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Lean Startup – Adding an Experimental Learning Perspective to the Entrepreneurial Process

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Statutory Declaration

I declare that I have authored this thesis independently, that I have not used other than the declared sources / resources, and that I have explicitly marked all material which has been quoted either literally or by content from the used sources.

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Management Summary

Sometimes, there are methods applied in reality that are overlooked by researchers. In the case of this research project, the phenomenon of Lean Startup has been empirically investigated. Lean Startup rejoices increasing popularity amongst entrepreneurs in Silicon Valley and meanwhile in over 90 countries all over the world. Being a synthesis of agile development techniques and market research methods, Lean Startup helps people to successfully develop innovative products and services in a close relationship with customers. The core element is a cyclic procedure consisting of the phases: build, measure, and learn.

A literature review in the domain of organization theory, especially entrepreneurship, organizational learning, and new product development has been undertaken to get an overview about scientific models that are similar to Lean Startup. Following, Effectuation and Bricolage, as entrepreneurial process models, the conception of learning sequences and the lead user concept have been extracted for further analysis.

Getting an in-depth understanding of the phenomenon under investigation, a qualitative phenomenological research approach was chosen. In total, eight interviews with Lean Startup practitioners and professionals have been conducted. The interview transcripts were synthesized and aggregated on the basis of a grounded theory approach. Applying open and axial coding, as well as subjective sense-making revealed 25 concepts related to Lean Startup. To identify meaningful relationships, computer-assisted methods have been applied additionally.

The results show, that the observed build-measure-learn feedback loop is echoed in the coded interview data. Therefore, it can be said that the fundamental elements of Lean Startup are learning, prototyping, running experiments and validating initial business assumptions. Moreover, the discussion and comparison with existing scientific methods show that the concept of learning is not yet incorporated adequately. Learning and uncertainty reduction in the opportunity development phase offer great potential for new insights by the Lean Startup methodology.

All in all, the research demonstrates effectively that the interplay between theory and practice can reveal interesting insights for practice and future direction for theoretical elaboration.

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1. Introduction

"From the perspective of Technical Rationality, professional practice is a process of problem solving. Problems of choice or decision are solved through the selection, from available means, of the one best suited to establish ends. But with this emphasis on problem solving, we ignore problem setting, the process by which we define the decision to be made, the ends to be achieved, the means which may be chosen. In real-world practice, problems do not present themselves to the practitioner as givens. They must be constructed from the materials of problem situations which are puzzling, troubling, and uncertain." (Schön, 1983, pp. 39–40)

I am a practitioner.

Entrepreneurship as an academic research domain dates back to Schumpeter (1934) and his understanding of an innovative individual who disrupts markets, the Entrepreneur. It is still considered very volatile in terms of a common understanding or convergence (Grant & Perrin, 2002). This is due to the fact, that Entrepreneurship borrows concepts from a variety of related research fields, such as decision science, economics, management, sociology, and psychology, thereby making it impossible to develop the one complete and concerted theory (Amit, Glosten, & Muller, 2007; Gartner, 2001).

One major element within the field of Entrepreneurship is the concept of an opportunity. Its emphasis lies on innovation, novelty, and the creation of new means-ends relationships (Davidsson, 2008; Shane & Venkataraman, 2000; Shane, 2003). The quest or activity undertaken to find, form and exploit opportunities can be labeled as entrepreneurial action and is divided into two different camps. On the one hand, market imperfections will exogenously arise e.g. through changes in technology, market environments or customer needs and need to be found by entrepreneurs; this is termed "discovery theory". On the other hand, "creation theory" assumes that opportunities are co-created (Aldrich & Ruef, 2006; Alvarez & Barney, 2007). Assuming that not all entrepreneurial opportunities arise through any change in the ecosystem, but are instead co-created through an entrepreneurial process of sorts, entrepreneurs' actions are brought into focus by the latter interpretation. Following the string of thought of an entrepreneurial process, Sarasvathy and Venkataraman (2011, p. 117) raised the open question "What do entrepreneurs actually do?" to motivate researcher to investigate on that subject. The quest on opportunity discovery and exploitation from a process perspective in Entrepreneurship is also shared by other scholars (Shane & Venkataraman, 2000; Ucbasaran, Westhead, & Wright, 2001; Wiklund, Davidsson, Audretsch, & Karlsson,

2011). In other words, a shift of focus towards specific actions undertaken by entrepreneurs to pursue opportunities can be noticed in the research domain of Entrepreneurship.

This brings me back to my first sentence: I am a practitioner. Based on this perspective in building upon social phenomena and the interaction within a real-life context, it is argued that Entrepreneurship could be researched using methodologies that are focused on things – on real-life occurrences- and how those are experienced and dealt with in order to explore new insights (Berglund, 2006; Hummel, 1991). Therefore, I have dedicated my research to a particular practical phenomenon within the context of the Entrepreneurship domain – Lean Startup.

Since 2008, the methodology of Lean Startup has been enjoying ever increasing popularity amongst entrepreneurs all over the world. Initially, it started as a best-practice of a company in Silicon Valley, San Francisco, USA, and finally emerged into a methodology facilitating entrepreneurs to successfully create an innovative venture. Meanwhile, there are meetings taking place on a regular basis in more than 94 cities worldwide. Moreover, the most recent popular science book on the topic has already sold over 90,000 copies. Lean Startup as method is "the application of lean thinking to the process of innovation" (Ries, 2011, p. 6). The underlying principles of Lean Startup are based on the lean manufacturing approach by Toyota including customer centricity and value, as well as continuous flow and improvisation (Ohno, 1988; Womack, Jones, & Roos, 1991). The method itself makes use of iterative or agile product development in small chunks with a focus on experimental learning. In other words, assumptions about the business model hypotheses need to be validated in goal-oriented experiments (Blank & Dorf, 2012; Blank, 2006). To accomplish those experiments, agile development techniques are used which are symbolized in the so called "build-measure-learn feedback loop".

Research on the literature for "*lean startup*" in particular and also for a combination of keywords (e.g. "*(agile OR lean) AND entrepreneur**", "*(agile OR lean) AND (startup OR "start-up")*") does not yield any results via Thomas Reuters' "Web of Knowledge". Nevertheless, there are theoretical concepts in the field of organization theory that show certain similarities with the method of Lean Startup. First of all, some teleological process models from the Entrepreneurship research domain, for example Effectuation (Sarasvathy, 2001; Wiltbank, Dew, Read, & Sarasvathy, 2006) and Bricolage (Baker & Nelson, 2005; Garud & Karnøe, 2003) follow an approach of social or environmental interaction towards opportunity development. Teleological theories are characterized by envisioning a certain end

state. To reach the aspired goal no prescribed paths are given. Instead, multiple options are offered through creativity and purposeful cooperation (Van de Ven & Poole, 1995). Secondly, experimental learning models from the organizational literature stream seem to be reflected in the Lean Startup method (Bingham & Davis, 2012; Lumpkin & Lichtenstein, 2005). Finally, thoughts of new product development processes under high uncertainty and ambiguity resemble the phenomenon under investigation (Hippel, 1986; Lettl, Herstatt, & Gemuenden, 2006; Slater & Mohr, 2006)

Specifically, an emerging popular phenomenon from the real-world has been identified but has not yet received adequate consideration in academic journals or literature nor is it tangible from an academic point of view. Since the "discovery theory" of opportunities has been in the spotlight of academic researchers, teleology as process model for Entrepreneurship theory is seen as a potentially fruitful approach (Alvarez & Barney, 2007; Steyaert, 2007). In addition, learning as theoretical concept is fundamental, but its implications for the search or for co-creating behavior in opportunity exploration are poorly understood by scholars (Ucbasaran et al., 2001). Therefore, the research gap that will be addressed in this paper deals with the following two research questions.

1. **What are the elements of Lean Startup?**
2. **How does the empirical investigation of the Lean Startup methodology contribute to the entrepreneurial process compared to Effectuation and Bricolage?**

The research question is broadly framed in order to allow space for the analysis to reveal a deeper understanding of the phenomenon and its description itself (Eisenhardt & Graebner, 2007; Lee, 1999; Van de Ven, 1989). The aim of this paper is to capture the method of Lean Startup in academic terms. Following it is essential to evaluate if it is only old wine in new bottles or if any extensions can be made to current theories.

The paper proceeds with a theoretical anticipation about Lean Startup as phenomenon and the research streams that are closely connected to it, as well as, an elaboration on how to approach a practical phenomenon. Following, the research design with the phenomenological interview as key element is explained in great detail. In chapter four, the results of the qualitative interviews are presented and illustrated with tables and figures. In the discussion, Lean Startup is compared to the models introduced in the theory part to clarify gaps and overlaps. Finally, the most important implications, limitations and suggestions for future research are outlined.

2. Theoretical Anticipation

2.1. Lean Startup – A Popular Science Phenomenon

Lean Startup has been popularized by Eric Ries (2011) through its final manifestation in the best-selling book "The Lean Startup: How Constant Innovation Creates Radically Successful Businesses". Making use of the concepts of customer development by Steve Blank (2006), Lean Startup also combines it with fast, iterative and agile development techniques (Blank & Dorf, 2012). In contrast to time-consuming planning, Lean Startup focuses on constant adjustments and trial-and-error learning in entrepreneurial behavior which is also bothering academic scholars (Brinckmann, Grichnik, & Kapsa, 2010; Loch, Solt, & Bailey, 2008). According to Ries, "Lean Startup is the application of lean thinking to the process of innovation" (2011, p. 6). Consequently that translates into some guidelines. First of all, it is essential to launch prototypes early, even if they are of low quality. It is said, that while the final target group is not yet identified, no claims about the quality can be made. Therefore, probing early manifestations of a product under real circumstances will reduce cost and speed up the process. While talking to people, entrepreneurs recognize that all efforts are welcome by people and feedback is in general positive. To not be fooled by those human habits, it makes sense to charge customers from day one or ask for some kind of valuable information in return for the product or service that entrepreneurs are working on. Besides money, direct contact to potential clients, introduction to suppliers, and allocation of working hours can all be seen as scarce resources for compensation and will validate if the product or service adds significant value to the customer. Finally, low volume revenue targets help to be realistic and force entrepreneurs to build a business making use of existing cash-flow and focusing only on value-adding product or service features (Ries, 2011). In the next part, general terminology from the Lean Startup methodology is explained.

A start-up company is understood as any human institution that pursues a vision of new products or services under conditions of high uncertainty. Due to that open definition of new venture, the concept of Lean Startup is suitable for any firm size and industrial sector. Furthermore, the aim of each start-up should be learning to build sustainable businesses by running experiments to validate and test assumptions. The activities from initial idea to a final product can be described by a feedback loop consisting of the phases: build, measure and learn (Figure 1). Another crucial element is the minimal viable product. It is the lowest feature set of a product that still delivers value to the customer but only needs a minimum of effort

and time to be developed. A further criterion is that each minimum viable product enables a full cycle through the build-measure-learn loop (Maurya, 2012; Ries, 2011)
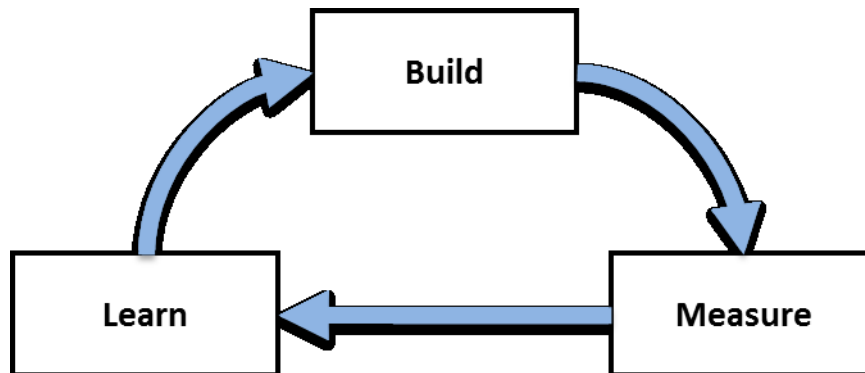

Figure 1 - Build-Measure-Learn Feedback Loop

General speaking each business starts off with a set of assumptions. For the Lean Startup methodology, two assumptions are very important and should imperatively be tested as soon as possible. On the one hand, it is important that the envisioned product or service delivers value to the customer and will also be perceived as such. On the other hand, for a sustainable business it is important that customers will discover the product or service (Ries, 2011). Similar ideas are also seen in Ash Maurya's (2012) more practice oriented book. An entrepreneur has to find a problem-solution fit by answering the question if the problem under investigation is worth solving. Subsequently, a product-market fit has to be achieved in order to validate decipher whether people want to buy the product. Summarizing, value and growth hypothesis or problem-solution and product-market fit need to be validated and accomplished. In order to make those assumptions about the business model more visual the BusinessModelCanvas by Alex Osterwalder (Osterwalder & Pigneur, 2010) is recommended by practitioners, and helps to identify the riskiest assumptions that need to be first tested (Blank & Dorf, 2012; Maurya, 2012). The canvas contains relevant information about the customer and product which are interrelated by the value proposition. Financial considerations can also be found in it (Osterwalder, Pigneur, & Tucci, 2005). In a nutshell, the BusinessModelCanvas provides a visual, easy to understand but still holistic overview about the business idea. In order to tackle the underlying assumptions in descending order by risk, the activity sequence of the build-measure-learn loop will be used.

Starting from an idea in terms of an initial sketch or prototype of the business model, the build phase aims realize a minimum viable product. Business model assumptions are tackled in experiments with clear learning objectives. The resulting product serves to establish something tangible on the actual progress and can take various forms. In the early stages of a

venture it might be useful to make use of mockups of websites or physical products to validate consumers' interest. Instructions or explanatory videos prove practical feasibility To demonstrate the functionality to demonstrate the functionality. Moving along in the process of product development, first prototypes reduced to the very essence of features that contribute to customer value are perfect means with which to test market viability and conduct first user tests. During the measuring phase, data and information are collected by talking to potential clients or demonstrating the prototype. It is important that learning milestones are clear and actionably described. Instead of looking at cumulative or gross figures, it is advised to take a closer look at numbers and performance in single targets groups and intervals. The question at hand in this phase is if one is able to make progress towards the final vision. In other words, entrepreneurs need to find out if they are able to validate or invalidate the assumptions stated in the business model. Finally, this new knowledge has to be incorporated back into the business idea. Analysis of the data determines whether the present strategy can be preserved with, or whether a different direction is required; this is referred to as 'pivoting'. The consequence of a pivot could mean considering different customer groups, focusing on one single function, changing the pricing model or even shifting towards other technologies (Blank, 2006; Osterwalder & Pigneur, 2010; Ries, 2011)

Making use of the build-measure-learn loop, the Lean Startup concept is especially suitable for situations when neither the problem nor the solution is clear yet. The interplay of customer and agile development methods helps to better understand the users while simultaneously working on prototypes of the solution itself (Maurya, 2012; Ries, 2011). The customer development process consists of four consecutive phases, namely customer discovery, customer validation, customer creation, and company building. So far, Lean Startup is mainly used in the first and second phase with the aim of scientifically providing evidence for a sustainable business opportunity. Following the cyclical activity stream of the build-measure-learn loop, guides entrepreneurs through the stages of understanding the problem and customer, of validating a prototype and finally verifying or falsifying the solution. In the latter case, entrepreneurs need to step back to customer discovery which reflects a pivot until the developed solution can be validated by customers, is repeatable and scalable (Blank & Dorf, 2012; Blank, 2006). Consequently, the journey of starting a venture will lead to the customer creation phase, where efficient execution and building end-user demand become high priority, to eventually company building.

In summary, the combination of the customer development process with the iterative cyclic activity sequence of build-measure-learn, helps entrepreneurs to be focused in developing the right things that create the most customer value and are simultaneously are risky in terms of a viable business model.

2.2. Engaged Scholarship – From Practice to Academia

After Lean Startup has been extensively described as the subject of investigation from entrepreneurial practitioners, we now need a method to realize it in academic terms. Even though, academic and organizational practitioners engage with and utilize their surrounding environment there is still a gap between theory and practice. Researchers generate knowledge which is either not relevant for practice or cannot be adopted because it is too general. Practitioners in contrast, are not able to wait for longitudinal research results and need concrete options tailored to their specific problems (Bartunek, Rynes, & Daft, 2001; Jarzabkowski, Mohrman, & Scherer, 2010; Van de Ven & Johnson, 2006; Whitley, 1984).

The described dilemma is called „knowledge production problem". Engaged scholarship as research method has been proven to approach that gap and helps to build theory that is both relevant and rigorous in theoretical and practical terms (McKelvey, 2006; Van de Ven, 2007). Engagement in the sense of the methodology means that scholars step outside their own paradigms and allow themselves to be informed by interpretations from others. Hence, the researchers task switches to enable alternative paths' emergence for a situation instead of proposing a solution (Jarzabkowski et al., 2010) The problem or phenomenon under investigation is seen as instance of a more general case (Van de Ven & Johnson, 2006). In this paper the particular investigation of the Lean Startup method will demonstrate the impact of experiences and best-practices on the theoretical entrepreneurial processes.

Engaged scholarship unfolds into a four step process consisting of problem formulation, theory building, research design and problem solving (Kenworthy-U'ren, 2005; Van de Ven, 2007).These phases and their validation criteria will be described in the following section.

Firstly, the problem formulation phase has already been realized in the introduction by capturing an observed or experienced phenomenon and trying to describe it from various angles. The validation criterion is to show relevance for the problem to be further investigated from an academic point of view. The second step is to build and elaborate on a theory which is grounded in existing research that deals with the research subject. The most important

aspect is that argumentations are validated using previous research. The next chapter will deal with the research design, which is intended to fully understand and shed light on the Lean Startup method. Simultaneously, the process model should be as clear and transparent as possible to induce trust in the results by the readers and research participants. Finally, in the problem-solving step, the findings are interpreted and referenced back to the initial problem statement to demonstrate its impact in terms of theoretical and practical implications.

2.3. Theory Development – For a Sound Contribution to Research

Before facing the theory development step, it is crucial to understand what constitutes good theory. There is no standard and explicit definition of what constitutes either a theory or theorizing (Lynham, 2002). However, scholars agree that a theory is an articulation of relationships between observable concepts within given constrains and boundaries on a certain level of generalizability (Bacharach, 1989; Klein & Zedeck, 2004; Whetten, 1989). Theorizing is understood as the process of developing a theory. Consequently, pure data, lists or references that point to theories are themselves no theory (Sutton & Staw, 1995; Weick, 1995).

When developing a theory, the following four elements should be considered. A theory always contains factors such as variables, constructs or concepts. Focusing on the most important factors, and leaving out subordinate ones that only make the theory appear vague, should be always the preferred choice. Making use of visuals, those factors need be incorporated into a logical relationship. Together, the elements describing the subjects (what) and their connection (how) create the basis for every theory. In addition, the underlying assumptions and dynamics of those correlations should be made explicit to enable the reader to understand why it is important. Finally, the environmental context (who, where, when) also plays a central role to set boundaries for a theory (Whetten, 1989).

Decent theoretical contribution explains and predicts incidents or events. Especially in the field of Entrepreneurship, the quest is to identify underlying principles that allow conclusions to be drawn on future entrepreneurial activity (Amit et al., 2007). Its focus is on why something happens and not only on what or if it takes place. Outstanding theories manage to explain what is not obvious through observation, but are plausible and interesting (Fiet, 2001; Weick, 1989, 1995). To evaluate the quality of theories one could use the falsifiability and

utility conditions (Bacharach, 1989) or criteria like internal consistency and logic, clarity of arguments, readability, novelty and theoretical contribution (Maanen & Sorensen, 2007).

Eventually, theory development is a cognitive and creative process and should not only produce obvious validated knowledge, but identify new relationships. In other words, the aim of research ought to expand through focusing on processes that have not yet been subject of any previous theory and ground predictions with existing theory (Colquitt & Zapata-Phelan, 2007).

2.4. Entrepreneurial Processes – Examples of Opportunity Creation Approaches

The entrepreneurial process described in particular by Bygrave is defined as "all functions, activities, and actions associated with perceiving opportunities and the creation of organizations to pursue them" (Bygrave, 1993, p. 257). Similarly, entrepreneurial action is considered to be any activity entrepreneurs pursue to form and exploit opportunities (Alvarez & Barney, 2007; Bygrave, 2006). Others came up with a phase model of the entrepreneurial process that takes into consideration the interplay between the entrepreneur and the environment but still struggles to explain what actually happens in early phases of the process (Moroz & Hindle, 2011; Steyaert, 2007; Van der Veen & Wakkee, 2004). In other words, there are general theoretical frameworks. Still, those models lack the ability to explain in employable steps where opportunities come from, why, when and how they are going to be exploited and developed (Sarasvathy & Venkataraman, 2011; Shane & Venkataraman, 2000; Ucbasaran et al., 2001). Research confirms that the existing landscape of entrepreneurial processes is very fragmented but six important mechanisms are identified amongst various models. Specifically, the relationship between the entrepreneur and the expected opportunity is imperative, as well as the timing, context and knowledge. Likewise, entrepreneurship is not about optimization but instead about delivering new value for shareholders which can only be achieved by putting things to action and start doing something (Moroz & Hindle, 2011)

Whilst on the topic of process, it is important to understand different process theories of organizational development. Following a classification by the organizational theorist Van de Ven (2007), one can differentiate four types of change theory. First of all, there is the life-cycle interpretation where events progress in linear way. Secondly, the evolutionary approach contains a series of competing events, with one being selected. Thirdly, dialectic change processes consist of contradicting states that end in synthesis. Finally, teleological theories

mean that change is enacted by goal-setting and cooperation (Van de Ven & Poole, 1995; Van de Ven, 2007). For this paper, the focus will be on teleological theories because its course is rather novel, discontinuous and unpredictable. Hence teleological processes are quite similar to those of Lean Startup. In teleology, development is interpreted as the cycle of goal formulation, implementation and modification. A new cycle starts with a refinement of the goal formulations based on earlier learning. To put it differently, teleology can lead to novel findings by socially constructing and changing goals according to environmental circumstances (Weick, 1979). In addition, teleology also can be the trigger for other process theories to build upon, and make use of it (Van de Ven & Poole, 1995). Therefore, teleological theories could be a good starting point to also capture the entrepreneurial process. On top of that, entrepreneurs and decision-makers in innovative undertakings face a high level of uncertainty, and more often than not they end up exploiting different services or products than initially intended, which is in line with teleological reasoning (Brettel, Mauer, Engelen, & Küpper, 2011; Van der Veen & Wakkee, 2004). Since two approaches to entrepreneurial processes appear to be similar the Lean Startup methodology and also show characteristics of the teleological theory, they will be described shortly.

The first concept is called Bricolage which translates into "making do with what is at hand" or "do it yourself". This idea stems from the French anthropologist Lévi-Strauss (1967) and has now also found its application in the field of Entrepreneurship. The essence of Bricolage is the creation of new options through a re-combination of existing resources for new purposes. In environments with new challenges but without any new resources, Bricolage sparks creativity and improvisation to find new ways of existence (Baker & Nelson, 2005). Through collaborating, people collectively engage in co-development of opportunities and therefore distinct social and network skills are necessary. At its core, it is about an active engagement with problems and incremental steps. This means that, artifacts created within the process of Bricolage do not have to be perfect. On the contrary there will always be space for improvement because the final product or solution is not known until it has been created. In other words, Bricolage builds on trial and error and makes use of each iteration's results while emphasizing interactions between designers, workers, producers, users and markets (Garud & Karnøe, 2003).

The second process model has been introduced by Sarasvathy (2001). Effectuation, in contrast to Causation, reverses the prevailing logic of setting a goal and gathering what is needed to achieve it. Specifically, Effectuations allows constructing one or several conceivable effects

irrespective of the initial goal. Consequently, it is suited in the process of firm creation in markets that do not yet exist, because it helps to reach a decision in absence of any pre-existing goals (Read, Dew, Sarasvathy, Song, & Wittbank, 2009). The process always starts with accessing one's own means concerning people in the network and skills available. In an interaction new means or new goals can emerge (Dew & Sarasvathy, 2007; Wiltbank et al., 2006). Four main principles underpin the effectual theory. Firstly, instead of maximizing returns, the focus lies on the affordable loss through experimentation. Secondly, strategic alliances and commitments serve to reduce uncertainty. The third principle is based on exploiting unexpectedly arising contingencies as opposed to existing knowledge. Fourthly, since decisions are taking place in an uncertain environment, entrepreneurs should focus on controlling certain aspects of the future instead of exploring with imaginative figures and assumptions (Sarasvathy, 2001, 2004).

2.5. Organizational Learning – Adapting to Environmental Changes

Learning is a key concept in the Lean Startup methodology and therefore also needs to be reviewed from the perspective of organization theory. Learning in general can be considered as the development of knowledge. For this work, the definition of learning "as systematic change in cognition and/or behavior" (Bingham & Halebilian, 2012, p. 153) is followed. This means, that learning takes place as reflection after an activity and will impact future decisions (Deakins & Freel, 1998; Hurley & Hult, 1998). Learning itself can take place in a variety of ways. Besides well-known concepts, like learning by doing, through life experience or through problem solving, learning from negative outcomes has been proven to have a disproportionally positive effect (Bingham & Halebilian, 2012; Cope, 2005a; Deakins & Freel, 1998; Gibb, 1997). Connections between entrepreneurship and organizational learning are portrayed in the following lines.

Organizational learning is a constant process to develop new abilities and knowledge to adapt to environmental changes in order to strengthen competitive advantages (Brown & Dugiud, 1991; García-Morales, Llorens-Montes, & Verdú-Jover, 2006; Gibb, 1997; Zollo & Winter, 2002). In addition, entrepreneurial-oriented cultures promote organizational learning due to greater flexibility and higher absorptive capacity, leading to higher innovativeness (Hurley & Hult, 1998). Nevertheless, there has been insufficient research on organizational and entrepreneurial learning. Especially in the small company context the distinction between company and entrepreneur or founder is missing, meaning that organizational learning is

always associated with the learning of the CEO (Bingham & Halebilian, 2012). On top of that, sufficient frameworks for how entrepreneurs learn are not available yet. Those could help in understanding who may become an entrepreneur or what potential learning needs they may have. Some researchers argue that Entrepreneurship itself could be seen as a process of learning since learning is one essential topic. This leads to the conclusion that effective entrepreneurs possess exceptional learning skills (Cope, 2005a; Harrison & Leitch, 2005; Minniti & Bygrave, 2001; Politis, 2005).

Focusing on the first phase of the entrepreneurial process, scholars have shown that there is a strong link between organizational learning and the opportunity recognition capability of a firm. Moreover, three different approaches towards learning have been identified. Behavioral learning is a form of adoptive trial and error learning. External events trigger an action that is based on experiences and add to the cumulative growing body of knowledge for continuous future leverage. Cognitive learning is a process that changes the cognitive content and ability of people to absorb knowledge or apply new behavior. This form is not outcome-centric and not obviously visible. Finally, action learning is considered to take place in real-time and can significantly enhance innovativeness and team performance by making use of learning communities (Lumpkin & Lichtenstein, 2005). That interpretation is in line with a recent study on learning sequences. Bingham & Davis (2012) differentiate between direct and indirect types of learning. While direct learning, like trial and error, experimental or improvisational learning, is considered to be time-consuming, indirect learning, like imitation, observation or adoption strategies, are easier and more efficient to follow. Based on those findings, two different learning sequences have been empirically examined. On the one hand, a seeding sequence takes place when firms begin using indirect learning and change towards direct learning afterwards. It has been found that the seeding approach is good for long term strategies. In other words, it makes sense for mature companies or new market entries. That is due to the reason that putting indirect learning first, demands prior experience, and if that is missing indirect learning approaches could lead to incorrect knowledge. On the other hand, the authors identified a soloing sequence, which starts with direct learning and changes to indirect learning afterwards. That approach is very efficient in the short term since through e.g. trial and error tactics, a good sense for a current market situation can be established. Since direct learning is time-consuming and uses scarce resources it would be very costly and inefficient for long term evaluation. Consequently, soloing sequences are especially useful for start-up companies to evaluate their efforts to pursue a market opportunity (Bingham & Davis, 2012; Deakins & Freel, 1998).

2.6. New Product Development – Adding the Customer Perspective

A high degree of uncertainty and ambiguity are not only playing a major role in Entrepreneurship research, but they are also central themes in new product development and innovation management literature (Loch et al., 2008; Pich, Loch, & Meyer, 2002). Traditional models, like stage-gate systems (Cooper, 2008; O'Connor, 1994) to manage risk and increase efficiency are more frequently challenged by academics and practitioners alike because the firm is predominantly responsible for new product development initiatives (Fuchs & Schreier, 2011; Veryzer, 1998). In turn, customer involvement or early customer integration into new product or service development projects is considered to be a successful strategy to create new business opportunities (Brockhoff, 2003; Carbonell, Rodríguez-Escudero, & Pujari, 2009; Yu & Hang, 2010). In other words, companies are shifting from a responsive customer-led towards a pro-active market-oriented culture, granting marketing strategies an important role in business strategy (Slater & Olson, 2001). Distinguishing that idea from pure market research, the aim is to discover latent, yet unmet customer needs and innovative solutions for future business (Eisenberg, 2011).

One condition for successful customer integration is, that companies manage to find the right prospect who is willing to deliver valuable input. As a result, the lead-user concept enjoys great popularity. Lead-users can be described as *"users whose strong needs will become general in a market-place months or years in the future"* (Hippel, 1986, p. 791). They are motivated to take action, seek and try out new solutions in order to solve their own problems. Leveraging their supportive attitude, firms can involve those users into development processes or test out prototypes (Hippel, 1986; Lettl et al., 2006). In this way, anticipating future customer desires equates to learn quickly about different needs and react in an entrepreneurial fashion to deliver superior value. Along with the lead-user concept goes continuous experimentation and the testing of preliminary product designs (Narver, Slater, & MacLachlan, 2004; Slater & Narver, 1998; Veryzer, 1998). Lead-user strategies take place in an iterative and cyclic manner until customer satisfaction can be validated (Veryzer, 1998). Further tools borrowed from the marketing that are used in exploratory product development include interviews, observation and customer visits (Eisenberg, 2011; Slater & Mohr, 2006).

In a nutshell, lead-users are able to contribute via suggestions, testing and feedback, or even participate in the development and co-creation of new products or services. Eventually, empirical evidence was provided that early customer integration has a positive effect on new

product success and also on its quality, development costs and speed (Carbonell et al., 2009; Lettl, Hienerth, & Gemuenden, 2008; Narver et al., 2004; Yu & Hang, 2010)

2.7. Phenomenology – A Research Design to Capture the Pure Essence

Phenomenology can be traced back to the thoughts of the German philosophers Edmund Husserl (1859-1938) and Martin Heidegger (1889-1976). Literally, phenomenology means the science of a pure manifestation of a phenomenon. Originally it involves the study of the consciousness, meaning a phenomenon itself and how it is experienced by humans in real life (Cope, 2005b; Ehrich, 2005; Groenewald, 2004). The underlying argument is that any appearance cannot be torn apart from its natural world contrasting with most positivistic research paradigms that try to isolate any research object. Phenomenology is an inductive research method that emphasizes the thing itself, or in other words, the self-presentation of the reality and thus needs to be evaluated in a particular context and time (Berglund, 2006; Giorgi, 1994). Following, the focus of phenomenological research is to provide a rich and in-depth description of experiences as a central feature in a protagonist's world view (Sanders, 1982).

A scientific phenomenological researcher will start to gather in-depth understanding and descriptive meanings from participants and their natural perspective. Following this, the researcher will read and analyze the data and withhold to the greatest extent his own subjective knowledge, which is called bracketing. The researcher's aim is to capture and understand the phenomenon from the perspective of others and be able to extract emerging concepts to synthesis these findings. The last step is to use free imaginative variations of those concepts to find the most invariant essence (Giorgi, 1994, 1997; Merleau-Ponty, 1962). By changing the point of view, phenomenology has the potential to discover something what is obviously there but not seen (Ehrich, 2005; Sanders, 1982).

Phenomenology can be used if the threat of missing out on opportunities exists, when characteristics of a certain phenomenon are overseen and not tackled in great detail (Zahra, 2007). As a qualitative method it allows to enrich existing theories or even exploit new research opportunities (Goulding, 2005; Pratt, 2009). Moreover, two studies have been found that apply a phenomenological research design to the domain of entrepreneurship (Berglund & Hellström, 2002; Cope, 2005b). Both papers have been looking for a methodological vehicle that can be used in the entrepreneurial research domain which is able to investigate a

very practical subject area. A different way to use phenomenology in entrepreneurship research is demonstrated by Cope (2005). He uses it to enhance the findings of a large quantitative study by applying the technique of phenomenological interviews about entrepreneurial learning.

All in all, the two papers mentioned above provide evidence that applying phenomenological research methods in the field of entrepreneurship is justified. Since one of the main application areas is to describe occurrences by making use of a variety of techniques, the approach suggested by Cope (2005) is convincing and aligned with former research in the field of entrepreneurship (Morgan & Smircich, 1980; Patton & Appelbaum, 2003; Rynes & Gephart, 2004). Furthermore, it should be the goal of entrepreneurial researchers to seize the meaning of entrepreneurs' experiences in real life. In conclusion, the inductive approach with emphasis on the pure essence of a phenomenon is able to augment findings from research domains dominated by quantitative studies and should not be a special case (Berglund, 2006; Cope, 2005b; Gartner & Birley, 2002).

In summary, using phenomenological interviews can reveal rich descriptions and knowledge about the experienced reality of the participants regarding the concept of Lean Startup.

3. Methodology

3.1. Methodological Motivation

Doing research purely for research's sake was not compelling for me. For that reason I have been looking for a topic that is of interest to me but could also be valuable to the scientific world. In the specific case of Lean Startup little to no research articles could be found. The lack of literature should not be the reason alone for conducting my research (Pratt, 2009). From my initial understanding of the phenomenon of Lean Startup it appears to me that it could provide interesting insights for the entrepreneurship or management research domain. It may be the case that Lean Startup is one example of how best practices of different domains are combined and applied specifically to start and run software companies. To fill the gap of ambiguity about the true essence what Lean Startup is all about, could itself be important to the entrepreneurial process or even to establish a new way of management behavior in quickly changing environments and disruptive markets (Sarasvathy & Venkataraman, 2011). To master those challenges of understanding what Lean Startup is about and how it is used in real life, a discovery oriented, explorative research approach has been chosen (Giorgi, 1994; Patton & Appelbaum, 2003). As outlined earlier, to grasp the pure essence of an occurrence, the tool of the phenomenological interview seems to be appropriate and has already been used in the domain of entrepreneurship and marketing (Berglund & Hellström, 2002; Cope, 2005b; Thompson, Locander, & Pollio, 1989).

Table 1 summarizes the proposed steps from the different streams of literature. It is noticeable that the two general approaches one by Yin (1994) about case studies and one by Sanders (1982) about phenomenology are quite similar in their structure. Both designs allot a phase of general preparation which contains the definition of the research goal, constrains and samples used. This phase is followed by the actual execution of the study by conducting interviews or collecting relevant data. Next, both suggest the analysis phase, where Sanders (1982) calls it appropriately "phenomenological analysis" which in turn consists of several steps. Only Yin (1994) rounds up the procedure with an explicit concluding phase whereas is already included in the third phase of the phenomenological process. The high degree of overlap of both of the proposed research designs confirms that it is conducive to embed phenomenological interviews in a case study design.

Current research design	Proposed research designs from various authors			
	(Yin, 1994)	(Eisenhardt, 1989)	(Sanders, 1982)	(Kvale, 1996)
Evaluation of research topic	Case study protocol	Getting started	Determination of limits	Thematizing
Design of the study		Selecting the cases		Designing
		Crafting instruments and protocols		
Execution of interviews	Conduct the study	Entering the field	Collection	Conducting
Preparation of data	Analysis	Analyzing within the case	Phenomenological analysis	Transcribing
Phenomenological analysis		Searching for cross-case patterns		Analyzing
		Shaping hypothesis		
Comparison with literature		Enfolding literature		Verifying
Writing of the report	Conclusion	Reaching closure		Reporting

Table 1 - Comparison of Research Designs

Taking a deeper look into the processes outlined by Eisenhardt (1989) and Kvale (1996) shows that all three of the general phases from above can be found there as well. Up to the point of actually conducting the study, both processes are aligned. Since the steps outline by Kvale (1996) are focused on interviews, he explicitly mentions the transcription as a separate phase. In contrast, Eisenhardt (1989) stresses more the cyclical phase of analysis of the data until saturation occurs or the process reaches closure as she refers to it in the article. Both series of steps also involve the verification, identification of patterns across cases or even contrasting the findings with existing literature.

Furthermore, another key factor to determine the research design is the unit of analysis (Shaw, 1999). Lean Startup as phenomenon has been observed and is applied by small startup companies which are driven by the spirit or the vision of the founder. In other words, the direction and the modus operandi are decided on the level of the individual entrepreneur. Hence, the recording of experiences and meanings should also be based on the single person

and can be accomplished using in-depth interviews to enhance the richness of data (Lowes & Prowse, 2001).

All in all, guided by the phenomenon itself in choosing the research design but also supporting it with logical and scientific based arguments will finally lead the design that is most appropriate for the given study (Hummel, 1991; Hycner, 1985; Morgan & Smircich, 1980). Following on from this, the case study approach outlined by Eisenhardt (1989) and Yin (1994) will be the primary research strategy combined with the phenomenological interviews on the level of the individual entrepreneur's experiences as subordinate but complementing tactic (Kvale, 1983, 1996; Lowes & Prowse, 2001).

3.2. Research Design

The final research design particular aiming to answer the research question in the given paper, discloses the following steps.

1. *Evaluation of research topic*

   The first step was to find a topic that both interests me and is suitable for a Master's assignment. Therefore, the matter of investigation had to be discussed with the supervisors and clear determining factors to be established.

2. *Design of the study*

   Secondly, the outline of the study had to be made clear. The tasks included in this phase entail the definition of the sample size and how the data was going to be collected. In addition, the rough interview guideline was constructed. Even though there is an ongoing discussion within phenomenologists whether to review literature before or after the interviews, I have decided to familiarize myself with the underlying concept of Lean Startup beforehand (Morse & Field, 1996; Oiler, 1982). To invalidate the argument that acquiring prior knowledge is contradicting the concept of phenomenological reduction, the research question does only concern Lean Startup and to better engage in a conversation or even a co-creation with the interviewees some domain knowledge is recommended (Lowes & Prowse, 2001; Thompson et al., 1989).

3. *Execution of interviews*

   The third phase was conditioned by intensive mail and telephone conversations with potential interviewees to schedule the interviews. It was important to find interview slots which were suitable for the interviewee in terms of having the time to engage in a

conversation of about 40 minutes' length. In addition, a quiet room where the interviewee felt comfortable and did not get distracted during our telephone conversation has been asked for (Saunders, Lewis, & Thornhill, 2003). In total, eight in-depth semi-standardized interviews have been conducted for the purpose of the Master's assignment. For being able to intensively engage in the conversation and not being distracted in writing notes, all interviews have been recorded with the permission of the participants.

4. *Preparation of data*

In order to use the amount of information generated throughout the interviews properly for further analysis, all interviews had to be transcribed. The interviews have been conducted in English to avoid problems with translation and transcribing (Larkin, Casterlé, & Schotsmans, 2007; Polkinghorne, 2005; Temple & Young, 2004). Furthermore, the interview transcripts were imported into ATLAS.ti, which is a software application to facilitate qualitative data analysis (Friese, 2012).

5. *Phenomenological analysis*

The main objective in the analysis phase is to extract the pure meaning of the phenomenon under investigation. For that reason, the methodology for this phase followed recommended steps by phenomenologist (Hycner, 1985; Kvale, 1983) and best practices in business research (Cope, 2005b; Ehrich, 2005; Goulding, 2005), which includes bracketing, clustering and identification of concepts.

6. *Comparison with literature*

After an understanding of the philosophy of Lean Startup has been established and general concepts emerged from the interviews, it is important to validate the findings with existing literature in order to answer the given research question. For that purpose not only entrepreneurship literature but also organizational learning, new product development, management research and organization theory streams will be considered.

7. *Writing of the report*

The final step is to write up the research in a compelling and scientific but interesting way. This will also include drawing tables and diagrams, as well as, proof-reading. The final report will use the APA style for its citations.

3.3. Data Collection

3.3.1. *Selection*

On the basis of case studies and grounded theory approaches, which are predominantly exploratory or focused on a specific case or social phenomenon, purposive or judgmental sampling will be used in this research project instead of probability and statistically relevant sampling methods (Babbie, 2007; Saunders et al., 2003). Lean Startup is not something that can be seen in the entire population nor is it statistically distributed amongst specific groups of people. It is applied by a small group of entrepreneurs and originated from Silicon Valley in the United States of America. Lean Startup followers or evangelists can now be found in over 90 countries around the world. For the purpose of this study and to answer the research question, the main protagonists had to be identified who already have rich experience and detailed information in relation to the phenomenon under investigation (Cope, 2005b; Groenewald, 2004; Kruger, 1988; Shaw, 1999). Following the case study methodology, the aim is not to achieve a representation of some population but to advance theory-building and better understanding of a phenomenon based on the knowledge and experiences of the participants (Berglund, 2006; Eisenhardt & Graebner, 2007).

In selecting the right participants for the purpose of that study, some criteria had to be established in order to qualify as interviewee (Shaw, 1999). First of all, participants should be knowledgeable in the domain of Lean Startup. Profound knowledge could on the one hand be demonstrated by published written work, teaching or mentoring engagements. Secondly, experiences in applying Lean Startup methodology or being involved in a startup were anticipated to enrich the conversations with personal practical examples. Finally, personal interest in Lean Startup itself was also important in helping to conduct this research project. Interviewees validated that last criterion by investing valuable time in telephone conversations and discussions.

It is difficult to determine a fixed sample size in advance of the study (Dyer & Wilkins, 1991; Shaw, 1999). In particular, there are different opinions about the number of participants. Similar studies involved between six and twelve practicing entrepreneurs (Berglund, 2006; Cope, 2005b). Books about qualitative research recommend up to ten cases using long interviews until saturation is reached (Boyd, 2001; Creswell, 1998). During the process of

conducting the interviews, theoretical saturation of the themes that were discussed was noticed and let to the conclusion that no more interviews were needed (Glaser & Strauss, 1973; Shaw, 1999)

3.3.2. Sample

As mentioned earlier, the final sample consists of eight people. All are male and between 25 and 40 years old. Two of them are located in the United States of America and six in different countries in Europe (Austria, England, Netherlands, Norway and Switzerland). Participants from different countries were chosen so that different experiences could be contrasted and validated against each another to increase objectivity (Blumberg, Cooper, & Schinder, 2008). Furthermore, participants from two different clusters have been drawn within the selected group. On the one hand, three interviewees qualified because they published groundbreaking books in the domain of Lean Startup which coined the mindset and understanding of most practitioners. On the other hand, five interviewees belong to the side of the practitioners. All of them help other people apply Lean Startup principles and are influential leaders within their respective communities. Most of the participants founded one or more technology companies during the course of their entrepreneurial journey. All in all, the sample consists of two types of participants with different points of view towards the phenomenon and geographical origins in order to increase the validity and reliability of the emerging results by making use of multiple perspectives (Bluhm, Harman, Lee, & Mitchell, 2011; Eisenhardt & Graebner, 2007; Groenewald, 2004; Kvale, 1996; Yin, 1994)

3.3.3. Phenomenological Interview

Using qualitative methods, researchers are able to reveal rich descriptions of the qualitative subjective human world. Within the case study research design, interviews will provide the researcher with an appropriate tool with which to gather well-founded knowledge about the participants' proximity (Kvale, 1996; Yin, 1994). The phenomenological interview is especially suitable to engage in a social co-creation and interaction between interviewer and interviewee which goes beyond ordinary question-and-answer-mechanics to uncover new insights about the phenomenon (Smith & Osborn, 2007). Unstructured interviews or only asking one opening question are advised for phenomenological research to let the conversation follow a loose structure and give the interviewees room to lead the conversation

into new areas (Berglund, 2006; Cope, 2005b; Lowes & Prowse, 2001). Nevertheless, a general interview guideline with six questions has been developed beforehand to ensure a certain structure that encompassed different types of questions e.g. introducing questions, direct questions and specifying questions (Kvale, 1996). For me that was quite helpful in times when the conversation was stagnant to regain traction and spark new topics or dive deeper into specific areas.

Another important issue is to differentiate between the interview questions and the underlying research questions of the given Master's assignment. This is essential in order to speak the interviewee's language and capture open and rich descriptions (Kvale, 1983, 1996). Simultaneously, question were formulated in a gentle and neutral way to avoid leading the participant into a specific direction (Smith & Osborn, 2007). During the interview the focus was about the phenomenon but always from a point of view of the participant as the following example demonstrates.

"From your personal experience, how would you describe Lean Startup?"

The interviews itself were conducted in a very loose semi-structured but in-depth phenomenological approach to capture subjective impressions and personal interpretations of the interviewees (King, 2004; Saunders et al., 2003; Thompson et al., 1989). Ideally, the whole interview conversation could be established around one critical incident situation of the participants' real-world experience.

"After you made clear your understanding of Lean Startup, do you remember any specific situation when you used Lean Startup principles in a very demonstrative way?"

Hereby, the commandments by Berg (2004) have been considered specifically when it comes to respect, hearing awareness and follow up by monosyllabic answers. On top of that, information about the study, its goals and estimated interview duration were given to the participants of the research beforehand, also to reduce interviewee bias (Saunders et al., 2003). Each interviewee agreed that the interview was audio recorded for the purpose of the study.

"Do you mind elaborating on that specific situation on how you applied Lean Startup practices specifically?"

In retrospect, it can be said that according to Kvale's (1996) criteria for an interview, they have been high quality. It was demonstrated by a lot of spontaneous and relevant answers by

the interviewees as well as the ratio of the length of the questions to the answers suggest that people wanted to talk and speak about that topic and often used well-chosen examples of their experiences.

Further information on the interview structure and interview prospects can be found in the Appendix – Interview Guideline.

3.4. Data Analysis

There are various approaches to finally analyze or even better to explicate the information gathered through those phenomenological interviews (Colaizzi, 1978; Giorgi, 1997; Groenewald, 2004; Hycner, 1985). From a very general view those practices overlap in some aspects. Those are namely a descriptive understanding, identification of overarching concepts and the synthesis into a comprehensive picture. Thus, the elements most suited for my explication of data are described in more detail in the following paragraph with reference to the theoretical foundation.

To serve as information bases for further inductive analysis, the interviews have to be fully transcribed as a first step (Cope, 2005b; Hycner, 1985). Each interview was transcribed individually and revised to eliminate expressions made during speech pauses to increase readability. In summary, almost six hours of interviews yielded 116 pages of written transcripts.

After extracting the row data, the process of analysis started. Therefore, it was important to free the researcher's mind of any understanding and opinion about the Lean Startup phenomenon to approach the interviews without any bias. From a psychologist's point of view the method applied in that steps refers to the phenomenological bracketing and later reduction of the phenomenon to its pure essence (Giorgi, 1983; Hycner, 1985). Bracketing was applied by not taking general expressions about Lean Startup as granted or even references to published books were ask to be summarized briefly. The aim was to establish a situation in which the interviewee should justify and explain actions in terms of the phenomenon. The ability of the researcher to enter in the discussion was built upon the information being divulged by the interviewee. Hence, the researcher only acquired the capabilities and knowledge about the phenomenon during the co-creating conversation for each interview separately.

After that mental preparation, each interview has been dealt with individually and open-mindedly. The transcripts have been read to identify statements or quotations that describe the phenomenon (Ehrich, 2005; Groenewald, 2004; Thompson et al., 1989). Those statements were used to delineate codes about the essential ideas around Lean Startup (Colaizzi, 1978; Giorgi, 1997; Goulding, 2005). Predominately, the focus was on activities, practices, environmental factors, elements or artifacts and principles. Names, dates and companies have not been considered for further analysis.

In that first iteration of going through the interviews, codes did not necessarily have a direct relation to the research question (Hycner, 1985). The advantage is that a wide range of potential starting points for the synthesis emerged. The step described here follows the same logic and are also often referred to the idea of open coding from grounded theory approach to reduce a huge amount of written data to a manageable number of few codes and factors that explain a phenomenon (Bluhm et al., 2011; Lee, 1999; Strauss & Cobin, 2008; Suddaby, 2006). Since coding in different forms is a key aspect of various qualitative analysis techniques like grounded theory or content analysis, it is valid to make references to those literature streams to back up the strategy followed in this research (Gibbs, 2007; Kvale, 1996).

Cross-case comparison, as known from case study research was applied in the following step (Eisenhardt & Graebner, 2007). Aiming to identify not only the essence of one particular experiences but the phenomenon as a whole, categories of codes were identified over all participants (Ehrich, 2005; Goulding, 2005; Hycner, 1985). In doing this, no position by the researcher was taken and all experiences and stories by the interviewees were treated in the same way without weighting (Groenewald, 2004).

So far, in qualitative data analysis there is no best way in how to analyze data. Here, a narrative strategy for sense-making was followed (Langley, 1999; Yin, 1994). Thus, the process of identifying categories was rather cyclical instead of sequential. For facilitation reasons, the scientific software application ATLAS.ti has been used (Friese, 2011). The iterative process described above could be easily integrated into the common approach of computer aided qualitative data analysis of notice, collect and think (Kelle, 1998; Konopásek, 2008; Lewins & Silver, 2007; Seidel, 1998). As the research embraced by reading the first transcripts, the first concepts as summation of categories have been noticed and also new data from following interviews has been collected. The identification of overarching emerging concepts is termed as thinking to link different categories from single interviews to each other. To put it in different words, constant comparison has been used constantly to identify

general interlinked clusters of concepts (Glaser & Strauss, 1973; Suddaby, 2006). Along the way, theoretical saturation within the emerging categories was one of the reasons to not extent the study beyond those eight interviews. In summary, the outcome did enfold iteratively by putting together consecutive pieces of the research.

To ensure high quality analysis, the proposed criteria by Thompson et al. (1989) have also been applied. Therefore, the initial round of coding and labeling of codes was based on the respondent's own terms. Following on from this, entire passages and not only segments of phrases have been used to develop the context sensitive categories. Further, during the coding, no theoretical explanation took place. Abstraction and generalization only took place based on the codes. Finally, the concepts that emerged at the end of the analysis could be found in all of the eight interview transcripts.

4. Results

4.1. The Big Picture

From the data analysis 146 codes have been identified overall from the eight interviews. Those codes have been further aggregated into 25 categories by grouping together single codes. In the end, ten final concepts emerged from the analysis. Figure 2 depicts the process of data analysis and aggregation. It should be noted that not all codes were able to be integrated into the final model and have not been used for further explanations.
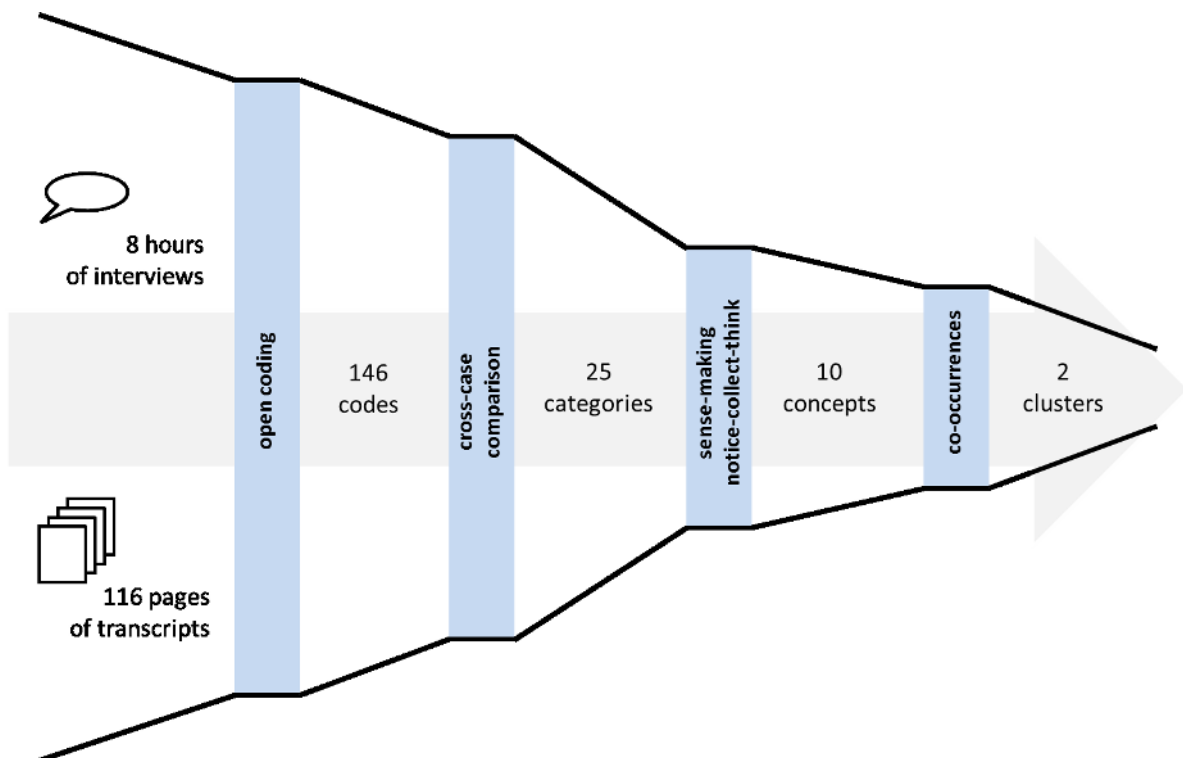

Figure 2 - Data Analysis and Aggregation Process

Aggregating those 146 codes followed a subjective sense-making strategy by trying to abstract and generalize over all the interview transcripts. Using the qualitative data analysis process that ATLAS.ti offered the emerged 25 categories could have been analyzed further. The method of choice was the co-occurrence matrix that allowed visually showing, which categories do co-occur with others in the given material. Figure 3 shows the resulting ten concepts with their co-occurrence factor (reaching from 0 – low to 1 – high) in a table. The co-occurrence factor is, similar to the coefficient of correlation, and exemplifies the degree of a linear relationship (Friese, 2012). The design of a matrix is chosen to show all possible connections. A low value means that there is no relevant connection of the corresponding concepts, whereas a high value hypothesizes a meaningful association. To make this tool

more understandable, one could take the concept of "learning" which has a co-occurrence factor of 0,22 with "experimentation" but a zero value linking to the concept of "composition". One plausible interpretation is that more experiments could lead to higher learning. On the contrary, the composition of Lean Startup in terms of its flexibility and the usage of principles do not have a significant relationship to the idea of learning about customers and markets. A relative color gradient from red (low values) to green (high values) has been added to the matrix to easily identify the differences in the factors.

	EXPERIMEN-TATION	COMPOSITION	INFLUENCES	ITERATION	CHARACTER-ISTICS	LEARNING	PRODUCT DEVELOPMENT	PROTOTYPING	RISK
COMPOSITION	0,03								
INFLUENCES	0,13	0,15							
ITERATION	0,19	0,07	0,12						
CHARACTERISTICS	0,14	0,04	0,07	0,15					
LEARNING	0,22	0	0,09	0,16	0,15				
PRODUCT DEVELOPMENT	0,06	0,08	0,03	0,07	0,08	0,09			
PROTOTYPING	0,16	0,01	0,07	0,13	0,14	0,21	0,09		
RISKS	0,03	0	0,02	0,01	0,03	0,04	0,03	0	
VALIDATION	0,2	0,05	0,13	0,12	0,14	0,26	0,06	0,12	0,02

Figure 3 - Co-Occurrence Matrix

Since qualitative sense-making strategies are very subjective, the co-occurrence factors have been used in the form of allusion to something meaningful. The factors by themselves should not be accepted without challenging the underlying interpretation (Glaser & Strauss, 1973; Kelle, 1998; King, 2004; Temple & Young, 2004). Moreover, values range only up to 0,26 from a maximum of 1,00 and should be seen relatively to the given dataset.

Figure 4 sheds light on different individual concepts within the co-occurrence matrix to account for the clusters that emerged. On the one hand, one can see that the concepts "Framework" and "Influence" have only very low co-occurrence factors with any of the others but relatively high values amongst themselves (cf. green cells in cluster one "Lean Startup Essentials"). On the other hand, taking a look at the concepts "Product Development" and "Risks" it is clear that they do not have any high co-occurrences with any other concepts making those rather the outliers (cf. many yellowish up to red cells in cluster three "Risk and Product Development"). On top of that, the centric cluster in Figure 4 shows almost exclusively green cells, meaning relatively high co-occurrence factors. In conclusion, those concepts have been pooled in the cluster of "Lean Startup Methodology".
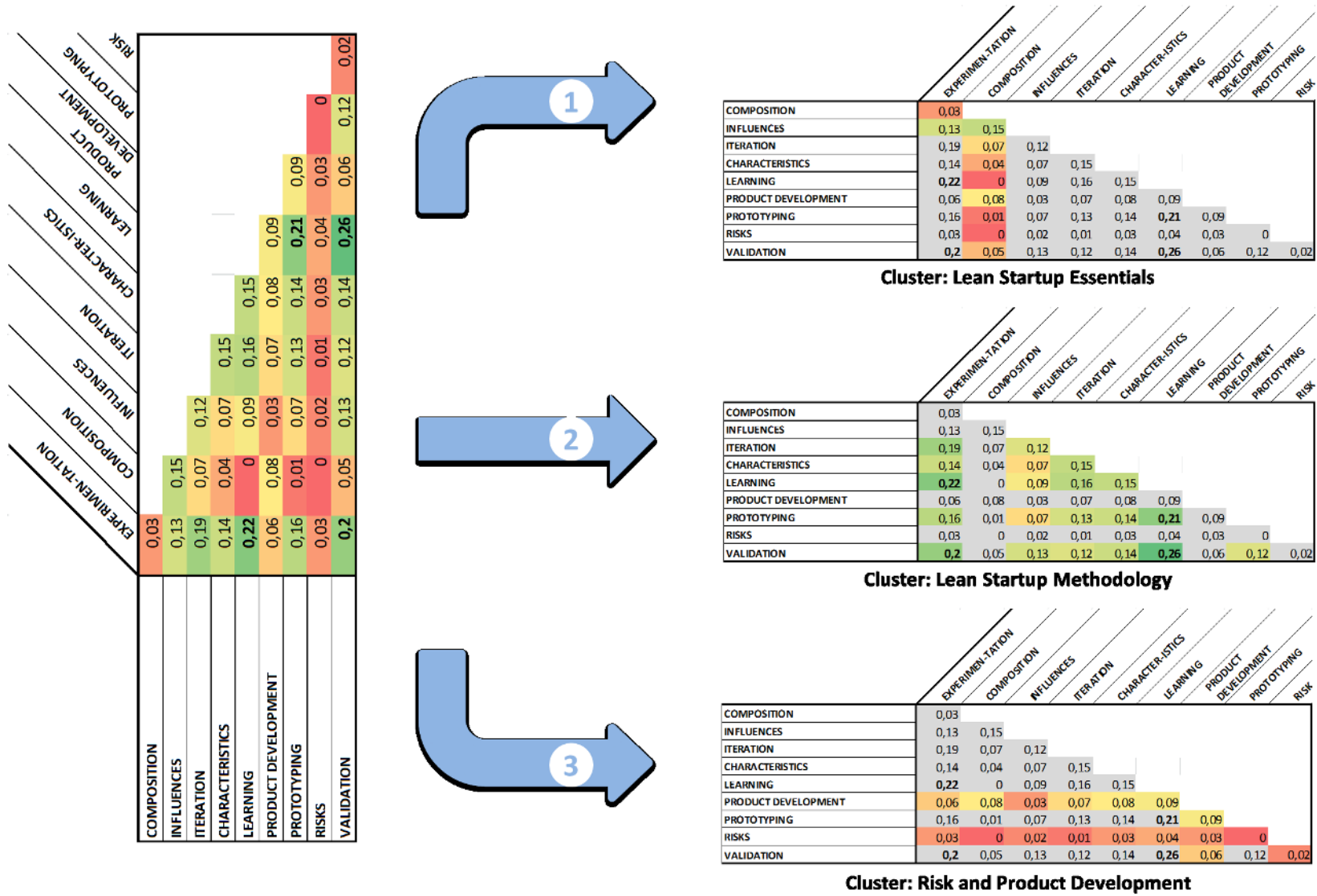
Figure 4 - Breakdown of Co-Occurrence Matrix

Besides, no difference in the concept formation could be noticed between the two groups of interview prospects. In conclusion, no divergent interpretations amongst the groups of practitioners and consultants who popularized the Lean Startup methodology could be found. Eventually, the geographical location was also of no concern in understanding the concept.

The further elaboration on the results is based on the co-occurrence factors between concepts and on an interpretation of those relationships. The discussions and insights into the Lean Startup methodology significantly contributed and shaped those subjective interpretations. Quotes of the interviewees (marked in *italics*) have been used and incorporated into the argumentation to back up the reasoning and give more objective evidence.

4.2. Lean Startup as an Adaptable Methodology

The first resulting cluster can be labeled as "Lean Startup Essentials". It consists of the two concepts "Composition" and "Influences". Table 2 summarizes the composition of the cluster's concepts.

Concept	Number of Categories	Number of Codes	Number of Quotes
Composition	4	13	45
Influences	5	13	40
Sum	9	26	75*

*Total number of quotes is less than the sum of quotes for all concepts because of co-occurrences of quotes

Table 2 - Cluster Composition: Lean Startup Essentials

The data that has been summarized in the concept of "Composition" mainly deals with different understandings of the Lean Startup phenomenon. On the one hand, it is seen as "*methodology that teaches entrepreneurs how to approach a new concept or an idea*" and "*lets product owners be able to bring new products to market and maximize their odds of success*". A different interpretation being Lean Startup as set of principles instead of a prescribed process. It helps entrepreneurs "*to navigate in a risk mitigating way*" through the uncertainty of the early phase of the entrepreneurial process whilst still allowing a high degree of flexibility to the practitioner. On the other hand, the Lean Startup phenomenon is seen as process consisting of problem understanding, solution definition, qualitative validation and finally quantitative validation. That is often referred to as the build-measure-learn feedback loop. A very concise and poignant definition is offered by one of the interviewees two pages ahead.

Concept	Category	Code	Quote
C O M P O S I T I O N	Principles	Set of principles Principles opposed to tactics People have been using principles but not rigorously DNA Tactics derive from principles	• *"it's really a synthesis of many other principles and so it goes back all the way to lean from lean thinking or the trade of production system"* • *"It really is a meta principles and that is a very important point to make because oftentimes people look at lean startup as a collection of tactics."* • *"Well, I would say, the downside is not as much in methodology. I say it's probably in the methodology as well, simply because one of the strength of the methodology is that it isn't really a prescriptive process that's really a set of principles. "* • *"I see it as a, in the end, it's kind of an open space, like a big bowl of approaches, ideas and principles. And just like you, you pick yourself what you feel this is interesting, like a big part is really think differently, right. So the big part of it really is contrary to existing knowledge of how to build business like how to build a restaurant. If you want to build a restaurant usually you would do it not lean really."*
	Flexibility	Adapt to own process / flow of work Different practices at different stages Combination Universal	• *"lean startup is a way of thinking, somewhat a philosophy in terms of, you would not actually. I don't use the principles the steps of rigorously. I'm not like, this is step 1, this is step 2, I have to do this and I have to do this. Basically, the way of doing it were using parts of it, the abstract, the overall way of thinking is of course there, and we would use some mechanism, some principles, some techniques, some tools, depending on where we are. So what it does basically is to help us navigate in a risk mitigating away hopefully, by applying parts of it. "*
	Process Characteristics	Lack of standardized process Process Methodology	• *"So there's the first step - to understand the problem; second step - define solution; third step - validate qualitatively or validate in small scale; and then finally- verify quantitatively or measure at a much lower "* • *"The lean startup is, how Eric Ries interpret it, is a lean principle as applied to startup process or process used to getting to market"* • *"I think it's a process and it's a set of principles. It's really hard to explain, it's a little bit of both. I see it as a process because it's a process and a shorted process that really explains close political steps, how to approach a project. It's also a set of principles that you have to take at heart and that have to become the DNA of your company"*
	Common Language	Common Language	• *"Yeah. I just mentioned a common language which I think is really important to all those kind of situations. Meaning that, if you're speaking in German and I'm speaking in Norwegian, we would not be able to understand each other and moving in the same direction necessary"*

I N F L U E N C E	Market Research	Marketing AB Testing	• *"And then you basically throw a lot of energies and to grow it, and you find out little things that don't work on the way. So basically doing a lot of PR, doing a lot of online marketing, spending money on advertising, optimizing your landing pages, optimizing everything in between pages, AB testing your features like this kind of stuff which is all good, which is all useful, as soon as the actual value proposition works and as soon as the extra solution in its core fulfills its value proposition."* • *"They manage actually to do the impossible, to make customer development actually something people think it's cool and want to do. So in my opinion like to sum it up, lean startup is basically trying to combine the processing of the lean manufacturing of Toyota with the approach of systematic validation of customer development and then to combining this with some sort of reverse best-practices like measuring of feature rollouts and systematic AB testing in this kind of stuff. "*
	Software Development	Agile Development Software Product Web Startup	• *"But of course, an iterative process for building our trading algorithm. So we started to it with really a small simple model and in each iteration we tried to improve it by adding more data or different features or more complex methodologies, so we definitely use iterate agile concept in building the product."* • *"... a methodology that often used is scrum methodology, extreme programming, the Agile management. These are methods for team management, for product management and this is the start of methodology build"*
	Lean Production	Continuous Improvement Lean Thinking / Lean Production	• *"so it goes back all the way to lean from lean thinking or the trade of production system"* • *"... focus on the example of how startups were using their like they apply their ideas and their methodologies and how they tried to basically build something, measure something, validate something, learn out of it and then improve, so basically continuous improvement."*
	Product Development	Long circle-times in former practices longer circle-time = higher risk Waterfall	• *"I started a company initially with just spark up of an idea and very quickly I find myself in this 2-year cycle. It took me 2 years to figure out that spark was going really achieve the success that I have set out to achieve. And that was just too long of a cycle time. And while I had some moderate amount of success, I got better and got some moderate amount of success. But some of the products, it was still not a systematic way, not a quick way of getting to that conclusion. So I had been in search for just faster ways to that product ideas because as entrepreneur's, we always get hit by ideas. "*
	Other	Best Practices BusinessModelCanvas / LeanCanvas Scientific based	• *"Parts of it are combined existing methodologies and other parts are basically reversing base best practices out of working teams working products. "* • *"And therefore, what creates a value in as startup situation are experiments that lead to that learning we call validated learning, scientific learning about what actually will work and everything else is waste."*

Table 3 – Aggregated Coding Table: Lean Startup Essentials

"So to me the biggest point behind Lean Startup really is that, it's kind of a map or a framework to think and there are a lot of tools in it. Basically Lean Startup is kind of a summarization of various approaches which increase the chance that you're successful. It's not a guarantee, but basically it increases your chance of success, because it helps you focus, otherwise you're just chaotic you don't know what you're doing and Lean Startup really helps you to have a more structured approach."

Finally, the terminology used in the Lean Startup method gave founders a common language with which to articulate what they are doing within their entrepreneurial journey in the different phases.

Moving on to the influencing factors, it quickly became clear, that "*Lean Startup is actually connecting the development phase and the customer, marketing and sales processes*". That implies in particular "*customer development techniques in terms of speaking, talking and understanding and observing customers*" from marketers. In addition, it borrows agile development principles like continuous deployment from software engineers and combines it with user experience principles by designers. Finally, the underlying attitude "*goes back all the way to lean from lean thinking or the trade of production system*" by Toyota.

Table 3 gives a more detail insight in the elaboration of the process of concept development with further supporting quotes from the interviews.

4.3. Learning as the Essence of Lean Startup

The second more complex cluster, named "Lean Startup methodology", emerged into what Lean Startup is about and how it can be applied. It is composed of four leading concepts, namely "Learning", "Validation", "Prototyping" and "Experimentation". Additionally, those are also closely related to the concept of "Characteristics" and "Iteration". Table 4 gives an overview about the structure including the categories, codes and quotes. Following, the different co-occurrences will be dealt with in descending order of their factors as an expression of its importance.

Concept	Number of Categories	Number of Codes	Number of Quotes
Characteristics	4	15	58
Experimentation	4	10	65
Iteration	3	20	69

Learning	1	6	47
Prototyping	1	6	34
Validation	1	9	71
Sum	14	66	186*

*Total number of quotes is less than the sum of quotes for all concepts because of co-occurrences of quotes

Table 4 - Cluster Composition: Lean Startup Methodology

According to the analysis of the interview transcripts, "Learning" is the core concept within the Lean Startup methodology. It shows the highest co-occurrence factors with other concepts and therefore can be considered as omnipresent, which can be supported by the following quotation:

> *"In Lean Startup there's a very big emphasis on maximizing learning versus maximizing just the building of the product. So it's really maximizing learning, specifically about customers and markets per unit time.*

The idea behind the strong focus on knowledge acquisition is "*trying to learn in the sense of trying to understand something or verifying the understanding. So if you don't really understand why your customer finds value in your product then you need to go in and understand that.*" The strongest co-occurrence can be seen in the relationship to "Validation". Within the Lean Startup terminology every assumption regarding a potential business model, customer segments, or market demand for the imagined product or service is seen as an untested hypothesis. Hence, the first task of any entrepreneur should be to validate the answer to the questions, if "*this problem is worth a thing*" to the customer. Afterwards, it is important to confirm "*if you have a solution that enough people want to buy*". In order to find out about these things, it is not necessary to build the full feature set of a product. Instead one "*could come out with a proxy of the solution. It might be a screen shot, it might be a video, or it might be a wireframe or even a verbal description*". This leads to the second most important co-occurrence between "Learning" and "Prototyping". Having a defined learning goal in order to validate one of the most risky assumptions in the business model, prototyping is probably the fast way to achieve that goal while focusing "*on some of the key risks that the business would face if you build the whole thing and by focusing on those things alone you could learn and adapt around it very quickly with very low waste in terms of building something that nobody would use*". Since those "*assumptions you have about the market, the product, the distribution channels, the pricing* [need] *to be validated by real customers*" the vehicle of "Experimentation" is used within the Lean Startup methodology. For each

assumption in the business, a learning goal has to be defined which will could be tested in an experiment making use of prototypes instead of the final product. The entire context of those four leading concepts is depicted in Figure 5. It should be noted that the thickness of lines correlates with the co-occurrence factors and makes the strength of the relationship visible.
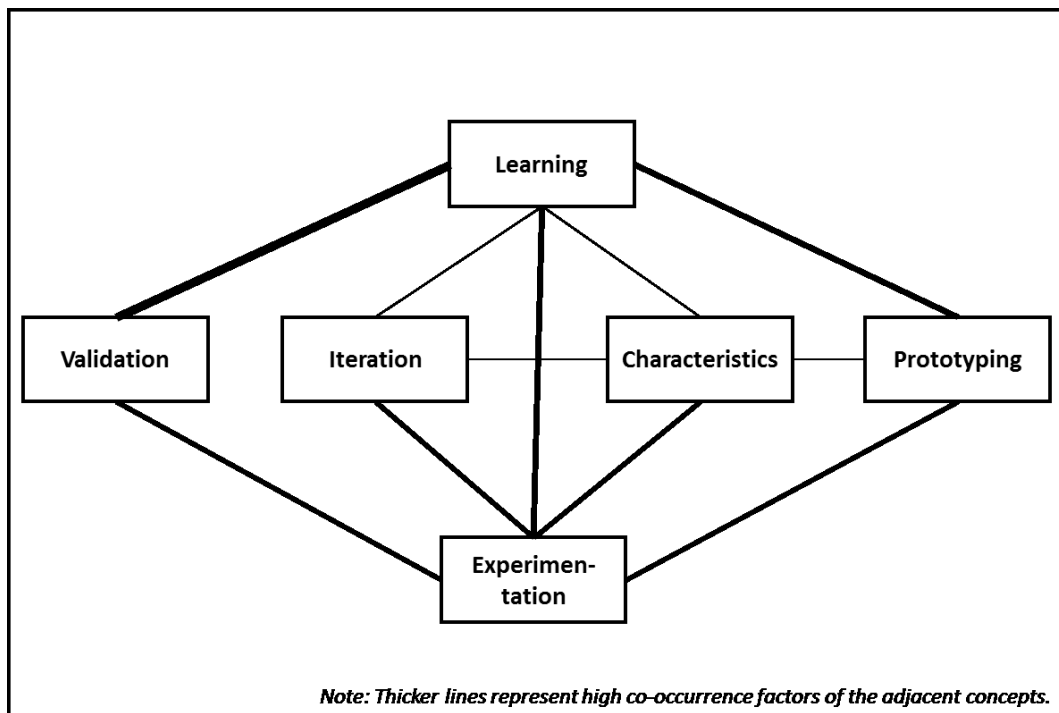

Note: Thicker lines represent high co-occurrence factors of the adjacent concepts.

Figure 5 - Visualization of Lean Startup Methodology

To be successful, the experiments are connected with some conditions. First, there needs to be strict time-boxing to not run the risk of open-ended projects that do not contribute to the actual progress of validating assumptions. Second, the execution should be aimed towards low resource allocation. Third, experiments help to double-check if certain development activities are effectively contributing to customer satisfaction and are not only minor features.

> *"So in the end I see a startup as an experiment where often the limiting factor is the amount of cash you have before finding market fits and a sustainable, scalable business model. So the only thing you can hold people accountable for, is the speed people go to the process."*

The result of each experiment is to validate one risky assumption. Afterwards, the gathered knowledge is taken and implemented *"into the next phase of building something, so you would constantly create small experiments in order to validate and proceed to this build-measure-learn feedback loop as fast as possible"*.

Moving to the center of Figure 5, the concepts "Iteration" and "Characteristics" are somehow connected to all of the outer ones. In particular, this means that the entire method of Lean Startup takes place in an iterative way. In other words, knowledge is built iteratively according to the experiments. Moreover, "Experimentation", "Learning", and "Prototyping" show some similar characteristics. The most important characteristic of the methodology is that it is customer oriented, which means to differentiate "*which activities in the corporation create value for the customer and which ones are just wasteful*". Additionally, continuous improvement should be incorporated into each phase of the method. To handle the resources at hand economically, efficiency with clear learning goals is an important corner-stone. Finally, a cyclic mode of operation has been established to maintain the flow of operation and not getting stuck into one phase.

After intense dispute with the originated model of the Lean Startup methodology, the cyclic characteristic of the build-measure-learn feedback loop is also reflected. Figure 6 shows again the developed model and additionally the phases which the interviewees have talked about.
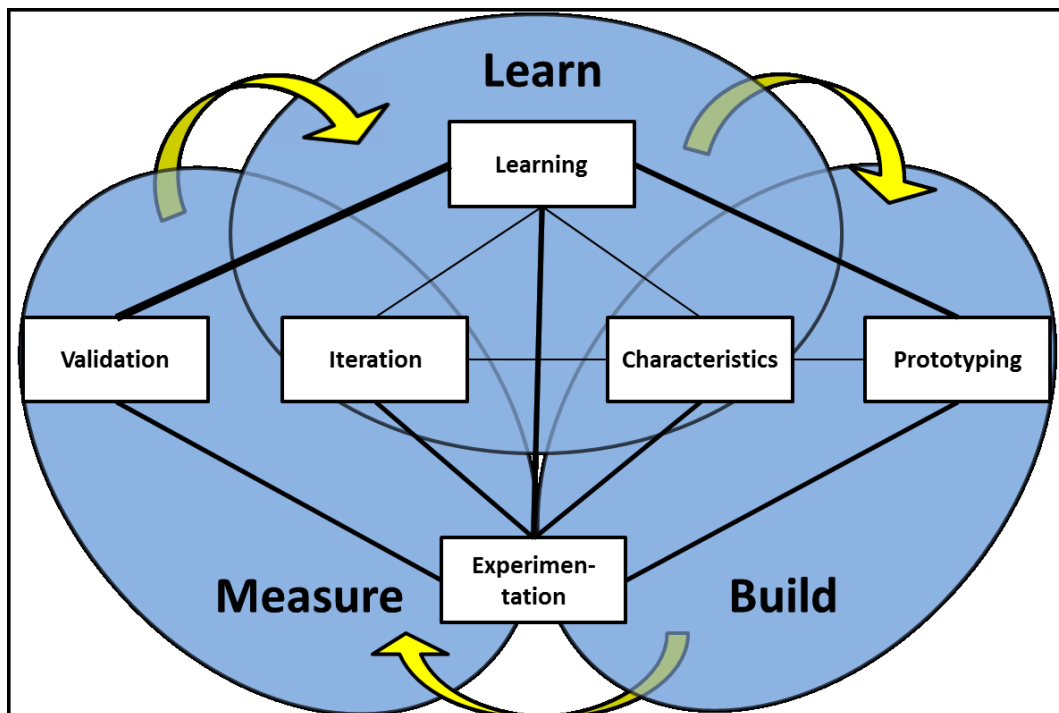

Figure 6 - Visualization of Build-Measure-Learn Feedback Loop within the Lean Startup Methodology

In a nutshell, the practiced Lean Startup approach utilizing the build-measure-learn feedback loop has been empirically validated.

Table 5 gives a more detailed insight in the elaboration of the process of concept development with further supporting quotes from the interviews.

Concept	Category	Code	Quote
C H A R A C T E R I S T I C S	Maintain Flow	Prioritization Productivity Efficiency Circle Times Speed	• *"And that brings us to another principle, managing by looking at constraints rather than make complaints, i guess a more healthy approach in the production system you would identify bottlenecks"* • *"So in other words, the fundamental cycle time is the amount of time that elapses between when we have an idea and when we have learned that the idea is promising."* • *"And the way lean startup does this is basically telling us how we could iterate the fastest way possible, using different kind of tools."*
	Cost-Efficiency	Minimize Effort Reduce Waste Risk Assessment Tackle Components by Risk Minimize Risk	• *"And then once broken down, the next principle is tackling those building blocks or those components in order by what are riskiest first. So again, for most products, building solution is not always the riskiest part. Sometimes it's actually finding customers who would pay for the product. So why not start there? And so the next principle would be, once you have broken down your vision into components parts, find what is riskiest and tackle that first."* • *"So the main idea in lean as get applied to lean startup is minimizing waste in the process."* • *" A minimum viable product could be like anything, the most important thing is that by definition minimum viable product is that version of a product or service and that lets you give the most feedback at the lowest possible investment at the time, meant that it would be the most efficient tool, artifact or object whatever you could use in order to create and made feedback based on your assumptions"*
	Continuous Improvement	Decision Based on Learning Metrics Driven Optimization Speed of Next Iteration	• *"focus on the example of how startups were using, how they apply their ideas and their methodologies and how they tried to basically build something, measure something, validate something, learn out of it and then improve, so basically continuous improvement."* • *"What you want to do is every timing of a learning goal is decide what's the the fastest way you can achieve that learning. [...] focus on the next speed through the next turning cycle not your overall speed through the learning cycle in general. "* • *"You can do this for example if you launch this feature only to 50% of your users. Or basically only 50% of the people will come to your website will see. This is one way and then by measuring the comparison of this success you say, is it now better for this 50% to experience the content yes or no. and if yes then this feature works obviously and if no, if there is no improvement in this maybe the feature doesn't work and then you need to change this feature or you can remove it again."*
	Customer-Orientation	Customer Focused No Features without Validation Customer Development Customer Discovery Create Value for Customer	• *"By learning to tell the difference between which activities in the corporation creation value for the customer and which ones are just wasteful. "* • *"So customer development is a very strong focus on validating the beginning quantitative, qualitative and the data qualitative and the build-measure-learn loop is basically a very abstract view of that but also like applied with everything else like feature rollouts and everything else."* • *"you should actually measure the feedback, to make sure that you are creating something that people want "*

E X P E R I M E N T A T I O N	Boundaries	Time-Boxing	• "So you define what you need to learn, you figure out what measurement is going to make that leaning a success. And then you only build what you need to create an accurate measurement of that whatever it is."
		Commitment to Validate an Experiment	• "So instead of putting a time box around things and putting a goal on things we were basically practicing learning, learning, learning which means every week or so, we do customer interview and then every 2 or 3 weeks or so, we got some interested in the product. they are doing a trial but they are not really moving forward and they might pay but they are not really paying and we never really put a software to tell until like 6 months after we did not have any money anymore though."
		Constraints to Experiments	
		Set Goals for Experiments	• "So then if I recap, what is really important for the whole concept of lean startup is time boxing, then the 2nd thing is that you set clear goals for your experiments which you can validate or on basis you can validate or invalidate your experiments."
	Documentation	Capture Assumptions	• "I used a lot of matrix to analyze behavior and all that site and what people are actually doing and if you are improving for our feature, this kind of stuff, and we take a load of customer interviews, we AB tested a lot, we change value proposition, we did like little smoke test, we went to customers with prototypes, like paper prototypes or mock ups and like this kind of stuff and try to get like early feedback before doing anything started."
		Define Hypothesis first	• "And within each step, each assumption have to be tested via the method"
	Execution	Run Experiments	• "Then the final step to me is really running experiments. And this is something that we do all agree on and the lean startup is the way you run in an experiment. Everything we do is an experiment and you want the experiment to be as small as possible. In the end you have a concrete goal or hypothesis that you're trying to validate or invalidate."
		Lab	• "And in order to do so, you go to a loop called the build-measure-learn loop where for each assumption you come up with an experiment. You try to run these experiments and afterwards you evaluate the results and see how this impacts your assumptions, your idea and how you need to move forward."
		Applying instead of Talking about Experiences	• " So in the case of the experiment, you really say, what are the kind of things you are trying to do right now or this might be like or this might just be note as defined like often you have your open experiment going on like you want to launch at some point and then go one or get users, alright? And so you basically want to try to narrow it down basically ask a small question, if we launch will bulk, it really ask ok what is our launch consist of, what are the hypothesis which contain it. And can we actually run smaller experiments"
	Revision	Questions	• "The good thing with lean startup and customer development is that, it's ok to double check your assumptions,"
		Testing	
		Fail	• "We test our business model all the time. So we test the product, we test the pricing, we test everything"
		Gather Data	• "And another principle is holistic measurement. In lean management they are always clear about what's the big number that the entire organization is working on. It's that one number or small set of number that we are trying to improve and that is with this idea of experimentation because you can run experiment of one small part of your process and you can make improvement of that small part but overall, it's actually detrimental to what you're doing. So, keeping a clear measure on which measure is important. "
		Measure	
		Double Check instead of quick scaling	

I T E R A T I O N	Strategy	Break Vision Down Document Strategy Document Vision	• *"What lean startup means to me is taking your big idea, your big vision and documenting that out first. And the tool of choice that I use is breaking it down into its individual components. The vision is a very big abstract concept but it can be decomposed into nine building blocks, what we call the business model canvas, or lean canvas. "* • *"capturing not just the vision but capturing the strategy that we are going to use to implement that phase"* • *"Like the startup founder has big idea and has a lot of vision and everything, and then if they build on that then they have built just that like in vanity-metrics,"*
	Operations	Build-Measure-Learn Rapid Iteration Small Chunks	• *""Now once we get that initial validation, we then go in and build and realize that demo. So we build something that can showcase that demo, and then we test it in small scale at first."* • *"Small batches are the key factor there within the flow. So flow provided two things in it, and small batches are one of them. "* • *"The first and most important step is what we call the minimum viable product or MVP. And this is simply the very first version of the product, the first experiment we want to run and begin the process of learning"*
	Adoption	Iteration around Customer / Problem Pivot Mental Leaps Change in Strategy	• *„So to go from the vision to risk and from vision to experiment sometime requires these mental leaps or jumps which are not obvious to everyone on the team."* • *"So the lean parallel to the lean production system is working in smaller batches. So if you work in smaller batches you get a number of benefits. And one of them is you basically get to see if something goes wrong and then you can make quick adaptation which is similar to agile but looks different in many production system"* • *„So if you are failing at optimization then the pivot may allow you to start optimizing again. And when you are in flow in a company, most peoples job , most people do in optimization job, and it feels good to want to keep optimizing. So usually after the pivot, things just get a lot, and everyone's just get happier. "*
L E A R N I N G	Learning	Customer Feedback Learning Goal Interviews Maximizing Learning Problem Interview	• *"In the lean startup there's a very big emphasis on maximizing learning versus maximizing just the building of the product. So it's really maximizing learning, specifically about customers and markets per unit time. "* • *"So, the first thing that I would do with any idea like that would be to do a root-cause analysis, to go and understand what the root problems are."* • *"The unit of progress for entrepreneurship is learning how to build a sustainable business and learning what the product should be, learning who the customer is, etc."* • *„But by itself a failed hypothesis is not a very viable source of learning because it will only tell you what doesn't, what is not true. But of course science is not a pursuit of the untruth, it's the pursuit of the truth. So we want to know what will work. "* • *"When measuring this, you would actually take the learning and implement this learning into the next phase of building something"*

P R O T O T Y P I N G	Prototyping	Fake Products Incomplete Products Landing Page Minimum Viable Product Proto- / Pretotype Smoke Test	• *"What we instead do is to come out with a proxy of the solution. What we usually call as a demo. It might be a screen shot, it might be a video, it might be a wireframe , or even a verbal description of what this would be"* • *" So the build is coming out with experiment, building a website, building a feature and doing customer development interviews, "* • *"So what i would do before building anything, is just to start sketching out business model, potential business model and then start talking to the customer you have in mind."* • *"So what we did, we made a small prototype so we made some carts which told the story behind the app. "*
V A L I D A T I O N	Validation	Buying Interest Concepts Customers Market Demand Pricing Problem Problem-Solution-Fit Value Proposition	• *"The assumption you have about the market, the product, the distribution channels the pricing and all of these are to be validated by real customers. "* • *"Whereas in lean methodology you try to diminish this risk because you first start talking to the customer and validating your idea and concepts before actually building the product."* • *"And right where you're basically showing version of your prototype to them and figuring out the rest of your business model more or less. And figuring out how you're going to charge for it, figuring out channel of market awareness all of these things. and basically at the end of that page you should have made customers"* • *"The first problem for me is answering the question, is this problem worth a thing? The second stage of that is basically answering the question, can we actually build that? And if we build something, can we actually solve the problem for the customer. "*

Table 5 - Aggregated Coding Table: Lean Startup Methodology

4.4. Last but Not Least, the Outliers

For the sake of completeness, the remaining two concepts are presented in this section. Table 6 gives an overview about the composition of those concepts.

Concept	Number of Categories	Number of Codes	Number of Quotes
Risk	1	6	12
Product Development	1	5	24
Sum	2	11	35*

*Total number of quotes is less than the sum of quotes for all concepts because of co-occurrences of quotes

Table 6 - Concept Composition: Risk and Product Development

Even though „Risk" and „Product Development" do not have any strong co-occurrences with the other concepts, they still emerged as important elements. Risk and uncertainty is present in almost every new business.

"You don't know exactly who your customers are going to be, and you don't know what your product needs to be to fit their needs."

Risk is something that needs to be accepted and must not be ignored by the entrepreneur. Lean Startup as methodology should help those people to better deal with uncertainties and finally build products that satisfy customer needs. In other words, Lean Startup is suited for situations of high uncertainty and rapid iteration, which means "*you would get a true advantage from it the more those criteria apply*".

"Product Development" can be seen as the goal of Lean Startup to "*bring new products to market and maximize their odds of success*". Thus, it dominantly appeared throughout the interviews.

"Lean Startup is a method for a starting company and to actually develop a product for customers."

Both concepts determine the boundaries of this study and the Lean Startup methodology. Practitioners that apply the methodology face high risks to build products or services that people are willing to pay for. Lean Startup starts within uncertainty and leads to a prototype that qualifies for conclusive product development activities and market commercialization. In Table 7 further quotes and the corresponding codes can be found.

Concept	Category	Code	Quote
PRODUCT DEVELOPMENT	Product Development	Building Products Get Products to Market Product-Market-Fit Starting a Business	• *"So the second step there is to really work towards defining the solution. And that to me is the second process, the second stage that we go through. Because once you understood the customers, their problems, we then start to define the solution. "* • *"And the third thing would be how can we maximize the reach of that particular product, how can we scale it"* • *"I would not say develop an idea. I think it's to start your business. Like lean startup is a method to, like a half structure for a starting company and to actually develop a product for customers."* • *"And if you have this, you have reached product-marked-fit and then you can scale your company. The next step is about building your organization and scaling your marketing and really testing what works and then you end up with a big corporation."*
RISK	Risk	Channel Risk Market Risk Problem Risk Product Risk Revenue Stream Risk Uncertainty	• *" So to me the problem risk which is in many ways crafted as the product risk, is very critical"* • *"The second risk that I put in that category to go and at least think about deeply, would be how would you reach those customers at enough level so that you could build a business model around what you're doing"* • *"the revenue stream risk which is how are you going to make money with this business model. "* • *"I define a product as the risk that the product cannot be built and in most industries the product can be built because the technology existences are sufficient."* • *"So entrepreneurs can't use that whole system of management because we can't make forecast, because our uncertainty is too high."* • *"In entrepreneurship, we faced too many uncertainties and know who the customer is or what the product should be."*

Table 7 - Aggregated Coding Table: Risk and Product Development

5. Discussion

Having laid the foundation in the theoretical anticipation section and elaborated on the phenomenon of Lean Startup and its elements in the previous chapter, the following paragraphs will consolidate and compare those theories. In order to compare different approaches regarding entrepreneurial action in general, a framework for discussion has to be established. This framework should be able to answer the important questions: "Where do those actions come from?", "How are those being implemented?" and "What do those create?" (Bucherer, Eisert, & Gassmann, 2012). Moreover, the developed framework makes use of the general entrepreneurial process (Shane, 2003) and also includes main elements for venture creation (Gartner, 1985). Inspired from the framework by Bucherer et al. (2012), Figure 7 illustrates the three phases of the entrepreneurial process and shows six elements that should serve as basis to discuss the different approaches to entrepreneurial action outlined in this paper.
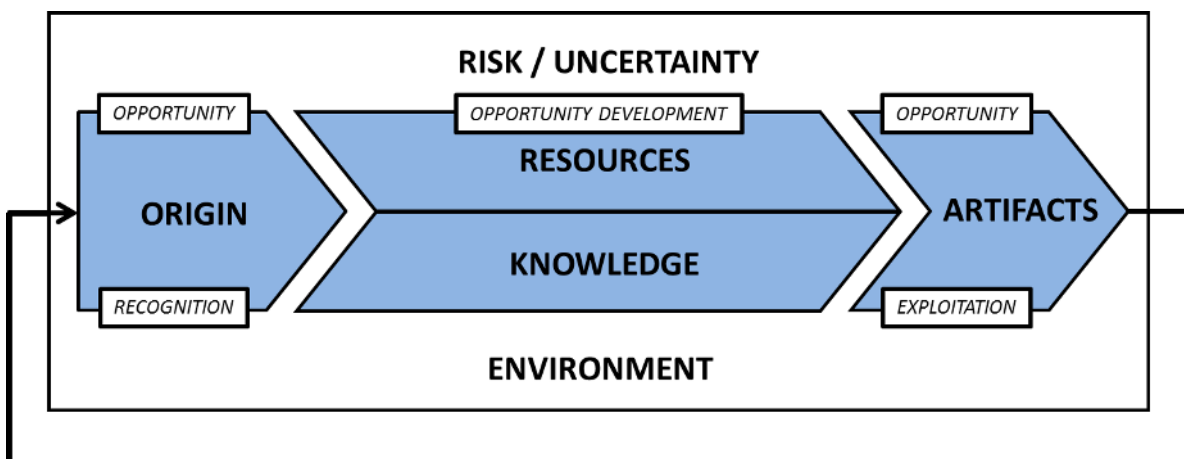

Figure 7 - Framework of Discussion

The first element deals with the origin of action. That includes events or circumstances that lead to the recognition of new opportunities. Secondly, resources, like materials, costs, people, will be considered that are need during the opportunity development phase and also how those are going to be used to deliver customer value. Thirdly, it is shed light on the acquaintance and acquisition of knowledge as important asset of a venture. Following, the characteristics of the resulting artifacts are being discussed in more detail. Furthermore, there are two overarching elements, namely environment and risk / uncertainty that influence all phases of the process. In those theories about entrepreneurial action the enactment with the environment such as customers, markets or competitors plays enfolds differently. Finally, dealing with risk and managing uncertainty is handled in a different way by each literature

streams. Table 8 summarizes the main aspects of each research field regarding the proposed elements of the framework for discussion.

The following discussion will be constructed around the phase model and the containing elements according to Figure 7. Having in mind the elaboration about theory development, this paragraph will not only cover the "what" and "how" Lean Startup is different, but also why it is important supported by further quotes of the interview transcripts.

Within the first phase of opportunity recognition, Effectuation entirely builds upon the available means of the entrepreneur and the surrounding. Bricolage in contrast, builds upon resource scarcity and thus is a reaction on constrained environmental changes. Lean Startup takes a broader view and generally starts with business assumptions which can be based upon markets, customers, or even technologies. Similar starting points can also be found in new product development and learning literature. Changes in environment and also the active search for new trends and latent – not yet even visible – customer needs are valuable input in order to discover potential business opportunities. On top of that, Lean Startup advocates doing customer development, "*like validating your assumptions before you jump ahead*" and also even before any product is existent.. That is especially important since "*assumptions are based on almost nothing or mostly your own opinion and own experiences*". This aspect distinguishes Lean Startup drastically from previously mentioned models from recent entrepreneurship theory.

The next phase of the process is opportunity development, which means getting active in shaping and working on the solution in order to come up with a viable business model. The Effectuation model does not any concrete guideline except from focusing on the affordable loss instead of predicted returns to avoid setbacks or liquidity problems. In the Bricolage approach, resource are limited, hence recombination and modification of existing resources is advocated. By contrast, Lean Startup introduces the idea of prototyping which can also be found in the literature stream of innovation management and new product development, as well as in agile software development. Prototyping allows quickly coming up with a proxy of the solution and getting feedback. What Lean Startup has in common with the entrepreneurial process is that resources should be used efficiently and not dissipative. The literature about learning adds further insights. It can be distinguished between two types for learning, namely direct and indirect, that consume resources including time and money differently. Considering learning sequences as a combination of direct and indirect learning techniques, it is important to understand that each is useful in a different context of time and experience.

Learning bridges the gap to the second element within the phase of opportunity development, the acquaintance and acquisition of knowledge. The Lean Startup methodology is centered on "*maximizing learning, specifically about customers and markets per unit time*". On the contrary, Sarasvathy did not explicitly deal with that issue in her Effectuation model and in Bricolage the idea of trial-and-error learning is used aligned with new combinations of resources. It is obvious that the domain of marketing influenced the process models of new product development researcher, because methods like interview feedback, customer observation and also literature research can be found in it. Those methods also found their way into the Lean Startup methodology, especially through the concept of customer development.

Each entrepreneurial undertaking comes along with risk and uncertainty. In order to reduce uncertainty, pre-commitment and the formation of alliances is demanded by effectual researcher. Additionally, the focus is on controllable aspects instead of attempts to forecast future events. In the field of new product development, the product vision is important, hence product championing by one responsible product manager has been proven to support marketing activities. Moreover, testing the commercial viability is a fundamental milestone. In Lean Startup the aspect of risk is tackled by running experiments with clear learning goals, which can also be found in the learning literature. Those experiments follow scientific procedures and are executed using the build-measure-learn loop.

Moving on to the next element, the experiments of the Lean Startup methodology are not conducted under laboratory circumstance, but in the real environment of the business to validate the initially hypothesized assumptions. In other words, Lean Startup makes use of its environment by a strong customer focus. Taking a look into the Effectuation literature, only an interaction component is mentioned. Bricolage scholars elaborate by clarifying that interaction with markets and different types of people is important to find a solution that attracts future clients. Testing ideas directly with people and finding lead users is the major strength of new product development models. Those practitioners aim to identify latent customer needs by embodying a market and entrepreneurial orientation of the firm. Engaging with the surrounding environment enables startup companies to get feedback quickly and continuously adjust and improve its services or products.

Finally, the artifact as resulting manifestation of the opportunity development phase will be investigated. Since Lean Startup is influenced by agile software development and lean manufacturing, one main aspect is an iterative proceeding in small chunks. On top of that, the

idea of a minimum viable product, which aims at testing business assumptions in experiments, is essential and does not demand a perfect product instantly. A similar concept is also found amongst new product development researchers as preliminary design or described as "making do" by Bricolage scholars. Further, all three have in common that they allow the final product or service to be co-developed and adjusted or improved over time. From the organizational learning stream of literature's point of view, it is added that a result of the process of learning should always be a shift in behavior or knowledge. In other words, what emerges from the opportunity development phase can also be intangible. Again, Sarasvathy is not that explicit in the Effectuation model. It is said that new goals can be derived from the previous actions.

In a nutshell, by applying the proposed framework, Lean Startup fills gaps that are not fully covered in previous models for entrepreneurial action. Especially in the phase of opportunity development, the Lean Startup methodology gives more actionable advice in running experiments to learn about the environment and challenge pre-defined business assumptions. Being in accordance in many aspects with presented theories, Lean Startup is not completely new but adds valuable components due to its various influences. It has been shown that the ideas seized by other research domains, are aligned with entrepreneurship and innovation management related theories.

Reconsidering criteria for a good theoretical contribution, what, how and why questions have been answered in the last paragraphs. Moreover, Lean Startup itself is not only consistent among all interviewees but also aligned to existent entrepreneurship modes of action. Arguments for newly or elaborated elements can be found in adjacent literature streams and all have been proven useful to the interview participants. Summarizing, the described methodology of Lean Startup can be considered as valuable theoretical contribution and extension to entrepreneurship research.

	Effectuation	Bricolage	Organizational / Entrepreneurial Learning	New Product Development	Lean Startup
Origins of action	• **Available means** (Who I am?; What I know?; Whom I know?; What I can do?) *(Sarasvathy, 2001, p. 253)* • **Exploitation of contingencies** *(Sarasvathy, 2001, p. 252)*	• **Resources at hand** (need because of scarcity) *(Baker & Nelson, 2005, p. 336)* • Environment with new challenges or problems that do not provide new resources *(Baker & Nelson, 2005, p. 329)*	• Adaptation to changing markets and environments *(Hurley & Hult, 1998, p. 43; Lumpkin & Lichtenstein, 2005, p. 464)*	• Identification of trends *(Hippel, 1986, p. 798)* • Latent customer needs *(Narver et al., 2004, p. 342)*	• Business assumptions (market, customer, problem, solution)
Resources	• **Affordable loss** *(Sarasvathy, 2001, p. 252)* • Develop new means (expanding cycle of resources) *(Moroz & Hindle, 2011, p. 25)*	• **Recombination of resources** (modification for new purpose) *(Baker & Nelson, 2005, p. 335)*	• Direct learning = time-consuming • Indirect learning = easy and efficient *(Bingham & Davis, 2012, p. 26)*	• Prototyping *(Hippel, 1986, p. 803; Veryzer, 1998, p. 316)*	• **Prototyping** • Cost efficiency
Knowledge		• Trial and Error / Improvisation *(Baker & Nelson, 2005, p. 341; Garud & Karnøe, 2003, p. 282)*	• Growth process based on prior actions *(Lumpkin & Lichtenstein, 2005, p. 455)* • Trial and Error learning *(Bingham & Davis, 2012, p. 28)*	• Interviewing = Feedback *(Hippel, 1986, p. 793; Narver et al., 2004, p. 337)* • Observation / Visits / Literature *(Narver et al., 2004, p. 336)*	• **Learning**

Environment	• Interaction with other people *(Moroz & Hindle, 2011, p. 25)*	• Interactions with markets and different types of people (designers, workers, producers, users, policy makers) *(Garud & Karnøe, 2003, p. 296)*	• Market- and entrepreneurial-oriented *(Hurley & Hult, 1998, p. 43)*	• Lead User *(Hippel, 1986)* • Test with customers *(Veryzer, 1998, p. 315)* • Market-orientation *(Narver et al., 2004, p. 337)*	• **Validation** • Customer development / orientation
Risk / Uncertainty	• **Strategic alliances** and pre-commitment to reduce uncertainty *(Sarasvathy, 2001, p. 255)* • **Controlling unpredictable future** (focus on controllable aspects) *(Sarasvathy, 2001, p. 252)*		• Experimental learning *(Bingham & Davis, 2012, p. 28)*	• Product championing with vision for product *(Narver et al., 2004, p. 337)* • Test commercial viability *(Veryzer, 1998, p. 315)*	• **Experimentation**
Artifact resulting of action	• Develop new goals (converging cycle of transformations of the artifacts) *(Moroz & Hindle, 2011, p. 25)*	• **Making do** (artifacts do not have to look perfect) *(Baker & Nelson, 2005, p. 334)* • Continual adjustment *(Baker & Nelson, 2005, p. 343)* • Co-shaping *(Garud & Karnøe, 2003, p. 295)*	• Shift in behavior or knowledge *(Lumpkin & Lichtenstein, 2005, p. 461)*	• Preliminary designs *(Veryzer, 1998, p. 315)* • Cyclic and co-development *(Veryzer, 1998, p. 316)*	• **Iteration** • MVP • Continuous improvement • Co-development

Note: phrases in bold represent the wording of the characteristics of each model how it is described in literature

Table 8 - Summary of Literature Streams and Research Findings

6. Conclusion

6.1. Major Contribution of this Work

Lean Startup as methodology has only been known to and applied by practitioners. Its popularity increased rapidly, hence an interest or a mystery for the academic community could be assumed, justifying the research project to shed light on the phenomenon (Alvesson & Kärreman, 2007). During the research, Lean Startup was empirically investigated using phenomenological interviews in order to better understand its essence. Having solved the mystery of a new phenomenon with its elements, Lean Startup has been compared with recent literature findings. The main takeaways are as presented.

First of all, the understanding of Lean Startup amongst practitioners, professionals and authors is very homogenous. The conducted interviews empirically confirm that Lean Startup is a practical methodology suited for situations of high uncertainty and ambiguity. Secondly, the essence of Lean Startup is a combination of adaptive learning and quickly developing prototypes to test market viability. A cyclic course of action, build-measure-learn, emerged as appropriate mean to apply the methodology. Thirdly, Lean Startup has been compared to entrepreneurial process theories. Even though several similarities can be noticed, Lean Startup adds and synthesizes various elements from different research domains, for example marketing, organizational learning and product development.

In order to answer the first research question about the elements of Lean Startup, this research confirms the components of the build-measure-learn feedback loop. Additionally, the importance of prototyping in the build phase, as well as validation in the measure-phase appeared as important concepts. Experiments have clearly emerged as useful in the transition from building to measuring. Eventually, the learning-phase has been proven to be the most important take-away from the Lean Startup methodology.

The discussion dealt in great detail with the second research question about the contribution of Lean Startup to the scientific theories about the entrepreneurial process. It turned out that learning is not only the central element in the Lean Startup methodology, but also a key contribution to theories like Effectuation and Bricolage. Besides, Lean Startup proposes an employable approach to reduce uncertainty in the process of opportunity development by iteratively working towards the desired solution.

6.2. Theoretical and Managerial Implications

The main theoretical contribution of the Lean Startup methodology to existing theories of entrepreneurial action like Effectuation and Bricolage, is adding the element of running experiments and stressing the learning aspect of the entrepreneur during the journey of starting a company. The focus on experimentation and learning instead of business planning has been challenged recently and this paper gives evidence that in practice there are camps that support this point of view (Brinckmann et al., 2010). Furthermore, the given research paper offers another alternative approach for a process of entrepreneurial action and supports the idea of entrepreneurship being understood as method (Sarasvathy & Venkataraman, 2011; Venkataraman, Sarasvathy, Dew, & Forster, 2012). In addition, Lean Startup incorporates many aspects that can already be found in the literature stream of innovation management and new product development. Maybe the combination of both areas offers the potential for new insights that both camps could benefit from.

Besides, the discussion showed that the elements that practitioners use while applying the Lean Startup methodology can be backed up with findings from empirical research. Since the understanding of Lean Startup is very homogenous, it can be assumed that it is has been clearly communicated and thus be adopted easily by venture managers. The emerged concepts and categories also offer a good guidance for being put into place, while leaving space for adoptions to specific business needs.

All in all, the study showed that the interplay of theory and practice can offer interesting insights or new directions for theory development (Schatzki, 2005). Quantitative studies are predominantly carried out in entrepreneurship research and in recent times, qualitative studies in high-class journals are increasing (Bluhm et al., 2011; Goulding, 2005). Specifically for the field of entrepreneurship, a phenomenological research approach can be used to dig deeper in the actual doing of entrepreneurs by using qualitative methods such as participant observation, interviews and archival data in small firm studies could be noticed (Cope, 2005b; Lowes & Prowse, 2001; Shaw, 1999).

6.3. Limitations and Further Research Directions

This research project in the context of an academic master thesis must have limitations. In the consequent paragraph the most important ones are mentioned as well as ideas on future research directions.

My ambition was to increase the scholarly understanding of the Lean Startup methodology. Therefore, I assume that a researcher bias is definitely included in the work, especially because data analysis has only be done by myself (Bluhm et al., 2011; Lowes & Prowse, 2001). Furthermore, during the process of conducting the interview, it has been tried to avoid leading questions, but cannot be excluded with all possibility of doubt (Giorgi, 1994; Kvale, 1983). Due to limited time and availability of participants only a limited number of interviews could have been conducted. All interviewees were also familiar with the interpretation of Eric Ries and his view on Lean Startup. Concluding, the generalizability could be questioned (Hycner, 1985). The interpretation and sense-making was based on factors of the co-occurrence matrix. Similar to any correlation coefficient examination from a statistical point of view, those methods only add up when a huge amount of data has been used. In this work, it was used to discovery evidence for further subjective interpretation in a small sample size (Berglund, 2006; Friese, 2011; Konopásek, 2008). Finally, making use of data triangulation by including also further media and material that deal with new topics, such as blogs, forums or observation techniques, could have enriched the findings on the phenomenon of Lean Startup.

Finally, I believe that the given work laid a solid foundation for a first attempt to investigate on the subject of Lean Startup in comparison to established models in entrepreneurship research. Nevertheless, future work could focus on the effectiveness of the Lean Startup methodology by making use of a quantitative research approach. Further, light could be shed on pre-requisites or industry fields most suited for that methodology. Eventually, a study concerning decision making from a managerial point of view could be of interest for theory and practice.

7. References

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8. Appendix – Interview Guideline

Overview

Topic   Lean Startup
Time   30-45min per interview
Medium   Skype with audio recording

Questions

1. Opening the conversation

    a. Introduction of myself

    b. Motivation and goals of the research

    c. Ethical guidelines and clarification of audio recording

2. Please introduce yourself, mentioning what you are doing and what is your point of intersection with Lean Startup.

3. From your personal experience, how would you describe Lean Startup?

    a. Elements and actions involved

    b. Methods used

    c. Resulting artifacts

4. After you made clear your understanding of Lean Startup, do you remember any specific situation when you used Lean Startup principles in a very demonstrative way?

5. Do you mind elaborating on that specific situation when you applied Lean Startup

6. How did you apply those methods in particular, maybe you could illustrate it with examples?

7. What advantages do you personally see compared to other product development practices? Can you also think about disadvantages of that methodology?

8. For what kind of use-case are Lean Startup principles applicable?

Interview Participants

	Name	Country	Profession / Qualification as Interview Prospect	Status
Authors	Eric Ries	USA	Author of the book "Lean Startup"	Interview conducted
	Ash Maurya	USA	Author of the book "Running Lean"	Interview conducted
	Alex Osterwalder	Switzerland	Author of the book "BusinessModelGeneration"	Interview conducted
	Brant Cooper	USA	Co-Author of the book "A handbook for Customer Development	No meeting could have been scheduled within the time frame
	Patrick Vlaskovits	USA	Co-Author of the book "A handbook for Customer Development"	Did not respond to mail contact
	Steve Blank	USA	Author fo the book "Startup Owner's Manual"	Did not respond to mail contact
Practitioners	Salim Virani	England	Founder of LeanCamp	Interview conducted
	Kees van Nunen	Netherlands	Founder of SNTMNT	Interview conducted
	Lukas Fittl	Austria	Partner at Spark 59	Interview conducted
	Andreas Klinger	England / Germany	Founder of lookk.com.	Interview conducted
	Trevor Owens	USA	Founder of LeanStartupMachine	No meeting could have been scheduled within the time frame
	Tor Grønsund	Norway	Professor of Entrepreneurship and LeanStartup Mentor	Interview conducted