data & Analytics, Energy & Cleantech, Advertising, Agriculture, Finance, Food & Beverages, Health/Medical, Productivity and Social Networking. For more information on Stockholm’s ecosystem resume about the economic sectors is presented in Figure 7.16.

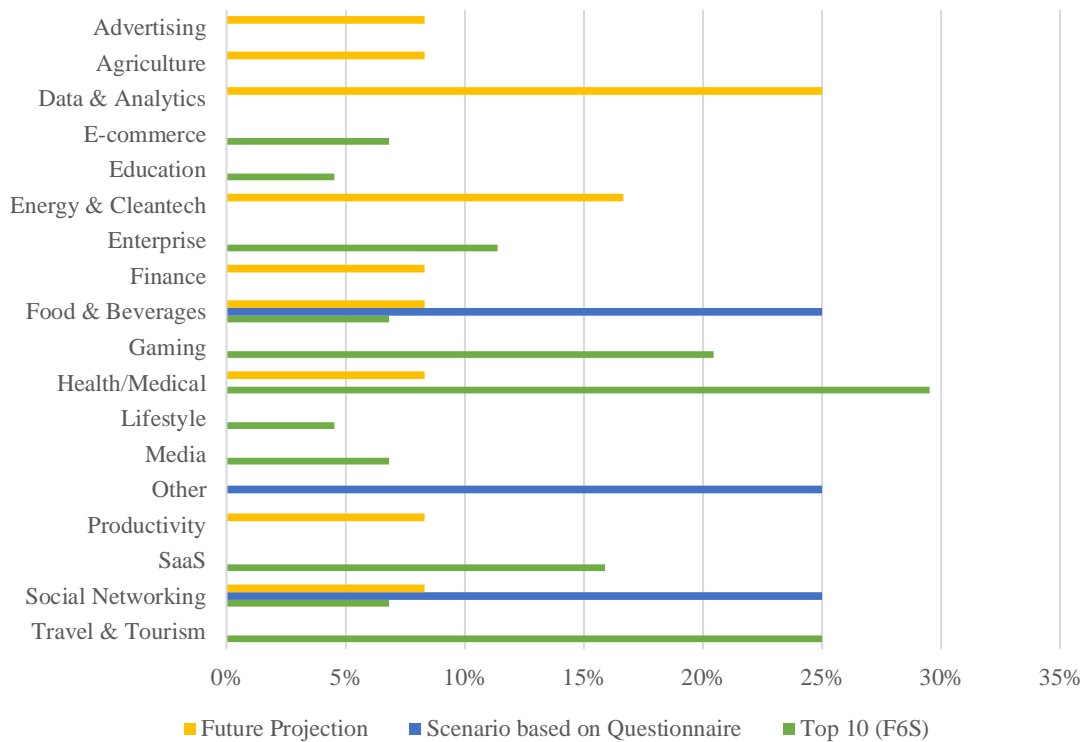


Figure 7.16 - Stockholm’s ecosystem resume: Economic Sectors

According to the online platform F6S, the business model that is the most selected by startups is the "B2B" business model, with a little over 40%, following the "B2C" model with a little over 30% and lastly, "C2C" model with almost 30%. Comparing to the scenario based on questionnaire, the business model that stands out is the "B2B" model with 75% and following the "B2C" model with 25%, not having been highlighted the "C2C" model. More information on Stockholm’s ecosystem resume about the business model is presented in Figure 7.17.

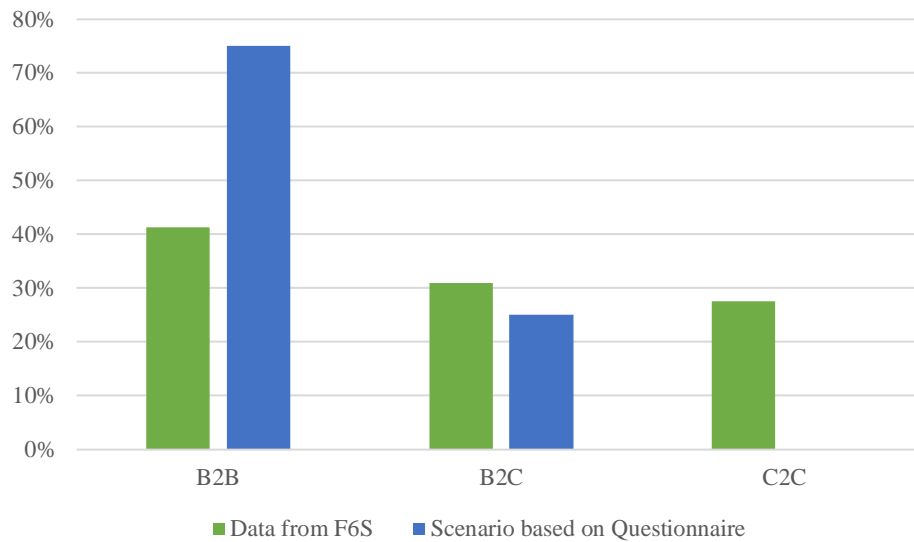


Figure 7.17 - Stockholm's ecosystem resume: Business Models

According to the online platform F6S, the pricing model that is the most selected by startups is the "Freemium", with almost 50%, following the "Pay per use" model with a little over 30% and lastly, "Subscription" model. Comparing to the scenario based on questionnaire, the pricing model that stands out is the "Pay per use" model with 75% and following the "Freemium" model with 25%, not having been highlighted the "Subscription" model. More information on Stockholm's ecosystem resume about the pricing models is presented in Figure 7.18.

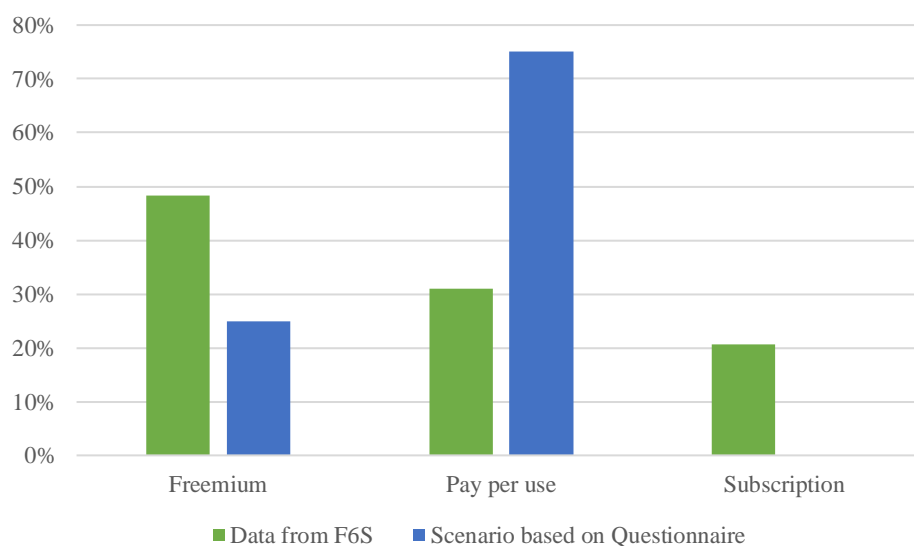


Figure 7. 18 - Stockholm's ecosystem resume: Pricing Models

7.7 Resume – Athens (Greece)

Athens, capital of Greece and the seventh largest ecosystem of this study. According to F6S platform there are about 525 startups registered and currently, there are 17 different economic sectors, which are in the Top 10: SaaS, Travel & Tourism, Media, Entertainment, Data & Analytics, E-commerce, Social Networking, Lifestyle, Sports, Gaming, Marketing, Health/Medical and Food & Beverages. With regard to the questionnaires were obtained responses of six different economic sectors: E-commerce, Energy & Cleantech, Fashion, Other, SaaS and Software Tools. According to the information received, the startups are expecting that, hierarchically, the economic sectors that will grow next five years are: Finance, Data & Analytics, E-commerce, Energy & Cleantech, Agriculture, Enterprise, Fashion, Fintech, Health/Medical, SaaS, Smart Cities and Travel & Tourism. For more information on Athens' ecosystem resume about the economic sectors is presented in Figure 7.19.

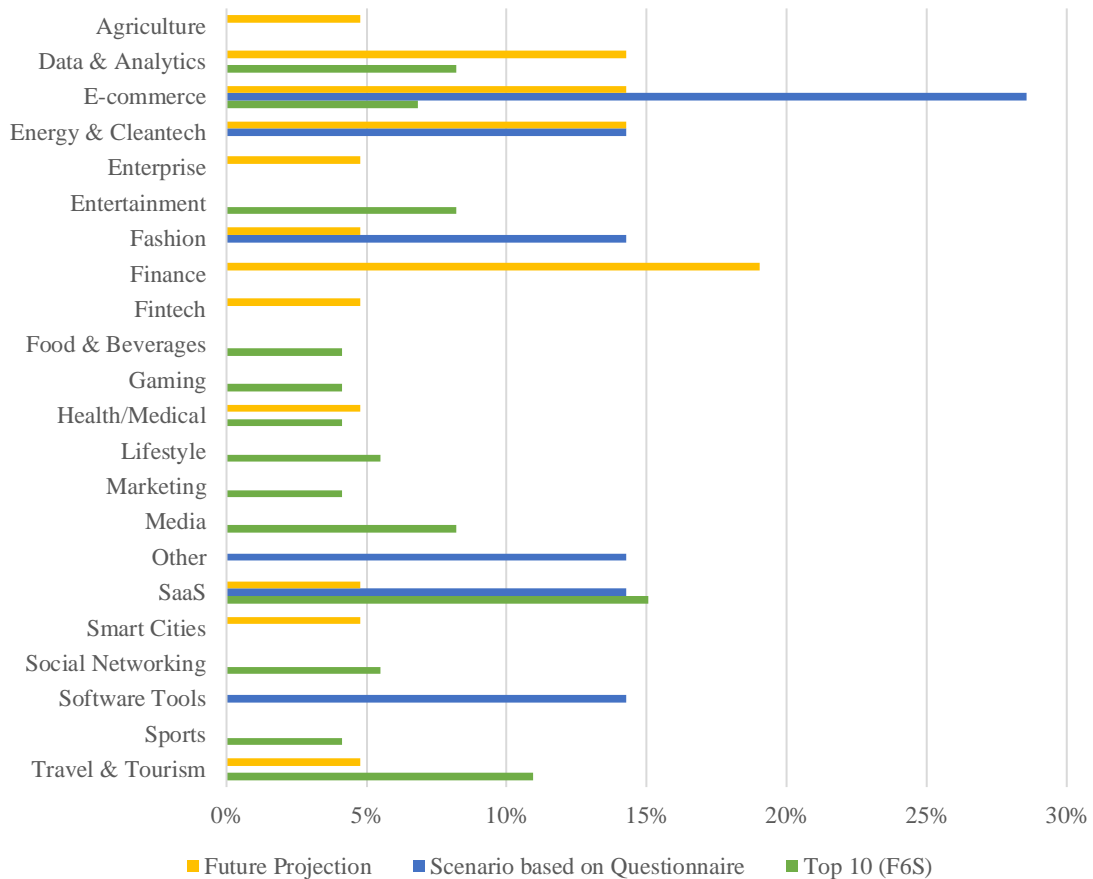


Figure 7.19 - Athens' ecosystem resume: Economic Sectors

According to the online platform F6S, the business model that is the most selected by startups is the "B2B" business model, with a little over 60%, following the "B2C" model with a little over 10% and lastly, "C2C" model with around 20%. Comparing to the scenario based on questionnaire, the business model that stands out is the "B2B" model with around 70% and following the "B2C" and "C2C" models with around 15% each one. More information on Athens' ecosystem resume about the business model is presented in Figure 7.20.

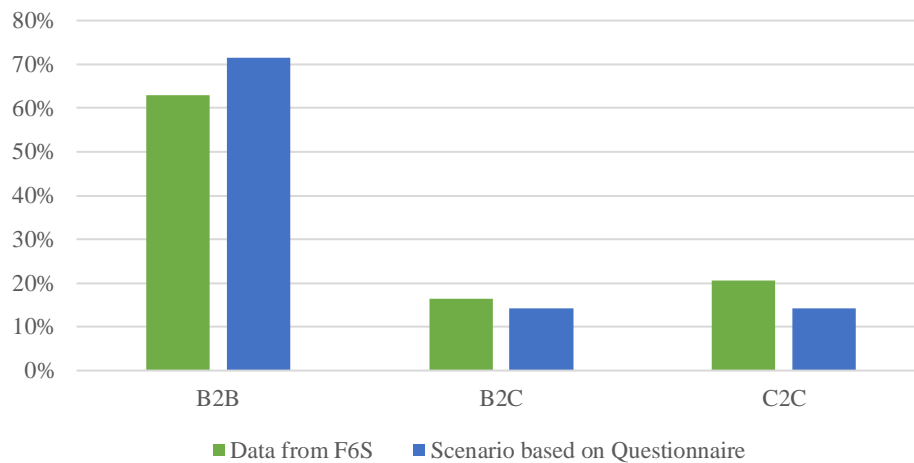


Figure 7.20 - Athens' ecosystem resume: Business Models

According to the online platform F6S, the pricing model that is the most selected by startups is the "Freemium", with almost 40%, following the "Subscription" model with a little over 30% and lastly, "Pay per use" model. Comparing to the scenario based on questionnaire, the pricing model that stands out is the "Subscription" model with a little less than 60%, following the "Pay per use" model with almost 30% and lastly, the "Freemium" model. More information on Athens' ecosystem resume about the pricing models is presented in Figure 7.21.

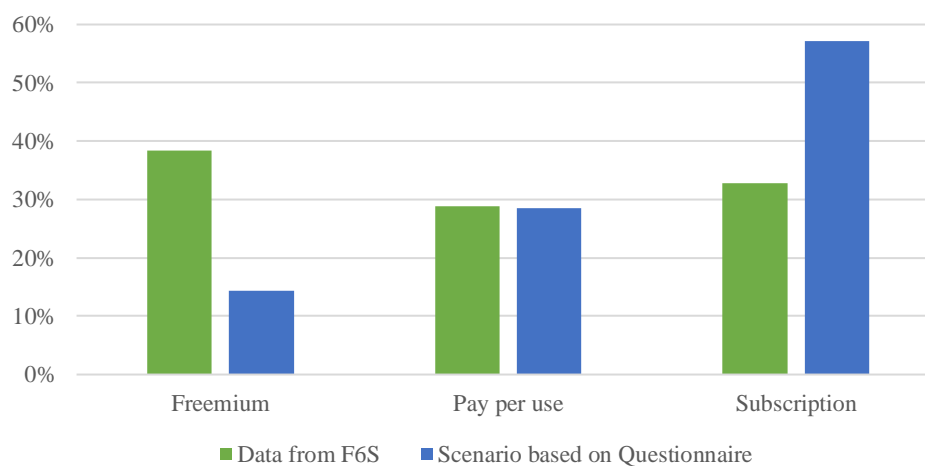


Figure 7.21 - Athens' ecosystem resume: Pricing Models

7.8 Resume – Malmo (Sweden)

Malmo is the last ecosystem of this study. Unfortunately, it was the only ecosystem which startups did not respond to the questionnaire. However, there is information on this ecosystem, collected in the online platform F6S. But, it proceeded to compare the two Swedish cities involved in this study - Stockholm and Malmo – in order to analyze if the two ecosystems follows the same trends.

Malmo, the 3rd largest town in Sweden and during the past 5 years it has become one of Scandinavia’s most dynamic places for startups in ICT, mobile, biotechnology, cleantech and design; although it is the smallest ecosystem of the present study. There is no need to highlight the 10 most powerful sectors in the ecosystem, because there are only 7 different economic: Social Networking, Health/Medical, Travel & Tourism, SaaS, Media, E-commerce and Computer Networking. Comparing both ecosystems, there are four economic sectors that stand out: E-commerce, Media, SaaS and Social Networking. For more information on Malmo and Stockholm’s ecosystem resume about the economic sectors is presented in Figure 7.22.

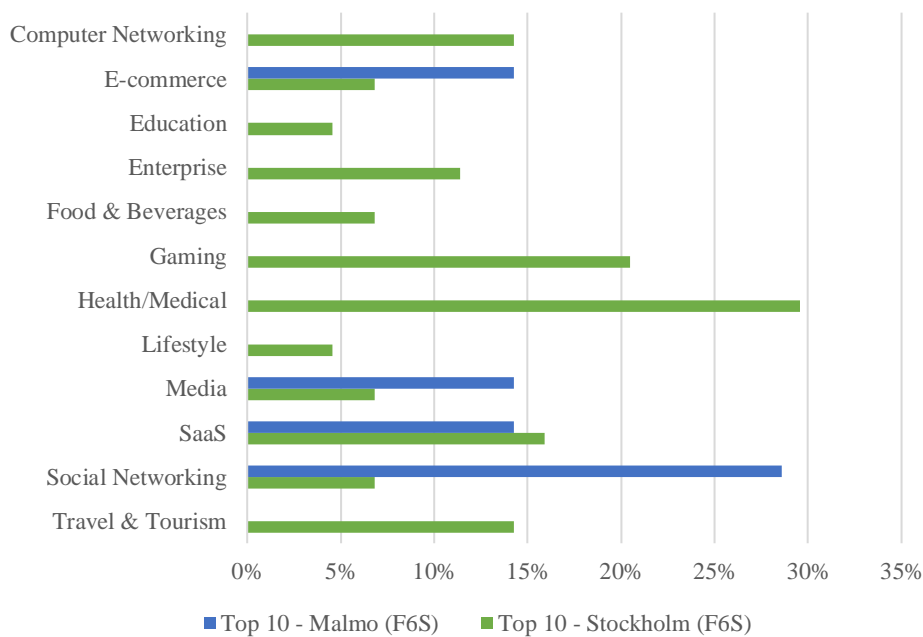


Figure 7.22 - Malmo and Stockholm’s ecosystem resume: Economic Sectors

According to the online platform F6S, the business model that is the most selected by Malmo’s startups is the "C2C" business model, with a little over 40%, following the "B2B and "B2C" models. It is the unique ecosystem of the study which the business model "C2C" stands out from other models. Comparing to the results of the Stockholm’s ecosystem, the business model that

stands out is the "B2B" model, following the "B2C" and "C2C" models. With regard to business models, it is noted that the business model "B2C" has a similar percentage, relative to the number of startups practicing this business model in Malmo and Stockholm. More information on Malmo and Stockholm's ecosystems resume about the business models is presented in Figure 7.23.

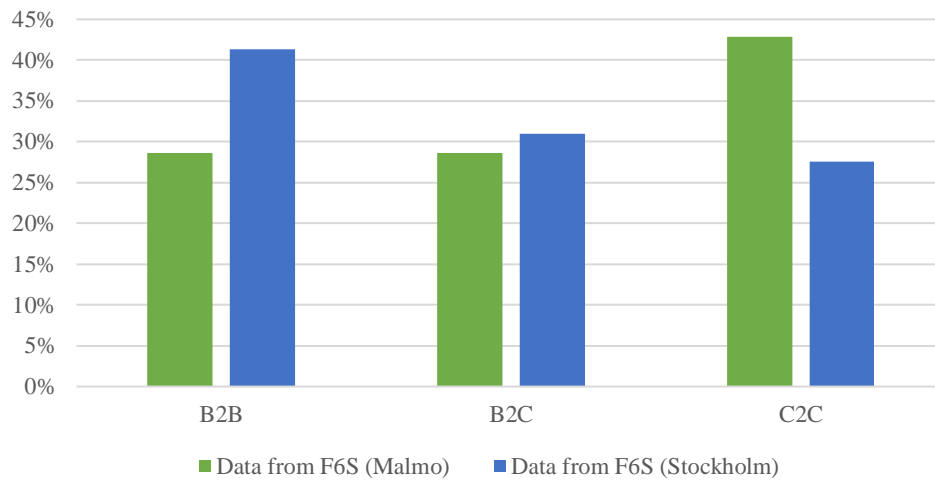


Figure 7.23 - Malmo and Stockholm's ecosystem resume: Business Models

According to the online platform F6S, the pricing models that are the most selected by Malmo's startups are the "Freemium" and "Pay per use", following the "Subscription" model. Comparing to the results of the Stockholm's ecosystem, the pricing model that stands out is the "Freemium" model, following the "Pay per use" model and lastly, the "Freemium" model. More information on Malmo and Stockholm's ecosystems resume about the pricing models is presented in Figure 7.24.

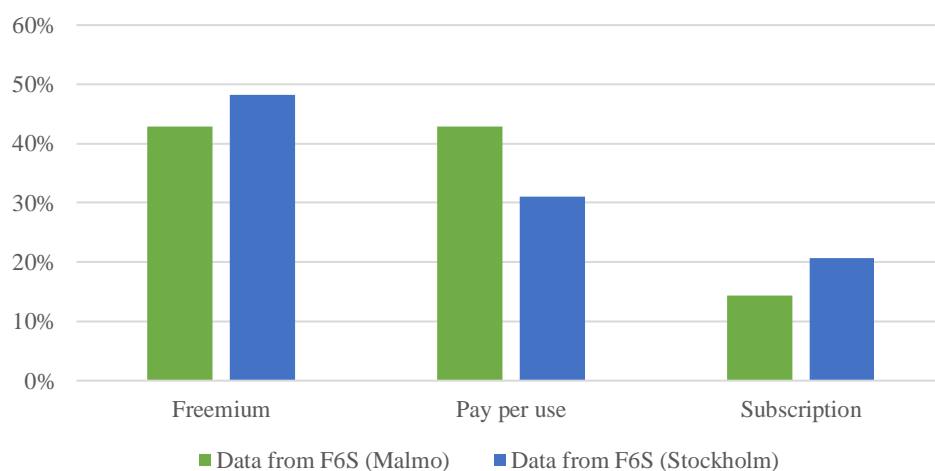


Figure 7.24 - Malmo and Stockholm's ecosystem resume: Pricing Model

7.9 Statistical Test

Denotes that all these results of the questionnaire, have a data independence test – chi-square test. This test determine whether research distributions of two or more unrelated samples differ significantly in relation to the given variable.

The Chi-Square Test of Independence is also known as Pearson's Chi-Square, Chi-Squared, or χ^2 . χ is the Greek letter Chi. The Chi-Square Test has two major fields of application: Goodness of fit test and Test of independence. Firstly, the Chi-Square Test can test whether the distribution of a variable in a sample approximates an assumed theoretical distribution (e.g., normal distribution, Beta). Secondly, the Chi-Square Test can be used to test of independence between two variables. That means that it tests whether one variable is independent from another one. In other words, it tests whether or not a statistically significant relationship exists between a dependent and an independent variable. When used as test of independence, the Chi-Square Test is applied to a contingency table, or cross tabulation (sometimes called crosstabs for short). For this case, was used a cross tabulation because was applied a test of independence.

In more academic terms, most quantities that are measured can be proven to have a distribution that approximates a Chi-Square distribution. Pearson's Chi Square Test of Independence is an approximate test. This means that the assumptions for the distribution of a variable are only approximately Chi-Square. This approximation improves with large sample sizes.

Taking this into consideration, Fisher developed an exact test for contingency tables with small samples. Exact tests do not approximate a theoretical distribution, as in this case Chi-Square distribution. Fisher's exact test calculates all needed information from the sample using a hypergeocontinuous-level distribution.

It is an exact test, a significance value p calculated with Fisher's Exact Test will be correct; i.e., when $p = 0.01$ the test (in the long run) will actually reject a true null hypothesis in 1% of all tests conducted. For an approximate test such as Pearson's Chi-Square Test of Independence this is only asymptotically the case. Therefore the exact test has exactly the Type I Error (α -Error, false positives) it calculates as p -value.

When applied to a research problem, however, this difference might simply have a smaller impact on the results. The rule of thumb is to use exact tests with sample sizes less than ten. Also both Fisher's exact test and Pearson's Chi-Square Test of Independence can be easily calculated with statistical software such as SPSS.

The Chi-Square Test of Independence is the simplest test to prove a causal relationship between an independent and one or more dependent variables. As the decision-tree for tests of independence shows, the Chi-Square Test can always be used.

Turned to IBM SPSS software to enter their data for each question and then there was the data independence test. More information in the appendix.

7.10 Overall Analysis

The purpose of this research is not only to analyze trends among economic sectors, business models and pricing models, but also map the principal economic sectors for each region. In this case will be considered two regions: the Nordic region - Amsterdam, Helsinki, Stockholm and Malmo – and the Mediterranean region - Lisbon, Madrid, Rome and Athens. For this, we used the information gathered from F6S platform because it is the largest sample compared to the sample of surveyed startups, which increases the level of confidence of the results.

The following Table 7.1 and Table 7.2 show the Top 10 of each ecosystem. Firstly, the Nordic Region and finally, the Mediterranean region. The aim is to select the five economic sectors with highest weight in each ecosystem.

	AMSTERDAM	HELSINKI	STOCKHOLM	MALMO
1	SaaS	Lifestyle	Health/Medical	Social Networking
2	E-commerce	Media	Gaming	Health/Medical
3	Travel & Tourism	Health/Medical	SaaS	Travel & Tourism
4	Fashion	Gaming	Enterprise	SaaS
5	Food & Beverages	Music	Social Networking	Media
6	Education	Jobs & Recruiting	Media	E-commerce
7	Data & Analytics	Data & Analytics	Food & Beverages	Computer Networking
8	Lifestyle	Travel & Tourism	E-commerce	
9	Health/Medical	SaaS	Lifestyle	
10	Finance	Education	Education	

Table 7.1 - Top 10 - Nordic Region

	MADRID	ROME	LISBON	ATHENS
1	Education	E-commerce	SaaS	SaaS
2	Lifestyle	Food & Beverages	Education	Travel & Tourism
3	E-commerce	Gaming	Travel & Tourism	Media
4	Social Networking	Entertainment	Social Networking	Entertainment
5	SaaS	Travel & Tourism	Data & Analytics	Data & Analytics
6	Travel & Tourism	Media	Entertainment	E-commerce
7	Data & Analytics	Sports	E-commerce	Social Networking
8	Finance	Health/Medical	Fashion	Lifestyle
9	Health/Medical	Social Networking	Lifestyle	Sports
10	Entertainment	Lifestyle	Consulting	Gaming
		Finance		Marketing
		Education		Health/Medical
		Automotive		Food & Beverages

Table 7.2 - Top 10 - Mediterranean Region

Below are presented the tables with top 5 of each region and their respective ecosystems. The main economic sectors in the Nordic region is SaaS and Health / Medical. The large number of startups in these areas is justified the largest R&D and S&T ratios. This unique combination of high-end research, education, innovation and technology makes it stand out in the European Union. These ecosystems are characterized by the most dynamic places for startups in ICT, mobile, biotechnology, clean-tech and design. Nordic culture is also highly concerned about wellness and health and in this sense, several startups are responsive to local needs. In these countries there is a very positive energy between big companies and the government to stimulate the entrepreneurial ecosystem, thus increasing the number of startups from year to year. Several companies such as Skype and Spotify began as startups in this entrepreneurial region. Finally, there are other economic sectors which also stands as Gaming, Media, Social Networking and Travel & Tourism. Finland is widely known for the success of its gaming startups such as Rovio and Supercell, but other sectors including Cleantech, Health and Mobile are also doing remarkably well. This ecosystem is characterized for comprises most high-level startups in gaming and Health and Wellness startups are becoming a close second. The growth of these sectors is boosted by investors. During the past 5 years Sweden has become one of Scandinavia’s most dynamic places for startups in ICT, Mobile, Biotechnology, Cleantech and Design. Over the years, tourism in this region has increased and complementing the incentives made by low-cost companies, justify the growing number of startups in this economic sector. Media and Social Networking respond to the constant need for societies to be always aware of all the world events

and communicate with the world. More information about the Nordic region’s principal economic sectors on Table 7.3.

	AMSTERDAM	HELSINKI	STOCKHOLM	MALMO
1	SaaS	Lifestyle	Health/Medical	Social Networking
2	E-commerce	Media	Gaming	Health/Medical
3	Travel & Tourism	Health/Medical	SaaS	Travel & Tourism
4	Fashion	Gaming	Enterprise	SaaS
5	Food & Beverages	Music	Social Networking	Media

Table 7.3 - Top 5 - Nordic Region

Follows the Mediterranean region which is also characterized by the strong presence of startups in the SaaS and Data & Analytics industries, also motivated by the technological companies. For example, Lisbon concentrates a large number of companies with a high degree of technology and R&D, being the space where they are located approximately 317 000 companies. As in the Nordic region, the tourism in this region has increased and complementing the incentives made by low-cost companies, justify the growing number of startups in this economic sector. It is important to note that the service provided by these startups are a strong complement to the successful visit to the city, as they make known a set of information such as, museums, hotels and restaurants. Other economic sectors that stand out are education and entertainment. In this region are located universities who want to develop and get on the podium among the best. To this end, it has made a huge investment to enrich the universities, making them more challenging for students of high school and university students. In this sense, there are startups that offer platforms with notes and online lessons. Entertainment is something particular in this region, since the Mediterranean culture is directed towards leisure - cinema, music, theater, shows - which explains the presence of several startups in this field. As an example, Madrid urban agglomeration has the third-largest GDP in the European Union and its influences in politics, education, entertainment, environment, media, fashion, science, culture, and the arts all contribute to its status of one of the world's major global cities. Responding to this digital age, are becoming increasingly made online business, including personal property, although companies have set up their shop, hence the presence of the E-commerce sector in the Top 5. Finally, the Social Networking sector, especially in these ecosystems, through the creation of startups that offer experiences to meet new people and applications to expose the everyday to friends and acquaintances. More information about the Mediterranean region’s principal economic sectors on Table 7.4.

	MADRID	ROME	LISBON	ATHENS
1	Education	E-commerce	SaaS	SaaS
2	Lifestyle	Food & Beverages	Education	Travel & Tourism
3	E-commerce	Gaming	Travel & Tourism	Media
4	Social Networking	Entertainment	Social Networking	Entertainment
5	SaaS	Travel & Tourism	Data & Analytics	Data & Analytics

Table 7.4 - Top 5 - Mediterranean Region

To conclude, the presentation of a map (Figure 7.25) with the Top 5 in each of the regions.

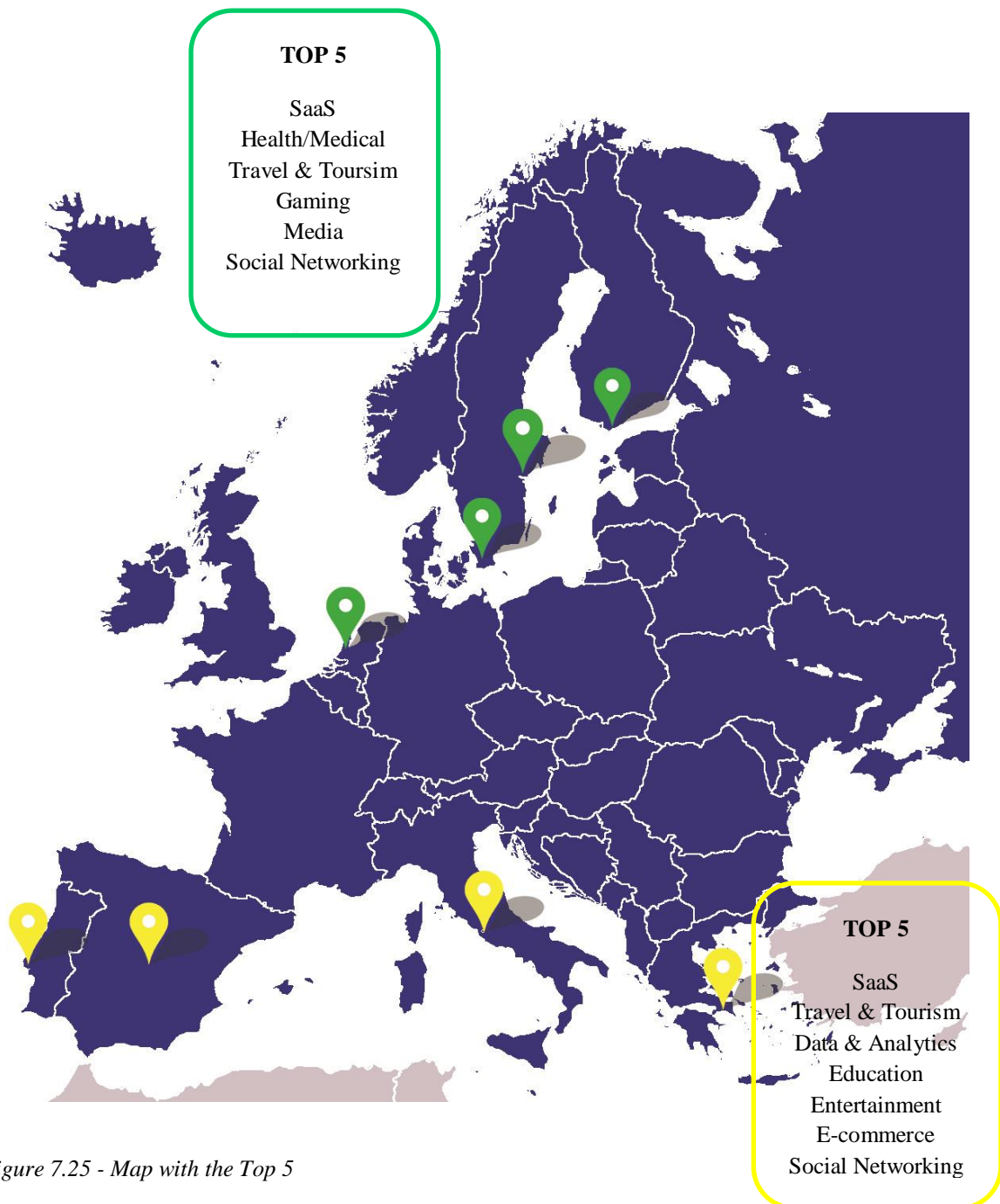


Figure 7.25 - Map with the Top 5

Chapter 8

Conclusions & Recommendations

In this final section of the study we will overview the overall research work conducted throughout this dissertation, followed by an analysis to our findings and a reflection on the accomplishment of the research objectives. At last, the limitations of the study and some suggestions for future research will also be presented.

8.1 Overall Conclusions

The development of this dissertation allowed us to study the trends currently existing between the different ecosystems around Europe, in furtherance of proposing a list of conclusive strengths and weaknesses and get some insights about future thinking from some European entrepreneurial ecosystem.

With the aim of increasing our comprehension on the topic of this research, we conducted a literature review to obtain a solid theoretical foundation of knowledge on the diverse topics of interest and relevance to the scope of this work. Over the course of this theoretical assessment we undertook a bibliographic research, where we resorted to books, academic research works, reports and websites, in order to collect data on the concepts of startup and startup ecosystems.

Although some previously developed research works have already covered some aspects of the classification of the various European ecosystems, but in different contexts of the context that was presented here. There are several research works to know how the startups contribute to the economy of the region where they are located, as there are investigations in order to factors that influence the decision to become self-employed and examines the individual and social attitudes

Conclusions & Recommendations

of young people towards entrepreneurship, comparing Europe with other comparable parts of the world.

During the literature review, it was observed that certain ecosystems are more benefit than others, in terms of research and production of scientific papers. In this sense and in order to fill these shortcomings, there was this research work in these ecosystems were chosen in order to enrich the set of information already collected from previous studies performed on European startup ecosystems.

The aim of this research was to classify these European startup ecosystems by the different economic sectors, business models and pricing models in order to understand if there are trends. Finally, we added to this work with some feedback received by surveyed startups, to collect information about the strong ones and the weak points of the ecosystems where they are located.

Following what has been presented above, it is concluded, there are trends among ecosystems with regard to the areas related to information technology, as the economic sectors "Data & Analytics" and "SaaS", that is justified by the investment made in these areas and since we are in the information age, it requires constantly the information be collected, treated and stored. The other economic sector that is added to the two sectors mentioned above, and also present in the Top 5 of the ecosystems studied, is "Travel & Tourism", since the tourism in Europe is enhanced by low-cost airlines and the economic local accommodations. It is important to mention that the sectors Health/Medical, E-commerce and Social Networking are also representative on startup ecosystems. Currently, we see a great concern with the issues of sustainable development of our planet and in this sense, startups gave feedback on the economic sectors that will emerge are Energy & Cleantech and Smart Cities. Finally, the ecosystems also reacts to the economic and financial conjecture by creating startups in the sectors Finance and it's predict that this sector will continue to develop over the years. With regard to business models, undoubtedly, that highlights the B2B model, in the majority of ecosystems. At last, the pricing model selected to complement the most of business models, was the "Freemium" model, followed by "Subscription" model. In conclusion, definitely there is a trend in business and pricing models. The online questionnaire conducted had collected valuable information on investments and the current stages of the startups, which even is important to note. About 27% of respondents startups received investment worth 100-500K €, 22% received between 0-20K €, 16% received between 20-50K €, 12% were between 500K-1M € and the remaining 8% were between 1 -10M. With regard to the current stage of startups, 43% of respondents are startups Market Prototype Stage, 35% are in Achieved

Local Market Sustainability Stage, 20% are in Scaling Up Stage and the remaining 2% are Unicorns.

8.2 Recommendations

The ultimate objective of this research work was of proposing conclusive solutions on understanding and also tracking the trends of European startup ecosystems, and consequently, the overall European entrepreneurial ecosystem. In that sense, based on the collected data and on the analysis to the results, we suggest a recommendation on how to collect information on startups more efficiently and reliably in order to correctly monitor trends, so that the government and potential investors and all ecosystem entities are aware of today:

Creating a platform for sharing information between startups and government

Currently, the government of each country requires the issuing of a questionnaire on each company in order to know what is the economic sector, years in business, investment, number of employees, etc. enables the government has a real perception of the present, in order to know what are the economic sectors that boost the economy or even see if there is an increase or decrease in the number of companies by economic sector. In this sense, we suggest doing the same for startups, by creating a platform, to list the actual number of startups, the startup stage, number of employees, investment and source of investment, strengths and constraints of the ecosystem, etc., in order to the local government to be aware and to respond to needs and future pass through feedback to the European Community. The implementation of this platform will also allow the government to fit startups' needs, since most ecosystems, criticize the "Existing Framework Legal" and complain that "Tax Benefits" are very few or even non-existent.

8.3 Limitations and future research

This research was successful with regard to investigation on understanding the trends of European startup ecosystems, and on proposing recommendations with the potential to help improve the European entrepreneurship ecosystem. However, throughout the development of this study we were faced with some limitations on the nature of our research which might affect the applicability of the results.

Conclusions & Recommendations

Firstly, this research revolved around of understanding the trends of European startup ecosystems. However, in the empirical part of this research we focused solely on the perception of startups, thus confining the scope of the dissertation to the point of view of only one of the involved entities. Future research could focus on the opportunity of comprising both entities' perspective on this topic.

Secondly, while the main objective of this research was to propose conclusive solutions about how to understanding and improving the overall European entrepreneurship ecosystem, the data was collected from only eight ecosystems. This can be pointed out as a limitation to the validity of the recommendations hereby proposed, as we don't possess much evidence that the results obtained in this study are consistent with the reality of other ecosystems in Europe. A more detailed study across other European ecosystems would be necessary to assess on the validity of our results in other ecosystems.

Finally, with regard to the questionnaire results, startups that were asked were those that were recorded in the F6S platform. We can not guarantee that the platform has registered all startups of all ecosystems studied, since the survey was conducted for all startups registered on the platform. Furthermore, not all startups contacted replied to the questionnaire, which limited the results. Given the aim of the thesis is to understand the trends of ecosystems, a sample of eight ecosystems may not be enough to have an overview of the European ecosystem. As a result, although this research's conclusions possess value, they may be considered to be of limited added value, as we do not possess enough data to validate this study's data analysis. A more detailed study throughout Europe with a larger sample size would be necessary to validate the findings from this research.

Bibliography

- Allen, D. N., & McCluskey, R. (1990). Structure, Policy, Services, and Performance in the Business Incubator Industry. *Entrepreneurship Theory and Practice*, 15(2), 61. Retrieved from <http://ezproxy.lib.umb.edu/login?url=http://search.proquest.com/docview/213811187?accountid=28932&http://linksource.ebsco.com/linking.aspx?sid=ProQ:abiglobal&fmt=journal&genre=article&issn=10422587&volume=15&issue=2&date=1990-01-01&spage=61&title=Entrepr>
- Autio, E., & Lumme, A. (1998). Does the innovator role affect the perceived potential for growth? analysis of four types of new, technology-based firms. *Technology Analysis & Strategic Management*, 10(1), 41–55. <http://doi.org/10.1080/09537329808524303>
- Bakri, A. a. Al, Steel, A. C., & Soar, J. (2010). The influence of B2B e-commerce on SMEs' performance and efficiency: a review of the literature. *International Journal of Liability and Scientific Enquiry*, 3(3), 213. <http://doi.org/10.1504/IJLSE.2010.033356>
- Björk, J., Ljungblad, J., & Bosch, J. (2013). Lean Product Development in Early Stage Startups. *From Start-Ups to SaaS Conglomerate: Life Cycles of Software Products Workshop (IW-LCSP 2013)*, 19. Retrieved from <ftp://ceur-ws.org/pub/publications/CEUR-WS/Vol-1095.zip#page=19>
- Blank, S. (2005). *The Four Steps to the Epiphany: Successful Strategies for Products that Win*. Lulu Enterprises Incorporated.
- Blank, S. (2010). What's A Startup? First Principles. Retrieved November 15, 2015, from <http://steveblank.com/2010/01/25/whats-a-startup-first-principles/>
- Blank, S. (2012). Search versus Execute. Retrieved November 13, 2015, from <http://steveblank.com/2012/03/05/search-versus-execute/>
- Blank, S. (2013). Why the lean start-up changes everything. *Harvard Business Review*, 91(5), 63–72.
- Blank, S., & Dorf, B. (2012). *The Startup Owner's Manual: The Step-by-step Guide for Building a Great Company*. K&S Ranch, Incorporated. Boley, H., & Chang, E. (2007). Digital ecosystems: Principles and semantics. *Proceedings of the 2007 Inaugural IEEE-IES Digital EcoSystems and Technologies Conference, DEST 2007*, (February), 398–403. <http://doi.org/10.1109/DEST.2007.372005>
- Bygrave, W. D., & Hofer, C. W. (1991). Theorizing about Entrepreneurship. *Entrepreneurship: Theory & Practice*, 16, 13–22. <http://doi.org/Article>
- Carree, M. a, & Thurik, a R. (2010). *Handbook of Entrepreneurship Research. International Business* (Vol. 5). <http://doi.org/10.1007/978-1-4419-1191-9>

Bibliography

- Choi, H. R., Cho, M. J., Lee, K., Hong, S. G., & Woo, C. R. (2014). The business model for the sharing economy between SMEs. *WSEAS Transactions on Business and Economics*, 11(1), 625–634.
- Clarysse, B. (2004). THE INITIAL RESOURCES AND MARKET STRATEGY TO CREATE HIGH GROWTH FIRMS Ans Heirman, (October), 1–64.
- Clarysse, B., & Bruneel, J. (2007). Nurturing and growing innovative start-ups: The role of policy as integrator. *R and D Management*, 37(2), 139–149. <http://doi.org/10.1111/j.1467-9310.2007.00463.x>
- Criscuolo, P., Nicolaou, N., & Salter, A. (2012). The elixir (or burden) of youth? Exploring differences in innovation between start-ups and established firms. *Research Policy*, 41(2), 319–333. <http://doi.org/10.1016/j.respol.2011.12.001>
- Davila, A., Foster, G., He, X., & Shimizu, C. (2014). The rise and fall of startups: Creation and destruction of revenue and jobs by young companies. *Australian Journal of Management*, 40(1), 6–35. <http://doi.org/10.1177/0312896214525793>
- Dee, N., Gill, D., Weinberg, C., McTavish, S., Stacey, J., Mocker, V., ... Aviv Matthew Gould, T. (2015). WHAT'S THE DIFFERENCE? Startup Support Programmes. *Yael Weinstein and Inbal Safir*, (February). <http://doi.org/10.1080/13533310008413860>
- Ernst & Young. (2011). Entrepreneurs speak out A call to action for G20 governments. *G20 Young Entrepreneur Summit*, (October).
- Eurofound. (2015). *Youth entrepreneurship in Europe: Values, attitudes, policies*. <http://doi.org/10.2806/274560>
- European Commission. (2012). *Entrepreneurship Education at School in Europe*.
- Fang, S., Fawley, D., Konanahalli, S., & Hill, B. (2015). Accelerating start-up ecosystems with the “ Power of 5 ,” 7(4), 10–19.
- Feldman, M., Francis, J., & Bercovitz, J. (2005). Creating a Cluster While Building a Firm: Entrepreneurs and the Formation of Industrial Clusters. *Regional Studies*, 39(1), 129–141. <http://doi.org/10.1080/0034340052000320888>
- Feldman, M., & Zoller, T. D. (2012). Dealmakers in Place: Social Capital Connections in Regional Entrepreneurial Economies. *Regional Studies*, 46(1), 23–37. <http://doi.org/10.1080/00343404.2011.607808>
- Fishback, B., Gulbranson, C. a., Litan, R. E., Mitchell, L., & Porzig, M. a. (2007). Finding Business “Idols”: A New Model to Accelerate Start-Ups. *SSRN Electronic Journal*, (July). <http://doi.org/10.2139/ssrn.1001926>
- Fogel, G. (2001). An analysis of entrepreneurial environment and enterprise development in Hungary. *Journal of Small Business Management*, 39(1), 103–109. <http://doi.org/10.1111/0447-2778.00010>
- Ge, K. (2011). The transition of Chinese dietary guidelines and the food guide pagoda. *Asia Pacific Journal of Clinical Nutrition*, 20(3), 439–446. <http://doi.org/10.1002/smj.187>

- Gedeon, S. (2010). What is Entrepreneurship? *Entrepreneurial Practice Review*, 1(3), 16–35. Retrieved from http://www.entre-ed.org/_what/stds-prac-brochure.pdf
- Georghiou, Luke and Clarysse, B. (2004). *Innovation Science Technology*, 64.
- Gnyawali, D. R., & Fogel, D. S. (1994). Environments for entrepreneurship development: key dimensions and research implications. *Entrepreneurship: Theory & Practice*, 18(JULY 1994), 43–62. Retrieved from <http://libproxy.tulane.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=9502013222&login.asp&site=ehost-live&scope=site>
- Gorevaya, E., & Khayrullina, M. (2015). Evolution of Business Models: Past and Present Trends. *Procedia Economics and Finance*, 27(383), 344–350. [http://doi.org/10.1016/S2212-5671\(15\)01005-9](http://doi.org/10.1016/S2212-5671(15)01005-9)
- Haley, C. (2016). Innovation & Economic Growth (or : why accelerating startups matters), (May).
- Hermann, B. L., Gauthier, J., Holtschke, D., Bermann, R. D., & Marmer, M. (2015). The Global Startup Ecosystem Ranking 2015. *The Startup Ecosystem Report Series*, (August), 1–156.
- Hochberg, Y. V. (2015). Accelerating Entrepreneurs and Ecosystems : The Seed Accelerator. *Innovation Policy and the Economy*, 16.
- Hospers, G.-J. (2006). Silicon Somewhere? *Policy Studies*, 27(1), 1–15. <http://doi.org/10.1080/01442870500499934>
- Isabelle, D. (2013). Key Factors Affecting a Technology Entrepreneur’s Choice of Incubator or Accelerator. *Technology Innovation Management Review*, (February), 16–22. Retrieved from <http://www.timreview.ca/article/656>
- Isenberg, D. J. (2011). The Entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurships. *The Babson Entrepreneurship Ecosystem Project*, 1(781), 1–13. Retrieved from [http://www.wheda.com/uploadedFiles/Website/About_Wheda/Babson Entrepreneurship Ecosystem Project.pdf](http://www.wheda.com/uploadedFiles/Website/About_Wheda/Babson_E Entrepreneurship Ecosystem Project.pdf)
- Johansson, D. (2010). The theory of the experimentally organized economy and competence blocs: An introduction. *Journal of Evolutionary Economics*, 20(2), 185–201. <http://doi.org/10.1007/s00191-009-0149-5>
- Kane, T. (2010). The importance of startups in job creation and job destruction. *Kauffman Foundation Research Series: Firm Formation and Economic Growth*, (July), 12. <http://doi.org/10.2139/ssrn.1646934>
- Khalil, M. A., & Olafsen, E. (2010). Entrepreneurship through Business Incubation World Bank Group. *World Bank Group*.
- Level, C., Wp, D., & Unidemi, S. (2015). Document Type Document & WP No. Document Title, 1–23.
- Lindsay, V., & Ashill, N. (2006). AN INSTITUTIONAL VIEW OF LOCAL, III(1).

Bibliography

- Lindstrom, G., & Olofsson, C. (2001). Early stage financing of NTBFs: An analysis of contributions from support actors. *Venture Capital*, 3(2), 151–168. <http://doi.org/10.1080/13691060110042754>
- Mason, Colin; Brown, R. (2014). Entrepreneurial Ecosystems and Growth Oriented Entrepreneurship. *Oecd*, 1–38. <http://doi.org/10.1007/s13398-014-0173-7.2>
- Maurya, A. (n.d.). Running Lean. Retrieved from <http://www.runningleanhq.com/>
- McMaster, R., & Watkins, C. (2012). Evolutionary Economics, 135–138. <http://doi.org/http://dx.doi.org/10.1016/B978-0-08-047163-1.00624-X>
- Melrose, J., Perroy, R., & Careas, S. (2015). No Title No Title. *Statewide Agricultural Land Use Baseline 2015, 1*, 1–22. <http://doi.org/10.1017/CBO9781107415324.004>
- Meyers, M. (2015). making (and measuring) AN ENTREPRENEURIAL ECOSYSTEM. *Economic Development Journal*, 14(3), 28. <http://doi.org/10.2139/ssrn.2580336>
- Moore, J. F. (1993). Predators and prey: a new ecology of competition. *Harvard Business Review*, 71(3), 75–86. <http://doi.org/Article>
- Mota, D., Nodehi, T., Zutshi, A., Grilo, A., & Cruz-Machado, V. (2016). What is a Digital Entrepreneurship Ecosystem: Players and Processes. In *International Conclave On Innovations in Engineering & Management (ICIEM-2016)* (pp. 298–307).
- Motoyama, Y., & Watkins, K. K. (2014). Examining the Connections within the Startup Ecosystem: A Case Study of St. Louis, (September), 1–32. <http://doi.org/10.2139/ssrn.2498226>
- Neck, H. M., Meyer, G. D., Cihen, B., & Corbett, A. C. (2004). An entrepreneurial system view of new venture creation. *Journal of Small Business Management*, 42(2), 190–208.
- OECD, P. (2013). Access to finance: Venture capital. *Entrepreneurship at a Glance*. Retrieved from http://dx.doi.org/10.1787/entrepreneur_aag-2013-27-en
- Oliveira, M. A.-Y., & Ferreira, J. J. P. (2011). Book review. Business model generation : A handbook for visionaries, game changers and challengers. *African Journal of Business Management*, 5(7).
- O'Mara, M. P. (2006). Cold War politics and scientific communities: the case of Silicon Valley. *Interdisciplinary Science Reviews*, 31(2), 121–134. <http://doi.org/10.1179/030801806X103343>
- Osterwalder, A., & Pigneur, Y. (2010). Business model generation. *New Jersey: John Wiley & Sons, Inc.*
- Paternoster, N., Giardino, C., Unterkalmsteiner, M., Gorscheck, T., & Abrahamsson, P. (2014). Software development in startup companies: A systematic mapping study. *Information and Software Technology*, 56(10), 1200–1218. <http://doi.org/10.1016/j.infsof.2014.04.014>
- Rasmussen, E., & Borch, O. J. (2010). University capabilities in facilitating entrepreneurship: A longitudinal study of spin-off ventures at mid-range universities. *Research Policy*, 39(5), 602–612. <http://doi.org/10.1016/j.respol.2010.02.002>

- Rey-Martí, A., Ribeiro-Soriano, D., & Palacios-Marqués, D. (2015). A bibliometric analysis of social entrepreneurship. *Journal of Business Research*. <http://doi.org/10.1016/j.jbusres.2015.10.033>
- Román, C., Congregado, E., & Millán, J. M. (2013). Start-up incentives: Entrepreneurship policy or active labour market programme? *Journal of Business Venturing*, 28(1), 151–175. <http://doi.org/10.1016/j.jbusvent.2012.01.004>
- Roper, S., & Hart, M. (2013). Supporting Sustained Growth Among SMEs - Policy Models and Guidelines, (7), 1–68. Retrieved from <http://enterpriseresearch.ac.uk/wp-content/uploads/2013/12/ERC-White-Paper-No-7-Roper-Hart-Supporting-sustained-growth-2.pdf>
- Saxenian, A., & Hsu, J.-Y. (2001). The Silicon Valley - Hsinchu Connection: Technical Communities and Industrial Upgrading. *Industrial and Corporate Change*, 10(Number 4), 893–920. <http://doi.org/10.1016/j.evalprogplan.2004.04.001>
- Schwiebacher, A. (2006). Innovation and Venture Capital Exits December 2006 RICAPE2 - Regional Comparative Advantage and Knowledge Based INNOVATION AND VENTURE CAPITAL EXITS, (32).
- Spilling, O. R. (1996). The Entrepreneurial System On Entrepreneurship in the of a Mega-Event, 103, 91–103.
- Tasic, I., Montoro-Sanchez, A., & Cano, M. (n.d.). Startup accelerators: An overview of the current state of the acceleration phenomenon, 1–23.
- Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, 43(2–3), 172–194. <http://doi.org/10.1016/j.lrp.2009.07.003>
- Thomas, L. D. W., Labs, E. I. T. I. C. T., Luhn, A., & Abduraimova, K. (n.d.). ICT innovation in Europe : Productivity gains , startup growth and retention, 1–44.
- Thomas, R. (2012). The Global Startup Ecosystem Report. *The Startup Genome*, 1–2. http://doi.org/10.4324/9780203165829_PART_ONE
- Tobergte, D. R., & Curtis, S. (2013). No Title No Title. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699. <http://doi.org/10.1017/CBO9781107415324.004>
- Tsai, S., & Lan, T. (2005). Development of a Startup Business. A Complexity Theory Perspective., 23. Retrieved from file:///E:/Documents/Recerca/02_TESI/Articles_tesi_i_Bibliografies/Entrepreneurship_articles/nfile:///E:/Documents/Recerca/02_TESI/Articles_tesi_i_Bibliografies/Entrepreneurship_articles/Tsai_S_Lan_T_10_tsai.pdf
- Tung, L. C. (2011). The Impact of Entrepreneurship Education on Entrepreneurial Intention of Engineering Students.
- Van Gelderen, M., Thurik, R., & Bosma, N. (2006). Success and risk factors in the pre-startup phase. *Small Business Economics*, 26(4), 319–335. <http://doi.org/10.1007/s11187-004-6837-5>
- Who, F. E. (2015). Startup Professionals, Inc ., 10–12.

Bibliography

Works, P. T. (n.d.). Iterate from Plan A to a Plan That Works.

Zott, C., Amit, R., & Massa, L. (2011). The Business Model: Recent Developments and Future Research. *Journal of Management*, 37(4), 1019–1042.
<http://doi.org/10.1177/0149206311406265>

Appendix

Appendix 1: Research Questionnaire

Research Questionnaire on Understanding the Trends of European Startup Ecosystems

Thank you for accepting to take part in this research questionnaire. The purpose of this questionnaire is to identify the strengths and trends of your startup ecosystem. Your perspective as a startup will greatly enhance this study. The results of the study will be shared with you. This questionnaire should take 10 minutes to complete. Be assured that all answers you provide will be kept confidential.

Startup Profile

1. Name of your startup:

2. Your name:

3. Your email:

4. Select your ecosystem:

- Amsterdam - Netherlands
- Athens - Greece
- Helsinki - Finland
- Lisbon - Portugal
- Madrid - Spain
- Malmo - Sweden
- Rome - Italy
- Stockholm – Sweden

5. Which year was the startup founded?

- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016

6. What is the current stage of the startup?

- Idea Stage
- Market Prototype Stage
- Achieved Local Market Sustainability Stage
- Scaling Up Stage
- Unicorn

7. Select the economic sector:

- Advertising
- Agriculture
- Automotive
- Business
- Consulting
- Data & Analytics
- Education
- Energy & Cleantech
- Entertainment
- E-commerce

- Fashion
- Finance
- Food & Beverages
- Gaming
- Government
- Health/Medical
- Jobs & Recruiting
- Legal
- Lifestyle
- Logistics & Transport
- Manufacturing
- Marketing
- Media
- Music
- Photography & Video
- Productivity
- SaaS
- Smart Cities
- Social Networking
- Software Tools
- Sports
- Travel & Tourism
- Other

8. Why did you choose this economic sector?

9. Select your business type:

- B2B
- B2C
- C2C

Appendix

10. Select the pricing model:

- Freemium
- Pay per use
- Subscription

11. How much investment (€) have you received till now?

- 0-20K
- 20-50K
- 50-100K
- 100-500K
- 500-1M
- 1-10M
- More than 10M

Ecosystem Profile

Then follows a set of questions to understand and analyze the ecosystem, where it is inserted.

12. How important are the following economic sectors in your Startup Ecosystem?

Please, score from 1 to 5 for each of the following sectors, based on the number of Startups and the importance given to the sector in your Ecosystem. The scores are based on your perception and need not be an accurate representation. (1 - Least Important, 5 - Most Important)

	1	2	3	4	5
Advertising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agriculture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Automotive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consulting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data & Analytics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy & Cleantech	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entertainment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E-commerce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fashion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gaming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health/Medical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jobs & Recruiting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Legal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lifestyle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Logistics & Transport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manufacturing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marketing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Photography & Video	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Productivity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SaaS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smart Cities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Networking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Software Tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel & Tourism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix

13. How much do the following factors contribute to the growth of your Ecosystem?

Please, score each of the following items from 1 to 5.

(1 - Inhibits Growth, 3- Neutral, 5 - Promotes growth)

	1	2	3	4	5
Accelerators & Accelerator Events	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business Angel Networks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost of Living	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crowdfunding Sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Entrepreneurial Education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geographic Location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incubators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Existing Legal Framework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mentors Available	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Network Platforms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Startup Events	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
State Investment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tax Benefits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Universities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. Select 3 economic sectors that you believe will grow in the next 5 years:

- Advertising
- Agriculture
- Automotive
- Business
- Consulting
- Data & Analytics
- Education
- Energy & Cleantech
- Entertainment
- E-commerce
- Fashion
- Finance
- Gaming
- Government

- Health/Medical
- Jobs & Recruiting
- Legal
- Lifestyle
- Logistics & Transport
- Manufacturing
- Marketing
- Media
- Music
- Photography & Video
- Productivity
- SaaS
- Smart Cities
- Social Networking
- Software Tools
- Sports
- Travel & Tourism
- Other: _____

The End

Thank you very much for your cooperation.

Appendix 2: Quantitative analysis

Question	Variable	Absolute Frequency							Statistical Test
		AMS	ATH	HEL	LX	MAD	RM	ARN	
Select your ecosystem:	2009	0	0	0	0	1	0	0	p = 0,34 p > 0,05 Non-significant Dif.
	2010	0	0	0	0	0	0	0	
	2011	0	0	0	0	0	0	1	
	2012	1	0	2	0	4	0	0	
	2013	0	1	1	0	2	0	0	
	2014	3	2	1	3	5	4	1	
	2015	3	3	1	1	6	1	1	
	2016	0	1	0	0	4	0	1	
Select your current stage:	Idea Stage	0	0	0	0	0	0	0	p = 0,014 p < 0,05 Significant Dif.
	Market Prototype Stage	3	1	3	2	10	1	3	
	Achieved Local Market Sustainability Stage	4	3	1	2	6	2	0	
	Scaling Up Stage	0	2	1	0	6	1	2	
	Unicorn	0	1	0	0	0	0	0	
Select your economic sector:	Advertising	0	0	0	0	1	0	0	p = 0,449 p > 0,05 Non-significant Dif.
	Agriculture	0	0	0	0	2	0	0	
	Automotive	0	0	0	0	0	1	0	
	Business	0	0	0	0	1	0	0	
	Consulting	1	0	0	0	0	0	0	
	Data & Analytics	0	0	0	0	1	0	0	
	E-commerce	0	2	0	0	2	0	0	
	Education	0	0	0	0	2	1	0	
	Energy & Cleantech	0	1	0	0	0	0	0	
	Fashion	0	1	0	0	0	0	0	
	Finance	0	0	0	0	1	0	0	
	Food & Beverages	0	0	0	0	0	1	1	
	Health/Medical	0	0	0	1	0	0	0	
	Jobs & Recruiting	0	0	0	1	0	0	0	
	Media	1	0	1	0	0	0	0	
	Mobile	0	0	0	0	1	0	0	
	Other	0	1	2	0	0	0	1	
	SaaS	4	1	1	0	1	1	0	
	Smart Cities	0	0	0	0	1	0	0	
	Social Networking	1	0	0	2	2	1	1	
Software Tools	0	1	0	0	3	0	0		
Sports	0	0	0	0	1	0	0		
Travel & Tourism	0	0	1	0	3	0	1		
Select your business model:	B2B	6	5	2	4	15	4	0	p = 0,095 p > 0,05 Non-Significant Dif.
	B2C	1	1	3	0	3	1	3	
	C2C	0	1	0	0	4	0	1	

Select your pricing model:	Freemium	2	1	2	2	6	1	1	p = 0,095 p > 0,05 Non-Significant Dif.
	Pay per use	2	2	3	0	8	3	3	
	Subscription	3	4	0	2	8	1	0	
How much investment (€) have you received till now?	0-20K	3	3	1	0	6	1	0	p = 0,765 p > 0,05 Non-Significant Dif.
	20-50K	0	0	1	1	4	2	0	
	50-100K	1	0	2	1	2	0	1	
	100-500K	2	3	0	1	5	1	2	
	500-1M	1	1	0	1	3	1	0	
How important are the following economic sectors in your Startup Ecosystem? [Advertising]	1	1	0	0	0	2	0	0	p = 0,903 p > 0,05 Non-Significant Dif.
	2	1	1	1	0	4	0	0	
	3	4	2	3	1	6	1	2	
	4	0	2	0	1	6	1	1	
	5	1	2	1	2	4	3	1	
How important are the following economic sectors in your Startup Ecosystem? [Agriculture]	1	4	3	5	2	14	3	4	p = 0,157 p > 0,05 Non-Significant Dif.
	2	2	0	0	0	5	0	0	
	3	1	2	0	2	1	0	0	
	4	0	1	0	0	1	2	0	
	5	0	1	0	0	1	0	0	
How important are the following economic sectors in your Startup Ecosystem? [Automotive]	1	3	4	1	2	9	2	1	p = 0,671 p > 0,05 Non-Significant Dif.
	2	3	3	2	1	4	1	2	
	3	1	0	1	1	7	1	1	
	4	0	0	1	0	2	0	0	
	5	0	0	0	0	0	1	0	
How important are the following economic sectors in your Startup Ecosystem? [Business]	1	1	0	1	0	0	1	0	p = 0,628 p < 0,05 Non-Significant Dif.
	2	1	2	1	1	5	0	1	
	3	1	0	0	1	6	1	1	
	4	2	1	3	1	7	3	1	
	5	2	4	0	1	4	0	1	
How important are the following economic sectors in your Startup Ecosystem? [Consulting]	1	1	1	1	1	2	1	0	p = 0,905 p > 0,05 Non-Significant Dif.
	2	2	1	1	1	4	1	1	
	3	2	0	1	1	10	1	2	
	4	2	3	2	1	5	1	0	
	5	0	2	0	0	1	1	1	
How important are the following economic sectors in your Startup Ecosystem? [Data & Analytics]	1	0	0	1	0	0	0	0	p = 0,075 p > 0,05 Non-Significant Dif.
	2	1	0	0	0	1	0	0	
	3	1	0	1	0	1	3	1	
	4	4	4	3	3	12	2	0	
	5	1	3	0	1	8	0	3	
How important are the following economic sectors in your Startup Ecosystem? [Education]	1	0	0	1	0	1	2	0	p = 0,012 p < 0,05 Significant Dif.
	2	3	1	1	2	5	0	0	
	3	4	2	0	0	8	1	4	
	4	0	4	2	2	7	0	0	

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	5	0	0	1	0	1	2	0	
How important are the following economic sectors in your Startup Ecosystem? [Energy & Cleantech]	1	1	2	1	1	7	2	1	p = 0,557 p > 0,05 Non-Significant Dif.
	2	2	0	0	1	4	0	0	
	3	3	1	1	2	5	2	2	
	4	1	1	2	0	5	1	1	
	5	0	3	1	0	1	0	0	
How important are the following economic sectors in your Startup Ecosystem? [Entertainment]	1	3	3	0	0	3	1	0	p = 0,693 p > 0,05 Non-Significant Dif.
	2	2	1	1	1	5	0	1	
	3	1	2	1	2	4	2	2	
	4	1	1	2	0	5	2	0	
	5	0	0	1	1	5	0	1	
How important are the following economic sectors in your Startup Ecosystem? [E-commerce]	1	1	1	0	0	3	1	0	p = 0,877 p > 0,05 Non-Significant Dif.
	2	0	0	1	1	3	0	1	
	3	3	1	2	1	3	2	1	
	4	0	2	1	2	5	1	0	
	5	3	3	1	0	8	1	2	
How important are the following economic sectors in your Startup Ecosystem? [Fashion]	1	1	1	2	0	6	2	1	p = 0,508 p > 0,05 Non-Significant Dif.
	2	3	2	2	0	4	2	0	
	3	1	2	0	1	4	0	2	
	4	2	1	1	3	3	1	1	
	5	0	1	0	0	5	0	0	
How important are the following economic sectors in your Startup Ecosystem? [Finance]	1	1	1	3	1	3	0	0	p = 0,533 p > 0,05 Non-Significant Dif.
	2	1	0	0	1	5	2	0	
	3	3	3	0	1	6	1	1	
	4	1	1	2	1	4	2	1	
	5	1	2	0	0	4	0	2	
How important are the following economic sectors in your Startup Ecosystem? [Gaming]	1	1	2	1	1	7	2	0	p = 0,321 p > 0,05 Non-Significant Dif.
	2	3	1	1	0	3	2	0	
	3	2	2	0	1	7	0	1	
	4	1	1	0	2	3	0	1	
	5	0	1	3	0	2	1	2	
How important are the following economic sectors in your Startup Ecosystem? [Government]	1	3	3	3	2	4	2	0	p = 0,738 p > 0,05 Non-Significant Dif.
	2	0	0	1	0	6	0	1	
	3	2	2	0	1	7	1	2	
	4	2	1	1	1	4	1	0	
	5	0	1	0	0	1	1	1	
How important are the following economic sectors in your Startup Ecosystem? [Health/Medical]	1	2	2	1	1	3	1	1	p = 0,718 p > 0,05 Non-Significant Dif.
	2	0	0	1	0	7	0	0	
	3	3	3	0	2	6	3	0	
	4	1	1	2	1	4	1	2	
	5	1	1	1	0	2	0	1	
	1	2	2	2	1	5	1	0	

How important are the following economic sectors in your Startup Ecosystem? [Jobs & Recruiting]	2	2	1	1	0	5	2	0	p = 0,550 p > 0,05 Non-Significant Dif.
	3	1	1	0	1	6	1	0	
	4	1	0	2	2	4	1	2	
	5	1	3	0	0	2	0	2	
How important are the following economic sectors in your Startup Ecosystem? [Legal]	1	3	3	2	2	4	1	0	p = 0,588 p > 0,05 Non-Significant Dif.
	2	2	1	1	1	9	1	0	
	3	2	1	2	0	6	1	2	
	4	0	2	0	1	2	2	1	
	5	0	0	0	0	1	0	1	
How important are the following economic sectors in your Startup Ecosystem? [Lifestyle]	1	2	3	2	0	5	0	0	p = 0,578 p > 0,05 Non-Significant Dif.
	2	3	3	0	0	3	1	1	
	3	1	1	1	2	4	2	1	
	4	0	0	2	0	5	2	1	
	5	1	0	0	2	5	0	1	
How important are the following economic sectors in your Startup Ecosystem? [Logistics & Transports]	1	1	1	1	1	2	1	0	p = 0,358 p > 0,05 Non-Significant Dif.
	2	2	1	1	1	4	1	1	
	3	2	0	1	1	10	1	2	
	4	2	3	2	1	5	1	0	
	5	0	2	0	0	1	1	1	
How important are the following economic sectors in your Startup Ecosystem? [Manufacturing]	1	5	2	2	3	9	2	2	p = 0,261 p > 0,05 Non-Significant Dif.
	2	1	1	2	0	3	2	0	
	3	1	1	1	1	9	1	1	
	4	0	1	0	0	1	0	1	
	5	0	2	0	0	0	0	0	
How important are the following economic sectors in your Startup Ecosystem? [Marketing]	1	1	1	0	0	0	0	0	p = 0,532 p > 0,05 Non-Significant Dif.
	2	1	0	1	1	2	0	1	
	3	4	0	1	0	8	2	1	
	4	0	3	3	1	8	2	1	
	5	1	3	0	2	4	1	1	
How important are the following economic sectors in your Startup Ecosystem? [Media]	1	2	1	0	0	1	0	0	p = 0,941 p > 0,05 Non-Significant Dif.
	2	0	1	1	1	4	0	0	
	3	3	1	2	1	6	1	2	
	4	1	2	1	1	7	3	1	
	5	1	2	1	1	4	1	1	
How important are the following economic sectors in your Startup Ecosystem? [Music]	1	4	3	2	1	6	2	2	p = 0,164 p > 0,05 Non-Significant Dif.
	2	2	2	2	0	4	1	0	
	3	1	0	1	2	8	1	0	
	4	0	2	0	0	4	1	0	
	5	0	0	0	1	0	0	2	
How important are the following economic sectors in your Startup	1	2	0	0	0	3	0	0	p = 0,588 p > 0,05 Non-Significant Dif.
	2	2	1	1	0	3	1	1	
	3	1	3	3	0	5	0	3	

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Ecosystem? [Photography & Video]	4	1	0	1	2	2	3	0	
	5	1	3	0	2	9	1	0	
How important are the following economic sectors in your Startup Ecosystem? [Productivity]	1	1	2	1	0	0	2	0	p = 0,408 p > 0,05 Non- Significant Dif.
	2	1	1	2	2	4	1	1	
	3	2	0	1	0	10	1	2	
	4	2	2	1	1	7	1	0	
	5	1	2	0	1	1	0	1	
How important are the following economic sectors in your Startup Ecosystem? [SaaS]	1	0	1	0	1	0	1	1	p = 0,594 p > 0,05 Non- Significant Dif.
	2	1	0	0	0	4	1	0	
	3	3	0	2	2	5	0	1	
	4	1	2	1	1	8	2	1	
	5	2	4	2	0	5	1	1	
How important are the following economic sectors in your Startup Ecosystem? [Smart Cities]	1	1	3	1	0	4	1	1	p = 0,671 p > 0,05 Non- Significant Dif.
	2	2	1	1	1	5	1	2	
	3	2	1	0	2	1	1	0	
	4	0	1	1	1	8	2	1	
	5	2	1	2	0	4	0	0	
How important are the following economic sectors in your Startup Ecosystem? [Social Networking]	1	0	1	0	0	0	0	0	p = 0,120 p > 0,05 Non- Significant Dif.
	2	2	0	3	0	8	0	0	
	3	3	3	1	1	1	1	2	
	4	0	0	1	1	7	3	1	
	5	2	3	0	2	6	1	1	
How important are the following economic sectors in your Startup Ecosystem? [Software Tools]	1	0	0	0	1	1	2	0	p = 0,430 p > 0,05 Non- Significant Dif.
	2	1	0	1	0	2	0	0	
	3	1	2	1	1	5	1	3	
	4	4	3	3	2	8	2	1	
	5	1	2	0	0	6	0	0	
How important are the following economic sectors in your Startup Ecosystem? [Sports]	1	3	2	1	0	7	1	1	p = 0,772 p > 0,05 Non- Significant Dif.
	2	3	1	3	0	3	2	1	
	3	1	2	1	1	4	0	1	
	4	0	1	0	2	5	1	0	
	5	0	1	0	1	3	1	1	
How important are the following economic sectors in your Startup Ecosystem? [Travel & Tourism]	1	2	0	0	0	3	0	0	p = 0,120 p > 0,05 Non- Significant Dif.
	2	2	1	1	0	3	1	1	
	3	1	3	3	0	5	0	3	
	4	1	0	1	2	2	3	0	
	5	1	3	0	2	9	1	0	
How much do the following factors contribute to the growth of your Ecosystem? [Accelerators & Accelerator Events]	1	1	1	0	0	1	1	0	p = 0,562 p > 0,05 Non- Significant Dif.
	2	0	0	1	0	2	0	0	
	3	3	0	0	0	7	0	1	
	4	1	2	3	3	6	1	1	
	5	2	4	1	1	6	3	2	

How much do the following factors contribute to the growth of your Ecosystem? [Business Angel Network]	1	0	1	0	0	0	1	0	p = 0,048 p < 0,05 Significant Dif.
	2	1	0	1	0	5	0	0	
	3	3	1	0	1	9	1	0	
	4	2	2	4	3	3	0	1	
	5	1	3	0	0	5	3	3	
How much do the following factors contribute to the growth of your Ecosystem? [Cost of Living]	1	0	1	1	0	5	1	1	p = 0,715 p > 0,05 Non-Significant Dif.
	2	3	0	2	1	6	1	0	
	3	3	3	1	1	10	2	2	
	4	1	1	1	1	0	0	0	
	5	0	2	0	1	1	1	1	
How much do the following factors contribute to the growth of your Ecosystem? [Crowdfunding Sites]	1	1	0	1	0	3	1	0	p = 0,705 p > 0,05 Non-Significant Dif.
	2	0	1	0	0	5	0	0	
	3	4	5	3	2	9	2	2	
	4	1	0	1	2	5	2	2	
	5	1	1	0	0	0	0	0	
How much do the following factors contribute to the growth of your Ecosystem? [Entrepreneurial Education]	1	1	1	0	0	1	0	0	p = 0,541 p > 0,05 Non-Significant Dif.
	2	0	0	1	1	4	1	0	
	3	3	0	1	0	6	1	1	
	4	1	2	3	2	9	2	3	
	5	2	4	0	1	2	1	0	
How much do the following factors contribute to the growth of your Ecosystem? [Existing Legal Framework]	1	1	1	1	0	3	1	0	p = 0,991 p > 0,05 Non-Significant Dif.
	2	0	0	1	1	3	0	1	
	3	4	4	1	2	9	1	1	
	4	1	1	1	0	3	2	1	
	5	1	1	1	1	4	1	1	
How much do the following factors contribute to the growth of your Ecosystem? [Geographic Location]	1	1	0	0	0	1	1	0	p = 0,321 p > 0,05 Non-Significant Dif.
	2	1	0	1	0	6	0	0	
	3	4	2	0	1	5	1	0	
	4	1	2	4	2	6	1	3	
	5	0	3	0	1	4	2	1	
How much do the following factors contribute to the growth of your Ecosystem? [Incubators]	1	2	2	0	0	5	2	0	p = 0,565 p > 0,05 Non-Significant Dif.
	2	1	1	1	1	5	0	1	
	3	3	1	1	3	5	3	0	
	4	1	3	2	0	5	0	2	
	5	0	0	1	0	2	0	1	
How much do the following factors contribute to the growth of your Ecosystem?	1	0	0	0	0	1	1	0	p = 0,437 p > 0,05 Non-Significant Dif.
	2	1	1	1	0	2	0	0	
	3	2	3	0	1	7	1	0	
	4	2	1	2	3	11	2	1	

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[Mentors Available]	5	2	2	2	0	1	1	3	
How much do the following factors contribute to the growth of your Ecosystem? [Social Network Platforms]	1	1	0	0	0	2	0	0	p = 0,600 p > 0,05 Non-Significant Dif.
	2	0	1	2	0	2	1	0	
	3	4	1	2	1	7	3	1	
	4	0	3	1	3	6	1	2	
	5	2	2	0	0	5	0	1	
How much do the following factors contribute to the growth of your Ecosystem? [Startup Events]	1	1	0	1	0	1	1	0	p = 0,290 p > 0,05 Non-Significant Dif.
	2	0	1	0	0	4	0	0	
	3	3	0	0	0	3	1	0	
	4	1	2	2	4	9	2	1	
	5	2	4	2	0	5	1	3	
How much do the following factors contribute to the growth of your Ecosystem? [State Investment]	1	1	3	1	0	4	1	0	p = 0,236 p > 0,05 Non-Significant Dif.
	2	0	2	0	1	2	0	0	
	3	4	1	0	2	3	1	1	
	4	1	1	2	0	10	3	1	
	5	1	0	2	1	3	0	2	
How much do the following factors contribute to the growth of your Ecosystem? [Tax Benefits]	1	1	4	0	1	7	1	0	p = 0,327 p > 0,05 Non-Significant Dif.
	2	0	2	2	1	1	1	1	
	3	3	1	2	0	3	1	2	
	4	2	0	1	2	6	2	0	
	5	1	0	0	0	5	0	1	
How much do the following factors contribute to the growth of your Ecosystem? [Universities]	1	0	2	0	0	3	1	0	p = 0,463 p > 0,05 Non-Significant Dif.
	2	1	1	0	1	3	1	0	
	3	4	3	0	1	4	2	2	
	4	1	1	4	2	5	1	1	
	5	1	0	1	0	7	0	1	
Select 3 economic sectors that you believe will grow in the next 5 years:	Advertising	0	0	0	0	4	1	1	p = 0,690 p > 0,05 Non-Significant Dif.
	Agriculture	0	1	0	2	2	2	1	
	Consulting	1	0	0	0	2	0	0	
	Data & Analytics	6	3	3	3	12	2	3	
	E-commerce	1	3	0	0	7	1	0	
	Education	0	0	1	0	3	1	0	
	Energy & Cleantech	4	0	2	1	4	1	2	
	Enterprise	1	1	0	0	1	0	0	
	Entertainment	0	0	1	0	1	0	0	
	Fashion	0	1	0	0	0	0	0	
	Finance	1	4	2	0	2	1	1	
	Fintech	0	1	0	0	0	0	0	
	Food & Beverages	0	0	0	0	0	0	1	
	Gaming	0	0	1	0	1	0	0	
	Health/Medical	0	1	2	1	4	1	1	
Jobs & Recruiting	1	0	0	0	1	0	0		

	Lifestyle	1	0	0	2	2	0	0	
	Logistics & Transport	0	0	0	0	2	0	0	
	Marketing	0	0	0	1	2	0	0	
	Media	1	0	1	0	0	0	0	
	Photography & Video	0	0	0	0	1	0	0	
	Productivity	0	0	0	0	0	0	1	
	SaaS	3	1	0	1	2	1	0	
	Smart Cities	0	1	1	1	5	2	0	
	Social Networking	1	0	0	0	2	1	1	
	Software Tools	0	0	0	0	0	1	0	
	Sports	0	0	0	0	1	0	0	
	Travel & Tourism	0	1	1	0	5	0	0	

Non-significant difference	The analyzed data with Fisher's exact test shows no evidence that the two sample groups possess different perceptions
Significant difference	The analyzed data with Fisher's exact test indicates that the null hypothesis can be rejected, hence there is a significant difference in the perception of the two sample groups