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Exploring the uncertainty in start-ups from bootstrapping, effectuation and scrum perspective

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ABSTRACT

The purpose of this thesis is to understand to what extent the principles of bootstrapping, effectuation and scrum are implemented together in a start-up and how do they relate to the uncertainty. By conducting a qualitative research method, the data were collected through semi-structured interviews and introspection. The findings of this study showed that two aggregated dimensions emerged – Internal Uncertainty and External Uncertainty.

The empirical investigation showed that the mentioned principles, while utilized separately, cannot guarantee clear guidance in the entrepreneurship. However, a new approach offered by the thesis, which will contribute to Innovation and Design area, is to combine the bootstrapping, effectuation and scrum principles. Doing so, an entrepreneur's possibilities to hunt the roller-coaster of uncertainties in a start-up phase and eliminate them dramatically increases.

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1. INTRODUCTION

The following chapter will present the general background of this thesis, a knowledge gap in the research area, its purpose and the research question.

1.1 Background

The research area of this thesis has to do with the establishment of new businesses (start-ups) and is deeply related with research on entrepreneurs, innovation, new establishment processes, opportunities and decision-making (Busenitz et al., 2003). The goal of entrepreneurship is to transform new innovative ideas into practical activities that lead to business development (European Commission, 2006). Here, start-ups are the source of innovation. To be successful, start-ups need a design process, which will guide them to avoid possible uncertainties in their early stage of establishment.

“The secret of getting ahead is getting started. The secret of getting started is breaking your complex overwhelming tasks into smaller manageable tasks, and then starting on the first one” (Harroch, 2014).

Several quotes as this one can be applicable to entrepreneurs while establishing a start-up. Dividing parts of the start-up is the key to identify the challenges and execute the necessary steps to succeed. While doing so the three success factors that need attention are capital, market, and people. These success factors are the most important for the thesis as far as they correspond the three principles (bootstrapping, effectuation and scrum) analyzed during the research.

From this perspective, the thesis will research how and when these three success factors interplay between each other and what are the *uncertainties* (i.e. circumstances that are not accurately known or predicted by the entrepreneur and that influences on the efficient development process of a start-up) from a theoretical and practical point of view which creates barriers or challenges for the entrepreneurs at their first phase of doing business.

The first element, capital, might be the cause of bankruptcy if the entrepreneur has no experience how to effectively manage the uncertainties of the financial process during the

ideation phase or later. **Bootstrapping** is the concept created recently to guide an entrepreneur in how to afford all the expenditure that might appear during the process and how to get alternatives to financial capital. Bhide (2003) describes bootstrapping as an approach of launching a venture with the minimum capital; In some cases, it might be personal funds, too. A challenge that the entrepreneurs have, is not to raise capital but to manage the financial situation without doing so.

Besides the capital, entrepreneurs need to pay attention to a market that requires communicational and technological skills. **Effectuation** is the second concept (Sarasvathy, 2001), which illustrates an effective tool for managing businesses under uncertainty and helps to identify the market as well as the segment and find the right network to avoid technological or other barriers (Sarasvathy, 2001). In some cases, the new start-up might have products and services that need a special market. Here the threat for a business might be non-existing guidance, targeting, and communication.

The third element comprised by people is the most subjective part of the start-up taking into consideration their individual expectations, knowledge, experience, and attitude towards the uncertainties. **Scrum** is the concept which derives from agile project management and offers more team focused process. It is a framework that includes stakeholders and users, and allows the changes to be more evolutionary, incremental and finally encourages the variety of ideas that are beneficial for the continuous improvement (Boehm & Turner, 2005). However, uncertainty within the team when it comes to transparency, self-organization, trust or task-execution can detriment the start-up.

The thesis is separated into five main sections: part (2) will give an overview and highlight contextual aspects of bootstrapping, effectuation and scrum principles in the context of start-ups. Part (3) will represent the methodology applied in the thesis. Part (4) in its findings will represent interviews and introspection of the entrepreneurs participating in the thesis research. Part (5) will then approach the detailed discussion of the research question posed. Part (6) will present concluding remarks to fulfill the overall objective of the research, which is to provide innovation and design understanding of the future entrepreneurs in their start-up endeavors.

1.2 Problem statement, Gap and Research question

What makes bootstrapping, effectuation and scrum special to be studied is the less researched field how these three concepts interplay between each other. The three concepts will be investigated by conducting an empirical research study. The research focus will be on the early phases of the start-up establishment.

According to João, Lopes & Porto (2018), some of the main success factors of start-ups are a capital, market, and people, which can have a heavy detrimental effect on the start-ups if they cause uncertainty. The latter is a situation that a clear majority of start-ups face at their early stage. If success factors already exist, why start-ups still have uncertainties and fail? The answer to this question will give us a problem statement which is as follows:

Although there are (i) success factors like capital, market, and people and (ii) the concepts that govern them – bootstrapping, effectuation and scrum, the problem is non-existing recipe how these three concepts relate to each other. This situation creates a gap that is a cosmic black hole for the start-ups. By conducting empirical and theoretical research, this thesis addresses the gap that exists in the theory and investigates the start-up improvement process.

The purpose of this paper is to understand to what extent the concepts of bootstrapping, effectuation and scrum are implemented together in a start-up and how do they relate to the uncertainty. Therefore, this study addresses the research question:

‘How important are the bootstrapping, effectuation and scrum principles to eliminate the uncertainty?’

Hence, the contribution of this thesis is to discover practical uncertainties in the start-ups and check the possible solutions by integrating the above-mentioned three principles.

1.3 Target and Delimitations

This master thesis will be beneficial for entrepreneurs who confront uncertainty and gain some insights by looking into this area from the capital, people and market perspectives. Moreover, this thesis can provide useful information and guidance for any researcher who wants to gather materials about the entrepreneurship and the uncertainty in the early phases.

In terms of the intended scope, this thesis seeks to draw a very narrow line on the research question posed under section 1.2 above so that the focus will be only on the uncertainties which can emerge during the early phases of a start-up. The research question will specifically discuss bootstrapping, effectuation and scrum and how they relate to each other while eliminating the uncertainty.

Additional delimitations relevant for the thesis are as follows: Principles that will be used to examine Bootstrapping will be according to Winborg & Landström (2001); Effectuation will be discussed only from market perspective, and Scrum will be seen from the principle perspective and not from the strict team-focused way of working.

Lastly, there are some time boundaries set in this thesis that need to be considered. The delimitation was to set a two-month limit on the practical execution of the start-up in corporation with an innovation hub (Idélab), which will be explained later in the methodology section.

2. THEORETICAL FOUNDATION

The following chapter will present the theoretical foundation of this thesis – the role and importance of bootstrapping, effectuation and scrum.

2.1 Bootstrapping

Definition

Bootstrapping is a well-known term in many different fields such as physics, biology, law, software, etc. According to Cornwall (2010), bootstrapping first appeared in the early 1900s with the phrase “to pull oneself up by the bootstraps”, which means self-reliance. Through years, bootstrapping started being used within the business area as well and its meaning primarily refers to an entrepreneur that uses a limited amount of personal capital or funds to start or grow a business. One of the earlier tries to define the concept of bootstrapping was made by Bhide (1992). After conducting interviews with the founders of 100 companies, the author drew a concrete definition of bootstrapping as “launching ventures with modest personal funds”. This concept was narrow since the relation was only about starting a new business. Freear, Sohl & Wetzer (1995) defined bootstrapping as “highly creative ways of acquiring the use of resources without borrowing money or raising equity financing from traditional sources”.

Taking it chronologically since 2001, the concept of bootstrapping has been defined as:

- “Financial bootstrapping refers to the use of methods in order to meet the need for resources without relying on long-term external finance from debt holders and/or new owners” (Winborg and Landström, 2001, p. 235-236).
- An “opportunity for a firm to develop and grow without necessarily incurring additional debt (which would represent a further drain on working capital and cash flow) or involving a loss of control of the business (which is a widely perceived, if misunderstood, consequence of selling equity in the business)” (Harrison et al., 2004, p.310);
- “A set of methods used to meet a venture’s resource needs while avoiding financial transactions” (Neeley, 2004, p.4);

- The “methods for obtaining resources that collectively reduce the need for outside financing” (Ebben, 2009, p.346);
- “Finding ways to avoid the need for external financing or funding through creativity, ingenuity, thriftiness, cost-cutting, or any means necessary” (Barringer & Ireland, 2010, p. 344);
- “Bootstrapping is not just finding the cheapest way to do something; rather, bootstrapping is about creating the desired impact using only those resources that are necessary to achieve the desired outcomes” (Cornwall, 2010, p.146);

The above-illustrated list clearly shows that bootstrapping has been analyzed from different aspects and brought various insights into this area. However, taking into consideration the fact that Winborg and Landström (2001) are identifying bootstrapping with the long exhaustive list of 32 principles, the definition given by the latter authors will correctly serve the goals of the research. Hence, bootstrapping in this thesis will be discussed from these 32 principles’ perspective.

The definition of bootstrapping offered by Winborg and Landström (2001) in other words means a number of methods that aim to meet the capital needs without using any external funding (such as including other partners or taking loans) and to reduce the need for capital.

Although the general definition of bootstrapping is presented under this subchapter, the principles of it will elaborate on the essence of bootstrapping with more details in sub-chapter “Principles of Bootstrapping”.

Meanwhile, it is important to draw the connection line between entrepreneurship, startups and bootstrapping to show the readers to what extent the relevance of the latter might impact the success of start-ups and entrepreneurship in general.

Connection to Entrepreneurship and Start-Up

Bootstrapping, as a way to facilitate entrepreneurs’ endeavors to successfully develop a start-up with limited capital and build a prominent company, might be seen as one of the key concepts generally from entrepreneurship and start-up perspective.

To understand how bootstrapping affects entrepreneurship, it would be necessary to highlight some theories within entrepreneurship. For this reason, it is worth to emphasize important theories presented by Schumpeter (1883-1950) and Kirzner (1930-present).

According to Schumpeter's (1934) theory, economic harmony rules the existing economy. If the harmony is destroyed or damaged by the new services or products, the economy is at stake too. It is the entrepreneur, who is behind all these damages, and who uses its skills and characteristics to carry out services or products that cannot be fought by other competitors. That means that the damage of the economy is the entrepreneur's 'fault'. Even though this ideology is presented to be wrong, it has a positive wave hidden inside, the wave of development. The entrepreneur is considered to be a special individual who can bring damage to the economy. According to Schumpeter, the entrepreneur has a strong desire to conquer the market or one can say the world and is also driven by a positiveness to create new things within its independent individuality. (Landström, 2005)

Kirzner's theory (1982) deals with the entrepreneur's position within the market, where due to the variety of competitors it is characterized as unbalanced, uncertain one. However, some entrepreneurs can see turbulence and unbalances as opportunities to develop or change their business. Changes that are caused by unbalancing might bring positive achievements by the Kirznerian entrepreneurs, which brings the economy back to its harmony. (Landström, 2005)

Bootstrapping as tool to efficiently use capital and effectively achieve the desired outcomes in entrepreneurship should be considered as one of the strongest concepts for the entrepreneur either to detriment "economic harmony" and conquer the market (Schumpeter's theory) or to fill up unbalances and by doing so achieve harmony in economy (Kirzner's theory).

To have an entrepreneur's mindset means to think globally and not to limit the possible outcomes of the company or start-up. The entrepreneur should bear in mind the above-mentioned theories as a motivational tool that each step was taken by the entrepreneur, especially during developing a start-up, can cause enormous outcomes in the future even for the economy. Using bootstrapping principles during starting-up is one of such behaviors. To understand the relevance of bootstrapping in the start-up world, it is relevant to discuss the notion of start-ups.

According to Blank & Dorf (2012), a start-up is a company that is looking for a scalable, repeatable and useful business model that can describe how organizations are developing, spreading and attracting value. Blank (2013) highlights the importance of an entrepreneur to

create a business plan before the process of product development starts since it helps on the prediction of the unknown that the business might meet. Spieth & Schneider (2016) stated that when a business wants to be innovative, the business model is important, while an innovative business model can symbolize a competitive benefit for the organization. According to Ries (2011:27), a start-up is “a human institution designed to create new products and services under conditions of extreme uncertainty”.

Nevertheless, the level and the type of uncertainty will vary depending on the stage that the start-up is and on the kind of start-up (Ries, 2011). Leppanen & Hokkanen (2015) mentioned that a start-up can be defined either as *internal* or as *external*, which describes the situation if a start-up is within a business or not. There is a difference between a company and a start-up; Blank (2013) explains that a company is a constant organization where executes a new business model, while a start-up is a temporary organization where it looks for a business model.

The internal start-ups, that are within an already existing business, have the advantage of the access in information, resources, capabilities and the most important, easily capital access. The support they get from the ‘parental’ organization, provide a less uncertain environment and fewer risks (Leppanen & Hokkanen, 2015). However, there is a disadvantage for the internal start-ups, even though they try to create a business model from the beginning, they are limited by the current one (Blank & Dorf, 2012). On the other hand, since external start-ups are not within any existing business, they have to work more because they have limited resources and have more risks and uncertainties. Therefore, external start-ups have to create a business model and look for partners, revenues, customers and costs, while there is nothing to do with any existing business model (Blank & Dorf, 2012).

Start-up development phases in *Figure 1* clearly shows how tough it might be to achieve the level of Growth (scale and expand). It takes resources (time, finances, etc.), where bootstrapping, as a universal tool for both, whether it is an internal or external start-up, is an opportunity to minimize costs and increase the chance of success.

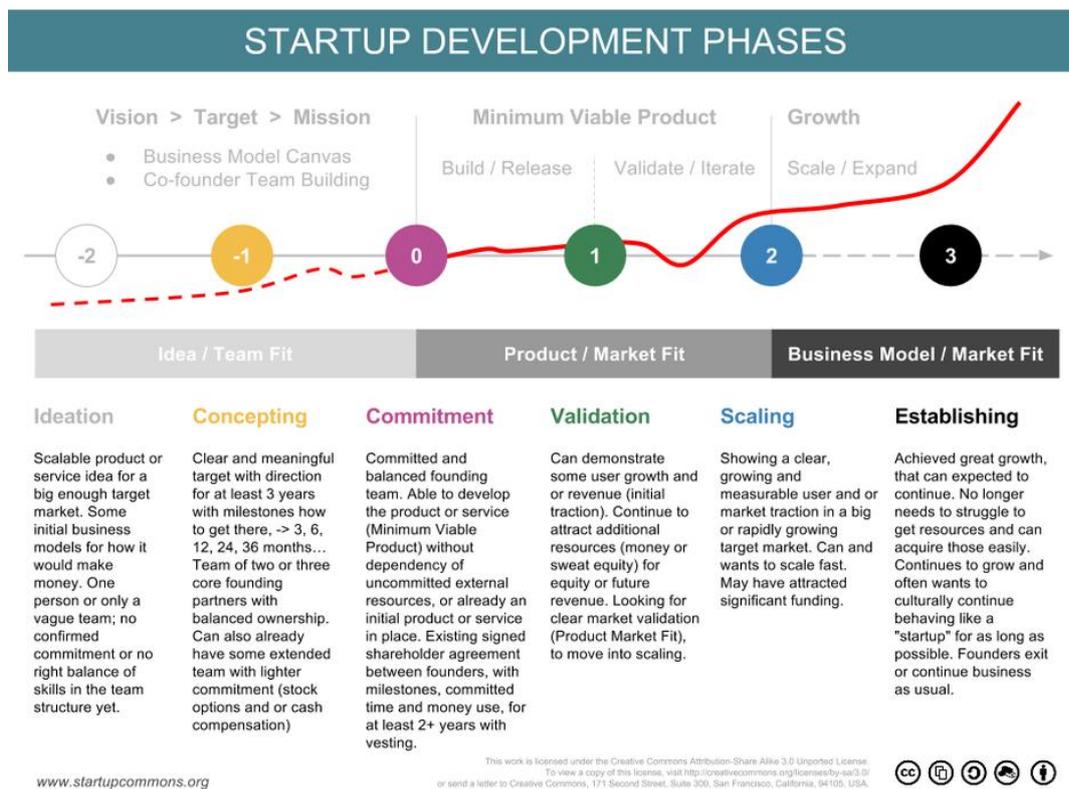


Figure 1: Start-up Development Phases (Startupcommons, 2015)

The short emphasis on entrepreneurship and start-up serves to highlight the relevance of bootstrapping. For more practical reason, the next sub-chapter will discuss how the start-ups or already existing companies should use the principles of bootstrapping from the standpoint of Winborg and Landström (2001).

Principles of Bootstrapping

The use of bootstrapping principles was examined by Winborg & Landström (2001). The investigation took place in Sweden where they examined small businesses which use the 32 bootstrapping principles (known as 32 bootstrapping techniques, too) identified back in 1997 (see Appendix 1). It unites principles such as e.g. usage of the second-hand facilities rather than buying new equipment or withholding manager’s salary for some period rather than spending finances for non-sustainable goals, etc.

The reasons for choosing those 32 principles of Winborg & Landström are clear – (i) the bootstrapping principles here are explained in depth by using 32 different categories, which guides the entrepreneur to the right way to minimize its costs and (ii) the majority of start-ups

participating in the research are partly or entirely of Swedish origin. Therefore, using Swedish co-author's bootstrapping principles are considered to be appropriate for this thesis.

Even though the 32 principles/techniques give the privilege of choice, at the same time some of them might look banal and not usable, such as the principles no. 10 and 11 in Appendix 1. It would be difficult to delay payments since the recent years most of the payments have to be done first, and then the product/service is provided. By having almost two decades since the principles were identified, these two special principles might be relevant nowadays only in occasions under a trustful collaboration or by using other payment methods, such as an invoice.

Going back to the investigation in 1997, the findings revealed six most commonly used principles and six not so commonly used principles of bootstrapping. The principles that are the most commonly used are as follows:

- 78% - Buy used equipment and do not buy a new one
- 74% - Find the ideal condition with the supplier
- 45% - Withhold the salary from the manager
- 44% - Delay the payments to suppliers on purpose
- 44% - Use routines so the invoicing will speed up
- 42% - Borrow the necessary equipment from others (Winborg & Landström, 2001)

The above-listed bootstrapping principle does not have the same impact on a business: e.g. the first five principles minimize the usage of financial resources of the business, while the last one minimizes the usage of financial resources since it depends on the individual social network (Winborg & Landström, 2001).

On the other hand, there are also the not so commonly used bootstrapping principles, such are:

- 0% - Receive subsidy from the Swedish Innovations centrum
- 3% - Raise capital from a sharing company
- 6% - Receive subsidy from the Swedish National Board of Industrial and Technical Development
- 8% - Receive subsidy from the Swedish Country Labor Board
- 8% - Have shared employees with different companies
- 8% - Have shared equipment with different companies (Winborg & Landström, 2001)

Although the principles derive from the late 90s, they are still relevant and used by the companies and start-ups in Sweden, according to the interviewees.

It is obvious that bootstrapping should be deemed individually depending on the market and the area of business. Van Auken (2005) made a study in the United States in the use of bootstrapping principles in the area of technological and non-technological businesses. The result revealed that the two areas of technological and non-technological differ from each other. Mainly, the author found that the principles that improve the income are essential to the technological businesses while the methods that minimize the costs are essential for non-technological businesses. That means that the traditional way of funding is more convenient for non-technological businesses than for the technological ones.

The relevance of Bootstrapping from the Thesis Perspective

There are various sectors that have not been researched enough. There is a lack of comparison. Having investigated how the participant start-ups (technological and non-technological) in my personal research utilize bootstrapping principles in their businesses while combining uncertainties from effectuation and scrum perspective, the thesis will draw interesting conclusions.

2.2 Effectuation

Definition

Effectuation is generally used by the expert entrepreneurs; According to Dew, Read, Sarasvathy and Wiltbank (2009), ‘expert entrepreneurs’ are the entrepreneurs that have an experience on successful investments by giving an excellent performance on applying methods and processes instead of using the logic to take decisions; The experience entrepreneurs have allowed them to make decisions and reason from limited amount of data. Even though effectuation is focused on the individualistic level, its principles can easily be applied on an organizational level as well. Effectuation can also be seen as a strategic direction that emphasizes the effectuation’s principles adoption from the employees (Werhahn et al., 2015). An organizational or individual environment, in order to be dynamic, demands innovative

techniques for maintaining competitive improvement and for that organizations are searching new ways to be more innovative and proactive (Werhahn et al., 2015).

To put this definition in simpler words, effectuation in practice for entrepreneurs means to find a place in the market, to define the market of the start-up – to identify their own status (Network and knowledge they have), to identify risks they want to carry, etc. These practical principles of Effectuation will be discussed more concretely in the sub-chapter “Principles of Effectuation”.

In the interim, it is necessary to mention why and to what extent effectuation matters from entrepreneurship and start-up perspective.

Connection to Entrepreneurship and Start-Up

Referring to the above-mentioned Schumpeter and Kirzner theories, they talk about the harmony of the economy that is brought or deprived by the unbalance or uncertainties that exist on a market. Whereas market includes the development, advertisement and the promotion of a service or product, effectuation as a tool to define entrepreneur’s place on a market can be a strong entrepreneurial weapon for start-ups to fight for their place in the unbalanced business environment.

While the unbalances are achieved by the Kirznerian entrepreneurs, the economy is coming back into harmony. Therefore, using effectuation correctly brings prosperity to the start-up and harmony – to the economy. Or following Schumpeter’s theory, to destroy or damage economic harmony requires the entrepreneur’s knowledge, skills, and characteristics to carry out services or products that the competitors can not oppose. The skills and knowledge to invade the existing market could be effectively done by following effectuation principles. Hence, effectuation might be perceived as a tool which plays a vital role in economic harmony by defining a strategy that the entrepreneur should use for a specific market.

Principles of Effectuation

There are five fundamental principles that hold on around effectuation (Sarasvathy, 2008). The first principle is ‘**bird-in-hand**’. During this principle, the entrepreneur designs potential effects using them in the set of means. The entrepreneurs usually start by identifying

themselves (who you are), the knowledge they have (what do you know), and the network (who do you know), rather than asking what their goal is. The three means (identity, knowledge, and network) will identify the resources.

Since entrepreneurs have the means' overview, most important for them is to know how to handle these means during the process. Network and knowledge are important means since knowledge is a value that is given to the product by providing information from the right people, while network adds value to the final product/service through co-creation/co-production (Prahalad & Ramaswamy, 2004). On the other hand, identity is new in effectuation and includes ways of deciding and living or preferences for the process than exact consequences (Sarasvathy, 2008).

The second principle is called '**affordable-loss**'. The main concern of this principle is not to invest more than the risk you take. This principle defines how much the entrepreneur is willing to lose and to create new ends and new means; that way the focus is on increasing returns by using optimal strategies.

The affordable-loss does not rely upon the company or venture, but on the entrepreneur and the circumstances and all the stages of the process. Affordable-loss does not predict the future but minimizes the dependence on predictions.

The third principle is the '**crazy quilt**' and with the first principle, 'bird-in-hand' is important for the effectual logic. During the 'crazy quilt' the inputs the stakeholders make should be taken into consideration without paying attention to the costs. Effectuation during this principle emphasizes the stakeholders' pre-commitments so they can minimize the uncertainty and establish limitations. Stakeholders are selected for their participation in shaping the start-up and not selected for the venture goals. The link 'crazy quilt' and 'affordable-loss' have, is that both focus on the low capital level (Sarasvathy, 2008).

The fourth principle is the '**lemonade**' and comes from the saying "When life gives you lemons, make lemonade" and involves the situations when unexpected surprises happen within the process and those surprises are used. In addition, unexpected situations have to be used as opportunities for development.

'Lemonade' principle is crucial for effectuation since it deals with the goal setting. Often, this goal is not settled strongly which means that goals might change when possible surprises appear. That way, uncertainty can be seen as a process or resource rather than a disadvantage.

Thus, this principle translates unexpected surprises into opportunities for development (Sarasvathy, 2008).

The fifth principle is '**pilot-in-the-plane**' and has to do with co-creation and future planning with the chosen partners. For the last principle, effectuation focuses mostly on the control of the uncertain future. Sarasvathy (2008) wrote "The pilot in the plane is often the window to unexpected opportunities and the key to outliving disasters"; this quote means that even though there is the autopilot, in case that something happens you have the pilot.

Thinking deeper and more critical about the above-mentioned principles, it is obvious that they encourage the entrepreneurs towards innovation. Taking into consideration the 'lemonade' principle and its description of the lemonade, it can encourage the entrepreneur to use every possible chance that might face during the process and develop or use it.

The relevance of Effectuation from the Thesis Perspective

Having effectuation as one of the principles of start-up/entrepreneurship is a way to eliminate uncertainties by using existing knowledge, connections, and skills. Next, to bootstrapping and scrum, it leads the entrepreneur to effectively conduct its business activities when it comes to market conquer. From this standpoint, it is interesting to pay attention to effectuation. It will facilitate to identify common practical behaviors or mistakes and contribute to the thesis.

2.3 Scrum

Definition

Scrum is a methodology within project management used on agile software development which uses incrementation and iteration. Its design was modified for projects that need rapid change by developing a better connection between the team members, project developers, and the project owners. It was 1986 when Hirotaka Takeuchi and Ikujiro Nonaka introduced scrum as a new product development standard within consumer and auto product companies (Takeuchi & Nonaka, 1986). According to Sutherland (2001), scrum defined as the first agile framework for software development, this limitation brings challenges on the field and motivates researchers to investigate more. It was 1993 when scrum was used for the first time within software development projects (Sutherland & Canwell, 2004). Even though scrum became a

common method since it was presented for the first time, the percentage of the existing literature evidence on agile software development that focuses on scrum is very low, around ~3% (Dybå & Dingsøy, 2008). Less researched area of it creates more uncertainties. That is why it is one of the reasons why scrum has been chosen to be studied. The following paragraph explains very briefly the scrum framework.

Within the scrum framework, the project development team consists of different roles. Next, to the team which conducts the various tasks, there is a scrum master and a product owner (Auer et al., 2003). The scrum master is the leader of the team and the role of this person is almost the same as a project manager. The scrum master is responsible for the organization of the tasks, empowers and instructs the team, is in charge of the stakeholder management, guarantees the good work quality as well as by performing some tasks helps the project development process (Kautz et al., 2014). The product owner is the representative of the customer who has all the information and the needs which are essential for the product vision. The product owner ensures that all the knowledge and information is shared with all members of the team and is taken into consideration during the development process. The product owner, in the end, validates whether or not the final product accomplishes all the requirements. New features are requested by the product owner. These new features are then prioritized in the product backlog, which is a table where all the tasks are set by importance (Auer et al., 2003; Kautz et al., 2014).

Besides the product owner, every team member has the possibility to initiate and create new features, but, it has to be under the product owner's supervision so that the latter can ensure the product's requirements and expectations (Brechner & Waletzky, 2015).

The product backlog is divided by "Sprints" – time period between two weeks and one month. During this period the team holds a meeting every morning that is called "daily scrum". Here they discuss the tasks each member has during 'Sprint' to accomplish – to be 'Done' and whether or not potentially releasable and usable product increment is developed.

Those daily scrums and sprints construct the workflow during the time period set by the team. The sprints' time frame needs to be defined from the very beginning. While a sprint starts, each team member gets a new task from the product backlog that needs to be achieved by the end of the sprint. When the product is 'Done', it gets tested and either it gets released or it can be edited in the upcoming sprint. The reason for the latter is one of the scrum rules according to

The agile approach and its characteristics one could say that they differ from the ‘traditional’ approach in some ways. The agile methods focus on the execution stage while the ‘traditional’ focuses on the planning stage (Jayawardena & Ekanayake, 2010). While an agile approach is applied, its target is the simplicity and the waste elimination (Association for Project Management, 2017).

Communication between the team and the stakeholders is something that agile methods emphasizing on, in order to guarantee the value of the project. The method can use iterations during the process to keep the flexibility and to adjust some tasks that allow to include some changes that might appear at that moment (Boehm & Turner, 2005). By breaking down the process into small stages, the tasks can be managed better and can be achieved easier. Even though those iterations might bring pressure on the work flow and on the time management, the performance of the employees is increasing which means better productivity (Kautz et al., 2014).

Therefore, agile project management claims to increase the results by eliminating the budget and time pressures (Raval & Rathod, 2014).

Self-management and **self-direction** are some characteristics of the agile teams that give more responsibilities to every member. To keep the agility within the team, it needs teamwork and active communication. In that case, the tasks of the manager are to coach them and manage the tasks between the team and the stakeholders to reduce the workload and keep them focused (Association for Project Management, 2016).

However, the use of agile project management can acquire some challenges. For example, a narrow mindset within the team members of the organization can prevent the adjustment of the agile approach. There is also resistance for changes which arises from the lack of knowledge on the field of agile approach; Communication complexities or inefficient collaborations will not bring the desired outcome. This resistance, one can say, is connected with the organizational culture that was mentioned before, which either prevents or encourages the process changes (Drury et al., 2012; Estler et al., 2013). Furthermore, it is challenging to keep the right way and not to lose track of the goal and the total project’s picture while focusing on the short iterations. As a result, traditional and agile project management can be successful, and the conditions must be critically assessed to choose the appropriate approach for a project or organization (Estler et al., 2013).

The characteristics that were described above presents the framework that all the tools use within agile project management. To sum up, project manager, progressive team, communication with the shareholders, tight deadlines, flexibility and self-management are the most common features of agile project management. These are features, that scrum includes and combines with its own principles, which will be discussed in the following sub-chapters.

Scrum Principles

The agile manifesto is the core of the principles and scrum is mainly built on the same four values which are (Scrum principles, 2016):

- Individuals and interactions over processes and tools;
- Working software over comprehensive documentation;
- Customer collaboration over contract negotiation; and
- Responding to change over following a plan.

Except for these four values, scrum has 6 basic principles that the users need to follow (Scrum principles, 2016):

- Empirical Process Control - This principle emphasizes the core philosophy of scrum based on the three main ideas of transparency, inspection, and adaptation.
- Self-organization - This principle focuses on today's workers, who deliver significantly greater value when self-organized, and these results in better team buy-in and shared ownership; and an innovative and creative environment which is more conducive for growth.
- Collaboration - This principle focuses on the three core dimensions related to collaborative work: awareness, articulation, and appropriation. It also advocates project management as a shared value-creation process with teams working and interacting together to deliver the greatest value.
- Value-based Prioritization - This principle highlights the focus of scrum to deliver maximum business value, from early in the project and continuing throughout.
- Time-boxing - This principle describes how time is considered a limiting constraint in scrum and used to help effectively manage project planning and execution. Time-boxed elements in scrum include Sprints, Daily Stand-up Meetings, Sprint Planning Meetings, and Sprint Review Meetings.

- Iterative Development - This principle defines iterative development and emphasizes how to better manage changes and build products that satisfy customer needs. It also delineates the Product Owner's and organization's responsibilities related to iterative development.

Depending on the type of every start-up, e.g. solo-owner or with partners or with investors, the above-mentioned principles are using accordingly. Not all of them can be used for a solo-owner entrepreneur; e.g. the latter cannot have transparency since he/she is solo.

The relevance of Scrum from the Thesis Perspective

It could be difficult to see the connection of Scrum to the start-up idea and entrepreneurship, in general, since it is a method used in project management. However, implementing a project is a way to evolve. Evolution is the first main goal of start-ups to conquer the market. Using scrum in a start-up is a chance to enhance the discipline and result-oriented approach within a start-up team. From this perspective, scrum might be considered one of the best ways in start-up and entrepreneurship to achieve success.

Since the thesis aims to combine uncertainties existing in the capital, market, and people while making the first steps in start-ups, the research of this thesis will explore the use of scrum framework (agile project management) within bootstrapping and effectuation.

2.4 Theoretical connection of bootstrapping, effectuation and scrum

The three success factors that were mentioned before, capital, market and people, each one has strong connections with the literature that was discussed before. In Figure 3, we see an illustration of how success factors connect with the theory and where the gap, which will be researched, is.

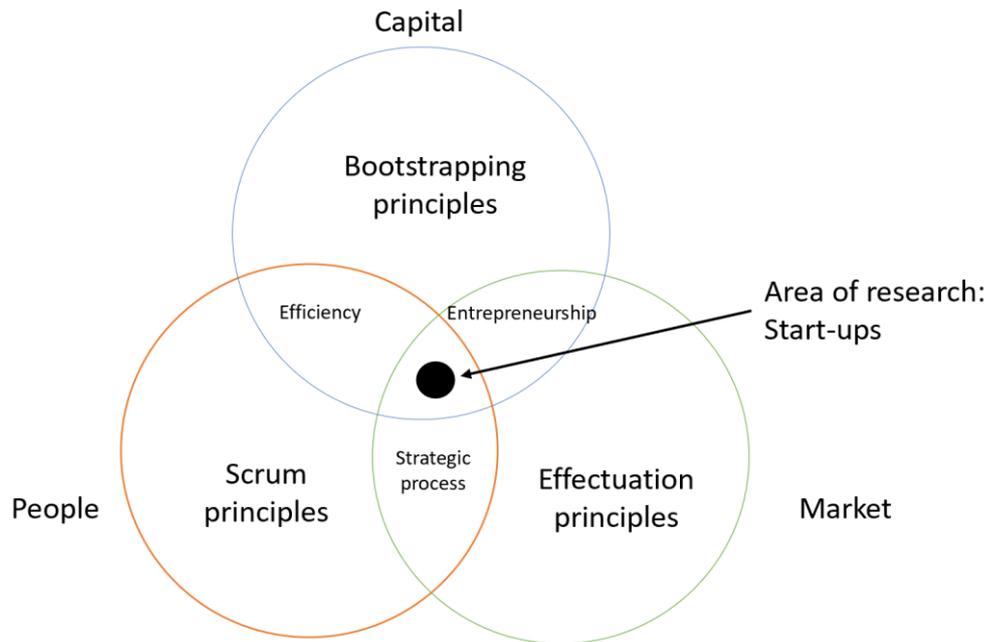


Figure 3: Connections between success factors and theory.

The main purpose of bootstrapping's principles is to provide ways to eliminate the expenditure, which proves its connections with the 'capital'. Moving on to the effectuation principles; they are at the general level of start-ups, but in this paper, the focus will be mostly on 'market' perspective since effectuation identifies the market through networks and knowledge. The final theory is about the scrum principles; they have to do with managing and organizing relations with partners and processes, something that could easily be part of 'people' since relations between partners might be complicated and scrum principles can provide a way to solve uncertainties.

In Figure 3, we see in the blue circle the bootstrapping principles that are part of 'capital'. The capital, in the down-left red circle, is connected with the people and the scrum principles. What bootstrapping, and scrum principles have in common is the efficiency, both principles aim to eliminate something in a process and be efficient, e.g. bootstrapping aims to reduce cost while scrum aims to reduce time. Secondly, the green circle is about effectuation and the market. Looking at the connections between scrum and effectuation principles, what both have in common is the strategic process they both include, e.g. both scrum and effectuation include a process towards a better result. In the end, the connection between effectuation and bootstrapping is, of course, the common area of study, entrepreneurship. The crossing point of

these principles creates the main focus of our thesis – the gap that exists in start-ups when it comes to the interplay between these principles, the gap that creates uncertainties.

By researching the common area of these three principles, this study will contribute to the field and will come a bit closer to offer entrepreneurs a chance to compare different fields that are connected to the bootstrapping/effectuation principles and their use. Having no research that combines the use of bootstrapping/effectuation principles with the scrum framework makes the thesis unique and very practical for those who are facing uncertainties in their start-ups.

3. METHODOLOGY

This chapter focuses on the description of the data collection. First, the research approach will be presented, followed by the data collection and the methods that were used. In the end, the data analysis with the Gioia methodology will be discussed.

3.1 Research philosophy

Ontology and epistemology have an important influence on the direction of the research and on strategy and the research design (Eriksson & Kovalainen, 2015). The following paragraphs explain the philosophical choices of ontology and epistemology.

Ontology is the consideration of ‘being’ and is related to ‘what is’, i.e., the existence’s nature and structure as such (Crotty, 1998) or what it is available to know more about the world (Snape & Spencer, 2003). For this research, the relativist ontology has been chosen according to which, “reality is made of multiple truths, and facts depending on the perspective we observe” (Easterby-Smith et al., 2015). The ontological position of relativism acknowledges that knowledge has been created by individuals and their interactions (Easterby-Smith, et al., 2015), and, thus, denies “that there can be any universal or apodictic truths” (Smith, 2008, p. 29 750). Relativism also recognizes that the understanding/accepting of the emerging findings is relative (Smith, 2008) since all individuals have different opinions, knowledge, identities, experiences, etc., which creates dependence on the reality of the opinions of the people concerned (Easterby-Smith, et al., 2015), and reference points (Rorty, 1991). In this thesis I intend to gather information through interviews with people that have gained different experiences. As opposed to believing that there is a universal truth about using the principles of bootstrapping, effectuation and scrum, I aim to learn more about the participants’ viewpoints. Thereby, I try to treat each of them as nuances that are a part of a bigger understanding.

Taking into account the Ontological positions of relativism, the **Epistemology** of this work will be considered by taking the interpretivism approach. The **Interpretivism** approach rejects certain realities and proposes that realities are based mainly on perceptions rather than on objective truths. “Interpretivism advocates that it is necessary for the researcher to understand differences between humans in our role as social actors. This emphasizes the difference

between conducting research among people rather than objects such as trucks and computers” (Saunders et al., 2005, p.116). To put it differently, interpretivism aims to understand and interpret the complexity of a phenomenon and the awareness of individuals in the social setting (Collis & Hussey, 2014). Additionally, with the intention of understanding the habits of others, emotions and feelings are mandatory to be involved in interpretivism (Saunders et al., 2012). The reason of using an interpretivist approach lies on the attempt to examine a process in another context from which it was initially designed for, constituting another perspective by evaluating the theory if it can work (or not) as it was intended. In this thesis, the principles of bootstrapping, effectuation and scrum are looked in the social setting and context of the interviewees.

3.2 Research approach

The research approaches used for the process are both, deduction and induction. Using deduction, in this thesis, is relevant since it gathers important data, which later on forms a ground for induction and a new theoretical approach. Specifically, in the beginning of the thesis, by focusing on the bootstrapping, effectuation, and scrum principles, as well as on a means of the data collection, I employ deduction. It helps the research focus to be narrow and more specific. After defining my focus, it is a turn for induction to come on the playground and by analyzing the given reality, create a new theory. The literature review, later on, in the current sub-chapter of 3.2, will more concretely describe how deduction and induction were used.

Meanwhile, I will touch the research approach for the data collection, which is based on semi-structured interviews and introspection. The reason the two methods are chosen to be part of this thesis is that both methods help to reflect on realities and can create new theory within the area.

Interviews

One of the most valuable social sciences in human observation within a society is **Qualitative** research.

“Qualitative research is multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them.”

Denzin and Lincoln (1994, p. 2)

In management research, even though case study is one of the most popular methods of qualitative research, case-based studies have also differences in methodologies by operations and purposes, containing interpretative case research (Klein & Myers, 1999), positive research (Eisenhardt, 1989; Yin, 1989), narrative research (DiMaggio, 1995), critical research (Morrow, 1994), ethnography research (Gephart, 2006), process research (Pentland, 1999), and action research (Greenwood & Levin, 1998; Gibson, Gibson & MacAulay, 2001). In general, qualitative research, that can defeat all the methodology limitations of hypothesis and theory-testing quantitative research, is followed in management studies. The aim of qualitative research is to build theory by exploring research (Gephart, 2004). The main purpose of building theory is specifically suitable for the dynamics of technology and concurrent business contexts. This thesis is based on qualitative research at the start-up level. It explores how bootstrapping, effectuation and scrum principles might change the result by implementing them that can lead to social innovations through an actionable process. Semi-structured interviews and action interventions held for the data collection which data are analyzed with various aspects and further interpreted with various theoretical lenses that are based on the literature discussed in the following chapter.

For collecting qualitative data, it is common to use observations and interviews (Ghauri & Gronhaug, 2005). In addition, “interviews are often considered to be the best data collection method” (Ghauri & Gronhaug, 2005, p.132). There are three types of interviews, they can be structured, unstructured and semi-structured. Using semi-structured interviews for this study will be a reasonable choice since semi-structured interviews are used when the researcher is not only interested in ‘what’ and ‘how’ questions, but also in ‘why’ questions (Saunders et al. 2005). Semi-structured interviews are mostly useful in the following conditions:

- When the researcher needs as much information as possible from the interviewee, regarding the phenomenon that is about to be developed from the interviewee’s ‘world’ (Cooper & Schindler, 2001);

- When the questions are complex and open-ended in nature (Hussey & Hussey, 1997); and
- When the logic and order of the questions need to be divergent (Saunders et al., 2005).

Introspection

According to Gustavsson (2008), introspection implies self-observation. This method was performed for two months (as mentioned in limitations section) during my participation with the innovation hub by exploring the uncertainty in the early phases of a start-up. Introspection is considered to be a suited method for this study to provide a proposal for the uncertainty. The precise type of introspection that will be used for the research is descriptive introspection which simply describes one's conscious experience by asking "What did I perceive/think/feel?". Descriptive introspection might be about dreams or daydreams but it might be about actions and real perceptions as well. The reason to use introspection in the thesis is to experience the early process of the start-up and understand it from my practical perspective. Introspection is the first method that is used for the data collection, and its understanding could be a basis for the interviews that followed (chronologically).

The introspection is applied as an interpretive technique, to gain a perception of consumption phenomena from an insider's view. Having experienced the uncertainties, I would be able to formulate questions that could be relevant for other start-ups while making their first steps. The introspection can be found at the end of the thesis as Appendix 2.

Literature Review

As mentioned above, the literature review will explain how deduction and induction serves the goals of the thesis.

For deduction purposes, I conducted a literature review by applying the snowballing approach (Easterby-Smith, et al., 2015) to allow the existing knowledge from different aspects and gaps in the literature. The areas of knowledge that I researched or was focused on are "entrepreneurship", "bootstrapping", "effectuation", "start-up", "scrum" and "principles". The database that I used for the literature review is Scopus and through this database I followed snowballing; the total number of pages that I used is 77. To find the appropriate literature I combined the areas of knowledge (e.g. "entrepreneurship AND bootstrapping") and in some

occasions I paraphrased some words (instead of using entrepreneurship and bootstrapping, I used “entrepreneur AND capital”). Meanwhile, I identified gaps in the existing knowledge about the literature that merges the bootstrapping, effectuation and scrum principles. It helped me to create the present research question.

Concerning the data collection, a researcher has to collect miscellaneous data by using various methods (depending on the type of research) and involving researchers and different individuals triangulating the objective reality in the current thesis (Easterby-Smith, et al., 2015). Therefore, I explain the sampling strategy, which allows me to reveal different realities, as well as the analysis, which enables the emergence of different ideas. In the discussion, I make use of discovered and existing aspects. Thus, the philosophical stand that I chose permits this study to bring the light to a deeper understanding of the bootstrapping, effectuation and scrum principles and their connections with the uncertainties.

For induction purposes, from my point of view, a deeper understanding can be achieved if and when I am able to define the differences in the entrepreneurs’ approaches while they identify their uncertainties and sufficiently use the principles to eliminate some of the uncertainties. This also means that I should put myself in a position to provide the reader with explanations of the perspectives that define the concept of bootstrapping, effectuation and scrum, and to support the reasons for the entrepreneurs' ways of dealing with uncertainties in the early phases of establishing a start-up. These descriptions have to be based on my estimates of collected knowledge, experience and insights.

3.3 Collection of empirical data and approach for literature review

This study used two different methods of data collection: semi-structured interviews and introspection. Five start-ups were chosen for the interviews, and for the introspection, the author’s experience, as a start-upper, will give additional data.

Interviews

Those points are situations that are found in this study. All interviews were held face-to-face, and the questions that were prepared was in a list of different themes (capital, market, and

people). The questions used for the interviews should not be very specific as they could hinder other ideas and perspectives from surfacing (Saunders et al., 2005). were based on the principles of bootstrapping, effectuation and scrum can be found in Appendix 3. The purpose of the questions was to define the process of start-ups and the methods they use to eliminate uncertainties.

Semi-structured interviews provide the flexibility to ask interviewees to analyze more points or give further examples which are important when the research adopts a phenomenological epistemology (in this case - interpretivist). There might be an opportunity to get in-depth data while probing on the ideas and messages presented by interviewees.

Based on experiences I had with the introspection, I tried to formulate the questions for the participants. The questions have to provide information if the entrepreneurs, (i) have had any uncertainty during their early phases while establishing their company, (ii) had knowledge of the principles and (iii) used any of them, as well as (iv) the contribution of the principles to the uncertainty.

In the beginning of the interviews, as an introduction to the participants, I briefly described myself and the purpose of the research. I explained the way that interview would look like [i.e. I ask the questions and write them down (word by word)] and I asked for permission if they want to reveal their names/company's name/etc. During the interviews I tried to be more active, and I asked follow-up questions to understand deeper the answers and to avoid the risk of getting partial information. As a result, the questions in some cases are not put in the same order as mentioned in the interview manual. In the end, if something was unclear to me I asked for corrections.

Introspection

Since I employed personal introspection in the thesis, it is relevant to mention that my participation as an author of the thesis occurred through cooperation with Idélab. Idélab is an innovation hub within the academia and specifically, it is part of Mälardalen Högskolan, the university where this master thesis is conducted. Idélab is the oldest innovation hub within academia in Sweden which counts over twenty years engaged with the market. The knowledge of the process to establish a start-up and the total contribution to the paper were the reasons for the cooperation with Idélab.

The personal introspection in corporation with the above-mentioned innovation hub provided many insights according to the type of the company that I decided to proceed with. The natural ‘objects’ of introspection are for the most part mental. While I will regularly use sensory and perceptual experiences as examples of cases we introspect, it has to be understood that emotional and cognitive states, such as desires, beliefs, fears, memories, etc.) can be potential ‘objects’ of introspection.

The method of obtaining introspective reports is in the category of diaries since I kept important notes of each situation that I perceived. The notes, depending on the situation, sometimes were a narrative or a sentence that described an important fact that just happened.

To be more specific on my actual actions during the introspection, I will explain how I used the diary/notes. At the beginning of the process, after the very first meeting with Idélab, I decided to keep track of my actions. I took an empty notebook and I divided it into two parts, the first was the To-Do list and the second was the ideas, feelings, actions, and results of my To-Do list or anything that could influence my process in any way. The list started filling up with actions for the canvases that I had to do for the Idélab; canvases such as business canvas, lean canvas, competition canvas, business model canvas, and project canvas. All canvases needed, (i) online research to identify competitors, similar ideas, etc. and (ii) to find possible help from the personal network instead of interacting with stakeholders or individuals to make door-to-door research. The first weeks I wrote on diary notes about possible people that might be helpful for my start-up and how their help would add value. As I mentioned also in Appendix 2, my uncertainties were not many since I took a safer path where I had many contacts that could help on the start-up that I want to establish.

After the period of canvases, I had to take more action and start thinking about a prototype. That part needed more time since I had to develop something. The notes that I kept during this period were mostly about the ideas I had about prototypes such as, children’s interests (games, activities, skills, etc.), children’s interactions with their classmates and teachers, behaviors. My routine that period was to go to the kindergarten and to observe children and teachers. Because of the fact that I was working I could not skip my responsibilities and write down my thoughts, so I decided to keep mental notes and at the end of my shift to write down directly all the insights I collected. At that point of introspection, I started getting confused because I felt that the product/service every entrepreneur wants to build might take more time than it was estimated in the beginning. On the other hand, involving others (end-user or stakeholder) in the

process of co-creation, the entrepreneur might need more time which can be beneficial for the outcome.

After the two-months' time-limit of introspection was over, to collect my data I went back to the notes, so I could read and remember my conscious experiences. The quotes from my notes that were used for the data analysis - were written by following the main theme of this thesis - the capital, market, people and uncertainty.

The data that were collected from the introspection were added to the data from the interviews before using the Gioia methodology for the data analysis. Therefore, the data from personal introspection will be introduced, along with the interviews, as quotes (6th participant) in the fourth chapter - Findings.

Sample

The target for the semi-structured interviews and data collection were start-ups that did not use external capital or any investor. That way the availability of start-ups was limited and more challenging, which can possibly increase uncertainties. It makes the interviews more valuable to make research on for this thesis. The number of start-ups that participated was 5.

	Type of company	Year of establishment	Size of company	Date and location of interviews	Duration of interview
1: Start-up 1	Drop – shipping	2018	1 person (male)	23 rd March 2019 – public area	59 min
2: Start-up 2	Educational center	2017	4 partners (2 female – 2 male)	28 th March 2019 – private area	67 min
3: Start-up 3	Online platform	2018	3 partners (1 female – 2 male)	8 th April 2019 – public area	52 min
4: Start-up 4	Medical center	2015	1 person (male)	9 th April 2019 – online interview	45 min
5: Start-up 5	Technological devices	2017	2 partners (male)	11 th April 2019 – online interview	53 min
6: Introspection	Educational	Not yet	1 person (male)	Data collection between 1 st February – 31 st March	Introspection
Total					4 hours & 36 min

Figure 4: Sample of data collection.

Except for the interviews, the introspection was taken into consideration as another input on the data collection. The introspection was from my perspective during participation. The total number of start-ups for the data collection are 6.

3.4 Ethical Consideration

Winter (1987) described some ethical principles that all the researchers should consider when conducting a research. Firstly, the researcher must be sure that all relevant people, authorities, and committees have been considered, and that the project guiding principles are accepted before the beginning of the research. All project members must have permission to influence the work, and for those who do not want to participate, their wishes must be respected. Secondly, the project and its development have to be visible and accessible to others for suggestions during the research process. Before publishing any work, if there is any description of others' work or points of view, they must be negotiated with all the participants. Finally, the researcher is responsible for maintaining confidentiality during the research process.

My ethical considerations based on these three ethical principles. Firstly, before involving in the research, I ensured that the participants were willing to contribute the work. Therefore, I have received consent from participants for further actions. Secondly, all the participants were explained that they could have access to the information connected to their participation in the research (i.e. interviews, quotes, the analyzed materials, conclusions, etc.). Lastly, the start-ups/companies were given confidentiality. Owing to it, the research will not reveal the names of the companies or the names of the interviewees. The reason to do so is financial and legal – no one should be able to identify the start-up or a company that might have had or is having some challenges in their business activities caused by some uncertainties, or which of them have used which principles to achieve further progress.

3.5 Data analysis

The analysis of the data is based on Gioia methodology. According to Gioia et al. (2013), semi-structured interviews are the heart of studies that implement this methodology, since through semi-structured interviews the data obtain retrospective descriptions on the interviewee's experience. Gioia methodology seems suitable for the current research since the focus of the

research is to understand uncertainties from bootstrapping, effectuation and scrum perspectives.

Figure 5 is an illustration of an example by Gioia, Corley, and Hamilton (2013) which presents how the concepts, derived from interviews, can form themes and aggregated dimensions.

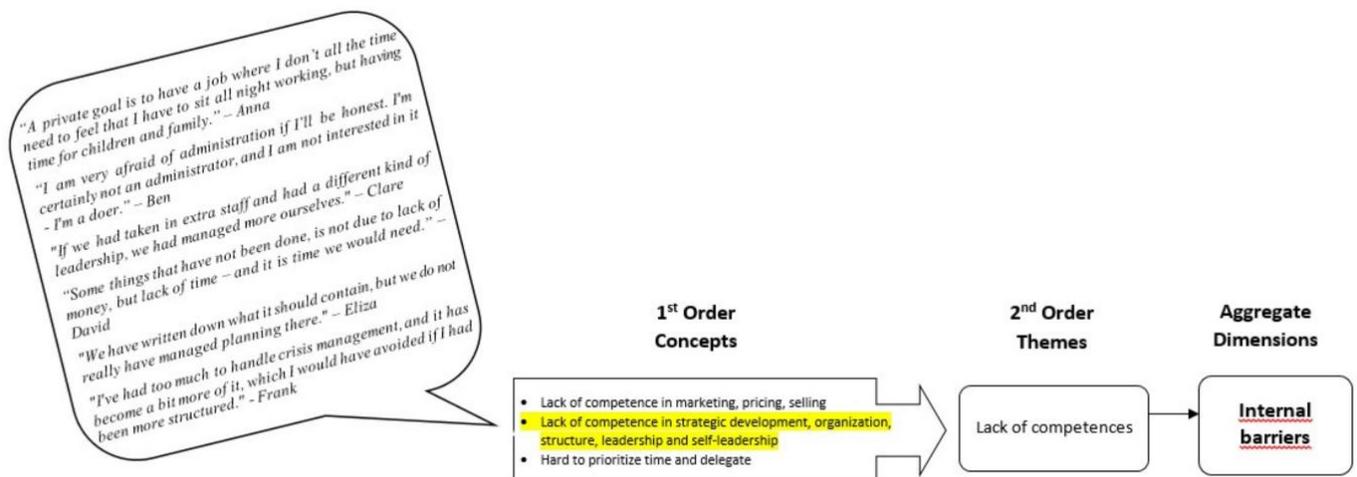


Figure 5: Example of how a concept is built in creating data-structure (Gioia et al., 2013).

According to Gioia (2013), there are several steps to follow to draw the structural analysis of the data. The first step is to transcribe the interviews where all quotes of the participants are collected for further categorization. The second step is to extract the quotes in a specific way so that after being coded, they form similar themes – the first order concepts. The third step is to find the similarities and differences between the first order concepts to create second-order themes. The last step is to create aggregated dimensions according to the second order themes and based on the theoretical considerations that are relevant for the thesis.

To draw Figure 6, the interviews (Appendix 3) and my introspection (Appendix 2) have been transcribed, extracted and coded. According to the data that I have collected, I could form the first order concepts with sixteen different categories (e.g. Behavior, Unconscious moves, Worry, and Identification), which could be paired with each other with some common themes – so-called second-order themes (e.g. Mentality). The sixteen categories from the first order concepts formed four different themes of the second order themes (Mentality, Action, Probability, and Connections). The latter four categories helped me to identify two aggregated dimensions – Internal Uncertainties and External Uncertainties.

Since the aggregated dimensions are based on the theoretical considerations that are relevant for the thesis, the internal and external uncertainties are the dimensions that correspond my research question dealing with the capital, market, and people.

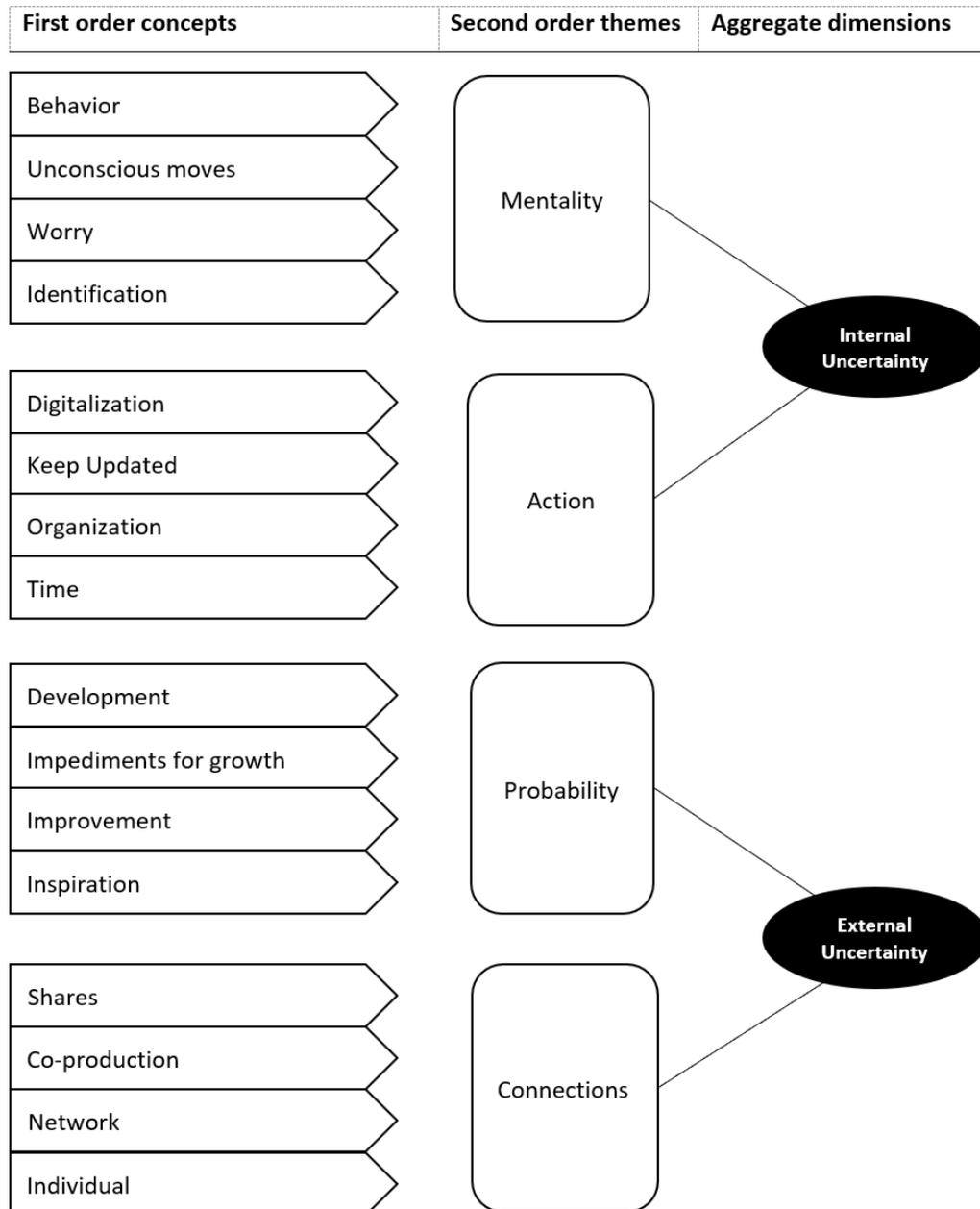


Figure 6: Data structure

3.6 Trustworthiness

According to Lincoln and Guba (1985), there are some criteria to evaluate the quality of the research method utilized during the research. The researchers emphasize the importance of trustworthiness, which involves the establishment of credibility, transferability, and confirmability.

Lincoln and Guba (1985) describe that credibility needs to provide confidence in the truth of the findings. One of the ways to establish credibility is through member-checking. It is taking place when the findings are submitted back to the participants to double-check whether or not conclusions and interpretations align with the participants' opinions. The way that member-checking performed in this research was formal since at first participants were asked directly after the interview if their opinions were perceived properly by double-checking the script written down during the interview. Later, they were asked to check if the findings and the data reflect their ideas.

Transferability means that the findings are transferable and applicable to other contexts (Lincoln & Guba, 1985). The aspect of the social world the qualitative findings have, tend to focus on contextual uniqueness (Bryman & Bell, 2015). On the other hand, Lincoln and Guba (1985) argue that researchers are encouraged to generate thick description which provides the opportunity to judge the findings if they can be transferred to the social world. This research provides a thick description of the research process where the reader can choose if the findings can be applied to other contexts.

Confirmability: It is important to create confirmability, objectivity, and neutrality during the research (Lincoln & Guba, 1985). The findings have to take the shape according to the respondent's words and not according to the researcher's personal values. It is not possible to ensure total objectivity in research, however, as Bryman and Bell (2015) mentioned, researchers could show that they have a good purpose. Having a good purpose can ensure that the researcher's personal values cannot affect the findings. For that reason, Lincoln & Guba (1985) said that an objective would be to create confirmability. This study created confirmability since the supervisor of this study had been giving periodical feedback to ensure that the research and its development is proper and that the research is not affected by personal values. Additionally, people out of this research have read the thesis and had given objective feedback.

4. FINDINGS

The following chapter will employ the structural analysis of the data discussed and drafted in the previous chapter. The data structure will be analyzed, and findings will be drawn according to the interviewees' and the author's perceptions. Here, the first order concepts are coded according to which the second order themes emerged. There have been formed the two aggregated dimensions – Internal Uncertainty and External Uncertainty. In the following chapter, these aggregated dimensions are presented through empirical evidence.

4.1 Internal Uncertainty

Internal uncertainty of the entrepreneur while establishing a start-up is related to the awareness of the business making process. Less awareness means more uncertainty, more questions, and doubts. The awareness is very individualistic since it is based on subjective feelings, knowledge, experience, intelligence, intuition and unconscious moves, which forms the thoughts and ideas of the entrepreneur i.e. mental readiness to take steps and act.

In this section, I want to illustrate what can be possible practical uncertainties during the start-up process and how it affects mentality and action from bootstrapping, effectuation and scrum perspective. To do so, I will make a reference to the collected data: interviews and introspection.

The collected data showed to what extent the entrepreneurs faced uncertainties in their business making process.

“How much time and money can I invest in my idea? How much time and money from everyday life?” – 2nd participant.

“Will I sell? Will the chosen product be successful? Will my marketing be successful?” – 1st participant.

“Do we know our team members/business partners? Do they need support from me? How can we divide functions?” – 2nd participant.

Mentality

Awareness as a mental state of the entrepreneur can influence the future of the start-up. From ***bootstrapping*** perspective, it is important that the entrepreneur understands the cost of each move. As mentioned above, the focus of bootstrapping is to eliminate costs and effectively use the existing capital to develop a start-up with personal fundings. The effective utilization of personal fundings can be a challenge in the start-up process. One of the interviewees describes a risk to fail in this process:

“Because it is your own fund, it mainly comes from your own savings. In this situation, you might risk more than if they were someone else’s capital. The extra money – savings – are leftover and to feel responsible for your actions can be lower. It might cause laziness, less action, low speed, ineffectiveness or careless attitude.” – 3rd participant.

Therefore, if the entrepreneur is not mentally ready to effectively manage the capital, it can be a huge hazard, especially when the start-up starts without having a single client.

“We took a big risk to invest without having any client.” 2nd participant.

Mismanaged capital and no client create a crisis in a start-up when it comes to finances and it affects the whole development.

“If personal funding is limited, you have challenges to implement the business plan, as fast as it was planned from the beginning.” – 5th participant.

Therefore, start-ups that do not have clients from the beginning and are not mentally ready to manage capital effectively via hard work, high sense of responsibility and accountability, will be under the threat either to fail or to change the business plan. The latter can cause the changed service or product – which might be less creative, less competitive and hence, less prosperous on the market.

Talking about the market, it is important to be defined which service or product you want to offer. Here comes the relevance of ***effectuation*** principles, which from the mental perspective, helps an entrepreneur to identify the start-up in a business plan and keep its’ special niche.

“It was important to know to which segment we were offering the service. It would not make sense if we did not know.” - 1st participant.

To define a start-up’s identity is important. It can be done also by researching the existing market, getting to know the possible competitors and future trends.

“I made a research on the field, I knew that I could correspond, and did not want to spend much money on the startup.” – 6th participant.

“*Bird in hand* helps you recognize who you are and what you can really offer to the customers, and then you can help the business grow.” - 5th participant.

Identification of the market and service/product will guide the entrepreneur to effectively spend capital while launching a service or a product on the market. Avoiding uncertainties on a market level (effectuation principles) will help to prevent uncertainties on a capital level (bootstrapping principles). Oppositely, uncertainties in market identification can cause waste of funds, bankruptcy or changes in a business plan.

The effective utilization of personal funds and market identification, as the mental state of the entrepreneur, can be facilitated by the *scrum* principles within the team. The interviewees that were not sole entrepreneurs confirmed the effectiveness of scrum principles, as a mental element in their daily work process.

“We are transparent. We inspect and adapt. Everyone knows everything.” – 3rd & 2nd participants.

“Transparency and inspection and adaptation played a significant role in improving many aspects of our everyday work in the company.” - 4th participant.

“Articulation, awareness and appropriation worked fine and had good results.” – 2nd participant.

However, when it comes to the sole entrepreneurs, in this specific situation, they did not need to be accountable to others – they should be accountable and responsible towards themselves. Therefore, transparency, inspection, adaptation, etc. could not be necessary.

“Most of scrum principles did not work for me, because I am a sole owner.” – 5th participant.

Mentality as a subjective attitude of the entrepreneur, which comes from the awareness, plays a vital role while facing uncertainties in a start-up process. However, not every entrepreneur has enough knowledge and experience or is lucky enough to unconsciously guess what should be the next step in a challenging situation. Here, it is important to take into consideration the importance of the combination of bootstrapping, effectuation and scrum principles, which eliminates uncertainties and opens a door to a clearer path to increase the success chances by getting more knowledge how to conduct business activities in start-ups.

As elaborated above, in case the entrepreneur fails to meet the mental requirements to utilize these principles, the start-up will either fail and bankrupt or change its niche and will not be creative enough to compete with the existing players on the market.

Action

Action is dictated and lead according to the mental state of the entrepreneur and influences on a whole process of start-up development.

The main threat for the action is a low speed and delay to comply with the deadlines. Being dependent on someone else's capital can cause a delay in the action, which is already detrimental to the business. This risk can be avoidable by having own funds. It helps the entrepreneur to save time on a bank bureaucracy, such as a long awaiting time for the loan confirmations, collecting a long list of documents, etc.

“Establishing my start-up with personal funds helped me to control the time by starting the company right over, without worrying about terms and interest rates for a loan.” – 6th participant.

“The advantages of having personal fundings are to avoid long waiting time for loan confirmation.” – 5th participant.

If the entrepreneur has own fundings, there might be two options at stake on a marketing phase. First, the entrepreneur knows how to promote a service/product and pays only inevitable costs for the ads. In this case, the entrepreneur is on a good track.

“The methods that I used to approach my market are Data-driven, Facebook adds report, Google reports, World trade reports, Web analytics. The time was on by my side in this case because I had the knowledge on how to identify and approach the market.” – 1st participant.

Second, the entrepreneur has less competence or does not know how to conduct marketing and needs an extra investment in time (to learn digital marketing) or money (to invite external source – digital marketing expert). The time investment lowers speed and delays to comply with the deadlines. The money investment risks the effective utilization of personal fundings.

“Only through my webpage, I tried to approach the market. If I would try to do something more, I knew that it would be time-consuming with no result because I am not the ideal person to do marketing.” – 4th participant.

“To approach my market, I used some basic methods such as Facebook adds and advertising platforms. I tried to build the brand by using a catchy name. I thought to contact marketing experts to help me with more advanced solutions but, the capital did not allow me to do this move.” – 2nd participant.

According to these experiences, **bootstrapping** and **effectuation** principles should be combined in a way to use maximum knowledge and minimum capital. Otherwise, the start-up will face a crisis from its early stage.

Following these two above-mentioned principles are not enough if the *scrum* principles (to be self-organized, motivated, disciplined and follow the time-boxing rules) are not well implemented.

“The fact that I am a sole owner gave me the privilege to make my own decisions and manage the time according to my schedule.” – 1st participant.

It might be easier to achieve goals when a start-up is based on a sole entrepreneur. The action caused by the mental state of an entrepreneur might face difficulties, which are more likely experienced in a team – a collection of individuals with subjective mental backgrounds. Using scrum principles to achieve a specific goal is ideal to develop better connections between team members and rapidly improve start-up. However, there might be some uncertainties:

“We do use time-boxing, but we do not accomplish very often.” – 3rd participant.

Depending on a mental state of each entrepreneur in the team, motivation, knowledge or any subjective feature of the person can cause turbulence in the time-boxing and delay the progress. Hence, correct utilization of scrum as a third element is very important in the combination with bootstrapping and effectuation to implement actions and eliminate internal uncertainties.

Similar to the mentality theme, action theme awaits risks that the start-up will either fail and bankrupt or change its niche and will not be creative enough to compete with the existing players on the market.

“I had a good strategy and a business plan. But sometimes you need to exceed yourself.” – 4th participant.

While sharing the experience, the interviewee noted that if internally everything is correct and there are still some uncertainties, it is important to focus on the external factors, too.

4.2 External Uncertainty

External uncertainties to some extent are influenced by internal factors such as mentality and action of the entrepreneur. However, the heavier burden lies on external factors that are coming from the outside environment and might be out of the entrepreneur’s control (force majeure, etc.). Discussion in the following section is derived from the external uncertainties the

entrepreneurs faced during their start-ups. Probability and connections are the two themes that will be discussed further in this section.

Probability

The entrepreneur which implements own idea and does not research the market may later realize that the time and capital invested in a service/product that already exists is a waste and there is no need to invent a new bicycle. Here, external uncertainty is market and unknown steps that should be taken by the entrepreneur by thinking of bootstrapping principles. These external uncertainties might influence on the probability to succeed due to lack of knowledge in bootstrapping.

To avoid the above-mentioned scenario, it is important to research the market.

“I checked what others did wrong, so I could do it better.” – 1st participant.

Taking this approach will save time and capital from the possible failure and bankruptcy and will be compatible with the ***bootstrapping*** principles. However, it is not that easy. Having own limited capital does not give the entrepreneur luxury to hire external human resources, which helps the company to develop.

“Having less fundings caused us to think harder how to fight against uncertainties but being not experts in the field we experienced less ideas. It affected our speed to act and therefore the prosperity of the company. Taking into consideration the seasonal nature of the marketing that our company needs to do, time was the most important, but limited funds and less knowledge of how to market ourselves caused less customers.” – 2nd participant.

This experience shows how the financial side combined with the external uncertainties can influence on a start-up.

The interviewees, who had experienced uncertainties in their start-ups, advised the following:

“Depending on the business, capital can help in value creation and bring the opportunity to build a good infrastructure, which can attract good employees as well as numbers of clients.” – 4th participant.

“You invest in something that has more quality as the main ingredient for success compared to others.” – 6th participant.

However, the financial side that is a bootstrapping's focus can be improved by *effectuation* principles, such as knowledge, skills, connections, etc. Having creative skills to innovate a service/product and introduce it on the market will give a positive impetus to the business. However, being innovative is not an easy job. To do so, the entrepreneur should have economic and law understanding to fight against existing barriers and despite limited marketing skills, accomplish success.

“There are many uncertainties and barriers with Facebook ads. Entrepreneurs waste their money without a desirable outcome from it by virtue of less competence and knowledge on how to advertise on a social media” – 5th participant.

“Law might cause barriers for companies. We might need extra resources to comply with the GDPR and pay attention to the protection of customers' personal data. The team was aware of the relevance of these rules and could identify the job which should be done.” – 2nd participant.

“In case the entrepreneur is unaware of these details, the ignorance and omission can cause fines from the governmental agencies. The financial burden can cause the bankruptcy of the company.” – 4th participant.

Therefore, the need for knowledge and skills are highly needed in the start-up. Being a group of entrepreneurs can decrease the expenditure because they are able to use internal knowledge, skills, and experience to achieve goals. The entrepreneurs should prepare a list of the areas the start-up will need and by assessing the entrepreneurs' abilities should plan how they are going to balance personal knowledge, external resources, and capital.

Having partners in the start-up is perceived to have both sides: negative and positive. The negative side is the uncertainty when it comes to a functional dichotomy between partners, subjective expectations, goals, working tempo, etc. The positive side is the chance to eliminate uncertainties by consolidating each other's force and skills.

“Be smart, predictive, experienced, have the knowledge and excellent skills of communication is the features of the ideal team. However, it was a big challenge for us to consolidate these skills and lead them in the right direction within the team.” – 3rd participant.

“We deal with the uncertainty with research and discussion with experienced people.” – 3rd participant.

Good partners have good communication within the team. The transparency in the process keeps the business clearer, partners - tuned and the company - motivated to achieve success. Implementing *scrum* principles in the start-up's team will increase effective utilization of the

knowledge of the partners, that will save cost, form a creative service/product and avoid the effect of probable uncertainties influencing the start-up externally.

Connections

According to the first female United State Secretary, Madelene Albright, the best political model so far in mankind's history has been democracy, which is achieved via discussion (Albright, 2018). The discussion starts after people connect with each other and plays a crucial role in each field, *inter alia*, in business. Tomáš Garrigue Masaryk, president of Czechoslovakia, in 1918 said that "...[R]eal discussion is possible only if people trust each other and if they try fairly to find the truth." (Čapek, 1995).

The sole entrepreneurs often avoid sharing a business with others mostly for the financial reasons - in case of success, the personal fundings invested in the company will be shared with no one. The other reason to avoid sharing business is the probability to totally control the process. According to the interviewees, there are some reasons for it:

"In the case of bankruptcy, shares can make the situation more complicated." – 6th participant.

"I want to take my own responsibilities and make my own decision-making." – 1st participant.

"It is good to have total control." – 5th participant.

"Feeling independent of decision-making." – 4th participant.

However, to find the truth and follow the right way to conduct the business needs discussion and dialogue with others. Without connections, it is impossible. As finding the truth is impossible in undemocratic society as misusing *bootstrapping* principle by limiting it with an unreasonable scale of personal fundings will not give a result.

According to the other entrepreneur:

"There is a lot of bureaucracy when dealing with a bank. There are many commitments and responsibilities that need to be aware of." – 6th participant.

To connect with the respective sources and get support by sharing knowledge, experience, and advice is the *effectuation* principle. This is sometimes used unconsciously by the entrepreneurs, who need help in their external uncertainties.

"I interviewed some big organizations to get knowledge and experiences, so I could avoid some of the uncertainties I had with my market." - 3rd participant.

“Having a big network helps you to reach the market or at least a part of it.” – 2nd participant.

Get knowledge and experience from experts is a better solution for the entrepreneur rather than keep being stubborn with own ideas and lead the company till bankruptcy.

Find the right partner or investor with vision is the other option for those who try to eliminate external uncertainties via establishing connections. However, connections are not the ultimate answer to success and it might include challenges, too.

Those, who share tasks with partners, sometimes face difficulties in collaboration on an effective way. Here *scrum* principles (transparency, self-organization, motivation, etc.) does not work, *per se*. The entrepreneur might face uncertainty on how to control imbalances in this case.

“I have to be demanded from the others and add some pressure to move.” – 3rd participant.

But is some pressure the option? As the interviewee’s experience shows, it makes things done, however, alternative advice from the interviewees are the followings:

“Find the right person to collaborate with (partner, investor, etc.) and to share the same vision.” – 6th participant.

“I believe that regular meetings can keep you on track.” – 4th participant.

“Listen to other people, get ideas and reach further (if you are partners).” – 2nd participant.

As the probability theme illustrates what might be the possible external uncertainties that influence the start-up, the connections theme offers ways how to overcome the external factors and eliminate uncertainties.

5. DISCUSSION

The following chapter includes the discussion of the Internal and External Uncertainty findings in connection with the theory. The discussion will be according to the three concepts (capital, people and market) and at the end, as a summary, the discussion of the uncertainty process will be presented.

5.1 Discussion on Capital (bootstrapping principles)

The purpose of the interviews was to find out how the start-ups faced financial challenges on their early stage if they used the 32 bootstrapping principles and how important were these principles to eliminate uncertainties.

Mental readiness to correctly manage the personal funds appears to be one of the important aspects in the entrepreneurs. Here the start-ups experienced difficulties to realize that personal funds are the limited possibilities and it does not give the entrepreneur luxury to act with low responsibility, laziness, carelessness, etc. The effective utilization of bootstrapping in case of limited capital can save the company from the delays and/or bankruptcy.

Taking a high risk and establishing the company without a single client was another alarming factor that worth to pay attention to. It takes time to attract clients. The entrepreneurs' mistake was that some of them were expecting the profit from the very first period of their establishment so that the implementation of the business plan was depending on their non-existing clients. The latter needs time to be attracted and it causes delayed income – i.e. delays in their **action** plan.

The interviews also showed that entrepreneurs' limited fundings decreased the **probability** to hire external human resources. It caused less brainstorming, less skill usage and slow development of the start-ups.

In this situation, the relevance of **connection** emerged a way to survive. Although the entrepreneurs prefer to have total control of the whole process and avoid the investors from the

decision-making process, without connections it is impossible to unify skills, experience, knowledge and to develop.

Taking into consideration the internal uncertainty, the findings showed that although some of the entrepreneurs managed to partly eliminate costs in their start-ups, their mental imagination to easily manage, firstly, themselves and secondly, the company itself was wrong. This low level of mental readiness caused fiscal problems in their business plans that affected a fast implementation of the action plan.

On the other hand, the findings on the external uncertainty represent, that the entrepreneurs are not keen to be open for the third parties (investors, banks, etc.) to share their company with. The exclusive control of the decision-making process and limited capacity to invest in a service/product development causes low probability to compete with the existing players and conquer the market.

Therefore, while talking about the cost elimination (in traditional/non-technological start-ups) and the improvement of income (in non-traditional/technological start-ups), it is important to follow the chosen 32 principles (Winborg & Landström, 2001), which gives the opportunity to identify and use the most compatible principle according to the start-up's type and try to eliminate the uncertainty, as much as possible, from capital perspective.

According to the findings, not all principles were used because each start-up has different needs and wants. In the cases of the interviewed start-ups and introspection, the most used principles are three and are: principle no. 1 'Buy used equipment instead of new', principle no. 9 'Seek out best conditions possible with suppliers' and principle no. 11 'Withhold manager's (the owner's in this case) salary for some period'. Even though the principles were executed unconsciously, their strong impact provided a good outcome for capital elimination and helped to eliminate also the possible uncertainties that might appear on the process.

However, the entrepreneur should bear in mind that complying only with bootstrapping principles is not enough and it should occur in combination with effectuation and scrum principles.

5.2 Discussion on Market (effectuation principles)

Since the main focus of the effectuation principle (Sarasvathy, 2008) is self-awareness, the start-up's place on the market and networks establishment to eliminate uncertainties (*inter alia*, unexpected challenges), the interviews were focused precisely on these issues.

The *mental* element of the entrepreneurs is not easy to be defined and since a start-up is an early stage of a company, it can change the direction and adapt the practical realities. What the findings showed about Internal uncertainty on market according to the effectuation principles is that entrepreneurs need to find themselves, in the beginning, to be able to identify their strengths and then they will be able to identify the right market for the product/service ('bird-in-hand' principle).

The interviews showed that although the entrepreneurs could identify their service/product, it was a challenge to find the right segment and reach the client. Risks caused by the lack of self-definition sometimes caused internal uncertainties (defining a price and a quality of the service/product).

The other challenge the entrepreneurs revealed was the *action* in time due to the skills the entrepreneur has. Action is dictated and lead according to the mental state of the entrepreneur and influences on a whole process of start-up development. Not every entrepreneur is aware of all the skills (e.g. digital marketing, Facebook ads, etc.) the start-up requires to evolve. In case the entrepreneur is dependent on external resources, the action of the start-up might delay. This is a cause of the internal uncertainty – lack of knowledge that is an internal factor and that affects speed compliance with the deadlines.

The next concern, relevant from the effectuation (Sarasvathy, 2008) principle ('bird-in-hand' principle) was the knowledge of the external factors that help to balance lack of personal knowledge, external resources, and capital.

The external uncertainty findings on the market have to do mostly with the digitalization. The interviewees had uncertainties on how they can approach the market and what kind of methods should they use. Without knowledge of digital strategies, entrepreneurs felt even more insecure for the future. Only one interviewee had knowledge on the field and his start-up was based on finding a market through digitalization. In case of having knowledge of digitalization, entrepreneurs can eliminate the uncertainty on market identification.

The entrepreneurs showed that they needed external help with economic and legal understanding to fight against existing barriers and despite limited marketing skills, accomplish the success. The principle of ‘lemonade’ (Sarasvathy, 2008) is relevant in this situation since entrepreneurs can use every unexpected experience, network, etc. that might be helpful for the development. According to their experience, the *probability* to be more efficient would increase if they had more knowledge and skills in various areas or if they had the right partners in their teams.

The latter can be approached via a big network, which gives opportunities to establish *connections* and find out if the network can contribute.

Having knowledge of effectuation as one of the principles of start-up/entrepreneurship would facilitate the entrepreneurs to correctly use knowledge and skills and make a list of relevant connections who can contribute to your start-up (for free or with a low expenditure). By following effectuation principles, it would be easier to identify a common practical mistake, challenges, and behaviors that would help the entrepreneurs to decrease or ideally eliminate internal uncertainties caused by the lack of knowledge. Again, the emphasis should be made on the relevance of the combination of effectuation principle with bootstrapping and scrum principle.

5.3 Discussion on People (scrum principles)

The highlighted scrum principles (Scrum principle, 2016) from the theoretical foundation praise the good collaboration between the partners which has an impact on the relationships and the uncertainties the entrepreneurs might have.

The internal uncertainties when it comes to scrum principle utilization covers mentality and action themes. The entrepreneurs demonstrated quite a good command in transparency, inspection, and adaptation (‘Empirical process control’ principle), as well as in articulation and iteration (‘Collaboration’ principle). However, the sole entrepreneurs have had challenges to use scrum principles because their awareness of how to employ these principles was limited. Findings on “self-organization” (‘Self-organization’ principle) showed that being organized can, first, eliminate the loss of deadlines which might have an impact on the uncertainty, and second, provide security on the task achievement.

The interviewees rather than sole entrepreneurs confirmed that scrum principles, that were applied in their work process mostly unconsciously, played a positive role. In case the entrepreneurs failed to meet the *mental* requirements to utilize these principles, the start-up had financial or organizational challenges, that questioned either their existence or their niche.

Unlike the mentality theme, where the sole entrepreneurs faced challenges in utilizing some of the scrum principles, in *action* theme, which covers self-organization, motivation, discipline, and time-boxing ('Time-boxing' principle), they were more successful. They usually were responsible before themselves and therefore they conducted the business plan better. Contrary, non-sole entrepreneurs experienced turbulence in the time-boxing due to the internal factors such as low motivation, less self-organization, dependence on the other partner, etc., which delayed the progress.

The external uncertainties revealed in the *probability* theme were mostly caused by the uncertain functional dichotomy between partners, where consolidating each other's force and skills were not that effective. It appeared to be the external factor since it did not derive from the inner subjective state of mind of the entrepreneurs.

In some occasions, the entrepreneurs needed to put pressure in their teams or partners to accomplish tasks and bring the maximum business value ('Value-based prioritization' principle) which were on their agenda. Although the goals were accomplished due to these measures, the entrepreneurs unanimously agreed that the discussion and right set of *connection* is a better choice. In this way, it is possible to get to know each other more, create trust easier and build up a team where everyone understands its role. The regular meetings were the most appropriate measure for the team building.

Not every entrepreneur has enough knowledge and experience or is lucky enough to unconsciously guess what should be the next step in a challenging situation. Someone might be an expert in bootstrapping and or effectuation principles, but failing in scrum principles, such as e.g. time-boxing and connections, which has an impact on delays, can generate the threat for the start-up and formulate other external uncertainties.

Here, it is important to take into consideration the importance of the combination of bootstrapping, effectuation and scrum principles, which eliminates uncertainties that the entrepreneur faces and opens a door to a clearer path to increase the success chances by getting more knowledge how to conduct business activities in start-ups.

5.4 Discussion about the uncertainty and principle process

When the entrepreneurs make a step to establish a start-up, there are many uncertainties how to begin, process and accomplish the business plan. Figure 7 will illustrate how the uncertainties are connected to the bootstrapping, effectuation and scrum principles and how important these principles are to eliminate uncertainties in start-ups to succeed.

Uncertainties (1) can be classified as internal (2) and external (3) ones. Internal uncertainties are originated from the individualistic features of the entrepreneur and can be segregated as mentality (4) and action (5). While external uncertainties are produced from the objective obstacles and can be divided as probability (6) and connections (7).

First, the entrepreneur needs to analyze possible uncertainties. Then, those uncertainties should be allocated depending on the origin they come from. After defining the type of uncertainties, the entrepreneur usually takes action in terms of how to deal with them. At that stage, the principles of bootstrapping, effectuation and scrum (8) are essences that can help to eliminate the uncertainties.

Depending on the knowledge of entrepreneurship and agile methods, the entrepreneur should make the right move. The knowledge and understanding of these principles can come from already existing education or external sources. In this case, the entrepreneur is aware of the uncertainties and the methods through which the uncertainties should be managed and eliminated. The entrepreneur, here, is falling into a category of guided (9) and has a high chance to succeed in business endeavors.

If the principles are unknown for the entrepreneur, then the latter is unguided (10) and there are three possible options either to eliminate uncertainties unconsciously by intuitions and by a need of survival (i) or to have the luck to success (ii) or fail (iii).

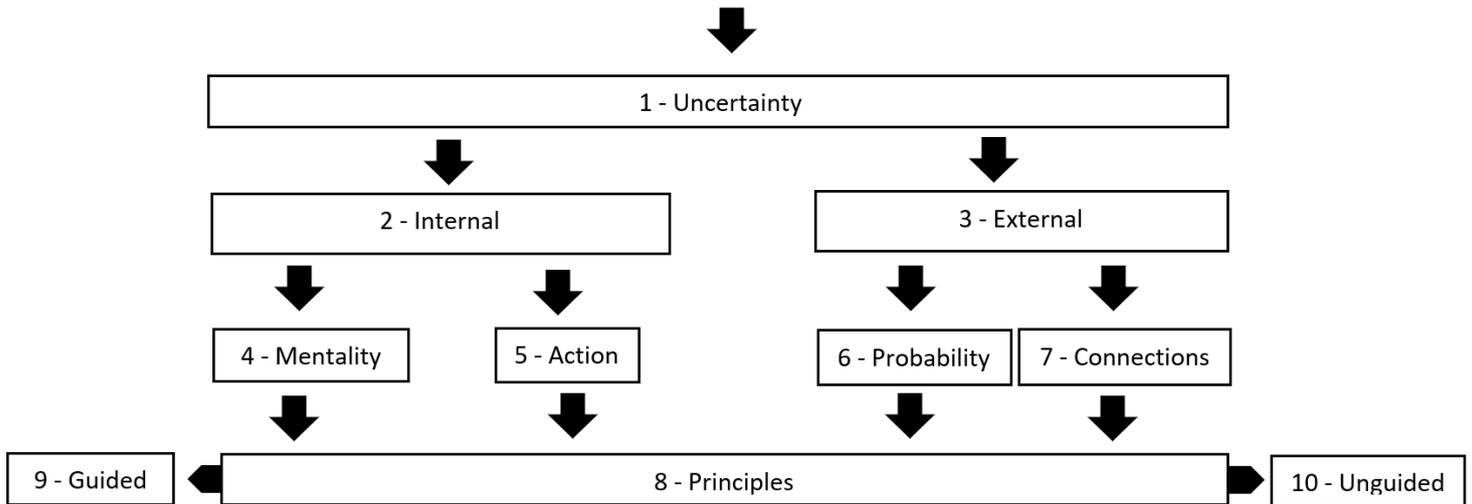


Figure 7: Model of the process of uncertainty.

5.5 Contribution in Innovation and Design

As mentioned at the beginning of the current thesis, start-ups have various uncertainties. Meanwhile, uncertainties are some of the reasons that interrupt innovation and the progress of new ideas that entrepreneurs have. The contribution of this thesis from innovation and design perspective are several. The combination of the bootstrapping, effectuation and scrum principles creates a new theoretical approach, which is a trial to create a new design process that leads start-ups to eliminate uncertainties and to succeed. Drawing aggregated dimensions by combining these three principles, is a practical contribution since it creates a new process, which might be seen as a contribution to the design area. Moreover, this creative process is innovative enough to contribute to the innovation area as well. The second factor to contribute to the innovation area is as follows: start-ups that usually have something new and innovative, have uncertainties. Some of them fail because they do not know how to conduct the whole process of start-ups. The result is that innovation can not find its place on the market and they fail. Introducing the research results in this thesis leads the start-ups to a clearer path on how to eliminate uncertainties and how to succeed. Saving innovative start-ups is the contribution to innovation area, too.

6. CONCLUSION AND RECOMMENDATIONS FOR THE FUTURE RESEARCH

The following chapter presents the most important conclusions of the research. The research question will be answered and some suggestions for the future entrepreneurs will be drawn.

The findings proved that people become entrepreneurs because they have an idea and want to make a business out of it. Although they might have the main success factors of start-ups - capital, market and people, there is a chance for failure, since there is no clear guidance which will show them the right path to success. The entrepreneurs face uncertainties (either internal or external) while dealing with the above-mentioned three success factors that are solved by different means. They are aware of the elimination, but they lack the competence to understand the whole complex process. The latter includes getting knowledge in the field of entrepreneurship, which might provide all the right information (principles, processes, innovation, and design, etc.).

As an answer to the research question, *how important the bootstrapping, effectuation and scrum principles are to eliminate the uncertainty*, the thesis discovered that the only way to success is to use these principles simultaneously. If the entrepreneur is excellent in bootstrapping but does not comply with the scrum principles, it can cause the delay or break down of the whole business plan execution. Here, the interplay of these three principles come into the game, where each principle is equally necessary to apply in the entrepreneurship and in case the entrepreneur skips any of them, the start-up will face a high risk of failure. According to the bootstrapping principles (Winborg & Landström, 2001), the entrepreneur can be guided through a safer path, towards the elimination of expenditure so that the entrepreneur will be able to avoid possible -capital- uncertainties. Using the effectuation principles (Sarasvathy, 2008) and the self-awareness that the principles provide, the entrepreneur has the chance to identify the market within its network or to make predictions about the market; the effectuation principles focus on the elimination of barriers and uncertainties that can be found within the personal network. According to the scrum principles (Scrum principles, 2016), the entrepreneur gets some guidance on what is important to have good communication with partners, and the focus is to avoid possible uncertainties within the partnership that might affect the process.

The ultimate combination of bootstrapping, effectuation and scrum principles is a shield that protects the start-up from the possible uncertainties, arrows that might lead a start-up till the bankruptcy.

By conducting empirical and theoretical research, this thesis, as a recommendation to the future entrepreneurs, sums up that the safest way to succeed in a start-up is to be informed about and guided by the bootstrapping, effectuation and scrum principles which should be utilized simultaneously. As a recommendation for future research, I would suggest, to establish a start-up and experiment whether the theoretical findings drawn by this thesis have a practical value.

References

- Albright, M. K., & Woodward, W. (2018). *Fascism: A warning*.
- Association for Project Management (2016). *The practical adoption of agile methodologies*. [electronic]. Available via: <https://www.apm.org.uk/media/1185/practical-adoption-of-agile-methodologies.pdf>
- Association for Project Management (2017). *Can agile be scaled?* [electronic]. Available via: https://www.apm.org.uk/media/6953/apm_scaledagile_2017.pdf
- Auer, K., Meade, E., & Reeves, G. (2003). The rules of the game. In: F. Maurer & D. Wells, eds. *Extreme Programming and Agile Methods – XP/Agile Universe 2003*. 1st edition. Berlin: Springer-Verlag. pp. 35-42.
- Barringer, B., & Ireland, R. (2010). *Entrepreneurship: successfully launching new ventures*. Upper Saddle River, NJ: Pearson Education.
- Bhide, A. (1992). *Bootstrap Finance: The Art of Start-ups*. Harvard Business Review, 70(6), 109-117.
- Bhide, A.V. (2003). *The Origin and Evolution of New Businesses*. Oxford University Press.
- Blank, S. (2013) *Why the Lean Start-Up Changes Everything*. *Spotlight on entrepreneurship*. Harvard Business Review May 2013
- Blank, S. & Dorf, B. (2012). *The Startup Owner's Manual: The Step-by-Step Guide for Building a Great Company*. Pescadero, Calif. : K&S Ranch, Inc., 2012, 1. Ed
- Boehm, B., & Turner, R. (2003). Rebalancing your organization's agility and discipline. In: F. Maurer & D. Wells, eds. *Extreme Programming and Agile Methods – XP/Agile Universe 2003*. 1st edition. Berlin: Springer-Verlag. pp. 1-32.
- Brechner, E., & Waletzky, J. (2015). *Agile project management with kanban*. 1st edition. Redmond: Microsoft Press.
- Bryman, A. & Bell, E. (2015). *Business research methods*. 4th ed. Oxford: Oxford University Press.

- Busenitz, L., West, G., Shepherd, D., Nelson, T., Chandler, G., & Zacharakis, A. (2003). *Entrepreneurship research in emergence: Past trends and future directions*. *Journal of Management*, 29 (3), 285-308.
- Collis, J., & Hussey, R. (2014). *Business research: a practical guide for undergraduate & postgraduate students*. (4ed). Palgrave Higher Education
- Conforto, E.C., & Amaral, D.E. (2016). *Agile project management and stage-gate model - A hybrid framework for technology-based companies*. *Engineering and Technology Management*, 40, 1-14.
- Cooper, D. R. & Schindler, P. S. (2001). *Business Research Methods* (7th ed.). USA: Irwin/McGraw-Hill, New York.
- Cornwall, J. (2010). *Bootstrapping*. New Jersey: Pearson Education.
- Crotty, M. (1998). *The Foundations of Social Research: Meaning and Perspective in the Research Process*. London: Sage.
- Čapek, K. (1995). Talks with T. G. Masaryk, ed. And trans. Michael Henry Heim. North Haven, CT: Catbird Press.
- Davis, K. (2012). *Different stakeholder groups and their perceptions of project success*. *International Journal of Project Management*, 32, 189-201.
- Denzin, N., & Lincoln. Y. (1994). *Handbook of Qualitative Research*. Thousand Oaks, CA, US: Sage Publications Inc.
- Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009). *Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices*. *Journal of Business Venturing*, 24(4), 287–309. <https://doi.org/10.1016/j.jbusvent.2008.02.002>
- DiMaggio, P. J. (1995). *Comments on “What theory is not”*. *Administrative Science Quarterly*, 40: 391–397.
- Drury, M., Conboy, K., & Power, K. (2012). *Obstacles to decision making in agile software development teams*. *Journal of Systems and Software*, 85 (6), 1239-1254.
- Dybå T. & Dingsøy T. (2008). *Empirical studies of agile software development: a systematic review*, *Inf. Softw. Technol.* 50 (9–10). Pp. 833–859.

- Easterby-Smith, M., Thorpe, R., & Jackson, P. (2015). *Management and business research* (5th edition). Los Angeles: SAGE.
- Ebben, J. (2009). *Bootstrapping and the financial conditions of small firms*. *International Journal of Entrepreneurial Behaviour & Research*, 15(4), 346-363.
- Eisenhardt, K. M. (1989). *Building theories from case study research*. *Academy of Management Journal*, 14(4): 532–550.
- Eriksson, P., & Kovalainen, A. (2015). *Qualitative Methods in Business Research: A Practical Guide to Social Research*. 2nd edition. Croydon: Sage, pp. 12.
- Estler, H.-C., Nordio, M., Furia, C. A., Meyer, B., & Schneider, J. (2013). *Agile vs. structured distributed software development: A case study*. *Empirical Software Engineering*, 19, 1197-1224.
- European Commission (2006). *Entrepreneurship education in Europe: Fostering entrepreneurial mindsets through education and learning*. In: European Commission Conference. Oslo, October 26-27. Available via: file:///Users/Alex/Downloads/oslo_report_final_2006.pdf.
- Freear, J., Sohl, J. E., & Wetzel, W.E. (1995). *Who bankrolls software entrepreneurs? In Frontiers of entrepreneurship research*. Babson College, 394-406.
- Garel, G. (2013). *A history of Project Management models: From pre-models to the standard models*. *International Journal of Project Management*, 31(5), 663-669.
- Gephart, R. P. (2004). *Sense-making and new media at work*. *American Behavioral Scientist*, 48(4): 479–495.
- Gephart, R. P. (2006). *Ethnostatistics and organizational research methodology*. *Organization Research Methods*, 9(4): 417–431.
- Ghauri, P. & Gronhaug, K. (2005). *Research methods in Business Studies (3rd ed.)*. Great Britain: Prentice Hall, Pearson Education Limited.
- Gibson, N., Gibson, G. & MacAulay, A. C. (2001). Community-based research. In J. Morse, J. Swanson & A. Kuzel (Eds). *The Nature of Qualitative Evidence*, pp.161-182. Thousand Oaks, CA: Sage.

- Gioia, D.A, Corley, K.G. & Hamilton (2013). Seeking Qualitative Rigor in Inductive Research: Notes on Gioia Methodology. *Organizational Research Methods*, 16(1), pp. 15-31
- Greenwood, D. J. & Levin, M. (1998). *Introduction to action research: Social research for social change*. Thousand Oaks, CA: Sage.
- Gustavsson, Bengt (ed.) (2008) *Kunskapande metoder inom samhällsvetenskapen (Knowledge of methods in social sciences)* (3rd ed.) Lund, Sweden: Studentlitteratur. First edition 2003.
- Harrison, R., Mason, M., & Girling, P. (2004). Financial bootstrapping and venture development in the software industry. *Entrepreneurship and Regional Development*, 16 (4), 307-333.
- Harroch R (2014). *50 Inspirational Quotes For Startups And Entrepreneurs*. Forbes, [Online] February 10. Available via: <https://www.forbes.com/sites/allbusiness/2014/02/10/50-inspirational-quotes-for-startups-and-entrepreneurs/#726f82d56ef0>
- Hussey, J. & Hussey, R. (1997). *Business Research: a practical guide for undergraduate and postgraduate students*. Basingstoke: Macmillan Business.
- Jayawardena, D. S., & Ekanayake, L. L. (2010). *Adaptation analysis of Agile Project Management for managing IT projects in Sri Lanka*. 2010 International Conference on Advances in ICT for Emerging Regions (ICTer), 1–4.
- João, P., & Lopes, J., & Porto, G. (2018). *Success Factors to Improve the Life Cycle of Information and Communication Technology Start-ups in Brazil*. 1-9.
- Kautz, K., Johansen, T. H., & Uldahl, A. (2014). *The perceived impact of the agile development and project management method scrum on information systems and software development productivity*. *Australasian Journal of Information Systems*, 18 (3), 303-315.
- Kirzner, I. M. (1982). *Uncertainty, discovery, and human action: A study of the entrepreneurial profile in the Misesian system*. Chapter, 12, 139-159.
- Klein, H. K., & Myers, M. D. (1999). *A set of principles for conducting and evaluating interpretive field studies in information systems*. *MIS Quarterly*. vol. 23, iss. 1. pp. 67–93.

- Kuura, A., Blackburn, R.A., & Lundin, R.A. (2014). *Entrepreneurship and projects: Linking segregated communities*. Scandinavian Journal of Management. Vol. 30. Pp. 214-230.
- Landström, H. (2005). *Entreprenörskapets rötter* (3:e rev. uppl.). Lund: Studentlitteratur. pp.23-26.
- Leppanen, M. & Hokkanen, L. (2015). Three patterns for user involvement in startups. In *Proceedings of the 20th European Conference on Pattern Languages of Programs, EuroPLoP 2015* [a51] ACM. <https://doi.org/10.1145/2855321.2855373>
- Lincoln, Y.S. & Guba, E. (1985). *Naturalistic Inquiry*. Thousand Oaks: Sage.
- Morrow, R. (1994). *Critical theory and methodology*. Thousand Oaks, CA: Sage.
- Neeley, L. (2004). Bootstrap Finance. In H.P Welsch (Ed.), *Entrepreneurship: the way ahead*, 105-115. London: Routledge.
- Pentland, B. T. (1999). *Building process theory with narrative: From description to explanation*. Academy of Management Review, 24(4): 711–725.
- Prahalad, C. K. & Ramaswamy, V. (2004). *Co-creation experiences: The next practice in value creation*. Journal of interactive marketing, 18(3), 5-14
- Raval, R., & Rathod, H. (2014). *Improvements in agile manifesto for small software development industries*. International Journal of Engineering Research and Applications, 4 (9), 80-87.
- Ries, E. (2011). *The Lean Startup: How Constant Innovation Creates Radically Successful Businesses*. Portfolio Penguin.
- Rorty, R. (1991). *Objectivity, relativism, and truth: philosophical papers* (Vol. 1). Cambridge University Press.
- Sarasvathy, S. D. (2001). *Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency*. Academy of Management Review, 26(2), 243–263.
- Sarasvathy, S. D. (2008). *What Makes Entrepreneurs Entrepreneurial?*. Darden Case No. UVA-ENT-0065. Available at SSRN: <https://ssrn.com/abstract=909038>
- Saunders, M., Lewis, P. & Thornhill, A (2005). *Research Methods for Business Students* (4th Ed.). Great Britain: Prentice Hall, Pearson Education Limited.

- Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research methods for business students*. Harlow: Financial Times Prentice Hall
- Schumpeter, J. A. (1912). 1934, *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*. Trans. Redvers Opie. Cambridge, MA: Harvard University Press.
- Scrum principles (2016). *A Guide to the Scrum Body of Knowledge (SBOK™ Guide)* – (3rd edition). SCRUMstudy.
- Smith, J. K. (2008). *Relativism*. In L. M. Given (Ed.), *The SAGE Encyclopedia of Qualitative Research Methods* (pp. 750-753). Thousand Oaks: SAGE Publications, Inc.
- Snape, D. & Spencer, L. (2003). *The foundations of qualitative research*. In J. Richie & J. Lewis (Eds.). *Qualitative Research Practice*. pp. 1-23. Los Angeles: Sage.
- Spieth, P. & Schneider, S. (2016) *Business model innovativeness: designing a formative measure for business model innovation*. *Journal of Business Economics*. August 2016, Volume 86, Issue 6, pp 671–696.
- Staller, K. M. (2012). *Qualitative Research*. In N. J. Salkind (Ed.), *Encyclopedia of Research Design* (pp. 1159-1163). Thousand Oaks: SAGE Publications, Inc.
- Sutherland J., Canwell D. (2004). *Key Concepts in Management*. Palgrave Key Concepts. Palgrave, London.
- Sutherland, J. (2001). *Agile can scale: inventing and reinventing Scrum in five companies*, *Cut. IT J.* 14. 5–11.
- Takeuchi, H. & Ikujiro, N. (1986). *The new product development game*, *Harv. Bus. Rev.* 64 (1).
- Van Auken, H. (2005). *Differences in the usage of bootstrap financing among technology based versus nontechnology-based firms*. *Journal of Small Business Management*, Vol. 43, 93-103.
- Werhahn, D., Mauer, R., Flatten, T. C., & Brettel, M. (2015). *Validating effectual orientation as strategic direction in the corporate context*. *European Management Journal*, 33(5), 305–313. <https://doi.org/10.1016/j.emj.2015.03.002>

Winborg, J., & Landström, H. (2001). *Financial bootstrapping in small businesses: examining small business managers' resource acquisition behaviours*. *Journal of Business Venturing*, 16.

Winter, R. (1987). *Action-Research and the Nature of Social Inquiry: Professional Innovation and Educational Work*. Aldershot, England: Gower Publishing Company.

Yin, R. K. (1989). *Case study research: Design and methods*. Newbury Park, CA: Sage.

Appendix 1

The 32 principles Winborg & Landström (2001)

1. Buy used equipment instead of new
2. Borrow equipment from other businesses for shorter periods
3. Hire personnel for shorter periods instead of permanently employing personnel
4. Co-ordinate purchases with other businesses
5. Lease equipment instead of buying
6. Practice barter instead of buying/selling goods
7. Offer customer discounts if paying in cash
8. Buy on consignment from supplier/s
9. Seek out best conditions possible with supplier/s
10. Deliberately delay payment to supplier/s
11. Withhold manager's salary for some period
12. Use manager's private credit card for business expenses
13. Obtain capital via manager's assignments in other businesses
14. Obtain payment in advance from customers
15. Raise capital from a factoring company
16. Obtain loan from relatives/friends
17. Deliberately delay payment of value-added tax
18. Obtain subsidy from County Administrative Board
19. Obtain subsidy from County Labor Board
20. Obtain subsidy from Swedish National Board for Industrial & Technical Development
21. Obtain subsidy from the foundation Innovationscentrum
22. Use routines in order to speed up invoicing
23. Use interest on overdue payment from customers
24. Cease business relations with customers frequently paying late
25. Offer the same conditions to all customers
26. Deliberately choose customers who pay quickly
27. Use routines in order to minimize capital invested in stock
28. Employ relatives and/or friends at non-market salary
29. Run the business completely in home
30. Share premises with others

31. Share employees with other businesses
32. Share equipment with other businesses

Appendix 2

Introspection

I performed introspection since the very first meeting (31st January) with the innovation hub - Idélab, where the idea of the start-up I wanted to establish was presented, the time limit was set (two months), and the agreement of collaboration began. The start-up will be in the educational area and its product will be used by the teachers with an impact on children. The documentation was according to the experiences I had during the already set -two month-period of time. The perspectives are according to the three success factors (capital – people - market).

Capital: By following the bootstrapping way of establishing a company, which means a very lean way on private investment, I can say that my situation was very beneficial since one of my stakeholders and user of the product that I wanted to develop, was the company that I worked part-time that period. This situation gave me a strong base on limited expenditure and this was proved on the business canvases that were created in collaboration with Idélab. Unfortunately, the combination of doing the start-up and writing my thesis at the same time did not give me the chance to go faster so I can have more results, especially practical. The uncertainty I faced in relation with the capital is not very strong, my concerns were around on the biggest expenditure I had, the production of the final product – since I did not have any final product yet and did not know about the costs.

People: The collaboration between the stakeholder and the hub was under the principles of scrum framework. It was difficult to meet all together since we do not work under the same project, company/organization or under the same conditions. I had three meetings with the hub during those two months, which helped me to develop my idea and create a business plan. With the stakeholder we were discussing product ideas that would be developed after some time; our collaboration was positive and creative most of the times. What I felt strongly was the need of a partner to motivate each other and discuss more about the idea. When you are a solo in this phase, even though the choices are on your hands, the idea of developing is more important. My uncertainties according to the people were during the co-production. Sometimes I felt like the people around me, do not express their opinion as they want and try to be kind which has an impact on the development of the product.

Market: The main target of the market are teachers, but the research objects are the children since the focus of the product is for children at the age of 5-6. The market can be approached through telephone, mail or personal visits at kindergarten stations. Many kindergarten stations are across Sweden but as the beginning of this start-up, the focus will be local. If the market corresponds positively on the product then the market will grow and expand. For my start-up, the most important situation was the chance I had to co-product with the client and the final user. This situation gave me the chance to experiment and explore different aspects of the end user which had an impact on the development of the product. Looking into my network and my connections, I found out that it is easier to get guided by someone who knows how things work and they can also give you important tips.

Introspection was an important additional method that supported the interviews. What introspection contributed to this research was, first of all, a clearer view of the findings and the results, and how the three principles/perspectives can work together. Finally, through introspection, I tried to feel and experience the uncertainties which gave me the chance to put my own beliefs as quotes and form this thesis.

Appendix 3

Semi-structured interview – Basic questions.

Explain my thesis focus.

A small discussion about the participant's start-up.

- Start-up has many uncertainties in the beginning. What kind of uncertainties did you have in the beginning?

Three of the main elements for a start-up to succeed are capital, people and market. These are the main chapters that we will discuss.

Let's start with the **capital phase**:

- Are you the sole owner of your company, right?
- Is your company built on external or personal funding?
- What do you believe are the benefits of personal funding?
- And what are the disadvantages?
- Did you take any risk during the establishment period?
- If in need of capital would you consider taking on outside equity?

At this point, I will question if any of the start-ups used any of the 32 bootstrapping principles (answer with just one YES or NO).

- How important do you believe is the capital for the value creation?
- Talking about management, how did you manage the tasks?
- Did you have any strategy/ plan?
- What about a business plan?
- Do you think that collaboration is important?
- What are the advantages and what the disadvantages in a collaboration?

- Since you did not work full time (8 hours per day) on this project, how much you reckon that you worked per week?

Scrum principles:

Empirical Process Control - This principle emphasizes the core philosophy of Scrum based on the three main ideas of transparency, inspection, and adaptation.

Transparency: This means presenting the facts as is. All people involved—the customer, the CEO, individual contributors—are transparent in their day-to-day dealings with others.

Inspection: Inspection in this context is not an inspection by an inspector or an auditor but an inspection by every- one on the Scrum Team. The inspection can be done for the product, processes, people aspects, practices, and continuous improvements

Adaptation: Adaptation in this context is about continuous improvement, the ability to adapt based on the results of the inspection.

- Did those three dimensions have any impact on your start-up?

Self-organization - This principle focuses on today's workers, who deliver significantly greater value when self-organized and this results in better team buy-in and shared ownership; and an innovative and creative environment which is more conducive for growth.

- Do you believe that self-organization helped you on the value creation and why?

Collaboration - This principle focuses on the three core dimensions related to collaborative work: awareness, articulation, and appropriation. It also advocates project management as a shared value-creation process with teams working and interacting together to deliver the greatest value.

Awareness — Individuals working together need to be aware of each other's work.

Articulation — Collaborating individuals must partition work into units, divide the units among team members, and then after the work is done, reintegrate it.

Appropriation — Adapting technology to one's own situation; the technology may be used in a manner completely different than expected by the designers.

- How could you describe your process with those three previous dimensions?
- Did you use time- boxing? If yes, how effective was? If no, how could it help you?
- Do you believe if you and your partners met more often the process and the result would be better?
- What would help in the process to go faster?

Before moving on the **market**:

Explain the first principle; the entrepreneurs usually start by identifying themselves (who you are), the knowledge they have (what do you know), and the network (who do you know), rather than asking what their goal is. The three means (identity, knowledge, and network) will identify the resources.

- How important are those three for the process and how important for you?
- Did you have any unexpected surprise during the process? Did you use it?
- How do you handle the barriers?
- And how the uncertainty?
- Did you have any barrier?
- What methods did you use to identify the market?
- And what methods to approach it?
- Which one of capital, people, and market is more important?
- On which you did pay more attention?
- Except for capital, market, and people, what according to your experience is important for a start-up to handle the uncertainty?