Collaborate? Let me check if I need you right now!

Collaboration and openness initiatives and activities in six Greek start-ups

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Dimitris dedicates this thesis: “to my family. A special feeling of gratitude to my co-partner whose words of encouragement and push for tenacity helped me finish this paper. I also dedicate this thesis to my many friends who have supported me throughout this process. I dedicate this work and give special thanks to my mum who have always loved me unconditionally and whose good examples have taught me to work hard for the things that I aspire to achieve”.

Sofoklis dedicates this thesis: “to my beloved ones. Friends and family that guided me through the years, and helped me to move forward when this was difficult. They know who they are. I know how much they love(d) me. They know how much I love(d) them”.

With the deepest gratitude and appreciation,
Dimitris and Sofoklis
Abstract

Context: Start-ups have recently emerged as an operational model for small and newly-founded firms globally. This increasing business acceptance is present within the European markets, as well as within the Greek. Researchers also compiled to the “commands” of the industry and start-up research followed the same, to practice, increasing course. Although the increase in both research and practice is visible, and the fact that several start-up related topics are well-documented, the start-up literature still shows certain limitations that need to be answered.

Theory: This study performs an extensive review of the start-up literature, provides definitions and descriptions of key start-up characteristics, and identifies the main streams, and limitations of start-up research, as long as cases of actual start-ups within the Greek business reality.

Purpose: The purpose of this study is to provide insight on certain literature limitations by examining start-up customs towards collaboration and openness initiatives and activities. More in detail, the study aims to identify whether start-ups are able to collaborate (newness and smallness paradox), what is the extent (breadth and depth, partner variety, and collaboration content) of their collaboration and openness customs with different partners, but also the individual importance of specific partners, and the ways this importance changes through different phases of the start-up growth. Also, documented matters such as the determinants of collaborations and the internal organizational structure of start-ups towards openness and collaborations are also discussed.

Design/Methodology/Approach: A multiple-case study that follows the replication logic is performed. The study focuses on six Greek online start-ups, and extracts information initially from the websites of the firms, and then by interviewing one key employee in each start-up. The combined information from each case are cross-analysed so as behavioural patterns to emerge and conclusions to be drawn regarding start-up initiatives and activities towards collaboration and openness.

Findings: Start-ups are indeed able to collaborate and practice openness with external partners from the beginning, while the collaboration and openness is closely related to the desired outcome/collaboration content that fulfils a specific need. This desired outcome is connected to the extent – breadth and depth – of the collaboration, but also to the type of each partner. Thus, start-ups closely collaborate with few and selected partners of each kind (e.g. universities, supplies etc.), with the exception of customers and users. The collaboration with customers and users is wide and limited on their feedbacks due to their numbers. Customers, users, suppliers, innovation intermediaries, and universities were identified as the most important partners to start-ups. The importance of these partners is connected to the start-up growth lifecycle. Innovation intermediaries are the most important startup partners, while customers, users and suppliers are important from the stabilization phase and during the whole start-up lifecycle. Universities importance were not found to be clearly connected to the startup growth phases, but mostly to the collaboration content. Regarding the importance, some differences might occur amongst start-ups active in different industries. Those differences are industry specific and affect how and when each start-up collaborates with different partners. Finally, this study confirmed the propositions of previous studies regarding the determinants and internal organizational structure towards collaboration and openness with external partners.

Research limitations and implications: Although the present study shows a set of limitations mostly regarding the number and distribution of the cases, it is the authors’ belief that it also shows a set of theoretical and practical implications. It provides managers and researchers with findings on uncharted territories in start-up literature, it connects its findings to prior start-up research, and provides insight on the almost undeveloped literature on Greek start-ups.

Keywords: start-ups; collaboration; openness; partnerships; innovation; growth phases; lifecycle; Greece; Greek online start-ups; service; software.

Paper type: Master thesis
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1. Introduction

Small and medium enterprises are frequently branded as the backbone of economy (Olzskak and Ziemba, 2012), mainly because they constitute a source of economic growth and employment (Hamdani and Wirawan, 2012). The latter reflects especially the case of innovative small and medium enterprises (Wynarczyk et al., 2013). In particular, start-ups, a specific type of small companies, are forces of wealth creation as they improve economies by enhancing their competitiveness (Peng, 2001). Thurik and Wennekers (2004, p.142), argued that during recent decades the focus have lifted from small firms as “a social good” towards “small business as a vehicle for entrepreneurship”. On that matter, Ries (2011, p.25) stated that “we are living an unreported worldwide entrepreneurial renaissance”, also due to the fact that the start-up concept has developed well beyond its roots, that is the software engineering entrepreneurship.

In fact, in the last two decades start-ups have emerged as a new model of doing business in a global scale. Start-up firms are actively performing in a variety of different industries, engaging different actors, and generating new innovative offerings constantly. Especially in industries of online products and services, start-ups increased dramatically both in terms of numbers and innovativeness.

Gigantic firms of the present day, firms with hundreds of thousands of employees worldwide, and revenues that worth billions of dollars, started their operations as start-up firms founded by a few intelligent individuals in a “garage”. Those individuals, had an innovative idea, a knowledge on how to make this idea a reality, and the belief that they will succeed. In other words, those individuals were entrepreneurs. From the mid-nineties till the present day, those ideas transformed firms with a budget of some thousands of dollars to the rulers of the global economy. Just to name a few, the likes of Amazon, Google, Twitter, Facebook, Dropbox, Netflix and Ebay (Verge, 2014), have an estimated brand value that starts from one or two billion dollars and exceeds to almost two hundred billions, ranking them amongst the “100 most valuable companies” across the globe (Brandz, 2014).

In 2011, Eric Ries described start-up firms as a series of crazy experiments, in order to outline the nature of these companies and their activities towards innovative products/services, and innovation in general. These crazy experiments turned out to be more than capable of turning the tables of the global economy by establishing the new rules of the business game. One example is Google, which was established in 1998 and, since then, developed a powerful search engine that provides “average earthling with internet access to tap into the accumulated knowledge of all humanity” (Verge, 2014). That way Google provided the biggest knowledge database for free to billions of people globally, by annihilating other forms of knowledge providers such as hard-cover or online encyclopaedias.

Of course, this might only be the “bright” side of start-up entrepreneurship, the fairy-tale of some companies that fought hard through the top of the business world. In fact, although this side represents only a small minority of start-up firms, the aforementioned successful companies are clear examples of how talented individuals took advantage of specific circumstances (e.g. the expansion of internet) to present their own innovative ideas to the world. Innovative ideas that changed the way of thinking and doing business.


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\(^1\) In the present study "start-up" is a business entity, while "startup" is a growth phase.
The aforementioned examples exemplify the crucial importance of start-ups within the modern-age markets and support the proposition of Ye and Kankanhalli (2013, p.69), that radical innovations might “propel small start-ups into dominant positions”, by destroying existing markets and vanish firms of colossal dimensions. These are also examples of a recent past, when internet and web-based activities were something new to the world, and all the ideas were developed in a “field of glory”, an uncharted and virgin territory. Although this past seems to be so close to the present day, that is definitely not the case. Internet expanded and advanced vigorously through the last decade offering many opportunities for success.

Research on start-ups, also, seems to follow the extremely growing business practice, and by now several research concepts and topics on the start-up literature are well-documented and researched (Hsu, 2006). On the other hand, a commonly accepted definition on start-ups is missing (Giardino and Paternoster, 2012), while several topics are underdeveloped and under-researched. Especially, topics in the field of start-up collaboration and openness present serious limitations. For instance, there is no clear evidence on whether start-ups are able to collaborate due to their inherent smallness and newness. Then - if they are indeed able to collaborate - the extent of these collaborations is not clear. For instance, start-ups collaboration and openness activities have not researched in terms of the breadth and depth (Laursen and Salter, 2006), the partner variety (Lazzarotti et al., 2011), and the content of collaboration. In addition, reasoning on the importance of different partners in collaboration and openness is not clearly documented. Finally, there is no evidence in the literature regarding whether this importance of individual partners might be a subject to changes during the different start-up growth phases.

Therefore, adding the facts that start-ups is an emerging business concept worldwide and that the start-up literature still shows several limitations regarding collaboration and openness initiatives and activities of start-ups, the need to take a deep look at the present start-up activities in a global scale appears to be more pressuring than ever.

1.1 The context of the study

In recent years, start-ups are experiencing an enormous growth both in terms of numbers and innovativeness in a global scale (GEM, 2015). That is also due to the fact that a supportive network of online organizations dedicated to innovativeness have been created around them (Up Global, 2015). For instance, in a European level, start-up initiatives are sponsored and promoted through special innovation programs (Start-up Europe Hub, 2015), with the financial contribution from the private sector and funds provided by the European Commission (European Commission, 2014). Although, European countries with established presence in innovativeness (e.g. UK, Sweden, etc.) still lead the innovative pathway in Europe (StartUps UK, 2015; Swedish Startups Space, 2015), countries with no prior history of innovativeness whatsoever are now emerging as players with high potential and willingness to innovate. Greece is one of those countries despite the fact that the crisis is “here to stay”.

During the last five to six years, Greece is in the middle of a horrendous crisis that shrinks the economy through memorandums of string economic measures, that lead to austerity and compel companies to dismiss part of their workforce, to reduce the salaries of their employees, and in general to suspend any action or even notion of investing. It is logical if one believes that during dark times «investors are tighter with their wallets and are making the “tossing good money after bad” calculations with a frugal eye», and this is
usually the case according to Blank (2013, p.9). In contrast, Greece is considered to be one of the most promising innovative players in Europe, as it is becoming "a huge start-up Incubator" (Business Insider UK, 2014), with start-ups “springing up like mushrooms” (DW, 2014) during these last five years. Greek start-ups are offering a glimpse of hope to the devastated Greek economy. They have grown in numbers (from 16 in 2010, to 182 in 2014), and in investments (from half a million in 2010 to 42 million euro in 2013), while they have opened-up new job opportunities (Business Insider UK, 2014; Greek StartUps, 2015; EMEA gr, 2013) in a country with 26.1% unemployment rate or 1.280.011 unemployed citizens (Elstat, 2014).

It would have been wrong to say that this hopeful outcome is happening randomly. On the contrary this is the result of an effort that combines various actors acting towards “building” the Greece of future, the Greece of innovation. More in detail, besides the numerous incubators that are active in other Greek cities, two major incubators currently operate in Athens, the capital city of Greece. One is EGG and was formed from the cooperation of one of the biggest banks in Greece (Eurobank) and an innovation intermediary (Corallia) (EGG, 2015). The other has been created by the Athens Chamber of Commerce and Industry and it goes by the name ΘΕΑ (ACCI, 2015). EGG supports 22, while ΘΕΑ supports 50 start-ups. Added to the aforementioned, Open Coffee Greece (2015), an active and well acknowledged online community of Greek entrepreneurs, organizes meetings, workshops and seminars with prominent entrepreneurs in various Greek cities. Finally, ELOT, the Greek organization for standardization, developed a set of guidelines and standards to support the development of Greek start-ups in an optimal way (ELOT, 2015).

In addition to the communities of entrepreneurs and young visionaries, the incubators, intermediaries, and accelerators, just described, the effort towards a Greece of innovation and prosperity also includes large companies of the private sector, other start-ups, established firms, NGOs, public agencies, private non-profit technological and cultural institutes, educational institutions, and of course universities. Start-ups are involved in collaborations and partnerships with all these actors, and exchange innovative ideas, solutions and materials that are necessary for the further development of their ideas and products/services.

Those facts alone seem enough to convince everybody that Greece presently speaks the language of innovation and that Greek start-ups act as the communicators of this language to the whole world.

1.2 Research purpose

In the shade of all the aforementioned it can be claimed that start-ups have emerged as a new model of doing business in terms of creating innovative solutions and promoting innovativeness in a global scale. Innovation as a present-day topic of research and business activity connects perfectly with the start-up business activity globally. Indeed, start-up research is quite extensive on specific matters, and more specifically to those regarding start-ups’ resources, complementary assets, learning, and competencies (Hsu, 2006). When it comes to other matters, though, the literature shows limitations and gaps. This is the case, for instance, of start-up collaborations and especially start-up collaborations

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2 Incubator is a “supporting environment for start-up and fledgling companies” (Peters et al., 2004, p.83).
3 ΘΕΑ is a Greek word that means either view or goddess.
towards innovation (open forms of collaboration - openness). The start-up literature explains thoroughly why start-ups collaborate, but is inadequate to explain how each different partner benefits start-ups, which partner emerges as the most prominent, or even how this importance changes throughout the growth lifecycle of a start-up. In addition, the literature often provides mixed signals regarding whether start-ups are indeed able to collaborate with external partners due to their inherent newness and smallness, while there is research on start-up collaboration and openness regarding the breadth and depth (Laursen and Salter, 2006), the partner variety (Lazzarotti et al., 2011), and the content of the collaborations. Finally, there is also a lack of a well-accepted start-up definition, while several authors describe start-ups in different manners and contexts (Giardino and Paternoster, 2012).

Therefore, the present study will perform an extensive literature review in an attempt, firstly, to identify some start-up definitions and gather together different descriptions of start-ups that are present throughout the start-up literature. Then, it will attempt to identify the main research streams in the literature and justify the aforementioned gaps and limitations. When the gaps and limitations are well identified this study will perform a multiple case-study in order to shed light on the connection amongst collaborations, openness, and start-ups. The centre of research will be on six Greek online start-ups active on the industries of online applications and software services.

The general purpose of the study is to fulfil certain limitations present within the start-up collaboration and openness literature. The first limitation of literature to be addressed is about the mixed signals coming from different researchers regarding the difficulties of start-ups to collaborate due to their smallness and newness. Then the study will seek to identify the extent of start-up collaboration and openness initiatives and activities with external partners. The extent will be analysed based on the breadth and depth (Laursen and Salter, 2006), the partner variety (Lazzarotti et al., 2011), and the content of collaboration. Those three parameters were chosen as there is no evidence of previous research on start-up collaboration and openness activities with the use of these parameters. Then, the study will seek to identify another under-researched topic, namely the importance of each different start-up partner. In other words, how start-ups are benefited by each different partner, how each partner is valued by start-ups, and why is valued that way. This importance will be studied in connection to the growth stage of start-ups, in order to become clear whether there is a link between specific collaborations with partners and particular start-up needs in each growth stage. Furthermore, two well-documented topics will be also researched, in order to be identified if prior research is confirmed. The first topic is about the determinants that motivate start-ups to engage in collaborations and openness, while the second is about the internal structure, strategies and procedures of start-ups towards external collaborations and openness.

Summing up, the purpose of this study is to provide insight on certain literature limitations by examining start-up customs towards collaboration and openness initiatives and activities. More in detail, the study aims to identify whether start-ups are able to collaborate (newness and smallness paradox), what is the extent (breadth and depth, partner variety, and collaboration content) of their collaboration and openness customs with different partners, but also the individual importance of specific partners, and the ways this importance changes through different phases of the start-up growth. Also, documented matters such as the determinants of collaborations and the internal organizational structure and strategies of start-ups towards openness and collaborations are also discussed.
1.3 Paper outline

Towards the aforementioned goals, a review of the extant literature will set the basis for a better understanding of the present research status, by defining start-ups and clarifying the gaps and limitations in literature. The methodological approach of this study will be outlined, while the cases of the six start-ups will be presented individually at the results section. The cases will be analysed based on data gathered from the companies’ websites and semi-structured interviews with one employee from each start-up. Cross-analysis of the findings from case studies and connection of findings with previous research will follow at the discussion section. Finally, conclusions will be drawn, while practical and theoretical implications will be pointed out alongside with the limitations of the study.

2. Theoretical Background

In this part, the theoretical background of the study will be set up. Through an extensive review of start-up literature, definitions of start-ups will be presented, while the main attributes of start-ups, as long as the main streams and limitations of previous research will be outlined and presented. Start-ups are approached and analysed as small, newly-founded and innovative organizations that are capable to act and develop in uncertain environments. The main concepts that set the background of start-up collaborative activities are analysed with the help of relevant start-up literature focused on collaborations and openness so as a better understanding of the topic to be reached. The limitations in start-up literature are highlighted when it is relevant, while the purpose of the study is outlined and connected to the gaps, and the research questions are formulated.

2.1 Start-ups

Although start-ups seem to “conquer” the modern business world, there is still lack of a specific and commonly accepted definition of the concept. In fact, Giardino and Patter-noster (2012) identified, through an extensive literature review, that different researchers and authors provide definitions that vary, while they also use the term “start-ups” to refer to different settings. They also added that there are a lot of differences between researches when defining start-ups based on their size or the age of their operations, while the term start-up, for some authors, merely describes a growth phase and not an enterprise. Finally, they argued that these facts add to the difficulty for a body of start-up literature to be easily visible. Through an extensive search on the literature, the authors of the present study have identified another fact that adds to the difficulty of easily forming a body of literature on start-up business related matters. In fact, when searching for “start-ups” and especially for “startups”, search engines, such as google scholar, science direct etc., produce a wide variety of articles that are relevant to other scientific topics (e.g. computer science, physics, engineering, biochemistry etc.), and completely irrelevant to business management. The aforementioned difficulty is especially present when searching for just start-up in any form and without using any other words that describe start-ups as a business entity (e.g. firms, companies etc.).

Trying to identify a definition, the authors of this study performed a review on the start-up literature and identified that most of the field researchers use the terms “start-up” and/or “startup” interchangeably without supplementing it by any definition, extensive or brief, whatsoever. Quite a few authors prefer to briefly describe start-ups and not extensively define them while they use those descriptions interchangeably with the term start-ups. As table 1 shows those descriptions usually refer to start-ups with the terms new or
newly founded, innovative or tech-based firms or other terms of similar or identical meaning. Moreover, some of the authors use two or three different terms at the same time (e.g. Davila et al., 2003: recently formed or young companies), or even a combination of two or three terms (e.g. Colombo et al., 2006 and Colombo and Grilli, 2010: new technology-based firms) to refer to and describe the start-up concept. Finally, only a few authors constructed or adopted comprehensive definitions on start-ups.

Table 1: Most common streams of start-up descriptions in the literature

<table>
<thead>
<tr>
<th>Start-ups described as</th>
<th>Author(s)</th>
<th>Concern of the article regarding start-ups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recently formed</strong> and/or <strong>newly founded firms</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Davila et al., 2003</td>
<td>Venture capital and growth</td>
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<td>Delmar and Shane, 2006</td>
<td>Founding team experience</td>
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<td>Freear et al., 2002</td>
<td>Angel investing</td>
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<td>Robb and Robinson, 2012</td>
<td>Capital structure decisions</td>
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<td></td>
<td>Stubner et al., 2007</td>
<td>Management support and performance</td>
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<tr>
<td><strong>New</strong> and/or <strong>young</strong> and/or <strong>entrant firms</strong></td>
<td>Aspelund et al., 2005</td>
<td>Initial resources and survival</td>
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<td>Audretsch et al., 2005</td>
<td>University spillovers and firm location</td>
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<td>Baptista and Mendonca, 2010</td>
<td>Proximity to knowledge sources</td>
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<td>Bertoni et al., 2011</td>
<td>Venture capital and financing</td>
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<td>Carter et al., 1996</td>
<td>Event sequences</td>
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<td>Chorey and Anderson, 2006</td>
<td>Success factors</td>
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<td></td>
<td>Colombo et al., 2004</td>
<td>Human capital and size</td>
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<td>Colombo et al., 2006</td>
<td>Determinants of alliances</td>
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<td>Colombo and Grilli, 2010</td>
<td>Human and venture capital</td>
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<td>Criscuolo et al., 2012</td>
<td>Differences with established firms</td>
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<td>Davila et al., 2003</td>
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<td>Founding team experience</td>
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<td>Gries and Naude, 2009</td>
<td>Growth and entrepreneurship</td>
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<td>Gruber and Henkel, 2004</td>
<td>Open source innovation</td>
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<td>Hellmann and Puri, 2000</td>
<td>Venture capital and outcomes</td>
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<td>Jensen, 2009</td>
<td>Start-up firms in US</td>
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<td>Ozmel et al., 2013</td>
<td>Alliances, venture capital and exit decision</td>
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<td></td>
<td>Preston, 2001</td>
<td>Success factors</td>
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<td></td>
<td>Presutti et al., 2007</td>
<td>Knowledge acquisition</td>
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<tr>
<td></td>
<td>Robb and Robinson, 2012</td>
<td>Capital structure decisions</td>
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<td></td>
<td>Roda and Vallaster, 2005</td>
<td>Corporate branding and the entrepreneur</td>
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<td></td>
<td>Shane and Stuart, 2002</td>
<td>Organization and performance</td>
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<td></td>
<td>Singh and Mitchell, 2005</td>
<td>Collaboration and sales performance</td>
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<tr>
<td></td>
<td>Van Auken and Neeley, 1996</td>
<td>Bootstrap financing</td>
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<tr>
<td></td>
<td>Walker et al., 1997</td>
<td>Social capital and industry networks</td>
</tr>
<tr>
<td></td>
<td>Yli-Renko et al., 2001</td>
<td>Social Capital, knowledge acquisition</td>
</tr>
<tr>
<td><strong>Entrepreneurial</strong> and/or <strong>innovative firms</strong></td>
<td>Block and Sandner, 2009</td>
<td>Crisis, venture capital and innovation</td>
</tr>
<tr>
<td></td>
<td>Boyer and Blazy, 2014</td>
<td>Survival, human capital and innovation</td>
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<tr>
<td></td>
<td>Freear et al., 2002</td>
<td>Angel investing</td>
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<tr>
<td></td>
<td>Grajkowska, 2011</td>
<td>Intellectual capital and innovation</td>
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<td></td>
<td>Gries and Naude, 2009</td>
<td>Growth and entrepreneurship</td>
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<td></td>
<td>Hellmann and Puri, 2000</td>
<td>Venture capital and outcomes</td>
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<td></td>
<td>Hsu, 2006</td>
<td>Venture capital cooperation</td>
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<tr>
<td></td>
<td>Nanda and Rhodes-Kropf, 2013</td>
<td>Investment cycles and innovation</td>
</tr>
<tr>
<td></td>
<td>Paradkar et al., 2015</td>
<td>Innovation, resources and capabilities</td>
</tr>
<tr>
<td></td>
<td>Stubner et al., 2007</td>
<td>Management support and performance</td>
</tr>
</tbody>
</table>

<sup>4</sup> Firms might be referred in the literature as corporations and/or businesses and/or ventures and/or companies.
For instance, Mann and Sanyal (2010, p.6), partially adopted a general definition provided by the “Kauffmann Firm Survey” to define true start-ups as any “new independent business that was created by a single person or a team of people; (…)”. Giardino et al. (2014, p.28) defined start-ups as “newly created companies with little or no history of facing high volatility in technologies and markets” that are also “small companies exploring new business opportunities, working to solve a problem where the solution is not well known (…)”. These definitions serve well the purpose of the present study as they both promote the traits of smallness and newness of start-ups, while the second also focuses on the uncertainty of their operations. The latter is also present on the definition provided by Ries (2011, p.17) in his work “The Lean StartUp” and defines start-ups as “[any] human institution designed to create new products and services under conditions of extreme uncertainty”. Lastly, the definition provided by Stubner et al. (2007, p.138) defines entrepreneurial start-ups as “(…) those newly founded companies that try to enter, or sometimes even open up, a market with innovative products or services”. The aforementioned definition states clearly another start-up trait, that of innovativeness. Innovativeness is also present on the previous definitions, but in a subtle way (“solution not well known” and “to create new products (…)”), but it is also used to describe start-ups by various other authors as shown on table 1. Thus and according to the way previous research defines and describes start-ups (see table 1 and definitions), there are four main traits that define start-ups, and that are their smallness, newness, innovativeness, and technology and market uncertainty. Each one of these traits builds to the creation of the “character” of start-up firms and used to define start-ups in the present study.

2.2 Start-ups: innovative small and newly-founded firms that operate in uncertainty

Zahra and Covin (1994, p.183) argued that “innovation widely considered as the life blood of corporate survival and growth”. Specifically on start-ups, innovation poses as of vital importance for their further development and growth (Cefis and Marsili, 2005). Giardino and Patternoster (2012), expressed the concern that authors usually refer to start-ups that
are active on innovative projects, but without making clear how they define innovation. In order for this concern to be avoided, a short presentation of the concept of innovation should be presented in this study. In 2003, Porter and Ketels defined innovation, in a broad sense, as the successful exploitation of new ideas. In the present study the definition provided by Bessant and Tidd (2011, p.40) will be adopted, as it is similar to but more explicit than the previous one, and defines innovation as “the process of translating ideas into useful – and used – new products, processes or services”. Thus, innovation is the specific function that entrepreneurs employ to exploit market and technological opportunities in order to create value (Drucker, 2002).

Most research on start-up activity, agreed that start-ups seek those innovative opportunities within markets and regarding technologies of high uncertainty and turbulence (Aulet, 2013; Bessant and Tidd, 2011; Blank, 2013; Giardino et al., 2014; Ries, 2011; also definitions in section 2.1: Start-ups). Furthermore, Ries (2011) stated that start-up companies need to reach a market, through their business model, and obtain customers (and/or users) as soon as possible. Thus, the “goal of a start-up is to figure out the right thing to build, (...) as quickly as possible” (p.30), and to make sure that this “thing” will be wanted by some customers. Blank (2013, p.22) claimed that “not all start-ups are alike”, and he proposed four categories amongst start-ups in relevance to the market type they target.

As shown on figure 1 these categories reflect “start-ups bringing a new product into a(n):

i. Existing market,

ii. New market,

iii. Existing market and trying to re-segment that market as a low cost entrant, and

iv. Existing market and trying to re-segment that market as a niche market”.

He added that the type of target market differentiates the size of the market, the way a company evaluates the needs of its customers, the way it positions its products into this market, as long as the way the customer understands his/hers needs. In one word, the uncertainty of the market. Blank (2013), also underlined that high market uncertainty is not usually the case of start-ups that target known markets or have already identified their new target market.

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5 “Segmentation (differs from differentiation) means that you’ve picked a clear and distinct spot in customers’ minds that is unique, understandable, and, most important, concerns something they value and want and need now” (Blank, 2013, p.33).
Start-ups, besides innovative, are also considered to be small and newly-founded. Indeed, start-ups are a fraction of small firms (Spithoven et al., 2013), namely those firms that employ less than 50 employees as proposed by the European Commission (2015)\(^6\). In addition, small firms show some common general characteristics or similarities, regardless the industry within they operate (Löfqvist, 2010), albeit the fact that the boundaries between start-ups and the rest small enterprises are often blurry (Bessant and Tidd, 2011). Thus, start-ups show similarities to other small companies, by just being small. On the other hand, entrepreneurship and small business activity, although related, are not identical concepts (Thurik and Wennekers, 2004), while start-up innovation activities are particularly different to those of established firms (Criscuolo et al., 2012). Thus, start-ups also show differences compared to other small firms (established and/or non-innovative), but also show differences to other small and newly-founded businesses as by "being newly-founded does not in itself make a company a start-up" (Giardino et al., 2014, p.28).

A difference between start-ups and the other types of small firms rests on the way each type grows towards maturity. Churchill and Lewis (1987) developed a framework of small business growth, and proposed that small enterprises are going through five steps of development from the moment they start to exist and towards maturity. They identified these steps as the stages of existence, survival, success, take-off and resource maturity. According to Crowne (2002), start-ups develop and grow through a growth model of four successive steps, the phases of startup, stabilization, growth and product maturity as shown on figure 2. The last stage, the one of product maturity, can be followed by either keep “doing business as usual” (Startup Commons, 2015), or exiting strategies (Ozmel et al., 2013; Startup Commons, 2015), by the founders and investors. This growth model shows many differences compared to the one proposed by Churchill and Lewis (1987) regarding small companies, with the most important that small companies start to operate having an already developed product placed in specific markets, or they know the product and market they are going to be engaged on before they start to operate. Of course this is not the case in most of the start-ups (see also figure 1, p.8, for start-up targeted markets).

![Figure 2: An illustration of Crowne’s (2002) start-up growth model (*see Ozmel et al., 2013; Startup Commons, 2015*)](image)

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\(^6\) European Commission (2015) defines all companies with less than 10 employees as micro enterprises. The authors of the present study are aware of that fact, but as there is no commonly acknowledged and widely accepted definition of micro and small firms (Laporte et al., 2008), the authors preferred to use the term "small enterprises“ or "SEs“ to refer to both micro and small enterprises or else, firms with less than 50 employees.
Bill Aulet (2013), in his book “Disciplined Entrepreneurship: Overview of the 24 Steps to a Successful Start-up”, proposed some additional differences between start-ups and other small business. In fact, he proposed a quite interesting distinction of small business activity, by distinguishing entrepreneurship in small and medium companies into two categories, as shown on table 2, the “small and medium enterprises entrepreneurship” and the “innovation-driven enterprises entrepreneurship”. He explained that the former reflects a small company that “serves a local market and grows to be a small or medium-size business that serves this local market” (p.22). These companies do not require to acquire a lot of money to grow, while they reward their owners through cash flows and personal independence. On the other hand, innovation-driven enterprises usually “looking to sell their offering to a global (...) level [markets]” (p.23). In addition, they are known for their risky and ambitious nature, as they seek to grow fast and become big in order to serve these global markets.

*Table 2: Aulet’s proposed distinction of small business activity [partially adopted from Aulet and Murray (2013)]*

<table>
<thead>
<tr>
<th>Small and medium entrepreneurship</th>
<th>Innovation-driven entrepreneurship</th>
</tr>
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<tbody>
<tr>
<td>Focus on addressing local and regional markets only.</td>
<td>Focus on global markets.</td>
</tr>
<tr>
<td>Innovation is not necessary to establishment and growth, nor is competitive advantage.</td>
<td>The company is based on some sort of innovation (tech, process, business model) and potential competitive advantage.</td>
</tr>
<tr>
<td>Non-tradable jobs: jobs generally performed locally, e.g. dry cleaners.</td>
<td>Tradable jobs: jobs that do not have to be performed locally.</td>
</tr>
<tr>
<td>Most often family businesses or businesses with very little external capital.</td>
<td>More diverse ownership base including wide array of external capital providers.</td>
</tr>
<tr>
<td>The company typically grows at a linear rate.</td>
<td>The company starts by losing money, but if successful will have exponential growth</td>
</tr>
</tbody>
</table>

Aulet’s (2013) proposed distinction (table 2) clearly promotes the innovative nature of start-ups as proposed by the definitions and table 1 (section 2.1: Start-ups), but also promotes the global appeal of some modern start-ups that is not a characteristic of most non-innovative small companies. Presutti et al. (2007) researched start-ups with an inherent international perspective and described this global appeal by labelling those start-ups as international new ventures or global high-tech start-ups. In the present study, the start-ups under investigation are both innovative and have an international perspective, as they are offering their innovative services through the internet targeting a global market.

Now, regarding the similarities of start-ups to other small companies, there is a two-folded way on viewing them. The first view regards the advantages of small companies when compared to larger ones (Tidd and Bessant, 2014), while the second is about the inherent disadvantages, or problems, of small companies (Churchill and Lewis, 1987) that stem

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7 Although Aulet (2013) proposed the term “innovation driven entrepreneurship” to refer to small companies with innovative characteristics, it is the belief of the authors of this paper that the concept of “innovation driven entrepreneurship” is extremely close to the one of start-ups as described on the previous parts of the theoretical framework (parts 2.1 and 2.2), as it will be described later on, and also as it is understood by the authors.
from and supplement their nature as small enterprises, in terms of operations and employment. The latter are also the consequential of the inherent start-ups’ liability of newness (Aspelund et al., 2005; Yli-Renko et al., 2001) and their lack of routines (Delmar and Shane, 2006) due to their short life and their lack of revenues.

Resource constraints pose on the literature as a disadvantage of central and great importance to the existence, development and growth of start-ups. These constraints regard a scarcity on resources that might be of both a financial and a human nature (Paradkar et al., 2015; Presutti et al., 2007; van Auken and Neeley, 2009; Yli-Renko et al., 2001). In addition, it might be a limitation on social and intellectual capital (Grajkowska, 2011; Walker et al., 1997; Yli-Renko et al., 2001). Stubner et al. (2007), argued that this limitation in financial capital and management ability, force start-ups to seek management support and financing from outsiders. Each of these constraints, namely financial and managerial (human, social and intellectual), though, can be confronted in different ways as shown on figure 3.

More in detail, to fill their financial needs and to finance their operations, start-ups require the financial aid from external sources and pitches (Criscuolo et al., 2012) such as angel investment and seed funding at an early stage and venture capitals at later growth stages (Blank, 2013; Skardon, 2011). Crowdsourcing (Howe, 2012) and crowdfunding (Belleflamme et al., 2014) are also early stage financing pitches. Securing that financial backing, also secures a smooth transition towards the growth of a start-up (Davila et al., 2003), and to the generation of profits for the investors, owners and founders of the start-ups through exiting strategies (Özmel et al., 2013).

**Figure 3:** Start-ups' constraints and possible solutions according to the start-up literature
To confront problems regarding the lack of managerial capital, start-ups usually have two options, one internal and one external that both can be used simultaneously and do not exclude each other. The former, advices start-ups to rely on their organizational structure and abilities of the founding team, while the latter is to form alliances, to seek interactions, and to collaborate with external partners.

More in detail, the internal option suggests that start-ups have a tendency to adopt simple organizational structures that foster an aptitude to hire talented people, quicker reaction to opportunities (Peng, 2001), and high levels of flexibility (Criscuolo et al., 2012). Simple organizational structure reduces the needed resources and make start-ups more dexterous. Another suggestion of the internal option is that start-ups should rely on the experience, knowledge and motivation of the founding team (Stubner et al., 2007), as the attitudes and skills of the core team were found to be of paramount importance for the growth of start-ups (Chorev and Anderson, 2006). In fact, start-ups often rely on the individual characteristics of their founding team (Brüderl et al., 1992), namely the education, skills and expertise (Bessant and Tidd, 2011; Colombo and Grilli, 2010), experience (Delmar and Shane, 2006), and creative spirit (Bessant and Tidd, 2011) of the founding team, in order to bring a wide variety of innovations forward (Aulet, 2013; Ries, 2011). Besides the aforementioned, start-up entrepreneurs and start-ups usually hold knowledge on the specific venture, but they do not always possess a variety of different skill sets (Bessant and Tidd, 2011; Ries, 2011). On one hand, this lack is often filled by an ability to perform in dynamic environments (Bhide, 2000), and an aptitude to manage unexpected changes (Gallego et al., 2011), that stem from their flexibility and small organizational structure. On the other hand, start-ups are reliable to a supportive environment, and prone to seek external partnerships from the beginning in order to be developed (Bessant and Tidd, 2011; Ries, 2011).

McDougall et al. (1994) stated that the growth and progress of start-ups particularly depends on innovatively combining their knowledge with that of partners (as cited in Yli-Renko et al., 2001). Baum and Silverman (2004), argued that alliances might have the power to moderate the liabilities that stem from the newness and smallness of biotechnology start-ups by providing new opportunities and resources. Baum et al. (2000), identified that biotechnology start-ups were able to lower their costs through partnerships. Singh and Mitchell (2005), argued that start-ups that start to exist by collaborating with established firms, show increased commercialization and sales benefits when compared to late collaborator start-ups, and start-ups that collaborate with other start-ups early on. According to Paradkar et al. (2015), collaborations with partners were found to be particularly significant for the commercialization of products/services of local start-ups in New Zealand. Criscuolo et al. (2012), identified that it is often the case of UK start-ups to save resources by collaborating with their customers. They argued that customers usually provide start-ups with valuable information and market understanding. Other researchers described how collaborating with specific partners each time, for instance incubators and accelerators (Haines, 2015), and universities (Durkin, 2015; Shane and Stuart, 2001; Stuart et al., 2007; Wang & Shapira, 2012), benefits start-ups. Chorev and Anderson (2006), argued that networking especially for financial and marketing gains is perceived as valuable because it reaffirms the existence of the start-up while opens new doors in the market. Pangarkar and Wu (2012), identified that more partnerships and a vast diversity of partners increases the performance of internet start-ups.
It is clear that research on start-ups have extensively discussed matters connected to why start-ups collaborate with external partners. Indeed, Hsu (2006) highlighted the fact that some specific start-up topics such as those related to resources, complementary assets, learning, and competencies are well documented and extensively researched, a fact that is also visible on the table 3 (table sections 3 and 4). Thus, there is knowledge and evidence on why start-ups prefer to partner up with external actors, but there is no clear evidence on whether start-ups are indeed able to collaborate at early stages and later on. In fact, Kotha et al. (2001), argued that the lack of performance history, limits the access to potential partners, while Shane and Stuart (2001), and Singh and Mitchell (2005) identified that limited prior performance records increase the uncertainty towards partnerships due to the unproven quality of young firms. In that matter, Hampe and Steininger (2001) could not confirm that start-ups are more engaged in partnerships than other companies, while they supported that start-up growth relates to higher cooperation activities. They also argued that cooperation with partners is most often a consequential of the entrepreneur’s personal networks. Therefore, a paradox seems to exist as there are several other authors that suggest that start-ups need to partner-up due to their smallness and newness (e.g. Peng, 2001). This “confusion” regards whether start-ups collaborate with external partners, and how start-ups understand collaborations in general, and can be formed as – Start-ups are indeed prone to collaborations, but do they collaborate? Or, is it easy for start-ups to collaborate with external partners? Or, are start-ups able to surpass their liabilities and collaborate with external partners?

Table 3: Predominant research topics in start-up literature

<table>
<thead>
<tr>
<th>Article concern</th>
<th>Author(s)</th>
</tr>
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<tbody>
<tr>
<td>1. Collaborations, alliances, cooperation, interactions, networks, partnerships etc.</td>
<td>Baum and Silverman, 2004; Baum et al., 2000; Colombo et al., 2006; Gans et al., 2000; Haines, 2015; Hampe and Steininger, 2001; Hsu, 2006; Huang et al., 2012; Ozemel et al., 2013; Pangarkar and Wu, 2012; Peng, 2001; Powell, 1998; Rothaermel, 2002; Rothaermel and Deeds, 2006; Singh and Mitchell, 2001; Shan et al., 1994; Skardon, 2011; Stuart et al., 2007; Velu, 2015; Walker et al., 1997; Wang and Shapira, 2012; Wu, 2005</td>
</tr>
<tr>
<td>2. Innovation-entrepreneurship</td>
<td>Block and Sandner, 2009; Boyer and Blazy, 2014; Boyer et al., 2008; Burke et al., 2013; Chien, 2013; Colombo et al., 2006; Criscuolo et al., 2012; Ferrary, 2011; Franke et al., 2006; Freetar et al., 2002; Fritzsch and Wyrwich, 2015; Graham and Sichelman, 2008; Grajkowska, 2011; Gries and Naude, 2008; Groen et al., 2008; Gruber and Henkel, 2004; Haines, 2015; Hampe and Steininger, 2001; Helmers and Rogers, 2009; Huang et al., 2012; Korosteleva and Mickiewicz, 2011; Nanda and Rhodes-Kropf, 2013; Paradkar et al., 2015; Pirolo and Presutti, 2010; Roda and Vallaster, 2005; Schmitt-Roedermund, 2004; Shan et al., 1994; Skardon, 2011; Soder, 2007; Velu, 2015; Weiblen and Chesbrough, 2015; Wen et al., 2012</td>
</tr>
<tr>
<td>3. Resource constraints</td>
<td></td>
</tr>
<tr>
<td>a. Social, intellectual and human capital</td>
<td>Baum and Silverman, 2004; Colombo et al., 2004; Colombo and Grilli, 2010; Fritzsch and Wyrwich, 2015; Grajkowska, 2011; Groen et al., 2008; Paradkar et al., 2015; Pirolo and Presutti, 2010; Presutti et al., 2007; Stubner et al., 2007; Walker et al., 1997; Wu, 2005; Yil-Renko et al., 2001</td>
</tr>
<tr>
<td>b. Initial resources-Founding team-Entrepreneur</td>
<td>Aspelund et al., 2005; Baron and Hanman, 2002; Delmar and Shane, 2006; Fitza et al., 2009; Fritzsch and Wyrwich, 2015; Huang et al., 2012; Paradkar et al., 2015; Roda and Vallaster,</td>
</tr>
</tbody>
</table>
The identification of articles on start-up collaboration also presented a set of difficulties as many articles shown on databases when searching on the specific topic are about irrelevant to the present study scientific matters. In some cases even, start-up was referred as a business growth phase (see again 2.1: a definition of start-up). In addition, the majority of the returned business related articles were about alliances and cooperation in general and not regarding start-ups specifically (e.g. Laursen and Salter, 2004). Nevertheless, regarding start-up collaborations there are indeed some noteworthy papers studying how start-ups’ act towards and within partnerships, as presented on table 3, table section 1. For instance, Rothaermel and Deeds (2006) talked about the influence of prior alliance experience on building the alliance management capability of biotechnology start-ups. Pangarkar and Wu (2012) studied the reflection of collaborations on the performance of start-ups in Singapore. Baum et al. (2000), also identified a connection between alliances and firm’s performance in the early stages of existence of biotechnology start-ups. Singh and Mitchell (2005) discussed how early collaborations benefit the sales of start-ups active within the hospital software systems industry in USA. All the aforementioned authors, talked about alliances and collaboration in general, without discussing how different partners benefit start-ups and under what context, or how each specific partner contributes to the growth and development of start-ups. Other researchers have tried to identify how different attributes and capabilities influence the creation of a network of partners around start-ups. More in detail, Peng (2001), researched networking start-up strategies in transition economies through the lens of the entrepreneur’s personal connections and ties. Walker et al. (2007), debated on how social capital affects the formation of start-up networks in the biotechnology industry. Ozmel et al. (2013), studied the ways that
present venture capital and alliance choices affect future venture capital, alliance activity and exiting strategies of biotechnology start-ups.

Another stream of research talked about how different partners specifically benefit start-ups through collaborations, but they analysed matters regarding specific dynamics between exact collaborative duos or triplets only. For instance, Hsu (2006) studied the impact of venture capitalists on the course of the cooperative commercialization strategies of start-ups in USA, while Wang and Shapira (2012) talked about universities collaborating with nanotechnology start-ups (for university-industry collaboration see Stuart et al., 2007 also). Another stream of researchers focused on specific characteristics that make start-ups attractive allies to other companies. Rothaermel (2002) examined the aforementioned from the perspective of established firms in the industry of biotechnology. Wu (2005), examined how dynamic capabilities and initial entrepreneurial resources make Taiwanese high-tech start-ups more likeable to external partnerships. The focus of these studies did not lay on start-ups and focused mostly on the other end of the partnership. An exception to that is the study of Baum and Silverman (2004) that concentrated on biotechnology start-ups’ upstream and downstream alliance (Baum et al., 2000 also) behaviour and choices as criteria for the selection of these start-ups by venture capitalists and investors. Finally, another stream of research focuses on biotechnology start-ups, or science-based start-ups – dedicated biotechnology firms- as Powell (1998) described them. That stream is also the predominant as it contains most of previous research on start-up collaborating activities (see Baum et al., 2000; Baum and Silverman, 2004; Ozmel et al., 2013; Rothaermel, 2000; Rothaermel and Deeds, 2006; Shan et al, 1994; Stuart et al., 2007; Walker et al., 1997).

Therefore, there are limitations and gaps on the present literature on start-up collaboration activities. More specifically, there is no clear evidence on whether start-ups are indeed able to collaborate (the paradox), what is the extent of the collaboration (in terms of breadth and depth, partner variety, and collaboration content), or which are the most important partners from the perspective of start-ups, and how this importance might be a subject to changes through the different stages of a start-up’s growth. Regarding the latter, the only exceptions are the studies of Baum et al., 2000, and Singh and Mitchell, 2005, which discussed matters at the first steps of start-up growth but not regarding the importance of partners specifically. Additionally, there is no clear evidence on the sectors of services and software development, in general and specifically about the uncertain Greek market. Therefore, the present study will attempt to clear out the aforementioned gaps in start-up collaboration literature, by examining cases of Greek services and software development start-ups.

This study understands “collaboration” in a general sense, and as a vehicle towards different outcomes, as analysed before. This study will also focus to a more specific type of collaboration, the collaboration towards innovation. Thus, the study will also focus in collaboration and open forms of collaboration towards innovation, namely “openness”, to identify whether start-ups collaborate to achieve innovativeness and increase their innovative potential. The topic of openness will be discussed in the next section (2.3: Openness is start-ups collaborations).

2.3 Openness

Besides collaborations of the more traditional form and for reasons that are known and well documented such as lack in resources, or limitations inherent to the nature of each
company (e.g. smallness and newness, etc.), firms also collaborate to achieve better innovative outcomes and to increase their innovative potential by seeking solutions through innovations of various dimensions, and intensity\(^8\) (Tidd and Bessant, 2014). Thus, companies should increasingly commit their future to open forms of collaboration towards innovation by cooperating with various external partners and different actors. In other words, companies should gradually embrace openness.

In the shade of a lack of a well acknowledged common definition, Knudsen (2007, p.4) defined openness in the innovation process as “a firm’s ability and willingness to make use of a wide range of external sources when the knowledge is needed”. Bengtsson et al. (2015), identified at least four ways which researchers have used to define and study openness. More in detail, the four ways regard (1) the involvement of a firm in inbound, outbound, and coupled innovation processes as proposed by Chesbrough et al. (2014), (2) the breadth and depth of partnerships as described by Laursen and Salter (2006), (3) the collaboration content as suggested by Huizing (2011), and finally (4) the phases of innovation as instructed by Lazzarotti et al. (2011). In fact, Lazzarotti et al. (2011) discusses the degree of company’s openness based on the innovation phase variety, but also on the partner variety, meaning the “number and type of partners with whom the company collaborates” (p.412). According to von Hippel (2005) another emerging concept of openness in innovation is that of the open distributed innovation, a concept that locates users at the centre of innovation processes. The present study understands openness as defined by Knudsen (2007), and in terms of open innovation, and open distributed innovation as proposed by Chesbrough (2003) and von Hippel (2005) respectively. Collaborations and openness’ extent will be further analysed in relevance to the breadth and depth of collaborations\(^9\) (Laursen and Salter, 2006), the partner variety (Lazzarotti et al., 2011), and the collaboration content or need that drives start-up enterprises to partner-up with external actors.

The term open innovation coined by Chesbrough (2003) and is initially defined as the need for firms that “can and should use external as well as internal ideas and internal and external paths to markets as the firms look to advance their technology” (as cited in Knudsen, 2007, p.4). Chesbrough et al. (2014), modified and expanded the initial definition, by defining open innovation as a process “based on purposively managed knowledge flows across organizational boundaries (...).”. This flow of knowledge might be inbound or outbound (Chesbrough, 2003), or even towards both ways also known as coupled (Gassman and Enkel, 2004). The present study locates start-ups at the centre of research, and focuses specifically on inbound (Chesbrough, 2003) or outside-in (Gassmann and Enkel, 2004) open innovation. Inbound open innovation enhances the innovative potential of the recipient enterprise as it “enriches company’s innovativeness” (Gassmann and Enkel, 2004, p.14). Tidd and Bessant (2014), suggested that this type of open innovation reflects to the ways of search, identification, development and commercialization of resources and ideas from external sources in order value to be created.

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\(^8\) Innovation dimensions: product/service, process, position, and paradigm. Innovation intensity: incremental, or radical (Tidd and Bessant, 2014).

\(^9\) Collaboration breadth and depth are the “the number of external sources or search channels that firms rely upon in their innovative activities” and “the extent to which firms draw deeply from the different external sources or search channels” respectively (Laursen and Salter, 2006, p.134-135).
The concept of open distributed innovation fundamentally differs from the one of open innovation proposed by Chesbrough (2003) (Baldwin and von Hippel, 2011). Open distributed innovation describes a shift towards more “democratized” forms of innovation where users and user communities (horizontal innovation networks) are at the centre of the innovation process (von Hippel, 2005). According to von Hippel (2005), a user is a “firm or individual consumer that expects to benefit from using a product, or a service” (p.4) in contrast to a “manufacturer” that expects to benefit from selling. In addition, a user might be a community of users, or an open source community (Tidd and Bessant, 2014). In the present report, a user is understood as just described (firms, individuals, and/or communities), while a customer is understood as one who pays for products and services (Kamara et al., 2002).

Based on the open innovation and open distributed innovation concepts, it can be said that a firm that adopts or is active in open forms of collaboration and innovation activities might collaborate with companies from similar or unrelated industries (Chesbrough, 2003), suppliers and supply chain partners, customers, competitors, universities and other educational institutions (public and private), government agencies, research laboratories and consultants (Laursen and Salter, 2006; Lazzarotti et al., 2011), users (Baldwin and von Hippel, 2011; von Hippel, 2005) and innovation intermediaries10 (Howells, 2006). The present study understands the aforementioned actors as external partners to start-up firms that collaborate towards innovative (openness) or general outcomes (collaboration).

2.3.1 Openness in start-up collaborations

Boyer et al. (2008) identified that collaboration and partnerships are crucial for the success of locally-led start-ups, while Velu (2015) argued that even policy-makers should encourage and support firms to the formation of alliances towards innovation. Huang et al. (2012), suggested that start-ups in order to serve their customers and improve their products seek alliances, interactions and cooperation with business networks (suppliers, customers, and competitors) for exchange of resources, technology transfer, expertise, training, and knowledge. On the other hand, he also identified that, although necessary, it is also difficult for start-ups to construct abundant partner relationships. On that matter, Hampe and Steininger (2001) found that networks formed with specific goals (such as innovation) hardly exist, and usually rely on the entrepreneur’s personal networks and ties. In general, start-up literature in regards to open forms of collaborations towards innovation shows not only inconsistencies of this nature, but is also disorienting most of the times.

Table 4 shows that literature on start-ups and open forms of collaboration can be divided into three general categories. Firstly, articles that talk about collaborations towards innovation, secondly, articles that are about openness in general, and finally, articles that discuss matters regarding open innovation, and open distributed innovation specifically. Most of these articles are not per se about openness, and/or open and open distributed innovation, but about topics vaguely related to collaboration openness. In fact, maybe only the “collaboration” category accurately reflects its content and is indeed about collaborations, alliances and networks.

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10 Innovation intermediary is “an organization or body that acts as an agent or broker in any aspect of the innovation process between two or more parties”. (Howells, 2006, p.720).
Nevertheless, there are some distinguished articles that connect openness in any form to collaborations with external partners. For instance, Colombo et al. (2006) focused on complementary assets and studied the determinants that motivate Italian start-ups to participate on explorative technology and exploitative commercial agreements with partners. Another stream of researchers focused specifically on the growth and survival of start-ups. In that matter, Hampe and Steininger (2001), concentrated on the ways collaborations, amongst other determinants, affect the growth and survival of German start-ups. More specifically, they focused on whether and how collaboration with different partners affects the growth of start-ups in different industries (pharmaceuticals, engineering-manufacturing, etc.). Velu (2015) investigated how alliances affect business model innovation, and how the latter reflects on the survival of US start-ups. Boyer et al. (2008) identified collaborations as critical to the success and performance of locally-led start-ups, while Shan et al. (1997) focused on partnerships’ impact on the innovative output of biotechnology start-ups. Some other researchers turned their attention to human, social, and financial capital issues, while others on specific collaborations. Huang et al. (2012) focused on the mediating role of business networks between the influence of founders’ resources and the innovation performance of China-based Taiwanese start-ups. Korosteleva and Mickiewicz (2010), investigated different determinants of financial openness and financing start-ups in 54 countries. Sudek (2007) specified his research on financing and angel investment criteria. Skardon (2011) discussed the role of trust in collaborations between start-ups and innovation intermediaries, while Gruber and Henkel (2004) focused on open source community’s contribution to open innovation. Haines (2015) examined the role of pitching as a form of open collaboration for collective innovation in start-up ecosystems of partners, and more specifically the start-up/start-up accelerator cooperation. Minshall et al. (2007) debated the use of university-based start-ups (spin-offs) towards innovation, and especially the university-industry collaboration between spin-offs and established firms.

### Table 4: Start-up innovation literature regarding openness and collaborations with external partners

<table>
<thead>
<tr>
<th>Article concern</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Openness</td>
<td>Boyer et al., 2008; Korosteleva and Mickiewicz, 2011; Suder, 2007</td>
</tr>
<tr>
<td>2. Open innovation/ Open distributed innovation</td>
<td>Ferrary, 2011; Minshall et al., 2007; Weiblen and Chesbrough, 2015 / Gruber and Henkel, 2004</td>
</tr>
<tr>
<td>3. Collaborations, alliances, cooperation, interactions, networks, partnerships etc.</td>
<td>Colombo et al., 2006; Gans et al., 2006; Haines, 2015; Hampe and Steininger, 2001; Huang et al., 2012; Shan et al., 1994; Skardon, 2011; Velu, 2015</td>
</tr>
<tr>
<td>4. Prescriptive-general-other</td>
<td></td>
</tr>
<tr>
<td>a. Articles (not relevant to the present study)</td>
<td>Block and Sandner, 2009; Boyer and Blazy, 2014; Boyer et al., 2008; Burke et al., 2013; Chien, 2013; Criscuolo et al., 2012; Franke et al., 2006; Freear et al., 2002; Fritsch and Wyrwich, 2015; Graham and Sichelman, 2008; Grajowska, 2011; Gries and Naude, 2008; Groen et al., 2008; Helmers and Rogers, 2009; Nanda and Rhodes-Kropf, 2013; Paradkar et al., 2015; Pirolo and Presutti, 2010; Roda and Vailaster, 2005; Schmitt-Rodermund, 2004; Wen et al., 2012</td>
</tr>
</tbody>
</table>
Gans et al. (2000) specified their study in the differences in start-up commercialization strategies for innovation returns through either product (service) market competition or (or compared to) cooperation with established firms. They also argued that start-ups serve either as upstream suppliers of technology to established firms, or as direct market competitors. The former is often a common characteristic in articles and books that do not focus specifically on start-ups, but perceive them as important providers of technology to established, most usually large, enterprises (see Bessant and Tidd, 2011; Bigliardi et al., 2012; Chesbrough, 2003; Chesbrough et al., 2014; Hagedoorn and Ridder, 2012; Skardon, 2011; van de Vrande et al., 2009 amongst others), but also in articles with a focus on start-ups. In that matter, Weiblen and Chesbrough (2015), examined the corporate mechanisms and models large companies employ to engage and benefit from innovative start-ups, while Ferrary (2011) focuses on start-ups as subjects of acquisition by large established enterprises.

As it can be seen by the previous analysis, the focus of research on open forms of collaboration towards innovation is on collaborations as tools that enhance the (innovative) performance and the success rates of start-ups. In that sense, the literature do not specifies how different partners (individually) benefit start-ups through collaborations and networks. In addition, there is no evidence on which partners are the most important from the perspective of start-ups, and how this importance changes through the different stages of start-up growth. Additionally, the literature predominantly focuses on start-ups as providers of innovation to other companies, and not as receivers of innovation from other companies. Finally, there is no sign of research on Greek start-ups whatsoever, and more specifically Greek services and software development start-ups. Therefore, the present study will attempt to clear out the aforementioned gaps in start-up openness literature, by examining the cases of Greek services and software development start-ups.

### 2.4 Constructing the research questions

The preceding analysis on start-up collaboration and openness initiatives (sections 2.2 and 2.3.1 respectively) shed light on a set of limitations and gaps within the two respective literatures. In fact, the limitations found in both literatures are similar or even identical at some points. Thus, the collective limitations on both literatures are:

- the paradox of newness and smallness and whether start-ups are able to collaborate
- the extent (breadth and depth, partner variety, and collaboration content) of collaboration with different externals partners
- which partner emerges as the most important collaborator, how different partners benefit start-ups, when the focus of collaboration is on the start-up as receiver and not provider of technology and innovative solutions
- how this importance changes over the growth stages of a start-up

The present study will also research the well-documented topic that regards the reasons why start-ups engage in collaborations and openness, but also matters regarding the internal structure, strategies and procedures of start-ups towards external collaborations and openness. The aforesaid topics will be researched in order to be identified whether previous research and theoretical propositions also apply (or not) on the chosen cases and the Greek experience.

All this topics will be studied by examining the cases of six Greek start-ups active in the industries of high-tech software solutions and online services. The present study focuses
only on start-ups that create and offer a single product/service and are active online having a global market appeal, as firms with a narrow portfolio of services and products active on a geographical dispersed market were found to perform better (Nath et al., 2010). The Greek market have been carefully chosen mainly for three reasons. Firstly, the authors’ national background provides them with a good knowledge of the specific market. Secondly, there is no research in the literature of innovation and start-ups regarding the recent Greek start-up collaboration and openness activities. Thirdly, Greek market provides an impressive increase in start-ups, an increase similar to the ones in the global and European business contexts (section 1.1: The context of the study).

Trying to shed light to the aforementioned, the authors of this paper formulated the following research questions:

RQ1: What is the extent of collaboration and openness of Greek online start-ups with external partners?

RQ2: How Greek online start-ups value the importance of each different external partner and how this importance changes over the different phases of their growth lifecycle?

RQ3: Why Greek online start-ups collaborate (in general and innovation specific) with external partners?

RQ4: How Greek online start-ups manage their internal structure concerning collaboration and openness with external partners?

3. Methodology

In this part of the study, the methodological approach of the research will be discussed. Reasoning on why a case study, and especially a multiple-case study, is appropriate for the present report will be provided. Insight on the ways of identification of the relevant theories, the construction of the questionnaire and the identification of the cases will be outlined. Finally, the data gathering and analysis techniques employed in this research will be described in depth, while matters of ethics, reliability and validity of the study will be also discussed.

3.1 Case study

Case studies are often a methodological tool employed in business studies (Vissak, 2010) and studies in operations management (Voss et al., 2002). More commonly, that is the situation when organizational behaviour is under examination (Mills et al., 2009), as case studies are appropriate and suitable for numerous purposes, including theory extension (Mills et al., 2009; Yin, 2013), and theory generation (Eisenhardt, 1989; Mills et al., 2009; Vissak, 2009). In that matter, Mills et al. (2009) argued that when the extant theories regarding the under study phenomenon are inadequate, a case study helps theory to be built from the ground.

According to Yin (2013), case studies are preferred if they meet the following conditions: (i) the researchers have minimal control over the events under examination, (ii) the focus of the research is on a present phenomenon in its actual, real-life, context, and (iii) the research questions begin with “how” or “why”. Regarding the latter, a standpoint that is also in line with Vissak (2010), Creswell (2013) differs his stance to the matter as he argues that ”what” research questions can be also used when a qualitative case study is
performed. The present study complies with the aforementioned criteria as, the researchers have no control over the events, the cases are contemporary and studied in their actual context (present day Greek online start-ups), and, finally, all research questions begin with either “why” (RQ3), or “what” (RQ1), or “how” (RQ3 and RQ4). In order the research questions (section 2.4) to be answered, a multiple-case study will be carried out within this study.

3.2 Multiple-Case study

Although a single-case study shows a possibility of a more in depth research of a particular case in its context (Mills et al., 2009; Voss et al., 2002), a multiple-case study develops a more in depth perception of a situation or event in its context (Mills et al., 2009), while it shows an increased degree of generalizability when compared to a single-case study (Eisenhardt and Graebner, 2007). Mills et al. (2009), described multiple-case studies as an extensive research method in which a number of instrumental bounded cases are studied, to provide data that are pointed “in focus and provide rich, detailed, and in depth information” (p.582).

In addition, Mills et al. (2009) described two possible procedures of conducting a multiple-case study. The first, follows a parallel design where the cases have been selected beforehand and the research is performed simultaneously. The second, regards a sequential examining of the cases. Moreover, Mills et al. (2009) claimed that researchers may choose between a set of positive and negative cases, and a set of cases that are alike. The latter are quite useful when a researcher seeks to identify patterns and analyse findings across comparable cases. This process is similar to what Yin described as the “replication” logic (Mills et al., 2009). Yin (2013) argued that the replication logic is similar to the logic of multiple experimentation, and described the process of replication as illustrated on figure 4. Thus, the plan of research is formulated throughout the research process, as instructed by Mills et al. (2009). The present study adopts the replication logic as described by Yin (2013) and is depicted on figure 4 and will examine six cases of Greek online start-ups active on the service and software development industries.

**Figure 4:** The replication process on a multiple-case study as described by Yin (2013)
3.3 An initial study

The present study constitutes the logical continuous of an anecdotal single-case study the authors performed within the same topic. This first study helped the authors in three dimensions. First, to become aware of the topic. Second, to identify the relevant to the topic literature. Third, to construct a set of questions, to deploy them and check their ability to extract appropriate and valid results. Thus, it can be said that this initial exploratory study served as “a prelude to a larger study” (Mills et al., 2009, p.583) - the present study – or as a vehicle for the definition of questions and for conducting further studies on the topic (Yin, 2013).

3.4 Identifying and developing the relevant theory

According to Eisehardt (1989), a case study that seeks to formulate theory should be based on an analytical theoretical framework of the extant literature. Mills et al. (2009) argued that the focus of a study and the format of the questions should be well-developed and connected to previous studies in advance and before the subject of the case be contacted by the researcher(s). Developing a rich theoretical framework is also an important part of the replication logic (Yin, 2013). Thus, a review of the extant literature have been conducted firstly, so as a better understanding of the prior literature and research to be obtained, the questionnaire to be build, and the cases under examination to be selected.

The appropriate literature have been identified through an extensive search on widely acknowledged international scientific online databases, such as Google Scholar, Science Direct and Research Gate, university libraries in Gävle, Sweden (Högskolan i Gävle - HIG), and Thessaloniki, Greece (University of Macedonia –UoM-, and Aristotle University of Thessaloniki - AUTH). The keywords used for the identification of the articles and books online were relevant to each topic under investigation. For instance, when looking for – innovation – the keyword was INNOVATION, while when looking for – innovation in start-ups – the keywords were INNOVATION AND START-UPS. The most cited, full-text articles were used whenever that was possible.

The product of this process was the construction of a theoretical background that laid the basis for the formulation of the research questions and the questionnaire, and the identification of the relevant to this study cases. At a later point, this theoretical background also acted as the basis for a cross-case analysis and discussion, and also for the extraction of conclusions.

3.4.1 Constructing the questionnaire

The questionnaire developed through an initial exploratory study (section 3.3), and refined for the specific study. Irrelevant and unimportant questions were removed so as the questionnaire to be constant with the theory in use. It is therefore constructed based on the preceding knowledge obtained from the literature review, and it shows a clear connection between the questions and the literature. The questionnaire consists of both structured and open-ended, yet targeted, questions (Appendix 1). The former provide straightforward answers in a rational way and without the emotional content, while the latter offer flexibility and answers of rich quality (Mills et al., 2009).

According to Hyman et al. (2006, p.1), using pre-existed questions offers the advantage that they are “extensively tested at the time of first use”. Thus, a part of the structured questions used in this questionnaire consists form pre-existed questions adopted from a
questionnaire under the title “Open Innovation Survey” (Appendix 2). On the other hand, the questionnaire “exploits” the flexible nature and richness of open-ended questions, with the use of questions targeted on specific topics relevant to the research matters. Questions, of the open-ended form, that directly reveal the research questions of this study were avoided, reducing that way any influence on the interviewees’ responses (Silverman, 2013). As shown on table 5, the questionnaire is divided into eight parts. The first and last reflect the opening and closing of the interview and contain no questions able to provide valid research results. The second part contains demographic and specific to each case questions. The third contains contextual information that are relevant to the whole study and all research questions. The rest four (4th, 5th, 6th, and 7th) are mirrors of the four research questions. Each part corresponds to a set of different questions.

3.4.2 Searching for the cases

The search of the cases mostly relied on a set of external and internal requirements. The internal requirements are relevant to the nature of the start-ups. More in detail, the present study concentrates on companies with the same national background that share similar general characteristics (2.2: Start-ups: innovative small and newly-founded firms that operate in uncertainty), and are innovative single-product start-ups with a global appeal due to their online presence. In addition, these start-ups must be active in either the industry of software services\(^{11}\) and/or that of online services. The external requirements reflect the availability and willingness of each start-up to be part of the research, and the way the start-up perceives its “personality” regarding innovation, collaborations, and open forms of collaboration. To identify if those requirements were met, the authors studied the websites of a wide number of Greek start-ups and then contacted the ones that met the internal requirements to express their will to conduct case studies on them.

3.5 Extracting the data

Within this study, a qualitative data gathering method have been preferred starting with performing research on secondary data (Eisenhardt, 1989) on the start-ups’ websites, and followed by interviews with key employees of the firms as shown on table 6.

\(^{11}\) software engineering or development
3.5.1 Cases websites

Mills et al. (2009, p.496), argued that interviews of the structured or semi-structured form are conducted when researchers “have some knowledge of the subject area”. Therefore, in order the authors to obtain an understanding and knowledge of the firms and their context, a secondary data research on the websites of the firms was initially conducted. An additional reason for this choice, was the need for cases that fulfil the specific internal requirements (section 3.4.2) to be found and contacted for interview.

According to Hine (2008), content analysis14 may be performed for the analysis of websites. The analysis should also contain both the content but also the context of the “documents” under analysis (Ritchie et al., 2013). Qualitative content analysis is one of a variety of research methods used in business research (Neuendorf, 2002) for text data analysis (Hsieh and Shannon, 2005), and aims to “to provide knowledge and understanding of the phenomenon under study” (Downe-Wambort, 1992, p.314). According to Given (2008, p.120), content analysis may provide insight on the stated priorities of an organization through “conscious or unconscious messages communicated by text”. After this analysis have been made, the authors contacted the employees responsible for the firms’ public relations and expressed their interest to conduct research on the firms. After the firms agreed to participate and some ground rules have been set, dates for interviews have been arranged.

3.5.2 Interview

Interviewing is considered to be the most common technique for qualitative data gathering (Mills et al., 2009), as it is a sufficient tool for qualitative data generation in case studies (Eisenhardt and Graeber, 2007; Yin, 2013). More specifically, interviews of the semi-structured form offer a deep understanding of the case and its context (Yin, 2013), while are more appropriate in the identification of how something has been done (Mills et al., 2009).

The authors performed one interview with one employee per case. All interviews were conducted either person-to-person, or with the use of online applications (e.g. Skype etc.). Each interview lasted for about 45 to 75 minutes. All interviews were recorded and then transcribed, as instructed by Mills et al. (2009), and communicated back to the interviewees, as proposed by Vissak (2010).

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Table 6: Interviewees’ business roles and number of employees in each case

<table>
<thead>
<tr>
<th>Case</th>
<th>Start-up</th>
<th>Interviewee</th>
<th>Role</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ToadBlender</td>
<td>Fay</td>
<td>COO</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Torch</td>
<td>Gerry</td>
<td>Founder and CEO</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>KIWI</td>
<td>Ilias</td>
<td>Co-Founder and CEO</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Urban Stories</td>
<td>Iosif</td>
<td>Co-Founder and CEO</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Trip-iti</td>
<td>Anastasios</td>
<td>Co-Founder and CEO</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>FEAST</td>
<td>Sotiris</td>
<td>Co-Founder and CEO</td>
<td>3</td>
</tr>
</tbody>
</table>

12 COO – Chief Operating Officer  
13 CEO – Chief Executive Officer  
14 Content analysis is an analysing method of written, visual or verbal communication messages (Cole, 1988)
3.6 Analysing the results

As the present study follows the replication logic of performing multiple-case studies (subsection 3.2), each individual case report has been written down before the next interview with the next case occurs, as shown on figure 4 (p.21), the results that concern each particular case initially will be presented individually at the “Results” section (section 4). More in detail, the “Results” section is divided into six subsections, one for each case. Each subsection is further divided into two parts. The first part contains preliminary information extracted from the website of the start-up. The second part contains the interviewees’ responses to the questionnaire (a number inside parentheses will follow each response, to show the connection of the response to the specific question of the questionnaire on Appendix 1). Thus, in the “Results” section each case will be presented individually and divided into two parts.

In the “Discussion” section (section 5), the two data sets (website and interview parts) are combined, while the different subsections (one for each start-up) are connected so as some preliminary conclusions to be drawn (“cross-case conclusions” in figure 4, p.21) and the theory to be modified (“modify theory” in figure 4). After the modification of the theory the results of all start-ups are cross-analysed, and connected to prior research. In that way any possible patterns that emerge within the results are connected to prior research and theory, while answers to the research questions (subsection 2.5) are provided. In addition, those answers help the present study to fill the, specifically stated in different parts of the study (section 1, subsections 1.2, 2.2, 2.3, 2.3.1 and 2.4), gaps and limitations that are currently present in the start-up literature. More in detail, as each research question is connected to a set of questions, as shown on table 5 (p.23), and aims to fill literature limitations or to confirm (or not) prior research, the discussion of each research question is based on the answers provided as response to those questions and additional information extracted from the cases’ websites. The cross-analysis of the results (“write cross-case report” in figure 4) is divided into five parts. One part contains contextual and demographic information, and the rest four answer the four research questions.

3.7 Ethics and quality

3.7.1 Research Ethics

Mills et al. (2009, p.66) highlighted the importance of trust when conducting a case study by stating that “mutual trust is, therefore, part of the research process”. For this trust to be gained and, more importantly, to be mutual, certain rules had to be agreed beforehand between the authors and the interviewees. The first was the way and time that the report will be delivered to the companies (Mills et al., 2009), and the second was ensuring them that every rule of anonymity and confidentiality will be respected, as instructed by Yin (2013) and requested by the interviewees. Thus, the authors complied with the requests that no information regarding the identity of the interviewees and their companies will be publicly disclosed, with the exception of the supervising teacher and the examining professor.
3.7.2 Validity, reliability and generalizability of the research

As this is a multiple-case study that follows the replication logic (section 3.2) a certain level of generalizability\(^{15}\) is given, especially compared to a single-case study (Eisenhardt and Graebner, 2007; Yin, 2013). Added to that, the existence of different sources of data gathering, namely semi-structured interviews and content analysis on the websites of the firms, enhances the validity\(^{16}\) of the research (Mills et al., 2009; Silverman, 2013; Yin, 2013). In fact, in qualitative case studies the researchers aim to identify what is significant from within the case (Mills et al., 2009), conclusions drawn based on different sources tend to be more convincing (Yin, 2013), as they mitigate any concerns regarding validity (Mills et al., 2009) and offer a sense of triangulation\(^{17}\) (Yin, 2013) and comparison (Silverman, 2013) of the data.

Moreover, the triangulated data and interviews were connected to previous search and theories as instructed by Eisenhardt (1989) and Mills et al. (2009). This connection constructs the external validity of a case-study (Rowley, 2002), while it enhances its reliability\(^{18}\) (Mills et al., 2009). Concerning the interviews, Eisenhardt and Graebner (2007) suggested conducting multiple interviews within the same organization. It is the authors’ belief that conducting one interview per organization will not affect the research in a serious way. The small size of the companies (number of employees) and the key positions of the interviewees, as shown on table 6 (p.24), leave no margin for several interviews, and the belief of responses of high quality, although the risk of bias might be present in some cases. Also, the fact that the interviews recorded, transcribed, and communicated back to the interviewees to be checked for missing information and/or mistakes, increases the validity of the study (Stuart et al., 2002).

Finally, regarding the position of the interviewees within their companies, the authors conducted employees that are both responsible and capable to offer access on critical information regarding the start-ups and their operations, as they are the "formal gatekeepers" in their companies (COOs and CEOs) (Given, 2008), and mutual trust of a certain level had been achieved (Mills et al., 2009). Thus, the data gathered from the interviews show a certain degree of credibility and representation of the truth. Based on the aforementioned analysis, it can be said that the present paper bears a satisfying degree of both validity (internal and external) and reliability, while a certain degree of generalizability due to the fact that several cases have been studied.

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\(^{15}\) Generalizability “of findings is the extent to which they may be applied to other cases” (Neuendorf, 2002, p.12).

\(^{16}\) Validity is “the extent to which an empirical measure adequately reflects what humans agree on as the real meaning of a concept” (Babbie, 1995, p.127)

\(^{17}\) According to Mills et al. (2009), there are five types of triangulation: data, investigator, theory, and method (Denzin, 1989), and analysis triangulation (Kimchi et al., 1991), while Milles and Huberman (1994) distinct data triangulation to data source and data type triangulation. The present study is constant with all of them.

\(^{18}\) Reliability is “the extent to which a measuring procedure yields the same results on repeated trials” (Carmines and Zeller, 1979 as cited in Neuendorf, 2002).
4. Results

In this part of the study, the results of the case studies will be presented individually for each case. Each case will be presented over two different sets of results. The results that extracted from the websites of each start-up will be presented first, while the results from the interview will follow. In the interview parts the responses are followed by a number inside parentheses, each number corresponds to a specific question within the questionnaire (appendix 1), thus each response corresponds to that question. The cases are presented in the same order as the interviews were held. As analysed in the methodology section, this structure provides the reader and the author with a basic knowledge of the under study cases and topics, and then with information on more specific and related to the present study matters.

4.1 ToadBlender

4.1.1 ToadBlender’s website

ToadBlender is a start-up dedicated on online software solutions and services. More specifically, it is an online platform/operating environment for embedded devices that is active in a fast growing industry since 2013. ToadBlender is one out of two companies that created the specific market and its offering, the platform, differs to previous offerings from competitors due to the fact that the only prerequisite to use it is to have internet access. Thus, you can access ToadBlender’s service from your laptop in your office in New York, or from your smartphone in a secluded island. This service is offered through a freemium business model to more than 36000 active users and customers around the world. The company operates with a variety of different partners, such as manufacturers and producers of embedded devices and hardware, software developers, and other innovative platforms. In addition, it is present on a wide variety of different online embedded devices and start-up communities. The founder and CEO of the start-up studied software engineering and holds expertise on the specific technological field that is relevant to ToadBlender’s offering. Also, seven out of eight employees have similar educational backgrounds, while the last one has specialty on marketing and management studies.

4.1.2 Semi-structured interview with Fay from ToadBlender

The first interviewee is the chief operating officer (COO) of ToadBlender also known as the person to connect the engineers to the “real” business world, and goes by the name of Fay. Her educational background includes studies in English, and marketing, advertising and public relations, while her experience is focused on management and marketing duties in start-ups and young organizations, and project management on EU projects (1). According to her, ToadBlender is an online platform for embedded devices that helps people program and design cool hardware stuff faster, easier, and more productively (2). The focus of their services is on software development and online services (3), while they are currently near exiting the stabilization phase and entering that of growth. ToadBlender is considered to be one of the five “hottest” Greek start-ups of 2015 (4), while a year ago, during its startup growth phase, ToadBlender secured a significant amount during a seed round (5). To commercialize its service, it employs a freemium business model targeting (7) a new market that created by the company and consists of ToadBlender and one main competitor (6). This market shows signs of moderate uncertainty regarding product lifecycles, development costs and customer needs, but high uncertainty and mobility in
terms of technological breakthroughs, product and service complexity, and technology in general (8).

ToadBlender understands collaboration as all the types of knowledge that can be obtained from the information around its activities. This type of information could vary from knowledge gained due to cooperation with suppliers, to feedback from users and customers’ complaints and requests. Also, includes insights gained from collaborations with universities and the lessons learnt after the interaction with various intermediaries. Due to all these and to the nature of ToadBlender, partnerships are inherent to the existence of the company (9). Fay identified universities, intermediaries, customers, users and suppliers as ToadBlender’s most important partners in innovation activities. While competitors and companies in other industries follow in importance (10).

Innovation intermediaries act as “business partners” by offering consultation and guidelines for every stage of the growth sequence. Hardware suppliers offer necessary material resources for the continuous growth and existence of ToadBlender. Workshops with universities and other educational institutions open up a new area for discovery, a potential new market where Toad Blender’s product could be used as a learning tool. The collaboration with internet titans such as Google and Mozilla offer to the company a gate to unreachable information, and knowledge on how to optimize its processes, as long as a way for expansion to new markets. On the other hand, “competition is always competition” as stated by Fay, and you can benefit by just watching its tactics, or by collaborating to increase awareness for your products. Finally, the customers and users are an infinite source of knowledge through their feedback, complaints, and overall use of the software. The users are able to enjoy the platform for free but without having access to limited features. Customers are more advanced users (e.g. professionals, engineers, professors, companies) who are willing to pay a fee to access many more general and targeted features and more online saving space. ToadBlender seeks to identify the opinion of customers and users through their feedback, and to work towards the optimization of the product and the satisfaction of the customers/users (12). Through these collaborations, the company seeks resources, high-edge technology solutions, the creation of high innovative products/services and processes, and opening of new markets (13).

Each partnership type benefits ToadBlender in a different way as the importance of each collaboration reflects on the extent of collaboration, but also on the needs of the present time. The type and extent of partnerships is usually connected to the type of the partner, the growth phase of the start-up, and to the desired outcome. Customers and users were and will be ToadBlender’s most important source of knowledge as their feedback is invaluable. Hardware suppliers are also of high importance as without their help ToadBlender’s job “cannot be done”. Innovation intermediaries should also be considered of high importance. Although their contribution is not as high as it used to be during the initial steps of the company, they still play an important role due to their power to provide advice and support and act as business partners. The engagement with universities follows the exact opposite development compared to intermediaries. The importance of universities was lower in the beginning, but it gradually increases and it is estimated to become quite a beneficial factor in the following months due to the future plans of the company. When considering customers and users the engagement is wide in numbers as the former are a few hundreds and the latter are some thousands. Additionally, users and customers’ feedback helps to the improvement of the platform step-by-step. When considering other
partners (e.g. suppliers and universities) the preference is the engagement to be close and deep (11-14-15).

ToadBlender aspires to become the technological leader in the industry that is actively engaged, by focusing on radical innovations and hiring the best employees. R&D and marketing processes are not considered to be on the core of ToadBlender’s practices though (16). Although there is no formal organization to manage and support external collaborations, there are distinct roles within the company that foster the organization’s development towards collaboration (17). ToadBlender enjoy the benefits of an environment that supports creativity, innovativeness, and personal development. An environment that is open to external knowledge, and gives resources and time for idea generation through creative and challenging objectives (18). An environment that facilitates high level of cross-functional collaboration, and a moderate level of interaction across functions (19). ToadBlender wants to be the tool of choice for professionals, educational institutes, hobbyists, hardware companies and companies that work on the hardware of the future (20).

4.2 Torch

4.2.1 Torch’s website

Torch is a start-up that is active on the area of counselling, online advisory, and entertainment. Torch collaborates with a range of enterprises and organizations, as long as educational institutes and individuals. It provide services on matters such as human resources, mentoring, experiential education programs for children and adults, team building, and training, and personal development sessions, but mostly on entertainment through an online application (currently on a beta version). Torch argues that nobody is able to improve, unless he/she fosters change and accept it as a chance to move towards a better future. Its application and online offerings try to disseminate that belief to their partners and customers- application provider, schools, other start-ups, established companies, suppliers etc. The company was founded nine months ago by two young individuals eager to work. Their educational background lies on human resources management and management in general, while they have a unique experience in matters regarding experiential education programs both locally and globally. Till now they have eight satisfied customers and are proud to claim that ”Torch will be by your side, to find and develop out-of-the-box solutions together”.

4.2.2 Semi-structured interview with Gerry from Torch

Gerry is the co-founder and CEO of Torch. His educational background includes studies on business administration, human resources management, and training, while his practical experience is focused on consulting, experiential education and entertainment (1). Torch is a small and new company that is active in the fields of mobile applications, mentoring, digital education, experiential education, and event planning and entertainment (2). The focus of its operations is on online services, while currently the company just entered the stabilization phase, and the service is nearing its full development (3-4). The start-up have received funding at its startup phase through a program co-developed by the EU and the Greek government (5). Torch targeted an existing market and entered it as a niche entrant (6). The mobile application will be free for the end-users, while the company will generate profit from its customers (e.g. bars, cafes, restaurants, and other
venues) that decide to be included on the application (7). Gerry described the firm’s business environment as a market without recent breakthroughs and rapid changes, but with highly increasing development costs, shorter product lifecycles, complex products and services, and uncertain customer needs (8). External collaboration found to be not only more than welcome, but absolutely vital, as the educational background of the founders is not relevant, for instance, to the IT field, a field that is necessary for the development of their service (9). According to Gerry, innovation intermediaries, government agencies and suppliers are Torch’s most important partners, customers and user are moderately important, while Torch is not collaborating at all with universities, competitors and companies in other industries (10).

Through these collaborations with external partners, Torch targets access to leading edge technology, access to new markets, resources, and know-how on innovative processes and product/services. These collaborations benefit the company in different ways while Torch asks from its partners different “returns”. These returns determine the extent of each collaboration. Usually it is close and cooperative with intermediaries, government agencies and especially suppliers, while Torch is listening to the needs of its customer and users. Innovation intermediaries helped Torch to understand whether its service is indeed innovative and to develop it to an entity. Government agencies provided the start-up with subsidy, so as to start exist as a company and begin the development of the application. As for customers and users, which are still few, helped by giving feedback regarding the impact of the service on the targeted market. Finally, suppliers (e.g. mobile application developers and graphic artists) supported towards the development of Torch’s online service practically, but also by providing insight regarding the difficulties and restrictions of the development process per se (11-12-13).

Each different collaborating partner offered something new in the process of the development and growth of the start-up. Something new and different in terms of the content of collaboration. Innovation intermediaries were rather helpful as they offered managerial guidance towards the management of the innovation process of the development of the service. Government agencies provided crucial help for the creation of the firm at the first place. Suppliers helped a lot for the development of the online application/service, which is Torch’s core operation, but their contribution was limited on technical matters regarding mobile application design and software development. As Torch just entered the stabilization phase, its history of collaborations mostly regards the startup phase of growth. Thus, all the aforementioned collaborations are mainly regarding the startup phase, but can be also projected to these first steps within the stabilization phase and act as an estimation for the immediate future and till the service is complete and stable (14-15).

According to Gerry, Torch aspires to lead the market in which it is engaged, based mostly on the marketing skills of its founders. Innovations are mostly incremental, while R&D is not a core process, and the company does not plan to hire staff in the near future (16). The coordination and support of external collaborations is not organized formally, but each employee understands his/hers role towards collaborations management (17). Torch fosters an internal environment that is open to knowledge generated externally and sets creative goals, while the staff, known for its adaptability to changes, is given time and resources to generate ideas, although continuous development of the employees is not given any special focus (18). High levels of internal collaboration and interaction in innovation activities are also quite high (19). Finally, Torch aims to make a breakthrough in the market of Thessaloniki and beyond, by developing an application that is rather
innovative in terms of User Interface, User-based customization and generally user experience. They have a solid financial background, their IT developers are ranked among the best in the city of Thessaloniki and they have support from experienced mentors. Their long-term objective is to expand and include entertainment feature in many European cities (20).

4.3 KIWI

4.3.1 KIWI’s website

KIWI is a human resources start-up that is serious about gaming and gaming development. Its core service is the endowment of a serious game that will be applied for hiring and shaping the future of recruitment. The service has the form of a video game, in which potential employees progress through the game, and based on their decisions they are validated psychologically. The online service is currently under development while the game is taking its final form (beta form). KIWI’s vision is to turn the business world into a big game, their mission is to help firms find the most suitable employees for their needs, and their objective is to replace the old and unsophisticated recruitment processes with a new and innovative online solution. KIWI is active in a series of different conventions and seminars, with different actors and partners such as institutions, agencies, intermediaries etc. KIWI was founded one year ago by a team of two young professionals with an educational background on management, marketing and law studies, and practical experience on human resources. KIWI claims to be innovative, effective, reliable, fast, and cost saving.

4.3.2 Semi-structured interview with Ilias from KIWI

Ilias is the CEO and co-founder of KIWI. His educational background consists of studies in business and management, and international business and management, and several certificates across quite a few marketing sectors such as data driven marketing, digital marketing, and gamification (1). KIWI is a start-up that is involved in the human resources market. The company develops a new innovative assessment tool to measure both internal and prospective employees’ soft skills, and to offer supplementary services in talent management and career development (2). Its core activity consists of both software engineering and online services and applications (3). KIWI is on the startup phase of its growth (4), and has not yet received any financial backing. Recently though, the start-up has been voted in an international start-up contest as the second most interesting start-up worldwide amongst 1200 contestants (5). KIWI’s service targets all types of markets as it is appropriate and capable to operate under various circumstances and for different purposes (6). The model they will employ, when the service is fully developed, will be a freemium model for approximately 6 months. By doing so they intend to acquire a large market share soon enough by locking up potential users and customers, and to get useful feedback from users during this time (7). The start-ups is active in a business environment that has produced many technological breakthroughs through the years and is characterised by product/services of high complexity, and technologies that are changing rapidly. Although customer needs are not uncertain, development costs are getting higher, and product lifecycles shorter (8). Ilias argued that KIWI is always open to new ideas and thoughts. It is very important to observe and analyse the external environment in order to gain new insights into customer needs but also to improve the products and services, and the business as a whole. However, like most things in life, Ilias takes everything with a
“grain of salt” and weighs the pros and cons, before KIWI makes any decision (9). Universities, customers, users, innovation intermediaries, and companies in other industries were found to be the most important KIWI’s partners. Government agencies are less important than the aforementioned, while suppliers and competitors are not important at all (10).

These collaborations are subject to specific needs that arise in different steps of the start-ups. For instance, universities are very important to KIWI for four reasons: the ability to gain access to a large pool of testers during the pilot, the boost in validity and credibility they attain having tested their product at a university, the possibility of having the universities approval for this tool to the commercial market, and lastly, the opportunity to network with potential clients through the universities career office. For those reasons KIWI collaborates closely with universities. KIWI engages with customers, users and companies in other industries for another set of reasons. For instance, to get feedback and improve its services, and to better understand the needs of each target-market. More specifically, users for user experience feedback, customers/companies for feedback regarding the results they need from the service. KIWI do not engage with suppliers as currently it does not have any, while it does collaborate with the Greek government due lack in support towards start-ups, but also because of the immense bureaucratic procedures of the Greek state. Finally, they do not cooperate with competitors so as to protect their concept and idea, although they imitate and copy features that might be applicable to their product (11-12-14). In addition, KIWI collaborates with partners to get access to resources, leading-edge technology, innovative product/services and processes, and new markets (13).

As KIWI is still “young”, there is no definite answer on the 15th question. However, in the short time KIWI has been active and as the company grows, it relies less and less on external sources and instead utilizes them as consultants to get feedback and new ideas on different aspects and contents. Furthermore, the importance of individual users and company-customers is crucial to the success and growth of KIWI as it is a customer centric company that the problems it tries to solve are problems that people and companies see and experience on a daily basis (15).

KIWI targets to become the leader on human resources assessment, through radical innovations and hiring the best available staff. In addition R&D and marketing processes are considered to be core for the normal operation and development of the company (16). Inside KIWI there are no organizational units responsible for organizing any external collaborations, but each employee has specific organizational roles (17). KIWI is characterized as an organization that is open to external knowledge, where resources and time is always available for the generation of new ideas, and the staff, known for its adaptability, competes on creative and challenging objectives (18). In addition, collaboration and interaction within functional areas is high in innovation activities (19). Finally, KIWI wants to become an end to end HR solution company assisting in all aspects of human resources, starting from recruitment management to assessment, performance and career development, in order to help any company reach the higher levels of success. KIWI aspires to be HR manager’s best friend, and his/hers only choice for talent management applications (20).
4.4 Urban Stories

4.4.1 Urban Stories’ website

“Is Urban Stories a start-up or your ticket to architecture?” Urban Stories is building a mobile application that knows your city and creates architectural narratives around it. In other words, Urban Stories connects the buildings in different cities, with their history and their tales and legends, forming that way the historical picture of each city base on each user/customer. The Urban Stories App aims to make architecture accessible to everyone that is interested, and redefine the relation between buildings and the urban fabric with people, tourists and citizens. Urban Stories collaborates with different partners, from individuals who want to submit their story about a building, to innovation intermediaries and incubators, and also with institutions, such as the Hellenic Institute of Architecture, with which Urban Stories has formed a strategic alliance. Urban Stories is also active on a set of start-up communities and workshops. The start-up was founded on 2014 and employs five young entrepreneurs. All five of them have studied architecture at the same university, and are also founders and employees of the Urban Stories architectural company. Urban Stories claims to be a new innovative way to explore your city.

4.4.2 Semi-structured interview with Iosif from Urban Stories

Iosif is an architect, CEO and co-founder of Urban Stories. His educational background lies on architectural and design studies, and his practical experience on actual day-to-day architectural work (1). Urban Stories is a start-up that develops an application for smartphones and tablets that will generate routes and narratives around the user, in order for him/her to discover the stories behind the city’s buildings (2). The core of Urban Stories’ innovative service is in online services and software development (3), while the company is currently on their first phase of growth, that of startup (4), and has yet to get official financial backing (5). The company targets an existing market as a niche entrant (6), while the application will be commercialized through a freemium business model (7). This market show a history of breakthroughs and rapid technological changes, increasing development costs and product/service complexity. Regarding product lifecycles and customer needs uncertainty, Iosif responded that he cannot answer with certainty right now, but they seem to be of a moderate uncertainty (8). Regarding collaborations, Iosif stated that Urban Stories consider them as of crucial importance for the whole venture, and that they usually through collaborations with partners and by outsourcing services the venture acquires knowledge resources necessary for its development (9). Non-governmental agencies (specified as others), universities, research centres and innovation intermediaries identified as their most important partners. Customers, users, universities, companies in other industries, and suppliers follow, but are not really important right now. While Urban Stories is not collaborating at all with competitors, and government agencies (10).

According to Iosif, each case of collaboration is dealt closely, carefully, and selectively, with the exception of users and customers where the numbers hopefully are going to be numerous. Urban Stories is trying to monitor each case and identify which source better suits the goals and specific needs of the company and its application. For instance, innovation intermediaries and incubators offer management guidance and help towards the growth of the start-up, while alliances with non-governmental organizations such as the Hellenic Institute of Architecture offer more on the actual content of the application in terms of what is necessary to be included, or a database with stories of buildings in dif-
different cities. In addition, universities, and innovation intermediaries and incubators enhance the networking ability of the start-up and provide specific know-how and insight on new technologies and trends, while users and customers make Urban Stories application better by providing feedback. Especially regarding innovation intermediaries and incubators, the start-up is collaborating closely with one that aims to boost young innovative entrepreneurship and improve employment opportunities for young people in Greece, as Iosif stated. Urban Stories may not collaborate with competitors, but it closely monitors their progress, therefore competitors are used as a differentiating and benchmarking factor for the better development of the company (11-12). In addition, Urban Stories mostly collaborates to attain information and insight on innovation processes, while access to leading technology and innovative products/services follow. Resources and the opening up of new markets does not seem to be important yet (13). Regarding the importance of each partner Iosif stated that the importance is based on the desired outcome of the collaboration. These collaborations are based on the expertise of each partner, and focuses towards the continuous improvement of the performance and operations of Urban Stories. As Urban Stories is still on the startup phase of growth the results concern only this stage, but according to Iosif the focus will remain on the content of the collaboration and the specific needs that the company will have at the specific time through-out the life of the venture (14-15).

Regarding the firm’s strategy in terms of radical or incremental innovation, Iosif seemed to be rather sceptical and answered that they show equal focus on both them. He argued that Urban Stories does not aspire to become a market leader, but of course everybody wants to do well. As they do not plan any hirings, hiring the best does not get any special focus, while R&D and marketing do not seem to be central operations of the company (16). Urban Stories has no organizational unit for organizing and dictating external collaborations, while each employee has specific instructions and organizational roles towards that direction (17). The company is also open to external generated knowledge, but regarding staff involvement, Iosif argued that the staff is involved on the project and is artistic, creative and adaptable by nature as they are all architects (18). As for collaboration and interaction between different functional areas in innovation activities, both are extremely high but there are no units, there are people that are both colleagues and friends (19). Finally, Urban Stories aims to develop, through their application, an international network of buildings and city stories. The founders envision the company to grow by developing partnerships and affiliates in various cities in Greece and abroad, and providing city knowledge to a wider audience (20).

4.5 Trip-iti

4.5.1 Trip-iti’s website

Trip-iti is a start-up that offers expertise in providing solutions for companies related or benefiting from tourism. Through Trip-iti’s online platform and application, companies that are actively engaged in any form of tourism are able to efficiently attract and engage visitors from Asian countries. Also, it offers a complete and innovative travelling experience to Asian visitors who want to visit Europe, and mainly Greece and Cyprus. Trip-iti, therefore, is acting as a middleman between European hotels, tour-operators, companies etc., which are in need of customers, with Asian tourists who are in need of safe and complete tourist packages. Thus, a relationship and cooperation with both ends of the deal (from companies to customers) is needed, a fact that is visible on Trip-iti’s site. In fact,
in one year of operations Trip-iti’s innovating applications and platforms have attracted and served more than 130,000 Asian users. Trip-iti currently employs three people with an educational and practical background on business management. According to its founders, if you like to visit Europe, Trip-iti is your innovative travelling solution.

4.5.2 Semi-structured interview with Anastasios from Trip-iti

Anastasios is the co-founder and CEO of the start-up Trip-iti. His educational background consists of music and international business studies, while his practical experience differs from founder of other start-ups companies on the field of tourism and music, to visiting professor at an international university (1). According to Anastasios, Trip-iti is a new company that provides complete and innovating traveling solutions to Asian visitors traveling in Europe, through disrupting mobile and web applications, portals and social networks (2). Thus, the core service and activity of Trip-iti is connected to online services and applications (3). The start-up is currently on the last stage of its growth, the stage of maturity (4). Trip-iti have been funded at the first year of its operations through an early seed round, while it has been awarded as one of the best performing start-up companies from an independent incubator in Athens, Greece (5). The commercialization of the service is happening through a free application that offers the opportunity for in-app purchases and advertisement (7), while Trip-iti have targeted and entered an already existing market as a niche entrant (6). Anastasios argued that his firm’s business environment is known for moderate changes in development costs and product lifecycles, as long as for moderate customer uncertainty, while it is known as an environment with many breakthroughs, rapid technological changes, and complex product/services (8). Trip-iti understands the collaboration between the company and a variety of different actors external to the company, as, for instance, the participation in an incubator/cooperation with an innovation intermediary, listening to customers and users needs, collaborating with the suppliers to optimize the service, and every other form of partnering up to acquire useful knowledge. In other words, close ties with partners that are crucial for the development of your company in different areas (9). In that matter, Trip-iti is collaborating mostly with users, customers, suppliers and companies in other industries, then with innovation intermediaries, incubators, and competitors, and finally with universities and not all with government agencies (10).

Trip-iti prefers to closely collaborate with selected partners such as suppliers, competitors and companies in other industries. Partners selected to offer specific results on specific needs of the company. Customers and non-paying users are usually several, therefore closely collaborating with everyone is difficult, but listening to their “worries” through their feedback is what Trip-it can and has to do. In that matter, innovation intermediaries and incubators offer management consultancy, while suppliers offer specific know-how on developing and optimizing the firm’s services. As noted before, users and customers offer their extremely valuable feedback, or even specific requests. Finally, besides benchmarking, Trip-iti collaborates with competitors to organize together conventions on tourism in Asia or in Europe to reach more potential users and customers respectively (11-12). In addition, Trip-iti collaborates with external partners to gain access on technology, scarce resources, innovative products/services and processes, but most importantly to gain access to new markets and expand its pool of users and customers (13). Collaboration with users and customers, and suppliers have been the steadiest through the expansion of the start-up. Especially suppliers are next to Trip-iti from the startup phase to that of maturity, while customers and users started to be more active from the stage of stabilization.
Innovation intermediaries and incubators offered a protective shield around the start-up at its early stages, mostly the first two stages of growth, but now their contribution is not so necessary. Finally, competition and companies in other industries, come and go through out the life of the start-up in order to fulfil different needs that are present in each different period and start-up stage of growth (14-15).

Regarding Trip-iti’s strategy, Anastasios argued that he and his colleagues aspire to lead the markets they are active in based on their marketing processes, by hiring the best, and with a mix of radical and incremental innovations. R&D found to be less important for the company (16). While there is no formal organizational unit within the firm responsible to coordinate collaborations, each employee has his/hers role towards that goal (17). Nevertheless, the employees of Trip-iti are lucky to work on an environment that is extremely open to knowledge created outside its physical borders that allocates resources for the generation of new ideas and the professional development of its employees. An environment that challenges its employees with creative goals, the same employees who are known for their adaptability to changes (18). Fostered by the aforementioned, the level of collaboration and interaction within the start-up is extremely high (19). Finally, Trip-iti is looking towards a bright future and expects its further expansion on new markets in Europe and the rest of the world and the expansion of its clientele, by offering the best and most complete travelling experience to Asian tourists (20).

4.6 FEAST

4.6.1 FEAST’s website

FEAST is a start-up that specializes in online product development consulting and simulation services. FEAST has a wide range of services which can be beneficial to almost any industry. Its offering is an online platform for product conceptualization, development and optimization through engineering simulation and consulting services. Their passion for designing innovative products through simulation is FEAST’s driving force towards the simulation driven product development of the future. FEAST collaborates with numerous partners such as companies, customers, research centres, and universities globally. Its aim is to help those partners understand the benefits of engineering simulation and to be committed to innovative solutions, through specialized and top quality services. In addition, FEAST is present and active on several conventions and seminars. The company was founded two years ago by three electrical engineers with experience in advanced scientific centres and companies worldwide. FEAST awarded, due to its commitment to innovation, from international and prestigious competitions for innovative solutions. FEAST: Product development done right.

4.6.2 Semi-structured interview with Sotiris from FEAST

Sotiris is the co-founder and CEO of FEAST. His educational background consists of studies in electrical and computer engineering, and a series of certificates on simulation and programming. His practical experience varies from mechanical and electrical engineering, to computer engineering and project management (1). According to Sotiris, FEAST is an engineering company that specializes in providing consulting and simulation services regarding all the stages of product development, from conceptualization to optimization (2). The start-up is active on the field of online services (3) in an existing market which the company entered as a niche entrant (6). FEAST is currently on the growth phase of its growth (4), while it has not received any funding whatsoever, in any
previous growth stage (5). FEAST provides and commercializes its services through a B2B business model, where employees of the company present the service to potential customer companies in person or online (7). The firm’s business environment can be characterized for the rapid technological changes and increased product/service complexity, and a moderate degree of breakthroughs and customer uncertainty. Development costs and products lifecycle are not subjects to changes though (8). FEAST collaborates with various partners and actors, for instance with universities, research centres and institutes, and of course with various agencies in governmental programs so as to gain insight and know-how in different technological and market aspects. The knowledge generated from these collaborations is considered by FEAST and Sotiris as a raw material capable to offer further development and growth to the company (9). Thus, FEAST collaborates mostly with universities, innovation intermediaries, government agencies and customers. Then, suppliers, companies in other industries and competitors (for benchmarking) follow, while the company does not collaborate with non-paying users as there are no such users on its commercialization concept (10).

From the aforementioned collaborations and partnerships, Sotiris and his colleagues seek the evolution and development of FEAST. Thus, each collaboration with each different partner offers to the company something unique, something that specifically aims to improve FEAST and enhance its operations and services. These collaborations are focused on the specific need, while each partner is monitored before chosen. Thus, the collaboration with few and the best of each kind, is what FEAST aims. For instance, by collaborating with universities and research centres is created a dynamic between the collaborating parties that favours the transfer of knowledge both ways. This transfer of knowledge helps FEAST to improve rapidly and grow faster, but also helps the other side of the partnership. Another example is FEAST’s participation in two different incubator clusters that besides management guidance also gave to the start-up the opportunity to penetrate new markets and industries in Greece, but more importantly internationally. These collaborations, therefore, acted also as a vehicle to examine and expand the company’s networking ability (11-12). These collaborations in general are extremely helpful for the company as they provide access to leading edge technology, resources, innovative products/services and processes, and the opening up of new markets (13). Regarding which partner is the “best”, Sotiris argued that universities and research centres and institutes are their most important partners alongside customers. The former offer specific know-how, expertise and knowledge on new technologies and trends, and they are the main “suppliers” of technical knowledge for the company. The customers on the other hand, offer more on the feedback and even co-development and specialization of the product in each case (14). Through the time and growth phases some changes have occurred regarding the importance of each different partner. At early stages innovation intermediaries and incubators acted as predominant partners for the creation of the firm but also by enhancing its networking ability. This networking ability that fostered by the innovation intermediaries, opened new horizons to the firm’s international collaborations by providing not only customers but also partners in other industries (shipping and aerospace industries). Customers remain a considerable and important force regarding the growth of the company, as long as the universities and research centres and institutes. Especially partnerships with universities and research centres are extremely important because of the highly innovative high-tech service of the start-up. The company will be based on all the aforementioned collaborations to make the leap towards the phase of maturity (15).
FEAST aspires to be a leader on simulation and product development, by focusing on radical innovations, hiring the best scientists and employees in general, and focusing on R&D and marketing processes (16). Each employee acts within his/hers organizational role towards collaborations, as there is no need for a formal organizational unit (17). FEAST can be described as an organization open to external generated knowledge that quite often allocates resources for the generation of new ideas and the development of its employees. While its employees show a certain degree of adaptability to changes and creativity (18), and collaboration and interaction between different functional areas and roles can be considered as extremely high (19). Finally, FEAST aims to develop new alliances and cooperation with international companies, and also to continue to operate in Greece, and create many job opportunities to young people with innovative and entrepreneurial thinking. FEAST targets to become the simulation hot-spot in Greece but also internationally, and intends to do that with teamwork, hard work, and collaborations (20).

5. Discussion

In this part the results, as deployed in the previous part, will be analysed together. The results derived from the content analysis will be connected to those acquired from the interviews, while the combined results for each case will be compared to the results of the rest cases. Firstly, some general remarks regarding demographics and contextual information of the six Greek start-ups will be provided. Then each research question will be answered individually based on the combined and compared results. Concluding remarks will be provided at the end of each subsection. The referred tables (7-18) can be found on Appendix 3, page 66.

5.1 Demographic and contextual information

One first general remark can be that all interviewees are highly educated individuals that hold educational and practical knowledge and experience on the specific topic within which each start-up is active, as can be shown in table 7 (p.66), and is instructed by the literature (Brüderl et al., 1992; Bessant and Tidd, 2011; Colombo and Grilli, 2010; Delmar and Shane, 2006). In addition, the vast majority of the interviewees are CEOs as long as (co)founders of their start-ups. The only exception to the aforementioned is Fay from ToadBlender. Fay is the COO and not a founding member of the start-up. As ToadBlender is bigger than the rest start-ups, it is also the only one that grew beyond its founder and hired additional employees. Nevertheless, both ToadBlender and the rest start-ups’ educational and practical experience follow the findings of prior research in the start-up literature.

Concerning the start-ups’ size and offerings, all of them are small enterprises employing from two to seven employees, as shown in table 8 (p.66). Each start-up offers a different service, but all of them offer their services online. One start-up is completely software dedicated, three are dedicated to application services, while the rest two are both software and application active. KIWI and Urban Stories are currently on their first steps of growth, namely the startup growth phase. ToadBlender and Torch have growth to reach the stabilization phase. The latter just entered that stage, while the former, as Fay stated, is heading towards the phase of growth, where FEAST is currently on. Finally, Trip-iti has reached the final phase, that of maturity. Therefore, table 9 (p.66) shows that there is evidence of start-up activity regarding all the phases of start-up growth lifecycle in the present study. Additionally, the vast majority of the start-ups have received external financing during
the startup phase. The only two exceptions to that are KIWI and FEAST. The former is still young and at the first steps of its growth and it might get financing at some point later on. The latter though is an exception to the general rule that start-ups are prone to seek external financing (Blank, 2013; Criscuolo et al., 2012; Skardon, 2011) in order to grow (Davila et al., 2003). Thus FEAST managed to reach growth without external financial backing. Another noteworthy point is that there is no obvious connection between external financing and start-up growth, mainly because of the FEAST case. Although financing is not relevant to the present study, it adds and enriches the information regarding the context (business and internal) of the Greek start-ups under examination.

From table 10 (p.66) it can be said that there is no consensus regarding which markets Greek online start-ups prefer to target in order to commercialize their offerings. Most of the start-ups targeted existing markets and tried to enter and re-segment them as niche entrants. ToadBlender is the only one that offered its service to a newly created market that has been created around this service. Finally, KIWI stated that is active and engaged in all market types (existing, new, niche entrant, and low cost entrant, as described by Blank, 2013) as its service, the serious HR game, targets all possible customers and users. The choice of a specific target market for the commercialization of a service also reflects on the uncertainty and other characteristics of the business environment (market specifics and technology) of each start-up, as they are shown on table 11 (p.67). In fact, this connection does not seem to be clearly linked only to the way start-ups choose to enter a market (e.g. as a niche entrant), but more importantly it is linked to the service type of each start-up and the targeted market itself. Thus, start-ups that offer services of a high technological background seem to be active in business environments that are known for major technological breakthroughs, rapid technology changes, and increased service complexity. Only Torch is active on a market that does not have the aforementioned characteristics, and that is because it is active into the entertainment and HR industries, industries that are not known for their high technological background. On the other hand, Torch seems to be involved in a market where service lifecycles are shorter, as something new, mildly upgraded is always created. KIWI, the other HR related start-up, is active on a market of highly developing technology as it offers a game that requires software engineering, but it seems to agree with Torch concerning shorter service lifecycles while all the other start-ups are active on markets of low and moderate service lifecycles. Another matter that needs attention is that customer needs uncertainty received a relatively low score amongst all start-ups. This, according to Blank (2013), reflects the fact that start-ups targeting existing or new markets do not seem to be concerned by high market uncertainty.

Thus, connections between specific characteristics (targeted market, technology, industry etc.) amongst two or more start-ups regarding the business environment are present, a general guideline though is difficult to be produced. Nevertheless, all start-ups are active on business environments that show a certain degree of uncertainty in different matters, as instructed by the literature and prior research (Aulet, 2013; Bessant and Tidd, 2011; Blank, 2013; Giardino et al., 2014; Ries, 2011; also definitions in section 2.1: Start-ups). Therefore, the market and technology uncertainty are present and connected to each specific venture based on the service that venture provides, the market that venture targets, and the industry that venture is active in. To commercialize their services, start-ups employ specific business models (Ries, 2011). The start-ups under examination showed a
tendency to use in particular free and freemium business model types. Table 10 (p.66) shows that three start-ups prefer freemium business models, and two of them employ free models that either require a fee for customers, or support in-app advertisement and purchases. Only FEAST prefers a B2B (business to business) model as the founders of the company prefer to "make a presentation of our service either in person or online to our customers" as Sotiris stated. Those start-ups that employ freemium models are the same that are dedicated to software engineering (ToadBlender, KIWI, and Urban Stories from table 8, p.66). According to Niculescu and Wu (2011), freemium business models are extremely effective when commercializing innovations in the software development industry. Finally, there is no clear connection between the targeted market and the employed business model, but there is an association that links the specific service that the start-up offers and the industry that the start-up is active in with the business model (e.g. software solutions and freemium business models). These links are similar to those described in the previous paragraph regarding target markets and business environment.

All in all, the six chosen start-ups show all start-up characteristics found on the literature (section 2). Thus, the chosen Greek online ventures are newly-founded, small, innovative start-ups, active in uncertain environment and their customs will be analysed and discussed based on that and in connection to the literature developed in the theoretical background.

5.2 Greek Online start-ups initiatives towards external collaborations and the extent of those initiatives with different partners

The content analysis as long as the interviews showed clear evidence of the collaborating nature of start-ups. In fact, all interviewees described collaborations with external partners as extremely important for the present and future development and growth of their ventures. More in detail, collaborations are inherent to the nature of the start-up (Fay – ToadBlender), are absolutely vital (Gerry – Torch), and of crucial importance (Iosif – Urban Stories). Collaborations are necessary so as to become better (Ilias – KIWI and Anastasios – Trip-iti) and to gain insight for the further development of the venture (Sotiris – FEAST). In that matter, the paradox that requires start-ups to encounter difficulties to form the necessary for their growth partnerships due to their lack of prior proven performance (see, for instance, Kotha et al., 2001 and Shane and Stuart, 2001, in contrast to Peng, 2001, but also Aspelund et al., 2005; Baum and Silverman, 2004; Yli-Renko et al., 2001), is answered, at least, when it comes to Greek online start-ups. Thus, there is clear indication that Greek online start-ups indeed collaborate with a variety of external partners, a fact that is quite visible on table 12 (p.67).

On the topic of the extent of collaborations with different partners, there is a set of different reasons that push Greek online start-ups towards each different partner. For instance, according to Fay, ToadBlender focuses on the type of partner and the specific need that this partnership will fulfil at the specific growth phase. Ilias from KIWI and Sotiris from FEAST also agree on the aforementioned. In general, all interviewees agreed that the

19 Freemium derives from the combination of the words "free" and "premium" and it is an emerging business model for the effective commercialization of innovations (Niculescu and Wu, 2011). It involves either offering for free a certain part of the product/service while offering for a fee more specialized features of it (feature-limited), or offer a product/service for free for a certain period of time (time-limited) (Anderson, 2009).
extent of each partnership is connected to the content or the desired outcome of the collaboration. The collaboration fulfils a specific need, a need that might occur in different phases of growth and it is connected to that phase. A need that, also, aims towards the further development of the venture. Thus, the content of the collaboration plays a crucial importance to the formation of the collaboration at the first place. For instance, those start-ups that collaborate with universities (ToadBlender, KIWI, Urban Stories, and FEAST) aim to enhance their networking abilities and to obtain expertise on new technologies and trends. Those start-ups are usually active on extremely high-tech industries. In fact, all software development start-ups collaborate with universities and research centres, while entertainment (Torch) and tourism (Trip-iti) start-ups do not. Another example of specific collaboration content is that of activities between start-ups and innovation intermediaries. Innovation intermediaries and incubators offer consultation and management guidance to start-ups thought out their development and growth. Sometimes are also useful to start-ups as they offer enhanced networking and market penetration. Suppliers, are important as they provide the start-ups with necessary resources (ToadBlender, Torch and Trip-iti), know-how and expertise (Torch and Trip-iti) in order to optimize their service (note that KIWI and Urban Stories have no suppliers at the moment, while FEAST understands universities and research centres as its main “supplier”). Customers and users are vital to all start-ups for the feedback they provide. Customer and user feedback helps start-ups to work towards the satisfaction of their customers and users and towards the optimization of their service (for Trip-iti and KIWI, companies in other industries are also considered as customers). Competition usually not used in direct collaboration, but for benchmarking. Collaboration with competitors occurs only to increase awareness of the industry as a whole. Finally, other actors such as government agencies and non-governmental agencies, and even companies in other industries, are important under specific circumstances and for specific start-ups. The analysis of those relations exceeds the purpose of the present study.

Regarding the breadth and depth of collaborations (Laursen and Salter, 2006), collaboration with partners such as universities/research centres, innovation intermediaries/incubators, government agencies, suppliers, competitors, and companies in other industries, is close and selective (described as deeply, carefully, with a few but the best, etc.), with a focus to fulfil a specific need. Concerning customers and users (whenever each one applies), the engagement is wide to many but limited on the feedback they give. In a sense, start-ups in order to optimize their service and satisfy their customers and users, are “listening” to their needs and remarks. Due to the fact, though, that the customers and users are (or might be) numerous there is no easy way for closer collaboration. Therefore, regarding the breadth and depth of collaborations, Greek online start-ups collaborate with different actors, but few of each kind (breadth) and closely (depth). This is not true only when it comes to customers and users, when the collaborations is limited to the feedback of numerous customers and users.

Answering the first research question (What is the extent of collaboration and openness of Greek online start-ups with external partners?), it can be said start-ups indeed collaborate with a variety of different actors, while their collaborative activities with a variety of partners (see table 12, p.67, also), reflect a high degree of openness in collaboration activities (Lazzarotti et al., 2011). The extent of collaboration and the type of the chosen partner are connected to the desired outcome, or else the content of the collaboration. Furthermore, this content differs from partner to partner (see above for more information). Finally, regarding the breadth and depth of collaborations (Laursen and Salter, 2006)
start-ups collaborate with few and selected of each kind, in a closely manner, while that is not the case in collaborations with customers and users when they are numerous and the collaboration is wide and limited on feedbacks. Those facts are also shown on figure 5.

**Figure 5:** Main collaborators, and the extent -breadth and depth, partner variety, and content- of the collaborations of Greek online start-ups

5.3 **The individual importance of each external partner, and how this importance changes over the different phases of growth of Greek online start-ups**

Table 12 (p.67) shows that each start-up valued different partners with a different grade from 1-7. Most important collaboration partners emerge, if, at least, hypothesized that the higher the extent (grade closer to 7 on table 12) the higher the importance of the partner for the start-up. This importance becomes even clearer as a pattern occurs regarding the most predominant to start-ups partners as shown on table 13 (p.67). Customers, users, suppliers, innovation intermediaries and universities emerged as the most important start-up partners.

In some cases, partners such as suppliers, or customers and users are not present. This is happening not because those partner types are present but not important, but because these start-ups have not yet engaged with partners of that type. For instance, Urban Stories has no suppliers as it does not need any, while it has no customers and users yet, as it is young and its service is not fully developed yet. Another example of a start-up that is not engaged in collaborations with suppliers is KIWI, while FEAST understands universities as its main supplier.

If the analysis expands further in combining the cross-analysed results shown on tables 12 and 13 (p.67) more patterns emerge. For instance, universities are not important for those start-ups involved in entertainment (Torch) and tourism (Trip-it), but extremely important for tech (ToadBlender, KIWI, and FEAST) or science-based (Urban Stories) ventures (Toadblender, Urban Stories, and KIWI are also software development start-ups). Innovation intermediaries are present in the responses of every start-up, while their importance ranges from moderate to high and is connected to what degree each start-up
values any gains received from this collaborating experience. Again, this type of partnership is more important for tech and science-based ventures. Customers, as analysed above, were not important only to the ventures that are still young and have no prior or present engagement with customers (Urban Stories). An exception is KIWI which according to Ilias is a customer-centric company that collaborates with customers (and users) from the beginning (startup phase). Customers are not extremely important to Torch also, as it has just entered the stabilization phase and its customer (and user) base is still limited. All the aforementioned regarding customers, also apply to users. The only exception is FEAST where users and customers perceived as an identical concept and referred as customers. Finally, suppliers analysed extensively in the previous paragraph.

Another point is that the importance of each partner is not clearly connected to the start-ups’ employed business model or targeted market, as no pattern have been detected, when combining the cross-analysed results of tables 10 (p.66), 12 and 13 (p.67), that connects the two concepts. The importance of each partnership, though, is closely related to the content of collaboration (desired outcome) and the specific industry in which each start-up is active as analysed in the previous subsection. It is also connected and closely related to needs that arise in each different start-up within the four different phases of growth (Crowne, 2002). Thus, different external partners come and go through out the lifecycle of a start-up in order to fulfil different needs. As described before, on table 9 (p.66), two start-ups are currently on their startup phase, two on the stabilization phase, one is growing, and one has already reached maturity. Therefore, there is evidence for every phase of growth, and also some predictions regarding the importance of partners in the near future or the next phases.

As shown on table 14 (p.68) innovation intermediaries are extremely important for start-ups at the beginning, namely the startup phase, but this importance fades-out in the next phases. Start-ups, usually start collaborations with customers and users in the stability phase. The only exception is customer (user)-centric KIWI. Suppliers are active partners in the stabilization phase for all tech and science-based ventures, while for entertainment (Torch) and tourism (Trip-iti) ventures are active from the startup phase (suppliers for those start-ups are mostly application providers and software developers). A common characteristic amongst customers, users, and suppliers is that once they are “activated” as partners, they stay that way till the end, namely the maturity phase. That has actually happened in the case of Trip-iti, and predicted in the cases of ToadBlender (for the phase of growth), Torch (for the phase of stabilization), and FEAST (for the phase of maturity). Universities are important only for tech and science-based ventures, while this importance is relevant to specific needs (as analysed in the previous subsection) which occur or might occur in different phases of growth without a visible pattern. Finally, government agencies are important only for Torch, and in that case only as financiers and not as active collaborators.

All in all, the second research question (How Greek online start-ups value the importance of each different external partner and how this importance changes over the different phases of their growth lifecycle?) is answered as follows: customers, users, suppliers, universities, and innovation intermediaries were found to be the most important partners for start-ups. This importance is constructed based on the desired outcome/collaboration content, the specific need to be fulfilled, and in some cases on the growth phase of the start-up. Regarding the latter, innovation intermediaries are important at the startup phase, while customers, users and suppliers (where there is any) are most often important from
the stabilization phase and throughout the life of the start-up. The exception to that might concern ventures active in the entertainment and tourism industries where suppliers are active partners from the beginning. The importance of universities though is not clearly connected to the growth phase, nut mainly to the desired outcome and the specific need. Finally, there was found no clear connection between collaboration with specific partners and the start-ups’ employed business model, or targeted market (see also table 10, p.66). Those facts are also shown on figure 6.

![Figure 6: The most important partners, and their importance in different phases of a lifecycle of a Greek online start-up](image_url)

### 5.4 The determinants that motivate Greek online start-ups to engage in collaborations

As stated previously (subsection 5.2) and proposed by prior research (McDougall et al., 1994) collaborations play a vital role for the further development and growth of start-ups. This importance might act also as a determinant for start-ups to engage to external partnerships and collaborations. Especially when start-ups face high uncertainty of some kind (see again table 11, p.67) tend to interact more with external partners (Powell, 2003). By interacting with external partners, start-ups manage to reduce this uncertainty and gain access to valuable resources (Pangarkar and Wu, 2012), as partnerships act as a shield against uncertainty (Baum et al., 2000), while they moderate the newness and smallness liabilities of the start-up (Baum and Silverman, 2004). Another reason, which extensively discussed in previous parts of the study, that motivates start-ups to collaborate is the fulfilment of specific needs and desired outcomes based on the content of collaboration (subsection 5.2 and 5.3), and the start-up growth phase (subsection 5.3).

Besides the aforementioned though, start-ups collaborate also to gain access to additional offerings provided by their partners. Thus, the vast majority of Greek online start-ups collaborate with external partners to gain access to leading edge technology, innovative products/services and process, the opening-up of new markets, and to gain human and material resources, as shown on table 15 (p.68). The latter is also well documented on the start-up literature (Hsu, 2006). Also, the opening-up have been proposed by previous research (Chorev and Anderson, 2006; Criscuolo et al., 2012) as a factor that motivates start-ups to engage in collaborations. Finally, Velu (2015) suggested that start-ups should
form partnerships towards innovative solutions such as product/service and process innovations, while Huang et al. (2012) argued that collaboration with external partners facilitates the transfer of knowledge and technology (access to leading edge technology and knowledge). The only obvious exception to the aforementioned, is the case of Urban Stories, which showed moderate scores to all collaboration determinants, with the exception of the opening-up of new markets where the score was even lower. An explanation to this can be identified if the table 15 (p.68) studied in combination with table 16 (p.68), where Urban Stories is the only start-up that firmly stated that becoming a market leader is not in their plans.

All in all, start-ups collaborate with external partners (third research question: Why Greek online start-ups collaborate (in general and innovation specific) with external partners?) to deal with uncertainty, to grow and develop, and to fulfil specific needs and desired outcomes based on growth. In addition, they collaborate because their partners provide them with leading edge technology and knowledge, innovative products/services and processes, the opening-up of new markets, and, finally, resources. All the aforementioned, are proposed by prior research regarding start-ups. Those facts are also shown on figure 7.

![Figure 7: The determinants that motivate Greek online start-ups to collaborate with external partners](image)

**5.5 Greek Online start-ups’ internal structure towards collaborations**

The fourth research question concerns the organizational structure of start-ups and their overall strategy towards collaborations and openness. The vast majority of interviewees stated that their start-ups claim to become market leaders. The three most technology intensive start-ups (ToadBlender, KIWI, and FEAST) found all parameters of strategy as extremely important. More in detail, those ventures focus more on radical innovations,
while they try to hire the best employees, and they value R&D and marketing as their core processes. Regarding the latter, ToadBlender is an exception as the focus on R&D and marketing is moderate. On one hand, the focus of its operations is actually to develop a software, an operation that should not be mistaken as R&D. On the other, it is the only start-up that created a new market, therefore marketing issues are not so important as long as the competition is limited (it only has one competitor), but also, because market uncertainty is low due to the newness of the market (Blank, 2013). Hiring the best was not a necessity for those start-ups that do not plan to hire new personnel (Torch and Urban Stories). R&D was not a priority to the entertainment (Torch) and tourism (Trip-iti) start-ups, as they do not focus on the technology, but on the content of their service. Marketing, though, is of high importance for the aforementioned start-ups as they target a wide pool of potential users and customers. Finally, Urban Stories is an exception again, as all its answers are moderate to low. One explanation to that is the artistic and creative nature - as Iosif stated - of the founders-architects, another might be the extremely young history of the venture. The former also explains the answers of Iosif regarding Urban Stories’ staff involvement in technological innovation as shown on table 18 (p.69).

Table 17 (p.69) shows that all start-ups reached consensus regarding the internal organizational structure towards collaboration with external partners, and also the levels of internal communication skills towards innovation activities. The collaboration, communication and interaction towards innovation activities is extremely high (sixes and sevens) within all six ventures. The organizational structure seems to be informal, without any form or unit, but with specific individual roles towards the coordination and development of collaborations with external partners. Thus, high levels of communication is facilitated, while the organizational boundaries are blurry, or there are even no boundaries and functional areas within the start-ups. These features are usually the consequence of the smallness of start-ups in terms of employment and organizational structures. In fact, start-ups tend to adopt simple organizational structures (Peng, 2001), are known for their flexible nature (Criscuolo et al., 2012), while in most cases “The whole company (...) sits in the same room. Communication is rapid, (...) and energy is high” (Crowne, 2002, p.1).

Adding to the previously analysed small organizational structure and communication ability of start-ups, staff’s involvement is another feature that adds to the flexible and innovative nature of start-ups. Table 18 (p.69) shows that all six cases found to be appreciative to externally generated knowledge. This also adds to the importance of collaborations for start-ups as analysed in subsection 5.2. The start-ups offer resources and time for the generation of ideas and the professional development of their highly adaptable staff (the only exception to the latter is Torch) enhancing their focus to their further development and growth, through creative and challenging objectives. Start-ups show an aptitude to hire talented people (Peng, 2001) a fact that is also present on table 16 (p.68), while they also rely on the individual abilities of their founding members (Brüderl et al., 1992) (all cases except ToadBlender, employ only their founding members), namely their education, skills, expertise (Colombo and Grilli, 2010), and creative spirit (Bessant and Tidd, 2011). As the small organizational structure enhances the start-ups’ ability to perform in dynamic environments (Bhidè et al., 2000), and their ability to manage (Gallego et al., 2011), and quickly react (Peng, 2001) to unexpected changes.

All in all, a brief answer to the fourth research question (How Greek online start-ups manage their internal structure concerning collaboration and openness with external partners?) is that start-ups employ informal organizational roles to support any activities with external partners. Also, they are known for their enhanced communication abilities
and flexibility towards changes that stem from their small organizational structures and the individual characteristics of their founding members and their talented employees in general. Those facts are also shown on figure 8.

![Figure 8: Internal organizational structure, strategies, and roles towards collaborations and openness of Greek online start-ups](image)

**6. Conclusions, theoretical and practical implication, and limitations of the study**

In this part, the most important conclusions as discussed in the previous section (5: Discussion) will be briefly outlined. A set of theoretical and practical implications will be provided, highlighting how this study contributes to the academic and business communities. Finally, the limitations and shortages of the present study will be described, discussed and connected to propositions for future research.

**6.1 Conclusions**

Start-ups seem to continuously gain supporters and fame in the business world, as a model that promotes the speedy growth and development of small newly-founded, innovative firms active in uncertain environments, to firms capable of changing the rules in many industries through the introduction of innovative solutions. Following this growing practical application of the start-up concept in the industry, the literature of start-ups is also experiencing an increasing stream of researches specifically focused on start-ups and their works and life. Regardless this increasing interest in researching start-ups, start-up literature still shows some gaps and limitations on some matters, while others are well-documented and grounded.

The present study focused on six Greek online start-ups that are active on different industries. These cases have been chosen carefully due to the fact that they represent newly-founded, small, innovative enterprises active in uncertain environments (section 5.1). These cases, therefore, represent the cases of six start-ups and the analysis of their customs has been performed on that basis, within the Greek reality, and according to the extant literature. The extant start-up literature were reviewed so as the most common definitions and descriptions of start-ups, as well as the streams of prior research and the gaps and limitations within it to be identified. After the literature review the cross-analysis and
discussion of the results of the six cases focused on two outcomes. Mainly, to fill some of the limitations and gaps (sections 5.2 and 5.3) that are currently present on the start-up literature, but also to provide confirmation (or rejection) on other well-documented research topics on start-up literature (sections 5.4 and 5.5). Towards those outcomes the authors formulated four research questions.

The first gap presented, has been addressed by the first research question, and was regarding the initiatives of Greek online start-ups towards external collaborations and the extent of those initiatives within collaborations with different partners. The study concluded that start-ups are indeed able to collaborate with a variety of different partners, regardless their liabilities of smallness and newness. They, in fact, show a high degree of collaboration openness (Lazzarotti et al., 2011). The desired outcome, or else the collaboration content, is closely connected to the extent (the breadth and depth – Laursen and Salter, 2006) of the collaboration, but also to the type of each partner. Thus, start-ups closely collaborate with few and selected of each kind partners (universities, suppliers, innovation intermediaries etc.). When they collaborate with customers and users, though, the collaboration is wide and limited on their feedbacks due to their high numbers. The collaborations reflect those in a general sense, but also those towards innovative solutions.

The second gap in the start-up collaboration literature was about the importance of different partners, and how this importance might be a subject to changes through the lifetime of a start-up. The study concluded that customers, users, suppliers, innovation intermediaries/incubators, and universities/research centres were found to be the most important. This importance is connected on the desired outcome (collaboration content), the specific need that is going to be fulfilled through each particular collaboration, and in some cases is based on the start-up growth phase, but it is not clearly connected to the employed business model and targeted model. During the startup phase innovation intermediaries are the most important partners, while customers, users, and suppliers are the most important on the phases of stabilization, growth and maturity. Customers and users were important startup partners only to customer-centric start-ups, while suppliers were needed from the beginning only to start-ups that were in need of specific expertise that were not present amongst the skills of the employees/founders (e.g. building an application for a start-up active on tourism). Regarding universities, there was no clear connection of their importance to any phase of growth, but the connection was mostly with the desired outcome and the specific need that the collaboration is going to fulfil.

The present study also researched two well-documented and grounded topics in the start-up literature, the determinants that push start-ups to collaborate with external partners, and the ways start-ups are structured internally in order to support collaboration and innovation activities. Regarding the former, the study provided support to previous studies, and concluded that start-ups collaborate to deal with uncertainty, to grow and develop, and to fulfil specific needs and desired outcomes. In addition, they collaborate because their partners provide them with leading edge technology and knowledge, innovative products/services and processes, the opening-up of new markets, and, finally, resources. Regarding the internal structure of start-ups towards collaborations and innovation activities, the study also confirmed previous researches and concluded that start-ups employ informal organizational roles to support external collaborations and openness to external generated knowledge (e.g. technology, ideas). Nevertheless, start-ups are known for their strategic focus towards innovative solutions and market dominance, through the support
of their employees towards creativity, and also through high levels of internal collaboration and interaction in innovation activities. All these stem from their tendency to adopt small organizational structures, their ability to manage the unexpected, but also on the individual skills of their founders and employees.

Finally, a set of differences between technology and science based ventures and other less intensive ones have been detected within this study. These differences seem to affect the collaborative initiatives of start-ups and to be closely related to specific industry characteristics. Thus, technology (e.g. software development) and science based ventures (e.g. architectural) and start-ups that are less technology intensive (e.g. entertainment and tourism start-ups), might use different business models, or collaborate differently with various partners. For instance, software development start-ups employed freemium business models, while the entertainment and touristic ones employed free for the end user and free with in app purchases and advertisements respectively. Regarding the latter, software development start-ups collaborate closely with universities, while the other are not. In addition, suppliers were important from the beginning for the less technology intensive start-ups, while for the software ones they were important from the stabilization stage.

6.2 Theoretical and practical implications

It is the authors’ belief that the present study provides a set of useful theoretical as well as practical implications for researchers and practitioners in different academic and business fields.

As for the theoretical contributions of the study, firstly, the performed literature review, which acted as the basis of the present study, provided a systematic view on the extant start-up literature, as it concentrated different start-up definitions and characteristics. It also, identified different lines and selected paths, and revealed limitations and gaps of prior research on start-ups. In addition, this report expanded the already extant start-up theory, by providing answers, based on the case of six Greek online start-ups, to gaps that are present in the literatures of start-up, start-up innovation and openness, and more specifically on the literatures of start-up collaboration and openness activities. Those answers regard the ability of start-ups to collaborate, the extent of start-up collaborations and openness with external partners, the importance of each partner, and the connection of that importance on the different growth phases of a start-up lifecycle.

Moreover, this study also confirmed the theoretical propositions of previous researches regarding start-up collaboration and openness determinants (see Criscuolo et al., 2012; Chorev and Anderson, 2006; Hsu, 2006; Huang et al., 2012; Pangarkar and Wu, 2012; Powell, 2003; Velu, 2015 amongst others), and start-up organizational structure (see Bhidè et al., 2000; Brüderl et al., 1992; Colombo and Grilli, 2010; Criscuolo et al., 2012; Crowne, 2002; Gallego et al., 2011; Peng, 2001 amongst others), and expanded their applicability on Greek online cases. Also, this study identified a connection between its findings and the theoretical propositions of previous studies in innovation -not focused on start-ups- (Laursen and Salter, 2006; Lazzarotti et al., 2011), and also potentially extended and expanded these propositions to the emerging concept of start-ups, and more specifically to the Greek online start-ups. All the aforementioned conclusions to the research questions are also addressed to managers and potential start-up founders and employees.
Another important theoretical contribution of this study emerges as a consequence of the general research focus of this study, which is the identification of the collaboration and openness initiatives and activities of start-ups. Thus, this study provides a connection of two distinct literatures, the one regarding start-ups with the one regarding innovation and open forms of innovation. Additionally, the correlation of start-up lifecycle growth phases as described by Crowne (2002) to the importance of different partners in each phase, and also to the content of collaboration poses as another significant theoretical contribution of the present study.

As for the practical contribution of this paper to managers and other individuals related with start-ups directly or not, besides its conclusions, there are also some specific matters that emerged during the recording and cross-analysis of the findings. For instance, the fact that some of the collaborative initiatives of start-ups seem to be closely related to specific industry characteristics. Business uncertainty found to be more relevant to the service and the industry type of the start-up, and not the way a start-up enters a market (e.g. as a niche entrant, or the creator of a new market). Thus, market and technology (business) uncertainty is connected to each specific venture based on the service, the market, and the industry of the start-up. Moreover, the targeted market seems not to be connected to the employed business model. The preferred business model is connected to the service and the industry of the start-up. An illustration of that, is the connection of software development start-ups to the employment of freemium business models for the commercialization of software services developed by start-ups (Niculescu and Wu, 2011).

Another practical contribution is that, technology and science based ventures (and especially software ones) showed distinct behaviour in collaboration and openness matters when compared to start-ups that are less technology intensive (e.g. entertainment and tourism start-ups). Thus, the former collaborate with universities, while the latter are not. In addition, suppliers are important from the startup of less technology intensive start-ups (tourism and entertainment), while they are active partners to technology intensive start-ups from the stabilization phase.

Finally, the present study provided evidence to both researchers and practitioners regarding the start-up business initiatives and activities worldwide, in Europe, and in Greece (see part 1.1: The context of the study). Also it provided insight on the uncertain Greek market that is currently within crisis, and on the initiatives and customs towards collaborations and openness of Greek online start-ups. This contribution is addressed primarily to managers and entrepreneurs active in Greek online start-ups, but also to anyone who might engage in such ventures in the near future.

6.3 Limitations and future research

Every research study has its limitations, and this one is not an exception. The following are some of those limitations, followed by propositions and suggestion for future research.

Firstly, this study is concentrated on the experience of Greek online start-ups, and therefore its conclusions mainly reflect the experience on collaboration and openness initiatives and activities of Greek online start-ups. Thus, the conclusions, primarily reflect the Greek reality. In addition, although this report performed a multiple-case study, the research was limited on getting insight of the collaboration and openness activities of just six cases. Two cases, from the aforementioned six, are currently on the start-up phase, and two on their stabilization growth phase, while just one case corresponds for each one
of the other two growth phases (growth and maturity). Furthermore, while three cases are about software development start-ups, only one is active on entertainment, one in tourism, and one in simulations. Although the authors of this study, believe that their effort constitutes a good start on researching the start-up initiatives in openness and collaborations, they also advice future researchers in qualitative research to further this study by adding more cases. In addition, to select cases in terms of industry (software development, tourism, entertainment etc.), and growth phases, in a more balanced way. In addition, future researchers might also perform a quantitative research by surveying several Greek start-ups, or in different contexts, to identify whether the conclusions of the present study are indeed applicable or not.

Another matter of concern that is present on this research regards the abilities of the interviewee and the interviewers. The interviewees were both responsible and capable to offer access on information regarding the companies, as they are the CEOs, COOs, and co-founders of the companies, or else their formal gatekeepers (Given, 2008). Additionally, a certain level of trust had been achieved between the two parties during the whole procedure (Mills et al., 2009) through confidentiality and mutual understanding, while the interviewers worked hard to perform the interviews and extract the results in an objective manner. Still some information might have been concealed, or mistaken, or unintentionally omitted. Thus, the authors of this study suggest future researchers to employ the proposed questionnaire, and follow the proposed methodology on their research and perform cases studies on start-ups, with multiple interviewees in each case if possible, in order to confirm or reject the propositions of this study, and develop a theoretical framework on start-up collaborations and openness activities with external partners. Finally, some previous researches and articles might have escaped the attention of the authors, as the term ”start-up” reflects a wide variety of different uses and meanings within different kinds of literatures and settings (see part 2.1: Start-ups).
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Baresel-Bofinger, A. C., & Panayiotis, H. Fostering cross-border early stage funding for innovative SMEs in the region of South-East Europe: The case of the VIBE


Durkin, R. Startup Firms Can Benefit From Engineering Technology Capstone Courses.


Haines, J. K. Collective Innovation: The Role of the Pitch in Startup Ecosystems.


Mann, C. L., & Sanyal, P. (2010). The financial structure of startup firms: The role of assets, information, and entrepreneur characteristics.


Appendix 1: The semi-structured questionnaire

[Opening part]

[1] Could you please shortly introduce yourself?

[2] Could you please shortly describe the company you work for?

[3] Please indicate your start-up’s core activity:

<table>
<thead>
<tr>
<th>#</th>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Software development services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Online application services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If your answer is “NO” to both first and second option, please do not proceed answering the following questionnaire.

[4] In which start-up growth phase your company is currently on? [According to Crowne (2002)] the phases of a start-up growth are:

- **Startup phase** - when start-ups create and refine the idea conception, up to the first sale,
- **Stabilization phase** - begins from the first sale,
- **Growth phase** - begins with a stable product development process and lasts until market size, share and growth rate have been established,
- **Maturity phase** – start-up evolves to a mature organization, where the product development becomes robust and predictable with proven processes.

<table>
<thead>
<tr>
<th>#</th>
<th>Growth phase</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Startup phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Stabilization phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Growth phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Maturity phase</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[5] Have you received financing?

<table>
<thead>
<tr>
<th>#</th>
<th>Growth phase</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Startup phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Stabilization phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Growth phase</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[6] [According to Blank (2013)], start-ups usually bring a new product:

- a. into an existing market
- b. into a new market
- c. into an existing market and trying to re-segment that market as a low-cost entrant
- d. into an existing market and trying to re-segment that market as a niche entrant

<table>
<thead>
<tr>
<th>#</th>
<th>Targeted market</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Existing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>New</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Low-cost entrant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
[7] Could you please say some words regarding the business model your company employs for the commercialization of its product/service?

[8] Please indicate your agreement with each of the following statements with respect to your firm’s business environment:

<table>
<thead>
<tr>
<th>#</th>
<th>Environmental factors</th>
<th>Not at all (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>to a great extent (7)</th>
<th>don’t know (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Increasing tech development cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Shorter service lifecycles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Customer/user needs are uncertain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A large number of new product ideas have been made possible through tech breakthroughs in our industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The technology in our industry is changing rapidly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Complexity of products and services is increasing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[9] How do you and your company perceive collaboration with external partners?

[10] Please indicate the extent to which your firm has collaborated with the following external actors in innovation activities:

<table>
<thead>
<tr>
<th>#</th>
<th>External Sources</th>
<th>Not at all (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>to a great extent (7)</th>
<th>don’t know (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Universities/research centres</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Innovation Intermediaries/incubators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Government agencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Customers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Users (non-paying)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Suppliers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Competitors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Companies in other industries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


[12] How do you feel each different source benefits your company in different areas of your company’s growth and development?

[13] Please indicate your agreement with the following: “We collaborate with our partners while they provide us with ...”:

<table>
<thead>
<tr>
<th>#</th>
<th>The partners provide:</th>
<th>strongly disagree (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>strongly agree (7)</th>
<th>don’t know (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Leading edge technology/knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Innovative products/services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Innovative processes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Opening up new markets/commercialization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Resources (human or material)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
[14] How do you “grade” each different external actor in terms of its support to the growth and development of your company through collaboration?

[15] How this relevant importance of each partner or source of knowledge has changed over the year and according to the growth of the company?

[16] Please indicate your agreement with each of the following statements with respect to your firm’s strategy:

<table>
<thead>
<tr>
<th>#</th>
<th>Strategic goals</th>
<th>strongly disagree (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>strongly agree (7)</th>
<th>don’t know (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>We aspire to be leaders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>We focus on radical rather than incremental innovations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>We try to hire the best</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>R&amp;D is a core process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Marketing is a core process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[17] Organisational and managerial structre to support collaboration initiatives:

<table>
<thead>
<tr>
<th>#</th>
<th>Internal processes</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>There is a formal organizational unit within the company to coordinate and support collaborations with external sources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>There are organizational roles within the company to develop the understanding, knowledge, processes and skills required in collaborations with external sources</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[18] Please indicate your agreement with each of the following statements with respect to your firm’s staff involved in technological innovation:

<table>
<thead>
<tr>
<th>#</th>
<th>Staff involvement</th>
<th>strongly disagree (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>strongly agree (7)</th>
<th>don’t know (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>We give our staff time and resources to generate new ideas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Our staff easily adapts to new situations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>We set our staff creative and challenging objectives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>We are open to knowledge generated outside the company</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>We allocate resources for our staff continuous professional development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[19] Intercommunication Skills:

<table>
<thead>
<tr>
<th>#</th>
<th>Internal communication skills</th>
<th>strongly disagree (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>strongly agree (7)</th>
<th>don’t know (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>There is a high level of collaboration and communication within functional areas to identify and resolve emerging issues in innovation activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>There is a high level of interaction across different functional areas in innovation activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What is the master plan behind [the name of your company]? How do you see the company after some years?

[Closing part]
Appendix 2: Information of specific questions

The items 8, 10, 13, 16, 17, 18 and 19 were adopted from the questionnaire of “Open Innovation Survey” and adapted to the specific needs of this study, while the items 3, 4, 5 and 6 were constructed specifically for this research. These questions, either use a “pre-determined response category scale” (Mills et al., 2009, p.769) (Likert scale) ranging from 1 to 7 (from not at all important/Strongly disagree to extremely important/Strongly agree) with an additional eighth option – don’t know -, or two-dimension responses (Yes or No).

- Information on “Open Innovation Survey” can be found here:
  

- “Open Innovation Survey” can be found here:
  
Appendix 3: Tables with cross-analysed results relevant to the “Discussion” section (section 5) of the present study

**Table 7: Interviewees' business roles, practical experience, and educational background (question 1)**

<table>
<thead>
<tr>
<th>Case</th>
<th>Interviewee</th>
<th>Role</th>
<th>Professional background</th>
<th>Educational background</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fay</td>
<td>COO</td>
<td>Project management</td>
<td>Marketing, advertising and public relations</td>
</tr>
<tr>
<td>2</td>
<td>Gerry</td>
<td>Founder and CEO</td>
<td>Human resources management</td>
<td>Business, HR management, and training</td>
</tr>
<tr>
<td>3</td>
<td>Ilias</td>
<td>Co-Founder and CEO</td>
<td>Business management</td>
<td>Business and management, marketing</td>
</tr>
<tr>
<td>4</td>
<td>Iosif</td>
<td>Co-Founder and CEO</td>
<td>Architectural engineering</td>
<td>Architectural and design studies</td>
</tr>
<tr>
<td>5</td>
<td>Anastasios</td>
<td>Co-Founder and CEO</td>
<td>International relationships</td>
<td>Business studies</td>
</tr>
<tr>
<td>6</td>
<td>Sotiris</td>
<td>Co-Founder and CEO</td>
<td>Electrical engineering</td>
<td>Electrical engineering</td>
</tr>
</tbody>
</table>

**Table 8: Start-ups' employee size, and offering specifics (questions 2 and 3)**

<table>
<thead>
<tr>
<th>Case</th>
<th>Start-up</th>
<th>Size</th>
<th>Offering (product/service)</th>
<th>Short description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Software</td>
</tr>
<tr>
<td>1</td>
<td>ToadBlender</td>
<td>7</td>
<td>Online platform for embedded devices</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Torch</td>
<td>2</td>
<td>Online entertainment application</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>KIWI</td>
<td>2</td>
<td>Online HR serious game</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>4</td>
<td>Urban Stories</td>
<td>5</td>
<td>Online architectural platform</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>5</td>
<td>Trip-itu</td>
<td>3</td>
<td>Online travelling application</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>FEAST</td>
<td>3</td>
<td>Online simulation platform</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

**Table 9: Start-ups' growth phase and financing pitches (questions 4 and 5)**

<table>
<thead>
<tr>
<th>Case</th>
<th>Start-up</th>
<th>Growth phase</th>
<th>Financing in</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ToadBlender</td>
<td>Stabilization (2)</td>
<td>Startup phase</td>
</tr>
<tr>
<td>2</td>
<td>Torch</td>
<td>Stabilization (2)</td>
<td>Startup phase</td>
</tr>
<tr>
<td>3</td>
<td>KIWI</td>
<td>Startup (1)</td>
<td>Not at all</td>
</tr>
<tr>
<td>4</td>
<td>Urban Stories</td>
<td>Startup (1)</td>
<td>Startup phase</td>
</tr>
<tr>
<td>5</td>
<td>Trip-itu</td>
<td>Maturity (4)</td>
<td>Startup phase</td>
</tr>
<tr>
<td>6</td>
<td>FEAST</td>
<td>Growth (3)</td>
<td>Not at all</td>
</tr>
</tbody>
</table>

**Table 10: Targeted markets and employed business models (questions 6 and 7)**

<table>
<thead>
<tr>
<th>Case</th>
<th>Start-up</th>
<th>Target market</th>
<th>Business model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ToadBlender</td>
<td>New</td>
<td>Freemium (feature limited)</td>
</tr>
<tr>
<td>2</td>
<td>Torch</td>
<td>Existing as a niche entrant</td>
<td>Free for end user/fee for customers</td>
</tr>
<tr>
<td>3</td>
<td>KIWI</td>
<td>To different types</td>
<td>Freemium (time limited)</td>
</tr>
<tr>
<td>4</td>
<td>Urban Stories</td>
<td>Existing as a niche entrant</td>
<td>Freemium (feature limited)</td>
</tr>
<tr>
<td>5</td>
<td>Trip-itu</td>
<td>Existing as a niche entrant</td>
<td>Free with in-app purchases and advertisement</td>
</tr>
<tr>
<td>6</td>
<td>FEAST</td>
<td>Existing as a niche entrant</td>
<td>B2B</td>
</tr>
</tbody>
</table>
### Table 11: Start-ups’ business environment (question 8)

<table>
<thead>
<tr>
<th>Environmental factors</th>
<th>Toad-Blender</th>
<th>Torch</th>
<th>KIWI</th>
<th>Urban Stories</th>
<th>Trip-iti</th>
<th>FEAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing tech development cost</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Shorter product lifecycles</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Customer/user needs are uncertain</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Tech breakthroughs in industry</td>
<td>7</td>
<td>2</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Tech changes rapidly</td>
<td>6</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Increasing product/service complexity</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

From 1-not at all, to 7-strongly agree. 1-2: low, 3-5: moderate, 6-7: high

### Table 12: The extent of start-up collaboration with different partners (question 10)

<table>
<thead>
<tr>
<th>Question</th>
<th>Toad-Blender</th>
<th>Torch</th>
<th>KIWI</th>
<th>Urban Stories</th>
<th>Trip-iti</th>
<th>FEAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities/research centres</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Innovation Intermediaries/incubators</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Government agencies</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Customers</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Users (non-paying)</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Suppliers</td>
<td>7</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Competitors</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Companies in other industries</td>
<td>4</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

From 1-not at all, to 7-strongly agree. 1-2: low, 3-5: moderate, 6-7: high

### Table 13: The relevant importance of different partners for each start-up (question 14)

<table>
<thead>
<tr>
<th>Case</th>
<th>Start-up</th>
<th>Relevant importance of different partners for each start-up</th>
</tr>
</thead>
</table>
| 1    | ToadBlender| 1. Customers, users and suppliers  
2. Innovation intermediaries and universities                           |
| 2    | Torch      | 1. Suppliers and government agencies  
2. Innovation intermediaries                                           |
| 3    | KIWI       | 1. Customers, users and universities  
2. Innovation intermediaries                                           |
| 4    | Urban Stories| 1.Universities and innovation intermediaries                               |
| 5    | Trip-iti   | 1. Customers, users, and suppliers  
2. Innovation intermediaries                                           |
| 6    | FEAST      | 1. Universities and innovation intermediaries  
2. Customers                                                             |
Table 14: Importance of collaborating partners in different start-up growth phases (question 15)

<table>
<thead>
<tr>
<th>Start-ups growth phases according to Crowne (2002)</th>
<th>“Startup”</th>
<th>“Stability”</th>
<th>“Growth”</th>
<th>“Maturity”</th>
</tr>
</thead>
<tbody>
<tr>
<td>ToadBlender Intermediaries</td>
<td>Customers</td>
<td>Suppliers</td>
<td>Predicted: same as in stability + Universities</td>
<td>-</td>
</tr>
<tr>
<td>Torch Intermediaries</td>
<td>Suppliers</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>KIWI Intermediaries, Customers, Users</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Urban Stories Intermediaries</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trip-iti Intermediaries, Suppliers</td>
<td>Suppliers</td>
<td>Customers</td>
<td>Suppliers</td>
<td>Customers</td>
</tr>
<tr>
<td>FEAST Intermediaries</td>
<td>Customers</td>
<td>Universities</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 15: Determinants for collaboration (question 13)

<table>
<thead>
<tr>
<th>The partners provide:</th>
<th>Case</th>
<th>Toad-Blender</th>
<th>Torch</th>
<th>KIWI</th>
<th>Urban Stories</th>
<th>Trip-iti</th>
<th>FEAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading edge technology/knowledge</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Innovative products/services</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Innovative processes</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Opening new markets/commercialization</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Resources (human or material)</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Other (please indicate)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

From 1-not at all, to 7-strongly agree. 1-2: low, 3-4: moderate, 6-7: high

Table 16: Firms’ strategies and strategic goals (question 16)

<table>
<thead>
<tr>
<th>Firm’s strategy</th>
<th>Case</th>
<th>Toad-Blender</th>
<th>Torch</th>
<th>KIWI</th>
<th>Urban Stories</th>
<th>Trip-iti</th>
<th>FEAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>We aspire to be leaders</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>We focus on radical rather than incremental innovations</td>
<td>7</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>We try to hire the best</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>R&amp;D is a core process</td>
<td>5</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Marketing is a core process</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

From 1-not at all, to 7-strongly agree. 1-2: low, 3-4: moderate, 6-7: high
**Table 17: Organizational and managerial interventions to support collaboration initiatives (question 17) and internal start-up communication skills (question 19)**

<table>
<thead>
<tr>
<th>Internal communication skills</th>
<th>Case</th>
<th>Toad-Blender</th>
<th>Torch</th>
<th>KIWI</th>
<th>Urban Stories</th>
<th>Trip-iti</th>
<th>FEAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a high level of collaboration and communication within functional areas to identify and resolve emerging issues in innovation activities</td>
<td></td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>There is a high level of interaction across different functional areas in innovation activities</td>
<td></td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

**Organizational structure**

<table>
<thead>
<tr>
<th>Organization structure</th>
<th>Case</th>
<th>Toad-Blender</th>
<th>Torch</th>
<th>KIWI</th>
<th>Urban Stories</th>
<th>Trip-iti</th>
<th>FEAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a formal organizational unit within the company to coordinate and support collaborations with external sources</td>
<td></td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>There are organizational roles within the company to develop the understanding, knowledge, processes and skills required in collaborations with external sources</td>
<td></td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

From 1-not at all, to 7-strongly agree. 1-2: low, 3-5: moderate, 6-7: high

**Table 18: Staff's involvement in technological innovation (question 18)**

<table>
<thead>
<tr>
<th>Staff involvement</th>
<th>Case</th>
<th>Toad-Blender</th>
<th>Torch</th>
<th>KIWI</th>
<th>Urban Stories</th>
<th>Trip-iti</th>
<th>FEAST</th>
</tr>
</thead>
<tbody>
<tr>
<td>We give our staff time and resources to generate new ideas</td>
<td></td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>-</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Our staff easily adapts to new situations</td>
<td></td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>-</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>We set our staff creative and challenging objectives</td>
<td></td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>-</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>We are open to knowledge generated outside the company</td>
<td></td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>We allocate resources for our staff continuous professional development</td>
<td></td>
<td>7</td>
<td>2</td>
<td>6</td>
<td>-</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

From 1-not at all, to 7-strongly agree. 1-2: low, 3-5: moderate, 6-7: high